ImmunoPrecise Antibodies Ltd
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Ticker (Exchange)	(IPA-NASDAQ)
Recent Price (05/18/2022)	$4.89
52-week Range	$3.51 - 16.47
Shares Outstanding	23.5 million
Market Capitalization	$115.1 million
Average volume	21,100
Insider Ownership +>5%	0.88%
Institutional Ownership	6.44%
EPS (Qtr. ended 01/31/2022)	($0.20)
Employees	102

IPA (NASDAQ) One-year Stock Chart

BUSINESS MODEL SUMMARY

Contract Research Organizations (CRO) Services

Talem Therapeutics

Active Preclinical Pipeline

Source: ImmunoPrecise Antibodies Ltd

COMPANY DESCRIPTION

ImmunoPrecise Antibodies Ltd ("IPA" or "the Company") is a full-service **contract research organization (CRO)†** for therapeutic **antibody** discovery and development. The Company's technology suite supports the biopharmaceutical industries in their pursuit to discover and develop novel, therapeutic antibodies against various disease targets. IPA is transforming the conventional, multivendor, product development model by bringing innovative, high-throughput, data driven discovery services to its partners. IPA has proven its ability to produce well characterized, functional therapeutic lead candidates rapidly and cost-efficiently. In addition to its CRO services, IPA's wholly-owned subsidiary, Talem Therapeutics LLC ("Talem"), offers research and development (R&D) to support its internally-owned and partnered therapeutic asset development. Talem is working towards building an intellectual property (IP) estate and portfolio of physical assets through internal research and collaborations, and is moving into **preclinical** analysis and functional studies with roughly half a dozen later-stage preclinical candidates. This portfolio contains novel therapeutic antibodies and vaccines in areas such as infectious disease (i.e. **SARS-CoV-2**), cardiovascular pathology, neurology, immuno-oncology, inflammation, and rare/specialty diseases. With headquarters in Canada, the Company has offices in the U.S. and Europe. Having gone public in 2016, IPA is dual listed on both the NASDAQ and the TSX Venture Exchange (TSXV) under the symbol "IPA".

KEY POINTS

- IPA is positioned as a leader in human therapeutic antibody discovery and development, disrupting the conventional multivendor **drug discovery** model by modernizing the antibody lead candidate selection and downstream development processes.
- The Company is addressing one of the greatest challenges in generating new therapies, the lack of access to rigorous and innovative technologies (to serve a $30 billion market and growing).
- IPA's strategy is backed by expanding trends as pharmaceutical/biotechnology companies look to outsource research, improve efficiency, lower development costs, increase turnaround time, and gain access to integrated expertise.
- The Company services over five hundred clients, including over 70% of the top 20 global pharmaceutical companies.
- One of Talem's most advanced pipeline programs, TATX-03 (anti-SARS-CoV-2 PolyTope® monoclonal antibody cocktail), is a fully human, multi-membered **monoclonal antibody** cocktail in development for the potential prevention and treatment of SARS-CoV-2 infection. Cocktail therapies are widely believed to be a promising approach to fight the SARS-CoV-2 virus. TATX-03 has shown 100% efficacy in well-established animal models and is holding up to all tested variants of concern.
- IPA closed a public offering in February 2021, raising gross proceeds of $25 million to further strengthen its balance sheet and create further runway to achieve its strategic goals.
- As of January 31, 2022, the Company held cash of C$33 million.

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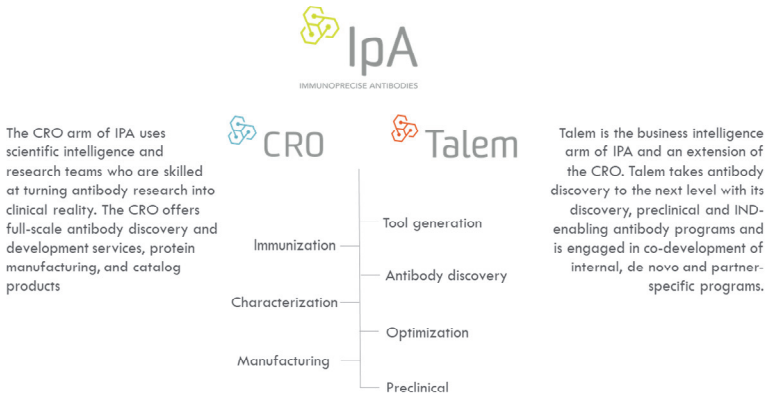
Executive Overview

ImmunoPrecise Antibodies Ltd ("IPA" or "the Company") is a full-service, contract research organization (CRO) supporting the biopharmaceutical industries who employ outsourced research for **clinical trial**-related activities on a contracted basis. As a disruptor of the traditional multi-vendor drug discovery model, the Company's CRO services are intended to provide high quality therapeutics in a short period of time based on rigorous science and innovative technologies. This includes, but is not limited to **antigen** design and modelling, immunization, antibody discovery, antibody characterization, lead optimization, antibody engineering, and manufacturing—with these services encompassing roughly 95% of IPA's revenue.

There is a tremendous amount of pressure on pharmaceutical and biotechnology companies to outsource work; however, there are limited numbers of capable CROs with technologies demonstrating success against truly challenging targets and diseases. Many pharmaceutical and biotechnology companies outsource their work to between ten to thirty different companies to produce a new therapeutic—a point in which vendor consolidation becomes incredibly challenging. IPA is working to transform the traditional, multi-vendor, product development approach by bringing innovative, high-throughput technologies to its partners, and incorporating the advantages of diverse antibody collections with its therapeutic antibody discovery and development suite of technologies, and enabling this process to occur *all under one contract*.

In addition to providing outsourced research on a contract basis to clients, the Company has a wholly-owned subsidiary, Talem Therapeutics LLC ("Talem"), which offers research and development (R&D) to support its internal and partnered therapeutic discovery programs, working towards building an intellectual property (IP) estate and portfolio of physical assets through research and collaborations. This subsidiary is focused on next-generation, clinically fit, monoclonal therapeutic antibodies to target multiple disease indications, where opportunities exist for both partnerships as well as out-licensing. Talem is focused on approximately half a dozen candidates, which are moving into preclinical analysis and functional studies. While investing in developing and licensing antibody technologies and related intellectual property assets, these investments have been accompanied by internal discovery programs focused on novel therapeutic antibodies and vaccines in areas, including infectious diseases (i.e. SARS-CoV-2 [the potentially deadly virus that can lead to COVID-19]), cardiovascular pathology, neurology, immuno-oncology, inflammation, and rare/specialty diseases, and moving these candidates into preclinical analysis and functional studies. Within SARS-CoV-2, the Company is employing the complementary strengths of each discovery platform to uniquely design products to protect against and treat current and emerging variants of SARS-CoV-2. Figure 1 summarizes the Company's business model, followed by brief descriptions of each area of development. Greater details of each subsidiary are provided within the Core Story of this Executive Informational Overview (EIO) on pages 15-37.

Figure 1
BUSINESS MODEL SUMMARY



Source: ImmunoPrecise Antibodies Ltd.

Contract Research Organization (CRO)

IPA has gained recognition over the past few years as a leader within the **biologics** CRO space with "IPA Canada" and "IPA Europe," both designated as approved CROs for the world's leading **transgenic animal** platforms. IPA's catalog of cutting-edge technologies provide for end-to-end services in antibody therapeutics—beginning with the initial idea and identification of a therapeutic target, all the way through to the preclinical process.

The Company's proprietary technologies allow for fast and scalable production of **recombinant proteins** and antibodies, complemented by antibody humanization, de-risking and **affinity maturation**. Antibodies can be manufactured from **hybridomas** (a method for producing identical, "monoclonal" antibodies in large quantities) or **recombinantly**. Depending on the antigen, the Company can generate synthetic **peptides**, recombinant proteins, antibodies or antibody fragments (for anti-idiotypic projects), cell lines suitable for immunization, or plasmids for genetic immunization. Guided by the use of the final product (therapeutic, diagnostic, or research), IPA's target analysis enables researchers to design a customized lead antibody campaign, which could consist of different strategies including optimized immunization routes in different species.

The Company holds many immunization technologies to deliver antibodies for the intended application with customized production of quantity and quality. Depending on the target analysis, IPA offers the selection of suitable antibody discovery approaches, including species/strain selection for immunization (e.g., mice, rats, rabbits, chickens, llama, transgenic animals) and preferred discovery technology (including hybridoma, B cell selection, and phage display). IPA does much of the work with multiple different species and strains of animals, which is unique to the Company and enables them to generate a much more diverse panel of drugs (with the majority of its competitors not offering this service). These immunization methods are tailored to the specific project and customer needs. For example, using its advanced hybridoma-, phage library-, or **B cell** selection technologies (B cell Select® and DeepDisplay™ platforms, as further described on pages 23-24), IPA is able to screen from any species and tissue sample to identify antibodies.

A summary of the key elements involved in IPA's antibody discovery process is provided in Figure 2.

Figure 2
ANTIBODY DISCOVERY

Source: ImmunoPrecise Antibodies Ltd.

In particular, the Company's B cell Select® technology has the potential to develop antibodies from any species (including humans) as well as from any suitable tissue, allowing for the generation of antibodies from samples not possible using other methods. These services provide for a broad range of therapeutically relevant protein families, including **G-protein-coupled receptors (GPCRs)** and other challenging, membrane-spanning proteins. The B cell Select® platform enables antibody screening directly from B cells, accelerating the analysis of a more diverse set of antibodies for faster, deeper screening versus traditional technologies. By interrogating isolated B cells, IPA is able to analyze the DNA sequences representing the full antibody repertoire from an organism with little manipulation. Furthermore, the B cell Select® technology takes place early in the antibody development process, allowing for the rapid selection of top candidates, which can dramatically increase the success rate of antibody discovery. The platform is further able to harnesses the power of the immune system to generate natural pairing of the antibodies produced by selected B cells.

IPA's phage display approach is based on building custom immune libraries from multiple species, including transgenic animals, or the selection of antigen-specific recombinant antibody fragments from the Company's proprietary, pre-made human or llama phage libraries. These pre-made libraries have been made from human autoimmune-diseased patient and naïve (scFv) repertoires, as well as from naïve llama (VHH) repertoires. DeepDisplay™ custom immune libraries can be prepared from blood, spleen, lymph nodes, and bone marrow of immunized animals or blood from humans and capture the entire immune repertoire for panning, rescue, and identification of unique antibodies with pre-specified characteristics. Phage display is an advanced technology and allows IPA to express antibody fragments in bacteria or rapidly reformat into any given Immunoglobulin (Ig) format, such as full-size IgG of various isotypes, bispecific antibodies, Fc mutants to modify effector functions, or chimeras with Fc regions from different species.

Manufacturing Plant

IPA's protein expression technology, rPEx®, is designed to deliver fast and large-scale production of recombinant proteins and antibodies for research and non-clinical applications. Antibodies can be manufactured as hybridoma suspension in a bioreactor, or recombinantly in a transient production system or with stable cell lines. With a track record of successfully producing complex proteins and antibodies in a variety of formats (such as Fc-fusion proteins and bispecific antibodies), and from a range of mammalian cell type, the Company offers gram scale production with low endotoxin levels.

DNA-RNA Manufacturing Facility

In addition to work that has been invested into its protein-based manufacturing, IPA has employed a well-known and respected expert to help design a 6,204 square meter high-capacity manufacturing facility, capable of processing approximately 50 **current Good Manufacturing Practice (cGMP)** batches of plasmid **deoxyribonucleic acid (DNA)** per year. DNA can be used in many applications, including the delivery of therapeutics and vaccines, in a fraction of the time when employing proteins, gene therapy, cell-based therapies, and viral vector production, and is the starting material for ***in vitro*** **messenger RNA (mRNA)** production. This facility design includes a dedicated mRNA manufacturing suite for RNA-based therapeutics and vaccine development. IPA has completed the engineering plans and budget and is in the process of applying for funding which, if received, could catalyze their manufacturing goals. This would enable client and partner research to continue longer with IPA through the development of clinical use products, while also providing a less recognized but rapidly advancing field of therapeutic antibody delivery using mRNA, relying on a clinical manufacturing process that greatly reduces manufacturing times compared to traditional methods currently used by most today.

CRO Partner of Choice to Approximately 500 Clients Worldwide

There is a growing trend where pharmaceutical and biotechnology companies are increasingly relying on CROs due to the improved development efforts, decrease in turnaround time, and access to greater expertise. The Company is able to provide its approximately 500 worldwide customers, including over 70% of the top 20 pharmaceutical companies, with:

- The ability to customize projects to optimize antibody diversity and support clinical success, with expertly integrated capabilities throughout North America and Europe;

- Extensive options for customizable services and deliverables that eliminate the need for additional vendors; and

- Scientific excellence and innovative technologies that are a proven combination for success, where thousands of programs have already been completed.

Talem Therapeutics

While CRO services are currently the primary focus of IPA's business activities, the Company's wholly-owned subsidiary, Talem Therapeutics, supports its internal and partnered therapeutic discovery programs. Talem was formed to build an intellectual property (IP) estate and portfolio of physical assets focused on the discovery and development of next-generation, clinically fit, monoclonal therapeutic antibodies to target multiple disease indications in (emerging) infectious diseases, neurology, immuno-oncology, inflammation, and rare/specialty diseases. Using the Company's proprietary antibody discovery platforms and innovative (characterization) technologies, Talem aims to accelerate novel, high-value, therapeutic antibody treatments to the clinic, where it has performed (and expects to continue to perform) partnerships and out-licensing.

The Company is working to gain insight into the functional diversity of its lead molecules to determine their specific, but different clinical applications. For specific assets developed through Talem, the majority of the novel molecules' commercial rights are completely unencumbered, which could provide for upside on the commercial end across a class of assets, including monotherapies and cocktail therapies, as well as across multiple disease indications.

Talem is moving into preclinical analysis and functional studies with approximately half a dozen later-stage candidates in its pipeline. The Company believes its potential first-in-class/best-in-class antibody for **Atherosclerosis Cardiovascular Disease (ACVD)** targeting ALK1, called TATX-21, holds tremendous promise and is currently evaluating its ability to directly interfere with low-density lipids (LDL) uptake by ALK1 *in vitro*. In addition, Talem announced in April 2021 that it had advanced development of a candidate panel of vetted, novel, therapeutic antibodies into formal lead candidate characterization, collectively referred to as TATX-112. Currently lead selection for the anticipated different clinical application is ongoing, thereby nominating molecules which individually serve different mechanisms of action. TATX-112 is a potential first-in-class therapy with unique subsets of antibodies targeting cancer and neurodegenerative diseases (including Alzheimer's) targeting TrkB. Talem is further continuing development efforts of its other potential products leveraging its pipeline of highly differentiated therapeutic antibody programs for the possible treatment of various disease areas, including heart disease, inflammation, infectious diseases, and cancer.

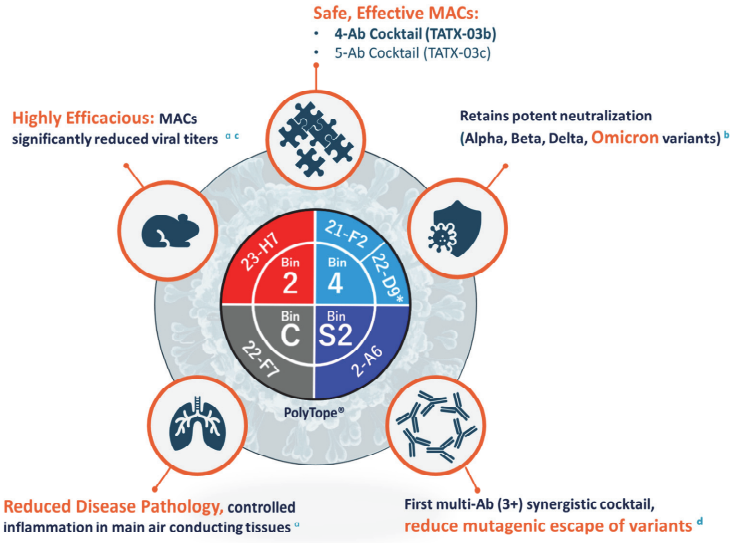
The Next Generation of SARS-CoV-2 Therapies

Since January 2020, Talem has been engaged in SARS-CoV-2 research. One of its most advanced development programs, TATX-03 (anti-SARS-CoV-2 PolyTope® monoclonal antibody), is a fully human, synergistic, rationally designed, antibody cocktail containing potently neutralizing antibodies against non-overlapping **epitopes** on SARS-CoV-2. The Company's SARS-CoV-2 PolyTope® monoclonal therapies are designed to protect against mutagenic escape with an emphasis on efficacy for every patient, variant, and strain of SARS-CoV-2, and have been developed with the goal of sustainable efficacy as the virus evolves, combining broadly characterized, neutralizing and synergistic antibodies that exhibit diverse epitope coverage.

In early March 2021, the Company announced details of its development efforts for this therapy, which may be used as a prophylactic treatment for high-risk patients. Cocktail therapies are widely believed to be a promising approach to fight the SARS-CoV-2 virus. The strategy of multi-antibody cocktails is believed to be more crucial now with the surge of new variants of concern and breakthrough cases (Figure 3, page 7).

Figure 3

POLYTOPE® - MULTI-AB COCKTAILS AGAINST SARS-COV-2 AND VARIANTS OF CONCERN (VOCS)
MULTI-ANTIBODY (AB) COCKTAILS (MACS) THAT CONSIST OF EITHER 4-ABS (TATX-03B) OR 5-ABS (TATX-03C)



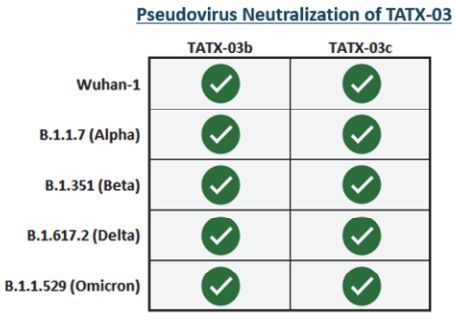
Source: ImmunoPrecise Antibodies Ltd.

Each polytopic cocktail is rationally designed to provide enhanced, long-lasting protection by simultaneously targeting multiple epitopes on the spike trimer, thereby engaging multiple mechanisms of action and reducing mutagenic escape risk. [[a] Preclinical ***in vivo*** efficacy Syrian hamster model; [b] Tested against pseudotyped virus; [c] Reduced lung viral titers to undetectable levels in (13/15) animals.; [d] Roodink, et al. bioRxiv, Jul 2021.; *22-D9 Ab only included in TATX-03c].

With the ongoing threat of COVID-19 and rising concerns from the frontlines about the effectiveness of existing vaccines and antibody therapies, IPA's Polytope® antibody cocktail continues to demonstrate promising efficacy during studies conducted by the Company, even when tested against newly emerged variants. New data from IPA reveals remarkable consistency in the ability of PolyTope TATX-03 antibody cocktail to retain its potent and complete *in vitro* neutralization against all variants, as demonstrated with Omicron pseudovirus reinforced with neutralization data against the wild-type parental virus (Wuhan) and all predominant variants of concern (Figure 4). The Company's PolyTope TATX-03 antibody cocktail was developed to target multiple, non-overlapping epitopes on the spike trimer, reducing the risk of mutagenic escape, and facilitating engagement of mechanisms of action that are collectively distinctive from other SARS therapies obtainable to date.

Figure 4

OVERVIEW OF TATX-03B AND TATX-03C PSEUDOVIRUS NEUTRALIZATION SCREENINGS TOWARDS SARS-COV-2 AND VARIANTS OF CONCERN (WUHAN-1, ALPHA, BETA, DELTA, OMICRON). GREEN CHECKMARKS INDICATE POTENT NEUTRALIZATION



Source: ImmunoPrecise Antibodies Ltd.

History

Founded in 1983, IPA went public in 2016 and is now dual listed on both the NASDAQ stock exchange under ticker IPA-NASDAQ and the TSX Venture Exchange (TSXV) under ticker IPA-TSXV. The Company's registered and records office is located at 1800–510 West Georgia Street, Vancouver, British Columbia V6B 0M3 and its head office is located at 3204–4464 Markham Street, Victoria, British Columbia, Canada V8Z 7X8.

In 2016, the Company completed its initial public offering (IPO) by way of a reverse takeover with Tanqueray Exploration Ltd. A supplier of custom hybridoma development services, the Company changed its name from Tanqueray Exploration Ltd. to ImmunoPrecise Antibodies Ltd. At the time, the target market for IPA's antibody products included the academic, biological, diagnostic, and pharmaceutical industries. Operating out of Victoria, B.C., the Company looked to expand its share of the U.S. antibody R&D market, improve margins, and increase operational efficiency.

In April 2018, the Company acquired ModiQuest Research B.V., which is now ImmunoPrecise Antibodies Europe B.V. (IPA Europe), a company that specializes in the generation of monoclonal antibodies, located in Oss, the Netherlands. IPA Europe's proprietary technologies and phage display libraries are used in many aspects of the antibody discovery process to generate large monoclonal antibody panels from various animal species. The year prior, the Company announced the acquisition of U-Protein Express B.V. located in Utrecht, the Netherlands for rights to its proprietary expression technology, rPEx®, used for offering small to large-scale recombinant protein and antibody manufacturing for research and preclinical applications. As of January 1, 2021, U-Protein Express merged with IPA Europe and now both Dutch entities operate under the same legal name.

Operations

IPA's operations are based in Utrecht and Oss, the Netherlands (IPA Europe); Victoria, British Columbia (IPA Canada); Fargo, ND (IPA USA) and Cambridge, MA (Talem Therapeutics). IPA Canada offers custom antibody generation since its inception. Following the acquisitions of IPA Europe, the Company has redirected the majority of its focus from the North American diagnostic market to the global therapeutic antibody market (a higher revenue/higher profit margin market), bringing an expanded portfolio of products and services to clients in Europe, North America, and the rest of the world. The Company has sought to increase capabilities at its Victoria location by adding equipment for protein purification and measuring protein binding kinetics, enlarging its **vivarium**, and further developing and improving technologies, such as its B cell Select® platform.

IPA Europe conducts operations in the biotechnology hubs of Utrecht and Oss, both in the Netherlands. The Utrecht site has been operating in the recombinant protein community for roughly twenty years, specializing in manufacturing complex proteins and antibodies in a variety of formats, including bispecifics, (and from a range of mammalian cell types) using its proprietary expression platform rPEx® (which provides large-scale production of recombinant mammalian proteins and antibodies for research and preclinical applications. IPA Europe's operations have enabled it to successfully support over five thousand different programs for pharmaceutical and biotechnology industries as well as leading, academic institutions. In 2022, the Company expects to expand its Utrecht laboratories by moving into new premises in the newly built Accelerator building. A year later, the laboratories in Oss anticipate moving into larger premises within the current Pivot Park campus.

Outlook

IPA is focused on building revenue by expanding assets through internal development and well-informed, strategic acquisitions and joint ventures. The Company's strategy also includes growth through alliances and partnerships within both its research (Talem) and service sectors, as well as from preclinical and clinical manufacturing. IPA seeks to grow as a preferred partner for therapeutic antibody researchers, delivering a range of integrated protein and antibody services to its partners, enabling them to bring new and enhanced therapies to the clinic faster.

The Company is working to continue its focus on developing and refining its integrated end-to-end CRO service platform, which, along with its solid scientific knowledge base, provides its partners the ability to navigate the critical lead candidate selection process. This strategy affords its customers customized solutions for antibody discovery while providing details via the project management team to ensure partners have the project data they need, along with the security measures required, to guarantee peace of mind.

IPA's strategy is supported by growing trends in which pharmaceutical and biotechnology companies continue to outsource research and increasing rely on CROs to improve the efficiency and cost of development, increase turnaround time, and access advanced and integrated expertise. In addition, by working to streamline the development process, pharmaceutical and biotechnology companies can limit the number of external CRO vendors that can be contracted, benefitting CROs that fill multiple niches in the discovery and manufacturing pipeline, which is the essence of IPA's business model.

IPA expects to work with advisors to engage federal, provincial, and state funding agencies to further the Company's objective of expanding its operations into Good Laboratory Practice (GLP)- and Good Manufacturing Practice (GMP)-certified facilities. The Company seeks to work to identify facilities meeting the specifications identified in their previously prepared GMP feasibility study, enabling either the new build or the retrofit of an existing building to establish the production of preclinical and clinical protein biologics.

Company Leadership

Management Team

Dr. Jennifer Bath, Chief Executive Officer (CEO) and President

Dr. Jennifer Bath is the CEO and President of IPA. She obtained a Ph.D. in Cellular and Molecular Biology, specializing in immunology and biochemistry, with a focus on discovering and validating biologics for the prevention and treatment of neglected tropical diseases. Dr. Bath held a tenured position as an Associate Professor of Cellular and Molecular Biology, while concurrently serving as the Founder and Executive Director of the Concordia Global Vaccine Institute. She also served many years as a strategic growth and business operations advisor for global pharma, biotech, and government. Dr. Bath has held executive roles in both biotechnology and contract research organizations (CROs), with her most recent post on the executive team at Aldevron, LLC, where she headed the global sales and client relations teams, and defined business strategies by applying knowledge based on the science, technology, and market. In addition, she served as a key technical specialist, converting challenges for pharmaceutical and biotechnology clients into operational initiatives.

Lisa Helbling, Chief Financial Officer (CFO)

Ms. Lisa Helbling serves as the CFO for IPA. At IPA, she oversees financial and strategic management, including the Company's financial reporting and long-range business planning. Additionally, she supervises information technology, human resources, and legal. She brings over thirty years of broad experience in accounting, finance, enterprise risk management, audit, and ESOPs. Currently, she serves on the Board of Directors for Healthy Dakota Mutual Holdings and Blue Cross Blue Shield of North Dakota, where she serves as the Chair of the Audit & Compliance Committee, as well as Border States Industries, where she is the Chair of the Audit Committee. Prior to joining the executive team, Ms. Helbling served as CFO at Anchor Ingredients and TMI Hospitality, as well as vice president of Internal Audit and Business Risk Management at Otter Tail Corporation.

Dr. Stefan Lang, Chief Business Officer (CBO)

Dr. Stefan Lang joined IPA as the CBO. He is responsible for corporate and business development initiatives, as well as corporate and product strategic planning. He holds a Dr. rer. nat. (Doctorate in Natural Sciences, the German equivalent of a Ph.D.) in biology from the Technical University Karlsruhe, Germany, and a diploma in biology from the University of Kassel, Germany. He started his career as a technical consultant and moved into the biotech industry in 2000. Dr. Lang has experience working at the organizational level and as a globally recognized and respected leader in antibody business development. In his most recent role, Dr. Lang worked in an executive role at Aldevron LLC, as the Vice President of Business Development, with his main focus on corporate strategy, R&D innovation, sales and business development. Prior to Aldevron, he worked at GENOVAC, a pioneer in genetic immunization for antibody generation.

Dr. Ilse Roodink, Chief Scientific Officer (CSO)

Dr. Ilse Roodink serves as CSO of IPA, supporting the Company's global research and development teams. Prior to her appointment as CSO, she held different scientific positions at the Company's Dutch facility in Oss from 2013 until 2021. In her last role as Scientific Director of IPA Europe, Dr. Roodink was overseeing contract research project execution and management and actively involved in the integration of innovative technologies supporting antibody characterization and engineering. Following its establishment in 2019, Dr. Roodink has served as Chairwoman of Talem Therapeutics' Scientific Advisory Committee, leading the development of Talem's pipeline assets. Dr. Roodink graduated from Radboud University of Nijmegen, the Netherlands, with a master's degree in Biomedical Health Sciences and a Ph.D. in Medical Sciences. Her work, resulting in several peer-reviewed publications, focused on platform development to facilitate the discovery of antibodies specifically recognizing native tumor targets.

Kari Graber, Vice President of Commercial Services

Ms. Kari Graber serves as the Vice President of Commercial Services for IPA and is responsible for the overall leadership and implementation of the Project Management program throughout IPA's global family of companies. She has over 20 years of experience in developing, implementing, and directing laboratory operations, quality assurance, regulatory compliance, and supply chain management programs for various food manufacturers, and has spent five years as Sales and Technical Director for a pasteurization/sterilization technology and equipment supplier. Prior to joining ImmunoPrecise, Ms. Graber served at Aldevron LLC, where she held a client relations management role for their antibody services platform. She holds a Bachelor of Science in Food Science & Technology and a Minor in Microbiology.

Carla Dahl, Vice President of Marketing

Ms. Carla Dahl serves as the Vice President of Marketing for IPA. She is an accomplished leader with more than 20 years of strategic brand and marketing experience in the bioscience and healthcare spaces. She has a proven track record of managing major marketing initiatives for medical device launches at both start-up and multi-national companies. Prior to joining IPA, she served as the Vice President of Marketing at Preceptis Medical, Senior Director Global Marketing Communication and Marketing Operations at Medtronic, Director Global Marketing at St. Jude Medical, and Director of Marketing at Cardiovascular Systems. Ms. Dahl has a distinctive history of success managing the translation of complex medical and scientific concepts into smart, market-leading brands and omni-channel strategies.

Dr. Barry Duplantis, Vice President of Client Relations

Dr. Barry Duplantis serves as Vice President of Client Relations for IPA and is responsible for managing and coordinating all sales-related activities. He is a scientific entrepreneur and business development specialist with over 10 years' experience in the commercial application of drug and vaccine discovery platforms. Prior to his appoint to Vice President of Client Relations, he served as the Director of Client Relations for IPA Canada and was the founder and CEO of DuVax Vaccine and Reagents. Dr. Duplantis obtained a Ph.D. from the Department of Microbiology and Biochemistry at the University of Victoria in 2012 with a focus on intracellular pathogenesis and vaccine development.

Brad McConn, Vice President of Finance

Mr. Brad McConn serves as the VP of Finance for IPA. He is responsible for oversight of the Company's financial reporting, financial planning & analysis, and complex accounting research. Prior to his current role, he served as the Director of Financial Planning & Analysis for IPA, and previously worked as an analyst in the real estate industry, focusing on a broad range of financial processes and business development. He is a CFA® charterholder, and holds a Bachelor of Arts in Mathematics with Minors in Chemistry and Business.

Dr. Debby Kruijsen, General Manager, IPA Europe

Dr. Debby Kruijsen is the General Manager of IPA Europe, formerly ModiQuest Research (Oss, The Netherlands), which became part of the IPA family of companies in April 2018. She began her career in immunology at Utrecht University in the Netherlands. In 2012, she joined ModiQuest Research, where she held different scientific and management positions until she became General Manager of IPA Europe. Dr. Kruijsen works closely with the executive and global teams to develop and execute business strategies, improve operational efficiencies, and support IPA as an innovative company in the CRO space.

Teri Otto, General Manager, IPA Canada

Ms. Teri Otto is the General Manager of IPA Canada (Victoria, BC). She works closely with the executive and internal teams to implement best practices and company strategy. Ms. Otto has held a variety of scientific and management positions prior to her role as General Manager. She holds a Bachelor of Science in Microbiology and Associate degrees in Psychology and Applied Chemistry/Biochemistry.

Board of Directors

James Kuo, MD, MBA, Chairman and Director, Committee Served: Audit

Dr. James (Jim) Kuo currently serves as CEO of Return Health and Managing Director of Athena Bioventures in La Jolla, CA. He is an experienced biotech industry executive and investor who brings financial and management experience to the Company. During his career, he has held executive positions in private as well as listed bioscience companies in the U.S., Canada, and Europe. He previously served as CEO of Tryp Therapeutics, Synthetic Biologics, BioMicro Systems, and Discovery Laboratories. Prior to that, Dr. Kuo was Associate Director in Corporate Licensing and Development at Pfizer and Managing Director of HealthCare Ventures, a $378 million venture fund. He received his MD from the University of Pennsylvania School of Medicine and an MBA from the Wharton School of Business. Dr. Kuo's undergraduate education is in molecular biology and music history from Haverford College.

Dr. Jennifer Bath, Director, Committees Served: Finance (ad hoc)

Biography on page 10.

Greg Smith, Director, Committees Served: Audit & Compensation

Mr. Greg Smith is an experienced capital markets veteran who has held senior positions in investment banking and institutional fixed income portfolio management before transitioning to private equity with the acquisition of one of the largest HVAC companies in Western Canada. Mr. Smith held the position of Portfolio Manager for Phillips, Hagar & North & Executive Director, Canadian Securitization Group, CIBC World Markets in Toronto for close to ten years. He currently serves as President and Director of Broadway Refrigeration & Air Conditioning Co. Ltd. He earned an MBA from Dalhousie University, is a Chartered Financial Analyst, and serves in advisory and board positions to multiple private and public ventures.

Dr. Robert D. Burke, Director, Committees Served: Audit & Nomination

Dr. Robert D. Burke is an Emeritus Professor at the University of Victoria, where he was a faculty member for over 35 years. He has a longstanding research interest in the molecular basis of cellular signaling in early embryonic development. His research involves production and characterization of antibodies, extensively employing them with high-resolution optical imaging methods. Dr. Burke has published over one hundred peer-reviewed publications and has supervised numerous trainees. He was Chair of the Department of Biochemistry and Microbiology for eight years, was on the University of Victoria Senate for twelve years, and served on numerous advisory and management committees nationally and internationally. Dr. Burke completed a BSc and a PhD at the University of Alberta.

Dr. Anna K. Pettersson, Director

Dr. Anna K. Pettersson is an experienced leader and advisor with extensive expertise in life sciences strategy, business development, financial analysis, and pharmaceutical R&D. She is the owner and founder of Barnegat Advisors, LLC, which provides strategic advisory services to the life sciences industry. Throughout her career, Dr. Pettersson held a number of positions at Pfizer Inc., most recently in the role of Senior Director, Innovation Policy. Prior to that, she served as a senior member of a life sciences consulting team and directed business development for the Mount Sinai School of Medicine. Dr. Pettersson holds a B.S. in biology from the University of Uppsala, a Ph.D. in genetics and diabetology from the Karolinska Institute, and was also a Postdoctoral Fellow at the Whitehead Institute for Biomedical Research and at Harvard Medical School.

Intellectual Property

IPA is focused on protecting its intellectual property (IP) primarily through a combination of trade secrets and copyrights. The Company has initiated the protection of new innovations in its product pipeline and has trademarked its suite of technologies, such as ImmunoProtect®, Rapid Prime®, B cell Select®, Abthena®, Artemis®, AIM®, LucinaTec®, NonaVac®, ModiVacc®, Deep Display™ and rPEx®. A summary of the Company's filed patents is listed in Figure 5 followed by its trademarks listed in Figure 6 (page 14).

Figure 5
IMMUNOPRECISE ANTIBODY PATENTS

Canada				
#	**Patent**	**Patent Title**	**Filed**	**Request for examination by**
1.	2964907	MONOCLONAL ANTIBODIES AND USE THEREOF AS A DIAGNOSTIC TOOL FOR LIMB-GIRDLE MUSCULAR DYSTROPHY AND GENETICALLY RELATED DISORDERS	April 20, 2017	April 20, 2022
2.	2947878	MONOCLONAL ANTIBODIES AND USE THEREOF AS A DIAGNOSTIC TOOL FOR LIMB-GIRDLE MUSCULAR DYSTROPHY	November 4, 2016	November 4, 2021
3.	2965017	MONOCLONAL ANTIBODIES FOR THE IDENTIFICATION AND CHARACTERIZATION OF ANTIESTROGENS AND SELECTIVE ESTROGEN RECEPTOR MODULATORS	April 20, 2017	April 20, 2022
4.	2940065	METHOD FOR THE RAPID PRODUCTION OF HIGH AFFINITY MONOCLONAL ANITIBODIES	August 22, 2016	August 22, 2021
USA				
#	**Patent**	**Patent Title**	**Provisional application**	**Non-provisional filing by**
5.		ANTI-SPIKE GLYCOPROTEIN ANTIBODIES AND THE THERAPEUTIC USE THEREOF	January 28, 2021	January 28, 2022

Source: ImmunoPrecise Antibodies Ltd.

Figure 6

IMMUNOPRECISE ANTIBODIES TRADEMARKS

Country	Trademark Name	Status	Symbol	Application No.	Filing Date	Registration No.	Registration Date
CA	Abthena	Pending	TM	A0103467	21-Dec-20		
US	Abthena	Registered	R	90/347,857	30-Nov-20	6584931	7-Dec-21
WO	Abthena	Registered		A0103467	21-Dec-20	1574384	21-Dec-20
CA	AIM	Pending	TM	A0103466	21-Dec-20		
US	AIM	Registered	R	90/347,852	30-Nov-20	6584930	7-Dec-21
WO	AIM	Registered		A0103466	21-Dec-20	1574397	21-Dec-20
CA	Artemis	Pending	TM	A0103465	21-Dec-20		
US	Artemis	Registered	R	90/347,848	30-Nov-20	6584929	7-Dec-21
WO	Artemis	Registered		A0103465	21-Dec-20	1573221	21-Dec-20
CA	B cell Select	Pending	TM	A0103468	21-Dec-20		
US	B cell Select	Registered	R	90/347,858	30-Nov-20	6465528	24-Aug-21
WO	B cell Select	Registered		A0103468	21-Dec-20	1573663	21-Dec-20
CA	Deep Display	Pending	TM	A0103474	21-Dec-20		
US	Deep Display	Published	TM	90/347,862	30-Nov-20		
WO	Deep Display	Registered		A0103474	21-Dec-20	1573044	21-Dec-20
CA	ImmunoPrecise	Registered	R	1847396	13-Jul-17	TMA1017861	21-Mar-19
US	ImmunoPrecise	Registered	R	87/754,228	12-Jan-18	6077423	16-Jun-20
CA	ImmunoProtect	Registered	R	1644222	19-Sep-13	TMA904043	20-May-15
US	ImmunoProtect	Registered	R	86/105,476	30-Oct-13	4960634	17-May-16
CA	LucinaTec	Pending	TM	A0103464	21-Dec-20		
US	LucinaTec	Registered	R	90/339,344	30-Nov-20	6541293	26-Oct-21
WO	LucinaTec	Registered		A0103464	21-Dec-20	1573897	21-Dec-20
EM	ModiQuest	Registered	R	14916506	16-Dec-15	14916506	29-Mar-18
US	ModiQuest	Registered	R	86/983,828	10-Dec-15	5481608	29-May-18
CA	ModiVacc	Pending	TM	A0103463	21-Dec-20		
US	ModiVacc	Registered	R	90/339,323	30-Nov-20	6541292	26-Oct-21
WO	ModiVacc	Registered		A0103463	21-Dec-20	1573682	4-Feb-21
EM	MY Logo	Registered	R	14916894	16-Dec-15	14916894	25-Apr-16
US	MY Logo	Registered	R	86/845,249	10-Dec-15	5130271	24-Jan-17
CA	NonaVac	Pending	TM	A0103476	21-Dec-20		
US	NonaVac	Registered	R	90/347,865	30-Nov-20	6541293	26-Oct-21
WO	NonaVac	Registered		A0103476	21-Dec-20	1573629	21-Dec-20
CA	PolyTope	Pending	TM	A0103462	21-Dec-20		
US	PolyTope	Registered	R	90/339,038	30-Nov-20	6549201	2-Nov-21
WO	PolyTope	Registered		A0103462	21-Dec-20	1573808	21-Dec-20
CA	Rapid Prime	Registered	R	1847395	13-Jul-17	TMA1017860	21-Mar-19
CN	Rapid Prime	Registered	R	28687736	14-Dec-18	28687736	14-Dec-18
US	Rapid Prime	Registered	R	87/754,234	12-Jan-18	6077424	16-Jun-20
CA	rPEx	Pending	TM	A0103477	21-Dec-20		
US	rPEx	Registered	R	90/008,680	18-Jun-20	6521819	12-Oct-21
US	rPEx	Published	TM	90/348,212	30-Nov-20		
WO	rPEx	Registered		A0103477	21-Dec-20	1577490	21-Dec-20

Source: ImmunoPrecise Antibodies Ltd.

Core Story

Business Summary

ImmunoPrecise Antibodies Ltd ("IPA" or "the Company") is a full-service, contract research organization (CRO) for therapeutic antibody discovery and development. As detailed in the accompanying section, an antibody (also called immunoglobulin) is a protein produced by the immune system in response to the presence of a foreign substance, called an antigen. Antibodies recognize and latch onto antigens in order to remove them from the body. IPA's innovation-driven technology platform supports the biopharmaceutical industry that employ outsourced research on a contracted basis in their mission to discover and develop novel, therapeutic antibodies against challenging disease targets.

There is a tremendous amount of pressure on biopharmaceutical companies to outsource work; however, there are limited viable outsourcing tools available, and such technologies can be difficult to access. Many of these biopharmaceutical companies outsource their work to between ten to thirty different companies to produce a new therapeutic—a point in which vendor consolidation becomes incredibly challenging. IPA is working to transform the traditional, multi-vendor, product development approach by bringing innovative, high-throughput technologies to its partners, and incorporating the advantages of diverse antibody collections with its therapeutic antibody discovery suite of technologies and enabling this process to occur all under one contract.

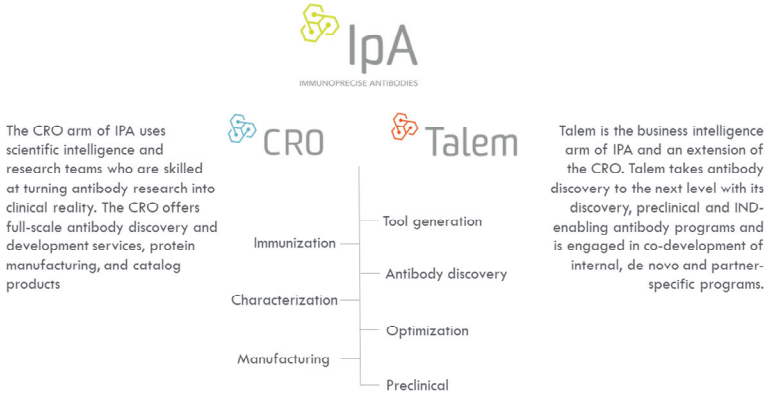
Importantly, the Company's goal is to allow this process to occur more quickly and effectively, while reducing risk, such that viable and valuable products are not being shipped back and forth and from vendor to vendor. While working to disrupt the traditional multivendor drug discovery model by simultaneously modernizing the antibody industry—lead candidate selection and downstream development processes with its aggregate technology platforms—IPA is addressing one of the greatest pain points in generating new therapies to treat diseases: the lack of effective and efficient technologies at CROs.

The Company has continued a robust growth path with an ongoing commitment to building and improving technologies, assets, and intellectual property (IP), not only as a CRO but also employing the same discovery engines to develop novel therapies to treat a range of diseases. As the Company moves to implement its business strategy within an industry experiencing massive consolidation, it is positioned to become one of the leading consolidators of other CROs, having acquired and successfully integrated several companies and technologies since being listed as a publicly traded Company in 2016 (see Company History, page 8).

Along with providing outsourced research on a contract basis to clients, IPA's wholly-owned subsidiary, Talem Therapeutics LLC ("Talem"), provides research and development (R&D) to support its internally owned therapeutic asset development. Talem is working towards building an IP estate and portfolio of physical assets through internal research and collaborations, and is moving into preclinical analysis and functional studies with roughly half a dozen later-stage preclinical candidates. While strategically investing in developing and licensing antibody technologies and related IP assets, the Company's internal discovery programs have focused on novel therapeutic antibodies and vaccines in areas including infectious diseases (i.e. SARS-CoV-2), cardiovascular pathology, neurology, immuno-oncology, inflammation, and rare/specialty diseases. Within its pipeline, one of Talem's more advanced programs is its SARS-CoV-2 candidate, in which the Company is employing the complementary strengths of each discovery platform to uniquely design products to protect against and treat current and emerging variants of SARS-CoV-2.

An introduction to antibodies is provided on pages 16-19 as a prelude to discussing the key elements of the Company's business subsidiaries: CRO, Talem Therapeutics, and its pipeline efforts, including COVID-19 (summarized in Figure 7 [page 16]). This is followed by greater details of each of the Company's subsidiaries and their respective efforts (pages 20-37).

Figure 7
BUSINESS MODEL SUMMARY

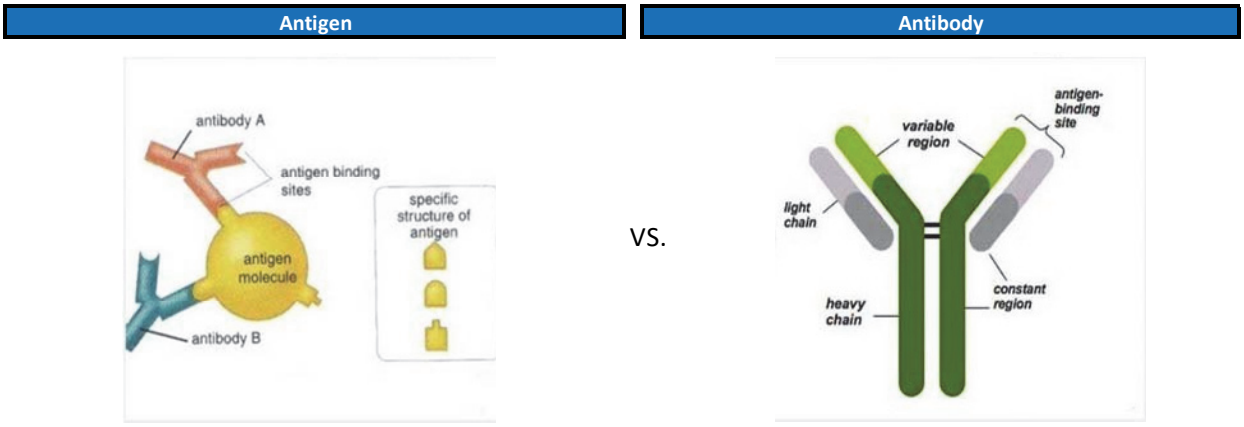


Source: ImmunoPrecise Antibodies Ltd.

Antibody Overview

Also called an immunoglobulin, an antibody is a Y shaped protein (Figure 8, right) produced by the immune system that binds itself to the epitope (specific target region) on the antigen (Figure 8, left). Antibodies are used in diagnostic applications and are vital research tools since they are able to detect a specific protein in an **immunoassay** (a procedure/test to detect or measure specific proteins through their properties as antigens or antibodies). An antigen is a substance that can stimulate an immune response by activating **lymphocytes** (the body's infection-fighting cells). Foreign antigens (also known as **heteroantigens**) are found outside of the body versus self-antigens (also known as **autoantigens**), which are found within the body. When a foreign antigen enters the body, the body can detect it and an immune response is provoked with the release of antibodies. An antigen that induces an immune response is called an **immunogen**. Figure 8 summarizes the difference between an antibody and an antigen.

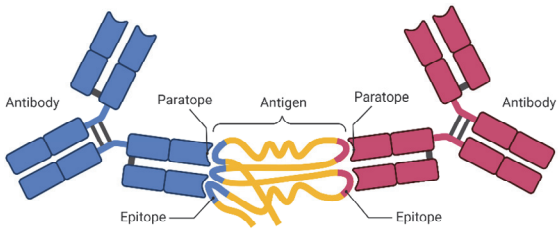
Figure 8
DIFFERENCE BETWEEN ANTIGEN AND ANTIBODY



Source: Microbe Notes.

Antibodies do not bind to the full protein but instead bind to a segment of the protein known as the epitope. A full protein contains many different epitopes where different antibodies can bind. Consequently, for a given protein sequence, multiple unique antibodies can recognize the protein and bind to their specific epitope on that protein. The binding between the antibody and the epitope occurs at the antigen binding site (**paratope**), which is capable of binding to only one unique epitope. Figure 9 illustrates the antigen's recognition by the antibodies.

Figure 9
ANTIGEN RECOGNITION BY ANTIBODIES



Source: GenScript.

How Antibodies are Produced

When a foreign substance enters the body, special cells, such as **macrophages** and **dendritic cells**, capture the foreign protein and break it down to present antigens to the B cell lymphocytes. A process known as "**Somatic Hypermutation (SHM)**" enables B cells to code for a new antibody that will contain a unique antigen binding site. Each B cell lymphocyte produces an antibody for a unique epitope and releases the antibodies into the bloodstream. Antibodies bind to the antigens, providing the immune system a chance to destroy the foreign entity and eliminate it from the body. The immune system is able to remember a foreign antigen and equips the body with a system to fight a foreign entity with its antibodies should it encounter the antigen again.

Monoclonal Antibodies

Monoclonal antibodies (mAbs) are antibodies from a single antibody producing cell that specifically binds to one unique epitope. Researchers can design antibodies for mass production in laboratories that can mimic the actions of the immune system. A **polyclonal antibody** refers to a collection of antibodies from various B cells that can recognize multiple epitopes on the same antigen.

There are five classes of antibodies in the human immune system: immunoglobulin (Ig)A, IgD, IgE, IgG, and IgM, each with distinct functions. IgG is the most common antibody class, abundant in the blood (plasma) and due to its multifunctional nature, is one of the many reasons that monoclonal antibodies are used as therapeutics. Therapeutic monoclonal antibodies began being produced and engineered in 1975 with Köhler and Milstein and their hybridoma technology, which enabled researchers to immortalize specific monoclonal antibody producing B cells and to produce quantities of antibodies sufficient for diagnostic or therapeutic use.

There are several types of monoclonal antibodies. Traditionally only murine monoclonal antibodies could be produced via the hybridoma technology; today other types exist, such as monoclonal antibodies from other species like rabbits, chickens or camelids, **chimeric monoclonal antibodies** (proteins made from part mouse and part human), **humanized monoclonal antibodies** (made by artificially replacing the majority of originally animal derived amino acids with human components), and **human monoclonal antibodies** (fully human proteins). Each antibody binds specifically to a unique epitope and the degree to which an antibody can differentiate between antigens is the **antibody specificity**. Essentially, antibody specificity can be seen as a measure of 'goodness of fit' between the paratope (antigen binding site) and the epitope, and the ability of the antibody to differentiate between other antigens (cross-reactivity).

The strength in which the epitope binds to a paratope on the antibody is known as **antibody affinity**. High affinity antibodies bind to the antigen quickly, allowing for greater sensitivity in assays. In the process of SHM, B cells mutate and are presented to the antigen, leaving only those that bind to the antigen with high affinity to survive (called affinity maturation). In the process of custom antibody production, there will be both high and low affinity antibody producing B cells (clones). Over time, the superior clones will survive.

To summarize, when a foreign entity, known as an antigen, enters the body it stimulates B lymphocytes to produce antibodies. Antibodies bind specifically to the unique area on the antigen, called the epitope. The binding between the antibody and the epitope occurs at the antigen binding site (paratope). Monoclonal antibodies are antibodies from a single antibody producing cell that bind specifically to one unique epitope. For diagnostic applications and therapeutic drug development, researchers can design antibodies for mass production using hybridoma technology or recombinantly. Hybridomas are hybrid cells that are produced by injecting an antigen into an animal (mostly a rodent) for the purpose of collecting the antibody-producing cells from the animal. Antigen specificity refers to the degree in which an antibody differentiates between different antigens; antibody affinity refers to the strength of the binding interaction between an antigen and an antibody. There are numerous details involved in the production of customized antibodies against specific antigens. These are services that are offered by IPA and further detailed on pages 22-25.

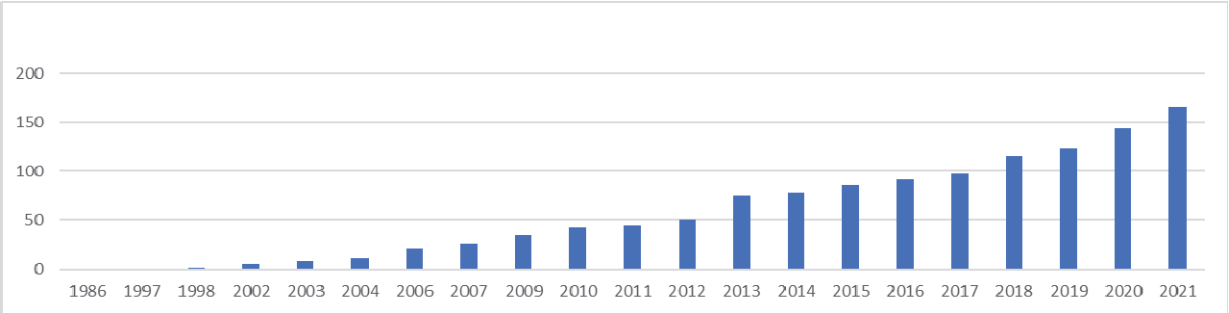
Therapeutic Antibody Market

The market for human therapeutic antibodies has expanded rapidly, with this market expected to more than double to over $300 billion by 2025 from $115 billion in 2018, according to a study published in the *Journal of Biomedical Science* in January 2020 titled "Development of therapeutic antibodies for the treatment of diseases". The number of monoclonal antibodies approved for commercialization has increased—with the 100th monoclonal antibody approved by the U.S. Food and Drug Administration (FDA) as of May 2021 (Nature Reviews Drug Discovery). In 2019, seven of the top ten best-selling drugs came from the antibody market (Figure 11, page 19). Driving this growth are the following factors:

- an increase in R&D within the life science and therapeutics industry;
- growth in funding from the biopharmaceutical industry;
- accelerated drug approval rates;
- greater innovation, which is facilitating development of new platform technologies;
- an increase in biopharma without internal research capabilities;
- growth in the number of antibody clinical trials;
- greater demand for therapies to address major diseases as populations age and life expectancies rise;
- an increase in the importance being put on antibody development at CROs; and
- growing applications in the environmental sectors.

Figure 10 depicts the growth taking place within the antibody market, according to sales.

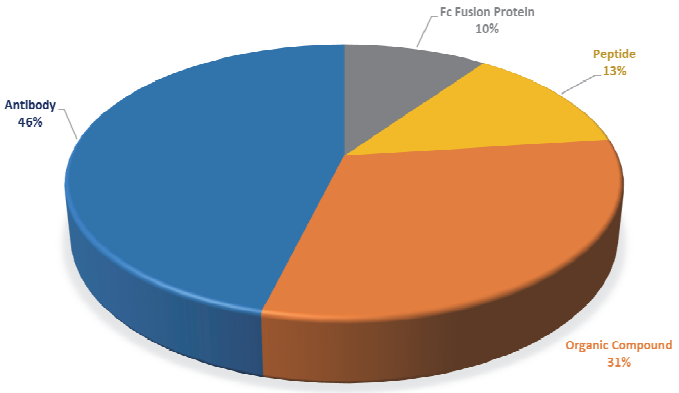
Figure 10
ANTIBODY MARKET, BY SALES (USD$ BILLIONS)



Source: Antibody Society, Journal of Biomedical Sciences, Viruses.

Figure 11 illustrates the top twenty pharmaceutical products worldwide, by sales (as of 2019), with antibodies representing almost half of total sales.

Figure 11
TOP 20 PHARMACEUTICAL PRODUCT WORLDWIDE BY SALES IN 2019



Source: Viruses. Antibody Society

Biopharmaceuticals represent the fastest growing market section within the pharmaceutical industry, largely led by Abbvie Inc., Novartis AG, Roche Holding AG, and Johnson & Johnson (J&J). These companies are sponsoring clinical studies for more than 570 monoclonal antibodies (mAbs)—90% of these being in early-stage studies designed to assess safety (Phase I) or safety and preliminary efficacy (Phase I/II or Phase II) in patients.

IPA is primarily focused on the therapeutic antibody market, delivering an expanded portfolio of products and services to customers in Europe, a broader segment of North America, and the rest of the world.

CONTRACT RESEARCH ORGANIZATION (CRO)

While the majority of products fail during the R&D stage, those that do advance into the clinic more often than not fail for reasons that may have been avoided had a properly diverse collection of candidates been identified, and/or comprehensive analytics been applied. While pharmaceutical and biotechnology companies have onboarded additional organizations to uncover more effective solutions to these problems, the burden of excessive vendors has led many decision makers in the direction of contract vendor consolidation, compounding the industry's challenges.

To address this issue, IPA has grown within the biologics and CRO space through service diversification and market penetration—along with accretive growth through strategic expansion of its operations into Europe—by acquiring and integrating innovative technologies and through R&D investments. IPA's efforts have propelled the Company into the spotlight as it has become a vendor of choice to deliver end-to-end services for pharmaceutical and biotechnology companies, with the capability to produce well characterized functional therapeutic lead candidates in a fraction of the time versus traditional methods. Accordingly, IPA believes that it is very well positioned with its broad array of biologic discovery capabilities along with cutting-edge technologies, which can be used to deliver traditional and/or alternative antibody formats to target any protein class and any disease class, creating an expanding recurring revenue base.

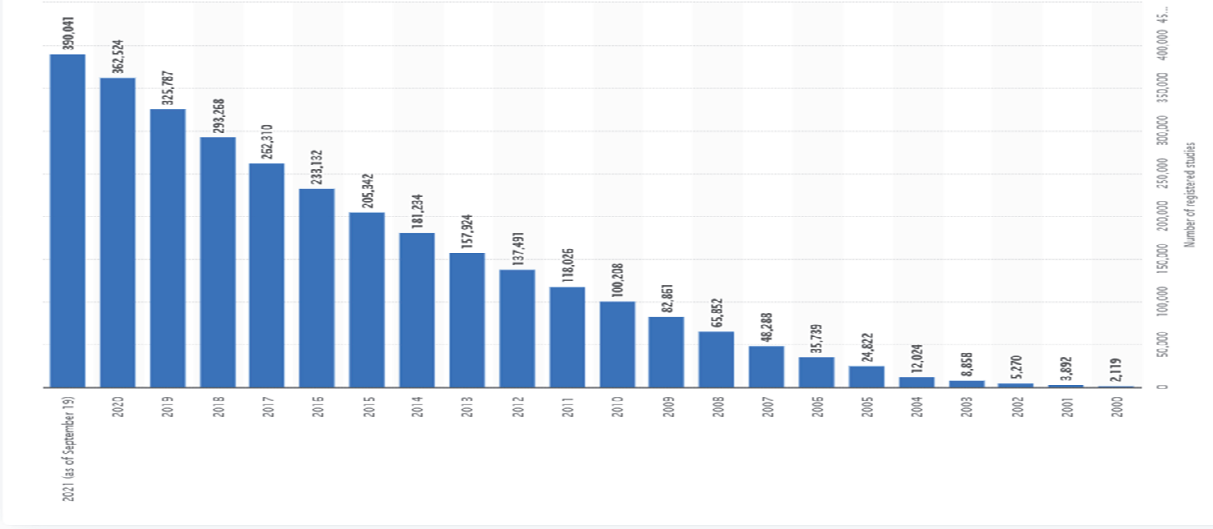
This success is bolstered by new technologies that support the Company's growing list of clients who are developing valuable therapeutic pipelines. Some of its leading technologies, include its DeepDisplay™ platform (described on page 24), which is the combination of an animal immunization with **phage display** antibody selection, and its B cell Select® technology (described on page 23), with its popularity expanding due, in part, to the relatively quick workflow that has been implemented for identifying antibodies with preferred characteristics—specifically, Rapid Prime® immunization, various early-stage high-throughput characterization capabilities, and single B cell sequencing expertise. As well, similar to the Company's established B cell platform, its custom immune libraries enable the development of antibodies from any species and delivery of multiple antibody formats.

Increasing CRO Demand

Clinical studies are a key component to the drug development process. The number of registered clinical trials has increased significantly in recent years. As of September 9, 2021, there were approximately 390,000 clinical studies registered globally, a figure which has increased multi-fold since 2000, when there were just 2,119 (Figure 12, page 21). In general, clinical trials have become more complex in recent years and remain crucial for the R&D of new drugs and products.

CROs provide full-service support to the pharmaceutical and biotechnology industries. Whether or not potential CRO clients have a designated in-house R&D department or not, CROs can aid in several individualized projects in the process of product development. According to Healthcare Insights, the CRO market continues to grow given the increased demand for more efficient, faster, advanced, and integrated expertise. Additionally, with larger R&D budgets, the $30 billion CRO market is expected to continue to grow as pharmaceutical and biotechnology firms pursue access to cutting-edge technologies to address unmet medical needs to assist in each stage of the development process.

Figure 12
TOTAL NUMBER OF REGISTERED CLINICAL STUDIES WORLDWIDE SINCE 2000 (AS OF SEPTEMBER 2021)



* Total number of studies registered on ClinicalTrials.gov since 2000, based on the First Received date. The first version of ClinicalTrials.gov was made available to the public on February 29, 2000.

Source: Statista.

Increased R&D Budgets

The Institute of Medicine (US) Forum on Drug Discovery, Development and Translation estimates that the cost to develop a new drug is more than $1 billion. The time between drug discovery and proof of concept is considered extremely risky and is difficult to fund. Basic discovery research is predominantly funded by government or philanthropic organizations, whereas pharmaceutical companies or venture capitalists normally fund late-stage development. The drug development process typically requires several partners throughout the process. Greater funding towards the pharmaceutical and biotechnology industry converts to overall larger R&D budgets as demonstrated by the rise in prevalence of chronic diseases and consequent shift towards antibody treatments.

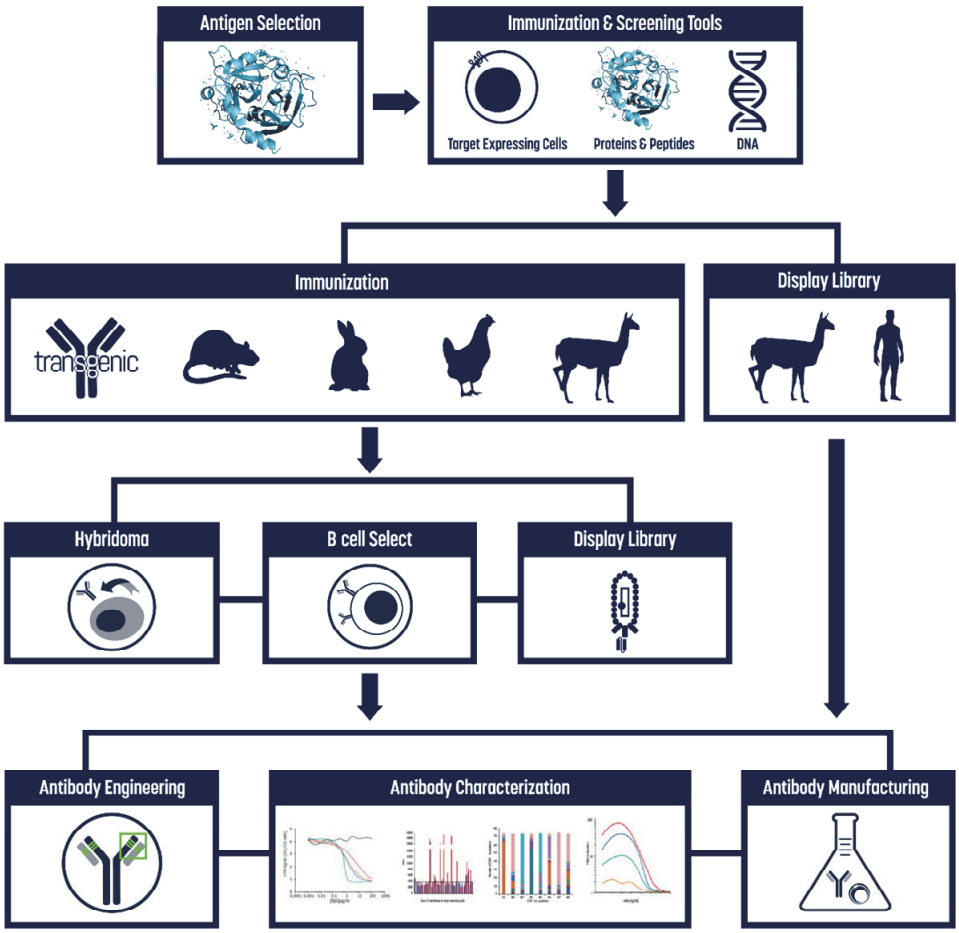
Outsourcing R&D

A Vantage Partners survey of bio-pharma respondents reported that over 80% have had an increase in alliance activity and strategic partnerships, with roughly 33% of all drugs in the pipeline of the top ten pharmaceutical companies initially developed elsewhere (outsourced). Outsourcing R&D can assist in reducing costs as companies seek success in their drug discovery process at an accelerated pace. CROs, such as IPA, have access to technologies as well as in-house infrastructure and staff for a more efficient and effective drug discovery program. Furthermore, companies looking to identify breakthrough therapies have been considering partnerships and expertise from CROs and other external partners, such as academic groups. Easier access to specialized technology and knowledge through CRO services is another reason for the increased demand from pharmaceutical and biotechnology companies choosing to operate without an internal R&D group.

In-House Capabilities

IPA is focused on (1) leveraging and using its experiences to improve technologies and knowhow, as well as (2) investing in its pipeline of fully-owned assets. This two-pronged approach has been a core focus over the past several years, where the Company is achieving these goals through investments in R&D along with acquisitions, as well as developing in-house capabilities that are now proprietary to the Company. A summary of IPA's in-house capabilities is depicted in Figure 13, followed by an explanation of each solution.

Figure 13
END-TO-END SOLUTIONS



Source: ImmunoPrecise Antibodies Ltd.

Target Design & Antigen Modeling

For each antibody generation project, IPA begins with a thorough analysis of the target protein, with careful consideration of requirements for the final product—whether the product will be used as a therapeutic, diagnostic, or tool antibody for research. The target analysis enables the Company to recommend and discuss options for the experimental part of the project. Depending on the antigen, the Company can generate synthetic peptides, recombinant proteins, antibodies, antibody fragments (anti-idiotypic projects), or cell lines.

Assay Development. IPA offers custom assay development services, which can incorporate *Cell line development.* Using its proprietary vectors, the Company offers stable cell line development services (non-GMP) of target proteins or antibodies adapted to specific growth conditions and media. Those cell lines can be used as tools for antibody discovery projects or for manufacturing.

Immunization

IPA offers multiple immunization technologies to deliver polyclonal or monoclonal antibodies from various species tested in the intended application and produced in qualities and quantities of a client's choice. The Company offers its clients a variety of options for the actual immunization and the selection of species or strains to be immunized with the antigen, including:

- *Rapid Prime® Immunization.* IPA's proprietary Rapid Prime® method can yield novel, monoclonal antibodies in as little as 32 days. It is used to generate any antibody type, including anti-idiotypic antibodies (generated to specifically bind to a monoclonal antibody drug) and has been used to produce monoclonal antibodies against **conformational epitopes (CE)**. CEs bind to complementary paratopes (antigen-binding site) on B cell receptors and/or antibodies, are directly correlated to therapeutic function, and are used during vaccine design.

- *DNA Immunization (NonaVac®).* Advised for highly complex protein classes, genetic vaccination is a technique that involves immunization with genetically engineered plasmid containing the DNA or mRNA sequence encoding the antigens against which an immune response is sought. The animal cells directly produce the antigen, evoking a protective immunological response. DNA immunization differs from traditional immunization, where the subject is immunized with the antigen itself. It eliminates the time needed to express the antigen for immunization and can be used to successfully generate very complex antigens (or targeted portions of antigens) that may not otherwise be readily manufactured.

- *Cell-based Immunization (ModiVacc®).* This propriety technology is based on the immunization of live mouse tumor cells in mice resulting in an initial expansion of the tumor cells to induce an immune response against the membrane protein-expressing cells. An immune response leads to a reduction and clearance of the expanding tumor cell. Subsequently, monoclonal antibodies can be generated by any of the Company's discovery services (B cell, hybridoma, or phage display). This platform has been highly successful in generating large panels of antibodies in recognizing a variety of conformational epitopes.

Antibody Discovery

- *B cell Select®.* The Company's proprietary B cell screening, sorting, and sequencing technology, B cell Select®, enables faster antibody screening directly from B cells, leading to higher sensitivity and specificity compared to traditional technologies (even for complex therapeutic targets). This species agnostic platform can be used on any species, including transgenic, humanized animals.

- IPA's proprietary electrofusion technology is utilized in creating hybridomas (hybrid cells produced by the fusion of an antibody-producing lymphocyte with a tumor cell and used to culture continuously a specific monoclonal antibody). IPA's technology can generate larger numbers of hybridomas compared to traditional fusion technologies, which allows for rapid and efficient generation of monoclonal antibodies against virtually any target. IPA's proprietary semi-solid media is used to grow mouse and rat hybridomas post-fusion. The media allows for the support and picking of single cell colonies immediately after fusion.

- *Phage Display.* The Company offers in-house phage display services and custom phage libraries. Phage Display is a technique used to discover peptides and proteins based on interaction (protein-protein, protein-peptide, protein-DNA) that use phages to connect proteins with the genetic information that encodes them. Phages are genetically engineered to "display" a broad repertoire of antibody fragments on their surface to subsequently select antibody fragments with (the highest) affinity to specific targets. One advantage of Phage Display is that the use of phages as a vehicle allows for performing consecutive rounds of target enrichment, facilitating identification of needles in the haystack.

- *Phage Library.* IPA's proprietary in-house ready-to-use libraries are made from human autoimmune-diseased patient and naïve v-domain repertoires of conventional antibodies, as well as from naïve llama single domain (**VHH**) repertoires of heavy-chain-only antibodies.

- *DeepDisplay™* custom immune libraries are prepared from blood, spleen, lymph nodes, and/or bone marrow of immunized animals or human blood to capture the entire immune repertoire for panning, rescue, and identification of unique antibodies with pre-specified characteristics. This advanced technology allows the Company to express antibody fragments in bacteria or rapidly reformat into any given Ig format, such as full-size IgG of various isotypes, bispecifics, Fc mutants to modify effector functions, or chimeras with Fc regions from different species. *DeepDisplay™* has been successfully combined with multiple transgenic animal platforms to generate and select sequence-diverse, highly specific antibody panels with the objective to generate fully human, therapeutic antibody candidates with mouse, cyno (non-human primate), and human cross-reactivity against any target class.

Characterization & Optimization

The Company provides services to characterize and optimize monoclonal antibodies, as described below.

- *ImmunoProtect®.* With *ImmunoProtect®*, the DNA sequence of the antibody is determined and can be used to express the antibody recombinantly.

- *Antibody Manufacturing & Characterization*. IPA offers highly purified, well-characterized, low endotoxin, or labelled antibodies for various applications. The Company offers a variety of high throughput antibody characterization methods and services covering profiling of the binding, functionality, epitope landscape, and developability.

- *Antibody Chimerization*. The Company can clone and produce any variable antibody domain into any immunoglobulin context required.

- *Antibody Humanization (LucinaTec®)*. The Company provides humanization services from many animal species (including mice, rats, rabbits, llamas, and chickens), which regularly retain affinity and specificity levels. The approach is based on ***in silico*** antibody modeling to identify essential framework and **complementarity-determining regions (CDR)** residues for grafting onto a human antibody framework.

- *Antibody Affinity Maturation.* Antibody affinity is important in therapeutic and diagnostic applications. Using several strategies, such as gene shuffling and random mutagenesis, IPA can increase antibody affinity (the strength at which the epitope binds to the antigen-binding site of the antibody).

- *Abthena® Bispecific.* IPA's Abthena® Bispecific technology complements its diverse discovery process, integrating seamlessly with the Artemis® Intelligence Metadata (AIM)® suite capabilities, to enable rapid turnaround on additional algorithmic outputs in therapeutic antibody optimization, stability, affinity, and manufacturability.

Key Service Offering

The Company's wholly-owned subsidiaries, IPA Canada and IPA Europe, have been designated as approved CROs for leading transgenic animal platforms producing human antibodies. Through IPA Canada and IPA Europe, IPA has made strategic investments in R&D activities to develop proprietary technologies, which enable the application of its B cell Select® and DeepDisplay™ platforms to a broad range of transgenic animal species and strains. These proprietary technologies, along with other key service offerings, are described below.

- *B cell Select®.* IPA began offering B cell services in 2018 in both North America and Europe on species agnostic platforms, including the use of transgenic, humanized animals. These services are offered for a broad range of therapeutically relevant protein families, including G-protein-coupled receptors (GPCRs) and other challenging, membrane-spanning proteins. The B cell Select® platform enables antibody screening directly from B cells, accelerating the analysis of a more diverse set of antibodies for faster, deeper screening versus traditional technologies. By interrogating isolated B cells, IPA is able to analyze the DNA sequences representing the full antibody repertoire from an organism with very little manipulation. This platform is

species independent, allowing for the generation of antibodies from samples not possible using other methods.

B cell Select® has the potential to develop antibodies from any species (including humans) as well as from any tissue. As the platform explores the entire antibody repertoire, it provides the opportunity to develop antibodies for anything that is possible in an animal's immune repertoire, including any protein class, complex therapeutic targets, post-translational modifications, and **small molecules**. The platform enables the examination of up to ten million blood cells to generate native monoclonal antibodies from immunized animals that specifically target an antigen.

The B cell Select® process takes place early in the antibody development process, allowing for the rapid selection of top candidates, which can dramatically increase the success rate of antibody discovery. The platform is also able to harness the power of the immune system to generate natural pairing of the antibodies produced by selected B cells.

Noteworthy is that by adding a high-throughput, label-free Octet HTX biosensor (under the tradenames FortéBio, Sartorius) at IPA Canada, IPA uses a state-of-the-art high-throughput platform to enable the rapid characterization and development of lead antibody candidates and addresses the need for increased speed and sample throughput when characterizing large panels of therapeutic antibody candidates, which are generated with its B cell or library-based platforms.

- *Phage Display***.** IPA's phage display services are based on building custom immune libraries from multiple species, including transgenic animals or, alternatively, the selection of antigen-specific, recombinant antibody fragments from its proprietary human or llama phage libraries. The exclusive libraries have been made from human auto-immune (diseased) patients and naïve (healthy donors) **single chain fragment variable (scFv)** repertoires, as well as from naïve llama (VHH) repertoires.

- *DeepDisplay™.* The Company's DeepDisplay™ platform is a phage display approach based on building custom immune libraries from multiple species, including transgenic animals. Custom immune libraries are prepared from blood, spleen, lymph nodes, and bone marrow of immunized animals or humans and capture the entire immune repertoire for panning, rescue, and identification of unique antibodies with pre-specified characteristics. This technology can be combined with, for example, Ligand Pharmaceutical's OmniAb® transgenic animal platform (www.ligand.com/technologies/omniab). Greater details on the Company's relationship with Ligand are provided on page 35.

- *rPEx® protein manufacturing.* The Company provides large-scale production of recombinant mammalian proteins and antibodies for research and preclinical applications. With a history of successfully producing difficult-to-express proteins and antibodies (e.g. Fc-fusion proteins and **bispecific antibodies**), IPA is able to offer gram scale production with low endotoxin levels.

Manufacturing Plant

In early 2021, to meet the needs of its clients, IPA launched a campaign to design a cGMP-certified protein manufacturing facility, which was a natural extension of its workflow as well as an extremely high profit margin area. This facility is very compatible not only with IPA's current service offering but also with the expertise of its management team. In doing so, the Company completed an in-depth engineering study and budget and began working with investment groups.

DNA-RNA Manufacturing Facility

In addition to work that has been invested into its protein-based manufacturing, IPA has pivoted its plan for the future of therapeutics and vaccines by engaging engineers, specialists, investment groups, and industry leaders on the design of a 6,204 square meter in-house high-capacity manufacturing facility, capable of processing fifty current Good Manufacturing Practice (cGMP) batches of plasmid DNA per year. DNA can be used in many applications, including the delivery of therapeutics and vaccines in a fraction of the time when employing proteins, gene therapy, cell-based therapies, and viral vector production, and is the starting material for *in vitro* mRNA production. The facility design includes a dedicated mRNA manufacturing suite for RNA-based therapeutics and vaccine development. IPA has completed the engineering plans and budget and is in the process of applying for funding which, if received, could catalyze their manufacturing goals.

Rapid Approval During The Pandemic Led To A Broad Acceptance of mRNA

In an unusual change to the landscape for the manufacturing of clinical products, an extraordinary occurrence took place over the past year within the contract development and manufacturing organization (CDMO) and therapeutics market. After years of uncertainty and hurdles surrounding regulatory approval for the use of messenger RNA (mRNA) as a direct injectable in patients, a rapid approval during the COVID-19 Pandemic led to a broad acceptance of RNA in a clinical setting. This technology had previously faced regulatory delays, and perhaps lacked sufficient safety and toxicity data (according to some individuals within the industry). In a market where downstream applications, such as DNA and RNA vaccines and therapies, cell and gene therapies, gene editing, and viral vector production are all converging, an almost overnight transformation from the industry changed the way researchers and physicians looked at vaccine and therapeutic drug administration. This led to a change in thinking in how the clinical manufacturing of these products is approached and also led to the rapid acquisition of nucleic acid CDMO leaders within the field, including Aldevron (www.aldevron.com) and Lake Pharma (www.lakepharma.com). This phenomenon, in part, is due not only to the strong forecasted DNA- and RNA-based therapeutic and vaccine markets, but a global strain on capacity.

CRO Partner of Choice to Over 500 Clients Worldwide

There is a growing trend where pharmaceutical and biotechnology companies are increasingly relying on CROs due to the improved development efforts, combined with a decrease in turnaround time and access to greater expertise. With the Company's clients/partners including 70% of the top 20 pharmaceutical companies, IPA is able to provide its 500+ worldwide customers (a selection of which is shown in Figure 14 where information has been disclosed publicly) with:

Figure 14
SELECT PARTNERS

Source: ImmunoPrecise Antibodies Ltd.

- The ability to customize in order to optimize antibody diversity and support clinical success, with unparalleled, integrated capabilities and expertise;

- Extensive options for customizable deliverables that eliminates the need for additional vendors; and

- Scientific excellence and innovative technologies that are a proven combination for success, where thousands of programs have already been completed.

IPA continues to increase the number of clients and the size of current contracts, while also recognizing revenue from recently developed and/or expanded services in areas such as high throughput label and fluidic-free antibody characterization, hybridoma sequencing, its advanced second generation B cell Select® platform (described on pages 24-25), and the geographical expansion of its manufacturing services (described on page 26). Worth noting is that the average contract size during the first half of FY22 was over $120,000 per program, with none of these clients representing any more than 10% of the Company's revenue at any particular site.

Co-promotion Initiative with Eurofins

In June 2021, IPA announced a copromotion initiative with Eurofins, one of the market leaders in testing and laboratory services for genomics, discovery pharmacology, forensics, and advanced material sciences, with a rapidly developing presence in highly specialized and molecular clinical diagnostic testing. This collaboration supports Eurofins' biotherapeutics strategy to extend their capacity and capability to develop new biologic entities, guiding clients from target validation through to preclinical development, production, and beyond with the expertise required to address the unique challenges of each discovery project.

Eurofins, with over 50,000 staff across a network of more than eight hundred laboratories in over 50 countries, offers a portfolio of over 200,000 analytical methods. With annual revenue of approximately $5 billion, Eurofins recently added a dedicated biotherapeutics department. Leveraging complementary strengths of Eurofins *in vitro* pharmacology services and IPA's *in vitro* and *in vivo* characterization and discovery technologies, this collaboration provides greater access to solutions that empower scientists to pursue life-changing medicines in a diverse range of indications across a broader geographic area. Specifically, Eurofins' global clients will have access to IPA's end-to-end antibody discovery capabilities using wild type and best-in-class *in vivo* and recombinant antibody discovery technologies that are optimized to deeply mine antibody repertoires.

IPA's comarketing program with Eurofins is poised to position the Company on a global scale, with this marking the first of many partnerships highlighting the value of its unique suite of antibody products and services to industry-leading organizations, and setting the stage for a market narrative as the emerging leader in end-to-end services. Notable advancements along this collaboration are expected to be seen over the course of the next several months as both companies actively promote this commercial opportunity at conference exhibitions, through presentations and comarketing materials, as well as with website integration.

French Research Tax Credit (CIR) Accreditation with Dutch Subsidiary

IPA announced in September 2021, that its Oss, the Netherlands facility, which is part of its subsidiary, IPA Europe, has been granted a three-year approval for the "Crédit d'Impôt Recherche" (CIR) from the French Ministry of Higher Education and Research. CIR is a French R&D tax credit initiative that will provide tax credits to eligible French companies when they engage IPA Europe, Oss, in qualified R&D activities. The CIR rate that an eligible French customer purchasing services from IPA Europe may receive varies depending on the amount invested, though is expected to be:

- 30% for eligible R&D expenses, up to €100 million of R&D activities, and 5% above that amount; and

- 20% for eligible innovation expenditure (for SMEs only) of up to €400,000.

TALEM THERAPEUTICS

To support the Company's internal and partnered therapeutic discovery programs, IPA established a wholly-owned subsidiary, Talem Therapeutics, LLC ("Talem") in 2019, which is run by a core committee of scientists who have expertise in designing and developing novel therapeutics. Based in Cambridge, Massachusetts, Talem was created to conduct in-house R&D of proprietary assets, specifically focused on next-generation, clinically suitable, monoclonal therapeutic antibodies to target multiple disease indications. This subsidiary has performed (and expects to continue to perform) partnership and out-licensing opportunities. Currently, Talem is focused on advancing its pipeline candidates as it leverages its highly differentiated therapeutic antibody programs to potentially treat various disease areas, including infectious diseases (i.e. SARS-CoV-2), cardiovascular pathology, neurology, immuno-oncology, inflammation, and rare/specialty diseases, and moving these candidates into further preclinical analysis. Figure 15 provides a summary of Talem's pipeline candidates across multiple areas of disease.

Figure 15
TALEM THERAPEUTICS PIPELINE

Source: ImmunoPrecise Antibodies Ltd.

Talem is moving into preclinical analysis and functional studies with approximately half dozen later-stage candidates in its pipeline. The Company believes its potential first-in-class/best-in-class antibody panel for atherosclerosis cardiovascular disease targeting ALK1, called TATX-21, holds tremendous promise and is currently evaluating its ability to directly interfere with low-density lipids (LDL) uptake *in vitro*. In addition, Talem announced in April 2021 that it had advanced development of a candidate panel of vetted, novel, therapeutic antibodies targeting TrkB, collectively referred to as TATX-112, into formal lead candidate characterization. TATX-112 is a potential first-in-class therapy with unique subsets of antibodies targeting cancer and neurodegenerative diseases (including Alzheimer's). Talem is further continuing development efforts of its other potential products leveraging its pipeline of highly differentiated therapeutic antibody programs for the possible treatment of various disease areas, including heart disease, inflammation, infectious diseases, and cancer.

Talem is working to gain insight into the functional diversity of its lead molecules to determine their potential for specific but different clinical applications. For specific assets developed through Talem, the majority of the novel molecules' commercial rights are completely unencumbered, which could provide for upside on the commercial end for the Company across a class of assets, including monotherapies and cocktail therapies, as well as across multiple disease indications. Details on some of these key pipeline candidates, where information has been made available, and any specific partnerships are provided in the accompanying section.

The Next-Generation of SARS-CoV-2 Therapies

Despite the availability of a vaccine, there continues to be a need for therapeutics to protect against COVID-19 as vaccines cannot protect all individuals, especially those who are immunocompromised, such as the elderly, cancer patients, individuals with HIV, or those undergoing bone marrow and organ transplants, as the immune systems of these individuals are too weak to mount an effective response to a vaccination. As well, breakthrough cases are presenting more frequently, which could be due to reduced efficacy of the vaccine against variants. Furthermore, countries seeing greater impact from COVID also tend to be the ones that see higher rates of variant spread and lower vaccination rates, which may perpetuate itself. Because of this, segments of the population who are at higher exposure risk will likely be left unprotected.

As of today, the availability of therapeutics for affected patients remains limited, with only one product—remdesivir (not a therapeutic)—authorized for emergency use to treat COVID-19 in hospitalized patients aged 12 and older who weigh at least 40 kg. This is largely due to the fact that antibodies that had been authorized for use did not stand up to the variants that emerged. The Company believes the need for a sustainable antibody therapeutic remains, and in fact, that the need is greater than ever given the current trajectory of the disease; higher infectivity of variants; a lack of availability of vaccines in certain regions; and the fact that vaccines are losing efficacy.

Therapeutic antibodies are providing breakthrough medicines for cancer, inflammation, autoimmune, and infectious diseases due, in part, to their high on-target affinity and specificity, which make them highly efficacious with remarkable safety profiles. Advances in antibody discovery methods, such as B cell sorting, provide for the rapid and systematic identification of high-quality fully human antibodies from healthy donors, diseased patients, and transgenic animals. As well, when therapeutic antibodies are combined into cocktails, they can provide excellent protection against infectious diseases by working as a team to neutralize **pathogens** by engaging multiple mechanisms of action in concert, boosting potency beyond the sum of their individual components. Single antibodies are vulnerable to mutagenic escape and can be rendered ineffective by a single point mutation in the pathogen. In contrast, antibody cocktails may protect against mutagenic escape because they cover a larger epitope footprint on the pathogen's surface (versus what is possible with a single antibody), providing longer-lasting protection against emerging mutations.

In February 2020, Talem announced its intent to develop vaccines and therapeutics against the SARS-CoV-2 virus employing its proprietary discovery platforms. In March 2020, the Company defined its PolyTope® approach, utilizing characterized protein and antibody combinations targeting multiple epitopes and mechanisms of virus evasion. This approach is expected to provide a clinical benefit against both current and future variants and strains of the COVID-19 virus by combining well-defined and fully characterized epitopes (for vaccines) and protective antibodies (for therapeutics).

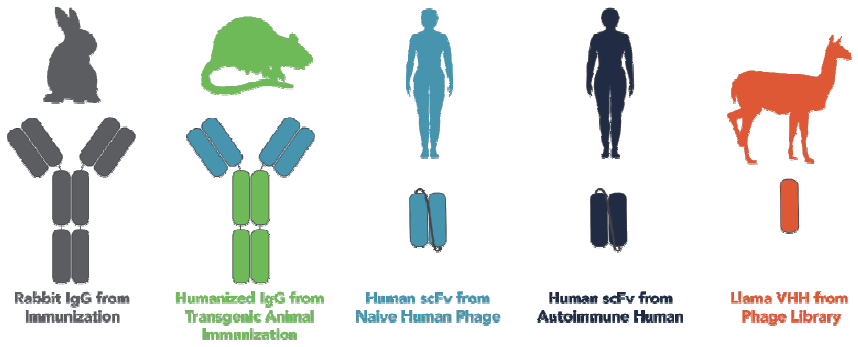
Talem's diverse panel of antibodies can be curated into synergistic cocktails, providing opportunities for out-licensing and sponsorship deals, which could enable the Company to respond quickly to emerging viral mutants as well as formulation into bi- or multi-specifics. Talem initiated clinical manufacturing of the components of their synergistic multi-membered antibody cocktail.

Talem is also proceeding with preclinical testing of an adjuvanted, protein-based vaccine based on a well-defined region of the SARS-CoV-2 spike protein. The Company has obtained additional funding from TRANSVAC2 (described on page 33) for a second preclinical study, which could be its first vaccine clinical candidate (pending positive results). The Company expects to combine the data obtained from this on-going trial with structural data from electron microscopy imaging of lead therapeutic candidates to form the final formulation of its Polytope® vaccine candidates, described in the following section.

TATX -03 PolyTope® Approach to COVID-19

One of Talem's most advanced development programs, TATX-03 (anti-SARS PolyTope®), is a fully human, synergistic, antibody cocktail containing potently neutralizing antibodies against non-overlapping epitopes on SARS-CoV-2. Talem leveraged complementary strengths of multiple antibody discovery programs as it recognizes that no one single platform has been shown to be "the best" and that the platform must cover "blind spots" with its multiple species/multiple antibody approach (Figure 16). As anticipated with this method, IPA yielded comprehensive epitope coverage, including unique epitopes. This large antibody library can provide massive possibilities for a plug and play cocktail approach.

Figure 16
LEVERAGING COMPLEMENTARY STRENGTHS OF MULTIPLE ANTIBODY DISCOVERY PROGRAMS



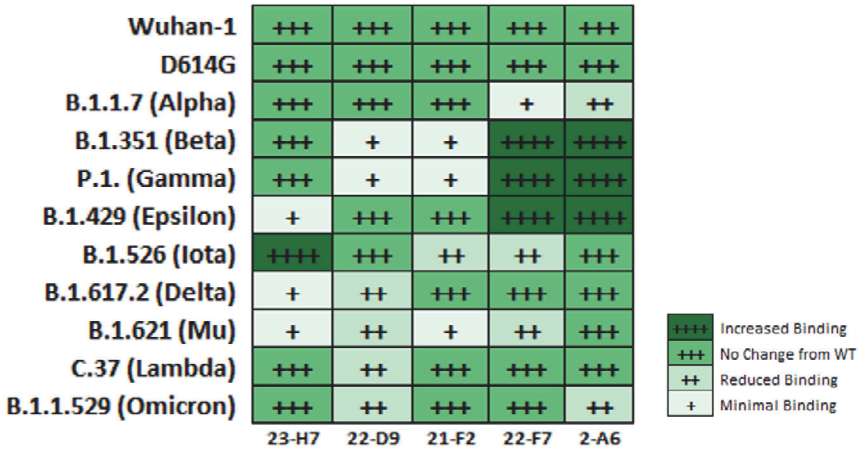
Source: ImmunoPrecise Antibodies Ltd.

The Company has confirmed multiple, fully human antibodies targeting SARS-CoV-2 that efficiently prevented its entry into cells as determined by a pseudovirus-based neutralization assay, which is an accepted surrogate for assessing viral entry into cells under safe, non-replicating conditions. Upon careful combination into multi-membered cocktails, the antibodies have been shown to exhibit neutralization synergy, demonstrating that specific combinations could enhance neutralization more than the sum of their individual components. As well, an antibody cocktail may be able to (a) minimize the risk of mutagenic escape as it achieves broader epitope coverage of the target than that of a single antibody, which can be escaped by a single point mutation in the target; and (b) engage multiple mechanisms of action.

Talem believes that its PolyTope® program has the potential to address all current and future SARS-CoV-2 variants of concern via its cocktail therapy—which has been shown to have 100% efficacy in a very well-established SARS-CoV-2 animal model, in both the treatment and protection of SARS-CoV-2 infection—and has held up in *in vitro* preclinical screenings to all tested variants of interest and all variants of concern. IPA believes it has developed and possesses the only first generation anti-SARS-CoV-2 therapeutic that has retained this broad efficacy.

Figure 17 illustrates the cell-based reactivity and pseudovirus neutralization screening against the variants of concern (VOCs). This heat map summarizes the complementary vulnerabilities of individual antibodies of the TATX-03 monoclonal antibody cocktails to cell-associated spike trimers of different variants of the SARS-CoV-2 virus.

Figure 17
CELL-BASED REACTIVITY AND PSEUDOVIRUS NEUTRALIZATION SCREENING AGAINST THE VARIANTS OF CONCERN (VOCS)



Source: ImmunoPrecise Antibodies Ltd.

Within the past year, Talem has built a team consisting of several regulatory consultants, clinical consultants, a strategic advisory board, and key opinion leaders (KOLs). These individuals have worked closely with the Company's Chief Scientific Officer, Dr. Ilse Roodink (biography on page 10) to lay out its SARS-CoV-2 clinical roadmap, while considering ongoing discussions with prospective partners, including partners that have their own clinical manufacturing facilities. The Company continues to focus on moving TATX-03 toward the clinic, reserving optionality for partners as well as itself. Clinical development of this product includes ongoing pharmacokinetic and toxicology studies to reveal the safety profile—data which are expected to become available early Q2 2022. This work will be performed in parallel with clinical manufacturing . If the program moves into the clinic, IPA could have a potential combined Phase I and II clinical trial design intended to determine the safety and efficacy with respect to transmission prevention as well as the reduction of disease in humans. These guidelines could be used by Talem or by prospective partners should the program become outlicensed.

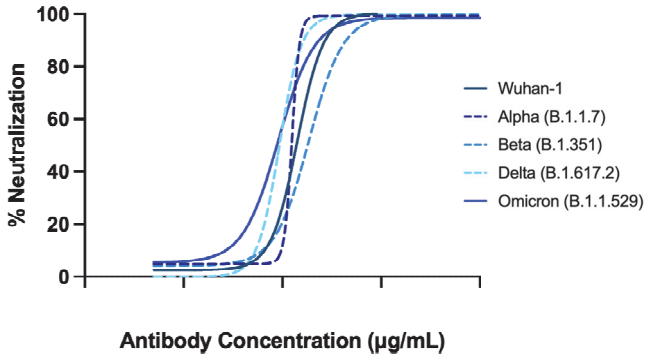
Potent Pseudovirus-Neutralizing Activity Demonstrated Against the SARS-CoV-2 Delta (B.1.617.2) Variant

In June 2021, Talem announced results from its *in vivo* hamster challenge efficacy study of TATX-03a PolyTope® Therapy, its four monoclonal antibody cocktail being developed for the potential prevention and treatment of SARS-CoV-2, demonstrating reduced bronchitis and tracheitis inflammation severity. The Company concurrently announced optimization results of TATX-03 cocktail components designed to improve clinical suitability of their PolyTope® therapy.

In July 2021, the Company revealed new results that its TATX-03 PolyTope® therapy demonstrated potent pseudovirus-neutralizing activity against the SARS-CoV-2 Delta (B.1.617.2) variant. The Company anticipated viral evolution leading to novel SARS-CoV-2 variants of concern throughout the design of their PolyTope® SARS-CoV-2 therapeutic cocktail, aiming to minimize the risk of mutagenic escape (a reduction or elimination in the efficacy of a therapy or vaccine by virus mutation).

Additional evaluation of virus neutralization potency in an *in vitro* pseudovirus-based assay revealed that the antibody cocktail is also not affected by the rapidly spreading Delta variant (B.1.617.2). Parallel reactivity screening of the individual antibodies of TATX-03 revealed differential susceptibility of the lead components towards the Kappa (B.1.617.1) variant with the majority showing they maintained binding. These results are consistent with previously announced binding data towards other SARS-CoV-2 mutants, including variants of concern Alpha (B.1.1.7), Beta (B.1.351), and Gamma (P.1) variants (Figure 18, page 32).

Figure 18
PSEUDOVIRUS NEUTRALIZATION SCREENING OF TATX-03B



Source: ImmunoPrecise Antibodies Ltd.

In January 2022, Talem revealed new data which showed remarkable consistency in the ability of the TATX-03 antibody cocktail to retain its potent and complete *in vitro* neutralization against all variants, as demonstrated with Omicron pseudovirus reinforced with neutralization data against the wild-type parental virus (Wuhan) and all predominant variants of concern.

These binding data, combined with the maintained neutralization potency of TATX-03 to tested variants of concern, supports Talem's expectation that rationally designed multi-membered antibody cocktails are more sustainable (can be functionally less prone to escape-by-one mutations). The data from the Company's screenings on the variants of concern address the importance of targeting diversified epitopes on the spike trimer for treatment sustainability and resilience of Talem's PolyTope® cocktail. Talem has demonstrated that TATX-03 retained efficacy against every variant of concern to date through *in vitro* pseudovirus assays conducted with respect to such variants of concern. PolyTope TATX-03 is unique in its ability to engage multiple modes of action, facilitated through simultaneously targeting various non-overlapping epitopes on the spike trimer.

PIND and Development Plan

With the first-in-human study being prepared, the Company announced that it has committed to ChemPartner Biologics for clinical batch production. This global CRO/CDMO has a rare capability and capacity to produce the multiple components of this therapeutic cocktail in parallel and in a relatively short timeframe. They also expect to report data on additional preclinical data points. Currently, IPA is working with Eurofins to generate IND-enabling toxicology and pharmacokinetic (PK) data (page 27). In parallel to these and with the support of its third-party regulatory teams, the Company is compiling the required data for the IND submission. To facilitate a successful IND application, they have also engaged the FDA and received feedback on the proposed clinical strategy and supporting data package. The goal is to finalize the corresponding data package for the IND filing in early Q2 2022. The first batches of these clinical products for the studies are expected to be ready late Q2 2022.

Nanomedicine Therapy SARS-CoV-2 Program

In December 2020, the Company announced that it was joining the COVABELP consortium, comprised of Radboud University Medical Center (Radboudumc) and Eindhoven University of Technology (TU/e). The academic partners of the consortium have been awarded €350,000 from Health Holland under the Eureka Program to develop a SARS-CoV-2-specific therapeutic nanomedicine that is administered via nasal inhalation and that can also be used for *in vitro* diagnostics. The COVABELP program combines IPA's technologies and expertise in antibody selection,

development, and engineering of single-domain antibodies (such as VHHs) with Radboudumc's specialized skills in targeted nanomedicine and TU/e's thermo-responsive diblock elastin-like peptide (dbELP) technology.

The potential advantage of this nanomedicine-based therapy is not only the capacity to deliver the therapeutic directly to the patient's lungs but also the induction of virus aggregation leading to patient immunity, in effect, simultaneously generating a vaccine response. In addition, the biochemical properties of the nanoparticles allow for easy adaptation to a format that enables the identification of infected individuals by sensitive and rapid virus detection in saliva and nasopharyngeal swabs. The integration of the Company's expertise in rapidly isolating anti-virus antibody fragments from its in-house antibody libraries, coupled with the nanoparticle-based theranostic platform, serves as a proof-of-concept study to enable the rapid detection of future pandemic pulmonary viruses.

CARES Act ND Bioscience Group Program Grant

In July 2020, IPA USA and Talem were awarded a grant of $1.5 million by the North Dakota Department of Agriculture through the CARES Act ND Bioscience Group Program for the development of antibody therapeutics against SARS-CoV-2. The total grant project cost is $2 million, for which the subgrantee must contribute an amount not less than 25% of the grant project cost, or $500,000. The Company has also had grants approved in the amount of approximately $55,000 in the form of reduced costs of services performed from the Canadian National Research Council's (NRC) Innovation Research Assistance Program to support collaborative research with the NRC.

Vaccines

TATX-99 SARS-CoV-2 Vaccine with LiteVax B.V. (funded by TRANSVAC2)

In June 2020, the Company was granted funding by TRANSVAC2, an E.U. vaccine and R&D infrastructure, to cover the costs of a preclinical vaccine study in a collaboration with LiteVax B.V, with the first preclinical immunogenicity study in large non-rodent species using the Company's protein fragments combined with LiteVax's adjuvant having been completed.

In December 2020, IPA and LiteVax announced the nomination of a lead vaccine for further preclinical evaluation and development based on results from their collaborative preclinical immunogenicity study. The vaccine candidate was selected following an assessment of the immunogenicity profiles of multiple COVID-19 vaccine candidates, each having an empirically designed, single SARS-CoV-2 spike protein segment in non-rodent species. Employing the Company's massive data sets, candidates were screened and optimized to maximize the inclusion of functional, antigenic, epitopes while at the same time, minimizing the total foreign epitope exposure—possibly reducing long-term, negative side effects.

TRANSVAC is designed to accelerate vaccine development by enhancing European vaccine research and training, and increasing sustainability of European Commission (EC) vaccine projects by implementing a permanent research infrastructure for early vaccine development. Reactivity screening of the animal sera revealed that one immunogen resulted in significant antibody responses after one injection. Antibody responses were considerably higher when this immunogen was combined with LiteVax's adjuvant compared to two benchmark adjuvants.

The Company was recently informed that TRANSVAC2 awarded a second round of funding to IPA and LiteVax. The funds will cover the further evaluation for the potential of the SARS-CoV-2 low single dose vaccine candidate. This will include an immunogenicity study in swine using a slightly fine-tuned version of the vaccine to enhance functional immunogenicity and reduce mutagenic escape. In the event that data further indicates the induction of functional immunogenicity, TRANSVAC2 has additionally committed to funding a follow-up vaccination challenge study in Syrian hamsters to accelerate proof-of-concept to support further development.

Antibody-Based Saliva Home Diagnostic Test

Talem began obtaining external, non-dilutive, non-debt funding through various granting agencies to support its COVID-19 endeavors and asset generation. This included a grant from Natural Sciences and Engineering Research Council of Canada to fund a collaboration between the University of Victoria and IPA Canada to generate an antibody-based saliva diagnostic test that can be conducted at home, with results analyzed using a cell phone application providing real-time, confidential data to health authorities. The COVID saliva test system is currently in the que awaiting validation with human samples. The timelines, direction, and level of Talem's involvement in the program will largely be dependent upon the outcome of those tests.

Other Pipeline Candidates

TATX-21

Pipeline candidate, TATX-21, is a potential first-in-class/best-in-class antibody for Atherosclerosis Cardiovascular Disease (ACVD) targeting ALK1. The Company is evaluating the ability of those leads to directly interfere with low-density lipids (LDL) uptake *in vitro*. By developing antibodies that block the uptake of LDL, the Company is targeting the enormous cardiovascular disease market. Talem is currently preparing for a functional test to determine whether they are able to prevent the **transcytosis** of LDL in the laboratory, which leads to plaque formation in the arteries. These initial proof-of-concept studies are crucial and valuable to determining the potential for these assets to both prevent and treat cardiovascular disease.

The Company presented results from *in vitro* characterizations investigating TATX-21, a diverse pool of antibodies (cross-) reactive to human and murine paralogous targets, at 2021 BIO International Convention partnering sessions. The antibodies, isolated via the Company's single B cell Select® technology (described on pages 24-25), were discovered using rabbit B cells as the source of novel antibodies, a host cell utilized by Talem with the aim to maximize the diversity and function of the resulting lead candidates. The lead candidate pool of 25 sequence-unique antibodies has been advanced for further testing to determine their potential to prevent LDL uptake—functional tests that are intended to shine light on the antibodies' potential to prevent and treat ACVD.

The Company is screening the lead candidate pool for the ability to block the interaction of the target of interest with LDL as well as for their ability to stimulate the target, thereby potentially activating a down-stream signaling cascade, which may provide a novel treatment approach for diabetic retinopathy.

TATX-23 with Genmab

On October 15, 2020, IPA Europe entered into a research evaluation agreement with Genmab in which IPA Europe was granted a research license for the purpose of evaluating Genmab's DuoBody® platform to be used in connection with the advancement of IPA Europe's infectious diseases therapeutic program. This agreement has been prolonged beyond its initial term, during which time IPA Europe can evaluate the use of this platform for *in vivo* application as well, and pending the results of such evaluation, the parties may negotiate a commercial license for IPA Europe to make use of the DuoBody® platform in order to commercialize and exploit the resulting product candidates.

TATX-112

In April 2021, Talem announced that it had advanced development of a candidate panel of vetted, novel, therapeutic antibodies, collectively referred to as TATX-112, against TrkB, into formal lead candidate characterization. TATX-112 is a potential first-in-class therapy with unique subsets of antibodies targeting cancer and neurodegenerative diseases, including Alzheimer's.

This program for **oncology** is supported by pharmaceutical inquiries by identifying molecules that are suitable for antibody drug conjugation, also known as ADC-based therapies, due to their ability to enter a cell upon binding a target through a process called internalization and subsequent release of a payload (the drug conjugate). The Company expects to finalize the *in vitro* nonclinical functional characterizations for ADC approaches in Q1 2022.

Additionally, Talem recently confirmed that antibodies in the same program have the ability to interfere with ligand binding to a target, which has prompted an investigation at the Company as to which candidates may enhance signals meant to communicate inside the target cells and which block this critical message. This is important because each function may reveal different potential therapeutic uses and distinctly different market opportunities.

TATX-115 with Twist Bioscience Corporation (TWST-NASDAQ)

In October 2020, Talem entered into a collaboration agreement with Twist Bioscience Corporation to expand its antibody pipeline to a wider range of oncology targets, combining their expertise in a highly collaborative manner to discover novel antibody therapeutics. As part of this agreement, both Talem and Twist are to contribute their own work and research to the project, with each entity incurring their own costs. Talem is to contribute targets of interest with relevant background data and the genetic sequences encoding for lead antibodies against the selected targets.

Twist Biopharma, a division of Twist, is working to design synthetic antibody libraries based on the provided antibody repertoire sequences from immunized animals to discover optimized, humanized lead antibody candidates. The parties seek to jointly advance the programs through proof-of-concept and preclinical development and to collaborate on any commercial opportunities generated by these joint efforts, which may result in milestones based on key preclinical, clinical, and commercial milestones as well as royalties for any antibodies resulting from the collaboration.

TATX-115 has the potential to be a powerful immuno-oncology target via two different mechanisms of action. Accordingly, the Company is focused on identifying and nominating two very distinct classes of lead candidates that are under further development, with Talem having 100% ownership of these assets, including monotherapies and cocktail therapies across multiple disease indications.

Other Partnerships

Ligand Pharmaceuticals OmniAb®

Talem entered into a license, dated October 30, 2019, with Ligand Pharmaceuticals for the use of OmniAb® transgenic animals pursuant to a commercial platform license and services agreement. OmniAb® is a suite of genetically engineered rats, mice, and chickens for generation of diverse mono- and bispecific, fully human antibodies. Talem has the right to discover, develop, and partner antibodies from these animals. This license agreement is for an indefinite period of time, with Talem required to pay a non-material upfront fee to Ligand and make further payments (which could be in the low single-digit millions), upon achieving certain clinical milestones. Talem has also granted Ligand a single-digit percentage royalty of net sales for commercial products developed in connection with this license agreement.

The Pierre Fabre Pharmaceutical Group

On October 7, 2021, IPA (through its subsidiary Talem) and the Pierre Fabre pharmaceutical group announced that the companies have entered a multi-year, multi-target research collaboration with the goal of discovering and developing therapeutic antibodies for up to nine targets. This collaboration is expected to help expand Talem's portfolio of novel antibodies across oncology to jointly address life threatening human diseases and adds to the variety of diverse relationships that the Company has within the pharmaceutical and biotechnology sector. Under the research collaboration, scientists from both companies are to work together and contribute their respective resources to discover and develop novel antibodies leveraging IPA's antibody discovery technologies, such as B cell Select® or Deep Display™ using **wild-type** and/or transgenic animals, available human libraries, as well as the Company's signature "end-to-end" services.

The antibodies developed in the research collaboration against the selected targets will be jointly owned by Talem and Pierre Fabre and, following the completion of each target specific research program, Pierre Fabre will have an option to obtain an exclusive worldwide license to Talem's interest in those jointly discovered antibodies against that particular target, and Talem would be eligible to receive certain up-front and contingent downstream payments. In addition, if licensed, Pierre Fabre will be responsible for the preclinical and clinical development, as well as the commercialization of the jointly discovered antibodies.

Janssen Research & Development

On March 10, 2020, Talem entered into a research license agreement with Janssen Research & Development, LLC, providing Janssen with exclusive access to a panel of novel monoclonal antibodies against an undisclosed target. Pursuant to this license agreement, Janssen held an option to acquire all commercial rights to the antibodies and engaged the Company for an initial term of six months for aggregate consideration of less than US$500,000. In July 2020, Janssen requested a temporary extension of the license agreement on a no-fees basis. In December 2020, Janssen exercised its option to purchase the assets resulting from the work being conducted by Talem for aggregate consideration of less than US$1,000,000.

Mila

In November 2020, IPA announced a research partnership with Mila, a world-renowned research institute dedicated to artificial intelligence (AI) development and focused on deep learning optimization for AI and machine language learning. Under this partnership, IPA and Mila will collaborate on research and talent development initiatives as IPA continues to advance next generation innovation in therapeutics. The collaboration is expected to leverage data and AI to transform how novel therapeutics are discovered and developed. The Mila Institute is recognized worldwide for its significant contributions in the field of deep learning and has established itself in the fields of language modeling, machine translation, object recognition, and generative design. Founded in 1993 by Professor Yoshua Bengio of the Université de Montréal, Mila is a research institute in AI with 500 researchers specializing in the field of deep learning. Based in Montréal, Mila's mission is to be a global pole for scientific advances that inspire innovation and the development of AI for the benefit of all.

BioStrand, BioKey, and BioClue

IPA announced in April 2022 that it had completed its previously announced acquisition of control over BioStrand BV, BioKey BV, and BioClue BV (collectively referred to as "BioStrand"), a group of Belgian biotech entities and pioneers in the field of bioinformatics and biotechnology, through its wholly owned subsidiary IPA Netherlands BV. BioStrand's focus is on handling of biological sequences, and generating biological sequence information, software development, algorithms, data visualization, and visual analytics. Potential applications are in the field of molecular diagnostics, point of care testing, in depth analysis for drug development, prediction, construction and adaptation of biopolymer sequences as well as a product, service, or tool which stores this information in a database. The business of BioKey is related to the identification of characteristic biological sequences in proteins, RNA and DNA, and their different information layers, the development of a knowledgebase containing these characteristic biological sequences and information layers, and the use of this database to process biological sequences and compare the processed biological sequences. BioClue focuses on technology for performing secondary analysis, consisting of read mapping/assembly and immediate identification of variations, as well as on products, services and tools related to the developed technology, primarily aimed at determining biological sequences in proteins, RNA and DNA, including through mass spectrometry, sequencing, microarray, or hybrid microarray system technologies.

Investment Highlights

- ***A full-service biologics Contract Research Organization (CRO)* involved in therapeutic antibody discovery.** The Company provides outsourced preclinical research within the biotechnology, pharmaceutical, and medical devices industries on a contracted basis.

- ***Greater demand for CRO services.*** There has been increasing demand for CRO service as pharmaceutical and biotechnology manufacturers seek greater efficiency and timely access to sophisticated technology and expertise. The CRO market is approximately $30 billion and growing. IPA's CRO services include, but are not limited to, antigen target design and modelling, immunization, antibody discovery, characterization, optimization, and manufacturing.

- ***A leader in transgenic animal platforms***. Over the past years, the Company has gained recognition as a leader in the biologics and CRO space with IPA Canada and IPA Europe, which have both been designated as approved CROs for the world's leading transgenic animal platforms producing human antibodies.

- ***Offers a full suite of CRO services.*** The Company is likely to benefit from the growth in demand for outsourced services related to antibody discovery and development as it offers a full suite of CRO services within antibody optimization, engineering, and manufacturing—affording IPA with a substantial advantage. The Company is also expected to benefit from its internal product pipeline, which includes its COVID-19 antibody program (via its Talem Therapeutics subsidiary, see below).

- ***Top pharmaceutical companies are their clients***. Working with 70% of the top 20 global pharmaceutical companies, IPA's laboratory operations are carried out from three facilities—Victoria, BC (IPA Canada), as well as Utrecht and Oss in the Netherlands (IPA Europe).

- ***The Company continues to see an increase in the number of clients and the size of its contracts***, while also recognizing revenue from recently developed and/or expanded services in areas such as high throughput label and fluidic-free antibody characterization, hybridoma sequencing, its advanced second generation B cell Select® platform, and the geographical expansion of its manufacturing services.

- ***The Company continues to realize the benefits from its new marketing approaches, tax incentive programs, and commercial partnerships***, which are designed to provide catalysts for growth in both its contract research and Talem partnering relationships.

- ***IPA's comarketing program with Eurofins is poised to position the Company on a global scale,*** highlighting the value of IPA's unique suite of antibody products and services to industry-leading organizations, and setting the stage for its market narrative as the emerging leader in end-to-end services.

- ***Successful dual listing.*** A major step to unlocking long-term shareholder value has been IPA's successful dual listing. Having gone public in 2016, IPA is dual listed on both the NASDAQ and the TSX Venture Exchange (TSXV) under the symbol "IPA", enabling the Company to diversify its shareholder base with long-term retail as well as institutional investors from not just the U.S. but worldwide.

- ***Raised US$25 million.*** In February 2021, IPA closed a public offering in which it raised gross proceeds of US$25 million, strengthening the Company's balance sheet and creating further runway to achieve its strategic goals. These goals include growing the presence within the CRO space, as well as ensuring a continual flow of internal candidates through functional and preclinical analysis toward potential out licensing and the continued launch of novel programs.

- ***At-the-market (ATM) Agreement***. On October 13, 2021, the Company established an at-the-market equity offering facility, which entitles the Company, at its discretion and from time-to-time during the term of the ATM Agreement to sell, through its agent, H.C. Wainwright & Co, common shares of the Company having an aggregate gross sales price of up to US$50 million.

- ***Current Cash Position.*** As of January 31, 2022, the Company held cash of approximately C$33 million.

Talem Therapeutics Subsidiary

- ***IPA continues to develop internal and partnered therapeutic discovery programs through its Talem subsidiary***. In pursuing this objective, Talem expects to continue to work with its current partners as well as others with which it may engage in the future on a number of research, development, and preclinical endeavors. Talem also expects to seek to expand its base of existing partners for novel research programs, as well as out-licensing and/or sales of internal assets.

- ***Talem is focused on advancing its pipeline candidates as it leverages its highly differentiated therapeutic antibody programs to potentially treat various disease areas.*** These include infectious diseases (i.e. SARS-CoV-2), cardiovascular pathology, neurology, immuno-oncology, inflammation, and rare/specialty diseases, and moving these candidates into preclinical analysis and functional studies.

COVID-19 Opportunity

- Since January 2020, Talem has been engaged in SARS-CoV-2 research. One of its most advanced development programs, TATX-03 (anti-SARS PolyTope® monoclonal antibody), is a fully human, synergistic, antibody cocktail containing potently neutralizing antibodies against non-overlapping epitopes on SARS-CoV-2.

- In February 2020, the Company launched its coronavirus vaccine and therapeutic antibody to address both the prophylactic (preventative) and therapeutic measures to fight SARS-CoV-2 through its Talem subsidiary.

- In March 2020, Talem announced the launch of TATX-03 PolyTope® monoclonal therapy, representing a treatment option for COVID-19 patients that is focused on broad protection to ensure efficacious treatment of patients even as the virus evolves.

- In July 2020, IPA was awarded a $1.5 million Bioscience Innovation Grant for Coronavirus Research from the North Dakota Department of Agriculture for the development of antibody therapeutics against SARS-CoV-2.

- IPA is developing its anti-SARS-CoV-2 PolyTope® monoclonal therapy, which utilizes characterized protein and antibody combinations aimed at targeting multiple epitopes and mechanisms of virus evasion in an effort to develop innovative therapeutics and vaccines against the COVID-19 virus.

    - The Company's PolyTope® approach is expected to provide a clinical benefit against both current and future variants and strains of the COVID-19 virus by combining well-defined and fully characterized, protective antibodies (for therapeutics) and epitopes (for vaccines).

- Using the Company's proprietary B cell Select® and DeepDisplay™ technologies, Talem combines various SARS-CoV-2 spike protein forms anticipating that it will accelerate the anti-SARS-CoV-2 human antibody discovery by targeting multiple viral epitopes and mechanisms of viral evasion.

- The Company successfully demonstrated preclinical *in vivo* results for its TATX-03 PolyTope® Therapy, a four mAb antibody cocktail developed for the potential prevention and treatment of SARS-CoV-2. The preclinical study demonstrated potent pseudovirus neutralizing activity against the SARS-CoV-2 Delta (B.1.617.2) variant.

    - Histopathology preclinical data from the TATX-03a Polytope® Program confirmed treatment substantially reduced bronchitis and tracheitis severity in preclinical studies.

- The Company released a publication entitled "Cornering an Ever-Evolving Coronavirus: TATX-03, a Fully Human, Synergistic, Multi-Antibody Cocktail Targeting the SARS-CoV-2 Spike Protein with in vivo Efficacy" on bioRxiv.

- In January 2022, Talem filed a non-provisional U.S. patent application and concurrent PCT international and other national patent applications.

- On January 31, 2022, the Company released information on potent neutralization of the Omicron variant by its immunotherapeutic Polytope® and moves further towards FDA/IND-submission.

Partnerships

- IPA is advancing its partnerships, having previously announced deals with Pierre Fabre, Twist Biosciences, and Litevax during the fiscal year (described on pages 33-36), among others.

- The Company has expanded its partnership with Eurofins Discovery's global clients, providing them greater access to IPA's end-to-end antibody discovery capabilities using wild type and best-in-class *in vivo* and *in vitro* antibody discovery technologies that are optimized to deeply mine antibody repertoires.

- In developing IP intended to further drive its technology, both in efficiency and innovation, IPA has created a research partnership with Mila, a world-renowned research institute dedicated to artificial intelligence (AI) development and focused on deep learning optimization for AI and machine learning language. The partnership provides the Company with access to world-class specialists.

- Within the deep learning space, the Company is optimizing its next generation sequencing pipeline and evaluating in depth analysis and prediction tools for their integration into its platforms, while using innovative *in silico* approaches to enhance computer-aided antibody discovery and optimization.

Other

- The Company announced its CIR tax accreditation status to eligible French companies who engage with it in Europe. This added benefit to the full service advantage of IPA strengthens the Company's platform of industry recognition and adds value to its ongoing expansion in France.

- IPA expects to continue to invest in employees, partnerships, cloud computing, data curation, and analysis to enable further work toward developing custom algorithms, cloud computing, large-scale sequence data analysis, and expanded access to next-generation sequencing technologies.

    - IPA continues to build out on its global infrastructure, having completed the global rollout of its **enterprise resource planning (ERP)** and **customer relationship management (CRM)** systems during fiscal year 2021.

    - IPA appointed Dr. Ilse Roodink to the Role of Chief Scientific Officer and Dr. Dion Neame to the Strategic Advisory Board.

    - The Company further expects to add additional full-time employees to assist in portfolio management, out-licensing, and program oversight.

- The Company believes that its internal projects will ultimately drive transformative revenue generation opportunity for the Company through upfront payments as well as clinical milestones and competitive commercial royalties.

- IPA has shored up its financial strategy, having completed the final deferred payments and profit-sharing payments from prior acquisitions.

Competition

IPA competes primarily with other contract research organizations (CROs) and services provided by in-house biopharmaceutical research and development (R&D) departments. Competitive factors within the industry in which IPA operates include, but are not limited to, experience within specific therapeutic areas, quality of staff and services, reliability, range of provided services, ability to recruit principal investigators into studies expeditiously, location of facilities, speed to completion, price, and overall value.

The Company believes it competes effectively with other companies across these areas, particularly due to its full service operating model, its therapeutic expertise, its single-vendor platform, and its experienced and committed management team. However, some of its competitors have greater financial resources and brand awareness within the market. Some of its competitors are also well known for niche specialties, such as antibody development against glycosylated peptides or specific chemical modifications—areas that the Company also participates but is not yet well known. This could put IPA at a competitive disadvantage when compared to these competitors. Certain competitors provide custom antibody production services simultaneously with large catalogs of antibodies available for sale through their websites. Some competitors have been acquired and merged into larger companies, particularly larger laboratory facilities.

IPA has established an acceptance of its customized antibodies services in the market. The Company believes that the market acceptance of its products will continue as it organically grows its business, optimizes its laboratories, generates new sales and marketing capacities, and its production processes support long-term growth. The Company is one of the few approved CROs for providing multiple transgenic animal models to the market, enabling development of therapeutic antibodies without the need for antibody humanization. The list of companies represented within this Competition section is not an exhaustive collection of IPA's potential competitors within the CRO market; however, it is believed to be a wide-ranging sample of the type of competition that the Company may face.

Potential CRO Competitors

AbCellera Biologics Inc. (ABCL-NASDAQ)
https://www.abcellera.com/

AbCellera is a technology company that searches, decodes, and analyzes natural immune systems to find antibodies that its partners can develop into drugs to prevent and treat disease. AbCellera partners with drug developers of all sizes, from large pharmaceutical to small biotechnology companies, empowering them to move quickly, reduce cost, and tackle the toughest problems in drug development. AbCellera initially mobilized its pandemic response platform against COVID-19 in March 2020, resulting in the discovery of bamlanivimab, the first monoclonal antibody therapy for COVID-19 to reach human testing and to be authorized for emergency use by the FDA. Bamlanivimab alone and together with other antibodies has treated hundreds of thousands of patients, preventing COVID-19-related hospitalizations and death. AbCellera's ongoing efforts to respond to the COVID-19 pandemic have identified thousands of unique anti-SARS-CoV-2 human antibodies. These include bamlanivimab, bebtelovimab, and other antibodies that are in various stages of testing by AbCellera and its partners. AbCellera is working with Eli Lilly (LLY-NYSE) in developing a monoclonal antibody treatment for COVID-19, similar to IPA's PolyTope® program, which is being developed as a monoclonal antibody cocktail for COVID-19. AbCellera's pandemic response capabilities were developed over the past three years as part of the Defense Advanced Research Projects Agency (DARPA) Pandemic Prevention Platform (P3) program. The goal of the P3 program is to establish a robust technology platform for pandemic response capable of developing field-ready medical countermeasures within 60 days of isolation of an unknown viral pathogen. The company has headquarters in Vancouver, British Columbia

Abveris, Inc. (Now part of Twist Bioscience [NASDAQ: TWST])
https://www.abveris.com/abv-home

Abveris is an antibody discovery company providing contract research services to the biopharma industry. The company applies advanced immunization methods combined with B cell screening and hybridoma-based antibody discovery technologies to provide comprehensive gene-to-antibody discovery services. Abveris is developing the next generation of biologics, cell therapies, vaccines, and diagnostics in partnership with global biopharma leaders. The company has headquarters in Canton, MA.

Antibody Solutions (private)
https://www.antibody.com/

Antibody Solutions is a CRO that provides research and discovery services and fit-for-purpose antibodies to biopharmaceutical and diagnostic companies and academic researchers worldwide. The company's services include monoclonal and polyclonal antibody and antigen development, molecular modeling, antibody sequencing and engineering, bioreactor technology, pharmacokinetic studies, antibody epitope binning, peptide **synthesis**, immunoassay development, ligand-binding assay analysis, and support for CAR-T research. Over the years, Antibody Solutions has had strategic agreements with a range of life science companies, including Open Monoclonal Technology, Inc., Reflexion Pharmaceuticals, Guava Technologies, Single-Cell Technologies, Trianni, Harbour Antibodies, and Alloy Therapeutics. Antibody Solutions has headquarters in Santa Clara, CA.

Aragen Bioscience Inc. (private) Formerly GVK Biosciences Pvt. Ltd.
https://www.aragen.com/

Aragen Bioscience is an R&D and manufacturing partner to the global life sciences industry, transforming ideas into solutions for better health—from concept to commercial. Whether large pharmaceutical or biotechnology entities, an agrochemical or animal health company, Aragen provides clients with global resources and proven capabilities at every stage of the biopharma lifecycle, in small and large molecules. Its ability to offer end-to-end solutions or support standalone programs is strengthened by its enabling technologies and a partnership approach. The company has U.S. headquarters in Morgan Hill, CA and global headquarters in India.

Evotec SE (EVTCY-OTC)
https://www.evotec.com/

Evotec is a global platform company, leveraging its data-driven multimodality platform for both proprietary as well as partnered research, and applying a combination of innovative technologies for the discovery and development of first-in-class and best-in-class pharmaceutical products. Its network of partners includes all top 20 pharmaceutical and hundreds of biotechnology companies, academic institutions, and other healthcare stakeholders. Evotec has strategic activities in a broad range of currently underserved therapeutic areas, including neurology, oncology, as well as metabolic and infectious diseases. Within these areas of expertise, Evotec aims to create the world-leading co-owned pipeline for innovative therapeutics and make them accessible to patients worldwide. To date, the company has established a portfolio of more than 200 proprietary and co-owned R&D projects from early discovery to clinical development. Evotec operates globally with more than 3,900 highly qualified people at 14 sites in six countries across Europe and the U.S. The company's sites in Hamburg (HQ), Cologne, Goettingen, and Munich (Germany), Lyon and Toulouse (France), Abingdon and Alderley Park (UK), Verona (Italy), Orth (Austria), as well as in Branford, Princeton, Seattle, and Watertown (USA) offer highly synergistic technologies and services and operate as complementary clusters of excellence.

Fusion Antibodies Plc (FAB-LSE)
https://www.fusionantibodies.com/

Fusion Antibodies is a Belfast, Northern Ireland-based, revenue generating and profitable CRO providing a range of antibody engineering services to develop antibodies for both therapeutic drug and diagnostic applications. The Company's mission is to enable biopharmaceutical and diagnostic companies to develop innovative products in a timely and cost-effective manner for the benefit of the global healthcare industry. Clients of the company have a number of new drugs, which Fusion Antibodies has been involved in the development of through antibody humanization, which have entered or are proposed to be entering clinical trials. The company was established in 2001 as a spin out from Queen's University Belfast. It was initially a drug development business but revised its operations to focus on CRO work in 2011. Fusion Antibodies provides a broad range of services in antibody generation, development, production, characterization, and optimization. These services include antigen expression, antibody production, purification and sequencing, antibody humanization using the company's proprietary CDRx™ platform, and the production of antibody generating stable cell lines to provide material for use in clinical trials. Since 2012, the company has successfully sequenced over 250 antibodies and successfully completed over 100 humanization projects for its clients. Fusion Antibodies has an international, blue-chip client base, which includes eight of the top ten global pharmaceutical companies by revenue, with a significant amount of its revenue generated from follow-on service requests from existing clients.

Genovac GmbH (formerly part of Aldevron, LLC) (private)
https://genovac.com/

Genovac was initially launched in 1999 by three University of Freiburg professors who built on the institution's contributions to pioneering antibody discovery research and development. Focused on delivering the most advanced genetic immunization and hybridoma technologies, the founders created the gold standard of the time for the generation of antibodies against challenging targets. With the management led buyout of the Aldevron's antibody discovery business unit, Genovac has been relaunched to redefine the gold standard for the delivery of antibodies against challenging targets through continuous improvement of immunization technologies and novel use of Berkeley Light's Beacon instrument. Genovac is currently the only contract research partner to offer two Beacon's for antibody discovery; the only partner to combine its powerful genetic immunization technology and with the screening power of two Beacons; and the only partner who offers Beacon screening with multiple species options, including Ligand's OmniRat. The company has headquartered in Fargo, North Dakota with research and manufacturing operations in Freiburg, Germany.

Genscript Biotech (GNNSF-OTCMKTS)
https://www.genscript.com/

Genscript Biotech Corporation (and its subsidiaries) is an internationally recognized leading biotech company specializing in fundamental life sciences research and early-phase drug discovery services. Based on its proprietary gene synthesis technology and the other technology and know-hows on life-science research and application, the company has four platforms including (1) a leading life-science services and products platform to provide one-stop solutions to global research communities, (2) a biologics contract development and manufacturing organization (the CDMO) platform, (3) an industrial synthetic products platform, and (4) an integrated global cell therapy platform. The four internally built platforms have demonstrated their strong growth from research and development to commercial delivery. The company has headquarters in Piscataway, NJ.

LakePharma, Inc. (Now a part of Curia, which is formerly AMRI) (private)
https://lakepharma.com/

In early September 2021, Curia (formerly AMRI) a leading contract research, development, and manufacturing organization, acquired LakePharma, Inc., a privately held biologics drug discovery, clinical research, development, and manufacturing organization, with operations in California, Massachusetts, and Texas. Curia provides products and services from R&D through commercial manufacturing to pharmaceutical and biopharmaceutical customers, with over 3,700 employees at 29 locations across the U.S., Europe, and Asia. With the addition of LakePharma,

Curia now offers deep expertise in both large and small molecules from drug discovery through drug substance manufacturing, sterile injectable formulation, and fill-finish production.

Syngene International Ltd. (SYNGENE-NSE)
https://syngeneintl.com/

Syngene is an integrated research, development, and manufacturing organization providing scientific services—from early discovery to commercial supply. The company offers services in a wide range of industrial sectors, including pharmaceutical, biotechnology, nutrition, animal health, consumer goods, and specialty chemical companies. It's culture of scientific innovation is driven by the expertise of its team of 5,000 employees and supported by state-of-the-art infrastructure and market-leading technology. Syngene offers clients a customized end-to-end solution to fulfil their R&D and manufacturing requirements. This is underpinned by a well-established safety framework, track record of quality and compliance, robust supply chain, and access to its skilled scientists. This approach enables Syngene to forge client relationships that move beyond the traditional service outsourcing model into true end-to-end collaborations. Syngene has headquarters in Bangalore, India.

Twist Bioscience (TWST-NASDAQ)
https://www.twistbioscience.com/

Twist Bioscience is a synthetic biology and genomics company that has developed a disruptive DNA synthesis platform to industrialize the engineering of biology. The core of the platform is a proprietary technology that pioneers a new method of manufacturing synthetic DNA by "writing" DNA on a silicon chip. Twist is leveraging its unique technology to manufacture a broad range of synthetic DNA-based products, including synthetic genes, tools for next-generation sequencing (NGS) preparation, and antibody libraries for drug discovery and development. The company is also pursuing longer-term opportunities in digital data storage in DNA and biologics drug discovery. Twist makes products for use across many industries, including healthcare, industrial chemicals, agriculture and academic research. Twist has headquarters in South San Francisco, CA.

As discussed on page 35, In October 2020, Talem entered into a collaboration agreement with Twist Bioscience Corporation to expand its antibody pipeline to a wider range of oncology targets, combining their expertise in a highly collaborative manner to discover novel antibody therapeutics. As part of this agreement, both Talem and Twist will contribute their own work and research to the project, with each entity incurring their own costs. Talem is to contribute targets of interest with relevant background data and the genetic sequences encoding for lead antibodies against the selected targets.

WuXi Biologics (WXIBF-OTCMKTS)
https://www.wuxibiologics.com/

WuXi Biologics, a Hong Kong-listed company, is a global open-access biologics technology platform offering end-to-end solutions to empower organizations to discover, develop, and manufacture biologics from concept to commercial manufacturing. The company is currently conducting on behalf of its clients and partners (as of June 30, 2021) a total of 408 integrated projects, including 212 in preclinical development stage, 160 in early-phase (Phase I and II) clinical development, 32 in late-phase (Phase III) development, and 4 in commercial manufacturing. With a total estimated capacity of exceeding 430,000 liters for biopharmaceutical production planned after 2024 in China, Ireland, the U.S., Germany, and Singapore, WuXi Biologics is expected to provide its biomanufacturing partners with a robust and premier-quality global supply chain network.

Historical Financial Results

Figures 19, 20, and 21 (pages 45-47) provide a summary of IPA's most recent key financial statements. For a complete list of notes and disclosures, please see the Company's most recent financial results filing: https://www.sedar.com/GetFile.do?lang=EN&docClass=5&issuerNo=00005542&issuerType=03&projectNo=03351031&docId=5155341.

Figure 19
IMMUNOPRECISE ANTIBODIES LTD.
CONDENSED INTERIM CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(Unaudited - Expressed in Canadian dollars)

		Three months ended January 31,		Nine months ended January 31,	
(in thousands, except share data)	Note	2022 $	2021 $	2022 $	2021 $
REVENUE		4,815	4,515	14,125	13,035
COST OF SALES		2,229	953	6,458	4,274
GROSS PROFIT		2,586	3,562	7,667	8,761
EXPENSES					
Advertising		228	216	589	505
Amortization and depreciation	8, 9	638	731	1,948	2,125
Asset impairment charge	8, 13	167	—	167	—
Bad debt expense (recovery)		7	(2)	(17)	(23)
Consulting fees		299	124	650	318
Foreign exchange loss (gain)		(55)	96	(16)	142
Insurance		510	204	1,470	301
Interest and bank charges		96	91	258	398
Management fees	15	—	—	—	269
Office and general		224	624	748	980
Professional fees		513	692	1,135	1,113
Rent		44	57	114	147
Repairs and maintenance		54	29	161	184
Research and development		1,820	—	5,787	1,358
Salaries and benefits	15	1,789	1,074	4,633	3,925
Share-based payments	14, 15	492	852	2,297	1,426
Telephone and utilities		12	23	35	51
Travel		55	12	169	42
		6,893	4,823	20,128	13,261
Loss before other income (expenses) and income taxes		(4,307)	(1,261)	(12,461)	(4,500)
OTHER INCOME (EXPENSES)					
Accretion	5, 6, 12	(21)	(78)	(65)	(287)
Grant income	17	36	—	36	1,881
Subsidy income	17	—	122	20	396
Interest and other income		160	12	170	557
Unrealized foreign exchange gain (loss)		514	—	821	(30)
		689	56	982	2,517
Loss before income taxes		(3,618)	(1,205)	(11,479)	(1,983)
Income taxes		(208)	(89)	(586)	(324)
NET LOSS FOR THE PERIOD		(3,826)	(1,294)	(12,065)	(2,307)
OTHER COMPREHENSIVE INCOME (LOSS)					
Items that will be reclassified subsequently to loss					
Exchange difference on translating foreign operations		(64)	(20)	(798)	460
COMPREHENSIVE LOSS FOR THE PERIOD		(3,890)	(1,314)	(12,863)	(1,847)
LOSS PER SHARE – BASIC AND DILUTED		(0.20)	(0.08)	(0.62)	(0.15)
WEIGHTED AVERAGE NUMBER OF SHARES OUTSTANDING		19,429,459	16,904,356	19,332,597	15,678,839

Source: ImmunoPrecise Antibodies Ltd.

Figure 20
IMMUNOPRECISE ANTIBODIES LTD.
CONDENSED INTERIM CONSOLIDATED STATEMENTS OF FINANCIAL POSITION
(Unaudited - Expressed in Canadian dollars)

(in thousands)	Note	January 31, 2022 $	April 30, 2021 $
ASSETS			
Current assets			
Cash		32,986	41,759
Amounts receivable		2,462	2,858
Sales tax receivable		104	491
Inventory		1,534	1,204
Unbilled revenue		889	770
Prepaid expenses		2,584	1,776
		40,559	48,858
Restricted cash		81	79
Deposit on equipment		160	52
Investment	7	105	111
Property and equipment	8, 13	3,571	4,024
Intangible assets	9	4,522	6,058
Goodwill		7,450	7,777
Total assets		56,448	66,959
LIABILITIES			
Current liabilities			
Accounts payable and accrued liabilities	15	3,297	3,011
Sales tax payable		—	140
Deferred revenue		983	1,111
Income taxes payable		588	326
Convertible debentures – liability component	12	1,292	—
Leases	13	982	986
Deferred acquisition payments	5, 6	—	498
		7,142	6,072
Convertible debentures – liability component	12	—	1,531
Leases	13	540	940
Deferred income tax liability		1,078	1,492
		8,760	10,035
SHAREHOLDERS' EQUITY			
Share capital	14	81,790	80,102
Convertible debentures – equity component	12	102	127
Contributed surplus	14	9,165	7,201
Accumulated other comprehensive income (loss)		(1,485)	(687)
Accumulated deficit		(41,884)	(29,819)
		47,688	56,924
Total liabilities and shareholders' equity		56,448	66,959

Source: ImmunoPrecise Antibodies Ltd.

Figure 21
IMMUNOPRECISE ANTIBODIES LTD.
CONDENSED INTERIM CONSOLIDATED STATEMENTS OF CASH FLOWS
For the nine months ended January 31, 2022 and 2022
(Unaudited - Expressed in Canadian Dollars)

(in thousands)	Note	2022 $	2021 $
Operating activities:			
Net loss for the period		(12,065)	(2,307)
Items not affecting cash:			
Amortization and depreciation	8, 9	2,843	2,822
Asset impairment	8, 13	167	—
Deferred income taxes		586	(294)
Accretion	5, 6, 12	65	287
Foreign exchange		(837)	—
Loan forgiven	11	—	(280)
Share-based payments	14, 15	2,297	1,426
		(6,944)	1,654
Changes in non-cash working capital related to operations:			
Amounts receivable		322	(818)
Inventory		(300)	(309)
Unbilled revenue		(125)	143
Prepaid expenses		(860)	(2,050)
Accounts payable and accrued liabilities	15	283	651
Sales and income taxes payable and receivable		(425)	509
Deferred revenue		(85)	351
Net cash (used in) provided by operating activities		(8,134)	131
Investing activities:			
Purchase of equipment	8	(924)	(850)
Internally generated development costs	9	—	(270)
Purchase of customer list		(191)	—
Deferred acquisition payment	5, 6	—	(519)
Net cash used in investing activities		(1,115)	(1,639)
Financing activities:			
Proceeds on share issuance, net of transaction costs	14	523	15,155
Repayment of leases	13	(702)	(696)
Loan repayments	11	—	(29)
Proceeds from convertible debentures, net of transaction costs	12	—	2,202
Repayment of debentures	10	—	(2,000)
Net cash (used in) provided by financing activities		(179)	14,632
(Decrease) increase in cash during the period		(9,428)	13,124
Foreign exchange		657	(14)
Cash – beginning of the period		41,838	2,691
Cash – end of the period		33,067	15,801
Cash is comprised of:			
Cash		32,986	15,720
Restricted cash		81	81
		33,067	15,801
Cash paid for interest		38	90
Cash paid for income tax		671	175

Source: ImmunoPrecise Antibodies Ltd.

Recent Events

May 9, 2022—IPA shared that its subsidiary Biostrand, a Belgian end-to-end multi-omics analysis platform provider, has received a €460,000 round of grant funding from VLAIO (Flanders Innovation & Entrepreneurship), the research fund of the Flemish regional government in Belgium. Conditionally awarded in January this year, BioStrand recently satisfied the remaining criteria for the award, which follows an original grant from VLAIO of €235,000 in 2020.

April 20, 2022—Announced the outcome of recent laboratory data on their PolyTope® TATX-03 antibody cocktail, which demonstrates strong neutralizing activity toward the Omicron subvariant BA.2. The BA.2 pseudovirus was neutralized with a potency comparable to the previously analyzed Omicron BA.1, demonstrating ongoing and continued consistency of the cocktail to potently neutralize SARS-CoV-2 variants of concern (VOC). This functional outcome was supported by demonstrated binding of each individual antibody constituent to spike-protein trimer BA.2, data which is also highly comparable with the binding observed against BA.1.

April 14, 2022—Announced that it completed its previously announced acquisition of control over BioStrand BV, BioKey BV, and BioClue BV (hereinafter collectively referred to as "BioStrand"), a group of Belgian biotech entities and pioneers in the field of bioinformatics and biotechnology, through its wholly-owned subsidiary ImmunoPrecise Netherlands BV.

March 29, 2022—Announced that it entered into a definitive share purchase agreement (SPA) to acquire, through its wholly-owned subsidiary ImmunoPrecise Netherlands BV, control over BioStrand BV, BioKey BV, and BioClue BV (hereinafter collectively referred to as "BioStrand").

March 16, 2022—Announced financial results for third quarter fiscal year 2022, which ended January 31, 2022. The Company achieved Project revenue of $4.1 million, an increase of $0.7 million or 22.6% as compared to Project revenue of $3.3 million from the same year ago period. Total revenue of $4.8 million was an increase of $0.3 million or 6.6% as compared to total revenue of $4.5 million from the same year ago period. The Company, primarily through its subsidiary Talem Therapeutics LLC, invested $1.8 million in strategic research and development costs as compared to an investment of nil in the same year ago-period. The Company recorded a net loss of $3.8 million compared to net loss of $1.3 million for the year-ago period. As of January 31, 2022, the Company held cash of $33 million.

March 14, 2022—Elektrofi (ELEKTROFI, INC) and IPA announced they are entering into a collaboration to explore a high-concentration formulation of IPA's COVID-19 antibody cocktail, PolyTope® TATX-03. This collaboration aims to generate an IND-enabling data package for the FDA for an alternatively formulated version of TATX-03, named TATX-03E, that could be easily self-administered in a non-healthcare setting. By joining forces, the parties anticipate formulating TATX-03E for stable and rapid distribution to the consumer, a drug product ideally suited to serve unmet needs for rapid deployment, field use, and higher frequency dosing for immunocompromised individuals requiring on-going access to therapies and prophylaxis. The collaboration between Elektrofi and IPA will be supported by Elektrofi's contract with the DHA Small Business Innovation Research (SBIR) Program within the Department of Defense (DoD). The companies will begin by conducting formulation feasibility studies followed by IND-enabling, non-clinical studies to establish safety and efficacy with the novel formulation.

March 9, 2022—Reported on the latest progress in the development of their PolyTope® TATX-03 antibody cocktail therapy with a proven strong efficacy against all tested SARS-CoV-2 variants-of-concern. The Company reported positive data indicating their recent IND-enabling animal studies do not show any observable acute adverse events, data which supports a highly positive safety profile for TATX-03 as a clinical product. In addition, results from the FDA reviewed and recommended animal study protocols demonstrate that the *in vivo* pharmacokinetic profiles of the individual antibodies show no aberrations, and each antibody demonstrates a characteristic human IgG1 pharmacokinetic profile.

March 8, 2022—Announced that it will host a conference call to discuss its financial results and recent business highlights for third quarter fiscal year 2022, on Wednesday, March 16, 2022, at 10:30 a.m. ET.

January 31, 2022—Announced the release of data demonstrating strong neutralizing potency of its PolyTope® TATX-03 antibody cocktail towards the SARS-CoV-2 Omicron variant (B.1.1.529) in *in vitro* pseudovirus assays. This first generation four antibody cocktail against SARS-CoV-2 was rationally designed to sustain efficacy against all SARS-CoV-2 strains and variants with the goal of protecting and treating all individuals. The Company believes that it possesses the only first-generation cocktail therapy against SARS-CoV-2 (first publicly announced 2020) that has been demonstrated to retain efficacy against every variant of concern to date through *in vitro* pseudovirus assays conducted with respect to such variants of concern. PolyTope TATX-03 is unique in its ability to engage multiple modes of action, facilitated through simultaneously targeting various non-overlapping epitopes on the spike trimer.

January 17, 2022—Announced the relocation of its IPA Europe Oss laboratories to a new multi-tenant biotech Center of Excellence at the Pivot Park Campus in Oss, Netherlands. The Company previously announced the move of its IPA Europe laboratories in Utrecht to the new Accelerator building at the Utrecht Science Park this year. IPA leased new space at Pivot Park to house its second future European site to support the continuation of advanced technologies and facilities for its growing list of clients and services. The new location provides more space as well as facilities for next-generation equipment to support IPA Europe's highly skilled personnel and continue to advance IPA's European operations. The building, called Grizzly, is expected to be LEED certified and designed to meet the requirements for a nearly zero-energy building. This fulfills a key tenet of IPA and its ongoing commitment towards environmental sustainability.

January 11, 2022—Announced that on January 7, 2022, its Board of Directors approved the grant of 170,000 stock options under its stock option plan to acquire up to an aggregate of 170,000 common shares in the capital of IPA. The Options were granted to certain officers of IPA. Each Option is exercisable for a period of five years from the date of grant at an exercise price of Cdn $7.94 per Common Share. One third of the Options granted to each officer will vest every six months from the date of grant.

January 3, 2022—Announced that its board of directors has approved the grant of 28,250 stock options under its stock option plan to acquire up to an aggregate of 28,250 common shares in the capital of IPA. Each of the three non-executive directors of IPA re-elected at the Company's recent Annual General Meeting has been granted 5,650 Options and, consistent with the Company's past practice for the first grant following election to the Company's Board of Directors, Ms. Anna Pettersson, who was first elected at that Annual General Meeting, has been granted 11,300 Options. Each Option is exercisable for a period of five years from the date of grant at an exercise price of $6.89 per Common Share. One quarter of the Options granted to each director will vest every three months from the date of grant.

December 20, 2021—Announced their global antibody manufacturing collaboration under which ChemPartner will manufacture and supply to IPA's specifications IPA's proprietary PolyTope® TATX-03 Therapy, a rationally designed four monoclonal antibody cocktail developed for use in human clinical trial for the potential prevention and treatment of infection with current and future variants of SARS-CoV-2. The goal of this collaboration is to secure the ability to quickly develop and manufacture in parallel the individual cocktail antibodies in IPA's PolyTope TATX-03 up to large scale required for use in clinical development and using ChemPartner's state-of-the-art manufacturing facilities, with the potential for additional capacity to manufacture 'plug-and-play' antibodies addressing novel variants of concern in the event this is desired.

December 13, 2021—Announced financial results for second quarter fiscal year 2022, which ended October 31, 2021.

December 7, 2021—Announced that it would host a conference call to discuss its financial results and recent business highlights for second quarter fiscal year 2022, on December 13, 2021, after the close of market.

November 30, 2021—Provided an update on its Polytope™ Development Program and announced that the Company continues to rapidly progress it SARS-CoV-2 multi-antibody cocktail therapy, Polytope™.

November 24, 2021—Announced the Company is presenting at the Benchmark Company's Discovery One-on-One Virtual Video Investor Conference. The conference was held on December 2, 2021.

November 9, 2021—Announced that Paul Andreola, a member of the Board of Directors of IPA, has resigned, effective immediately, from the Company's Board of Directors for personal reasons unrelated to the Company.

October 13, 2021—Announced that it has entered into an At-The-Market Distribution Agreement (the "ATM Agreement") with H.C. Wainwright & Co., LLC, as sole sales agent. Under the ATM Agreement, the Company will be entitled, at its discretion and from time-to-time during the term of the ATM Agreement, to sell, through the Agent common shares of the Company having an aggregate gross sales price of up to US$50 million. Sales of the Common Shares will be made in transactions that are deemed to be "at-the-market offerings" as defined in Rule 415 of the United States Securities Act of 1933, as amended, and "at-the-market distributions" as defined in National Instrument 44-102 – Shelf Distributions, including, without limitation, sales made directly on the Nasdaq Global Market or any other existing trading market for the Common Shares in the United States. No offers or sales of Common Shares will be made in Canada on the TSX Venture Exchange (TSXV) or other trading markets in Canada.

October 7, 2021—IPA and the Pierre Fabre pharmaceutical group announced that IPA's subsidiary, Talem and Pierre Fabre have entered a multi-year, multi-target research collaboration with the goal to discover and develop therapeutics antibodies for up to nine targets. This strategic collaboration is expected to help expand Talem's portfolio of novel antibodies across oncology.

September 9, 2021—Announced financial results for first quarter fiscal year 2022, ending July 31, 2021.

September 7, 2021—Announced that its site in Oss, the Netherlands, which is part of the Company's subsidiary, IPA Europe, has been granted a three-year approval for the "Crédit d'Impôt Recherche" (CIR) from the French Ministry of Higher Education and Research. CIR is a French R&D tax credit initiative, which will provide tax credits to eligible French companies when they engage IPA Europe, Oss, in qualified research and development activities.

September 7, 2021—Announced that it will be presenting at the H.C. Wainwright Annual Global Investment Conference being held virtually on September 13 to 15, 2021.

September 3, 2021—Announced that it will host a conference call to discuss its financial results and recent business highlights for first quarter fiscal year 2022, on September 9, 2021, after the close of market.

August 4, 2021—Announced the promotion of Barry Duplantis, Ph.D., to VP of Client Relations and welcomes Ms. Carla Dahl as VP of Marketing. Dr. Duplantis, who joined the Company in 2018, was previously IPA's Director of Client Relations, where he was responsible for client interactions and the design and oversight of global therapeutic antibody campaigns. Ms. Carla Dahl, who has over 25 years of experience in leadership and entrepreneurial roles across consumer health, life sciences marketing communications and branding joins IPA as VP of Marketing, where she will lead IPA's brand amplification initiatives, including industry awareness of IPA's products and services as well as highly targeted marketing and communications campaigns directly aimed at driving revenue.

July 28, 2021—Reported financial results and recent business highlights for full fiscal year 2021. For the year, the Company reported total revenue of $17.9 million, up 27% from $14.1 million in fiscal 2020. They successfully dual listed to Nasdaq Global Market and subsequently raised US$25 million in bought deal offering. Furthermore, IPA advanced proof-of-concept for TATX-03 COVID-19 program lead asset, effectively neutralizing SARS-CoV-2 Delta variant in non-clinical *in vitro* study.

July 22, 2021—Announced new results from its TATX-03 PolyTope™ Therapy, a four monoclonal antibody cocktail developed for the potential prevention and treatment of SARS-CoV-2, demonstrating potent pseudovirus neutralizing activity against the SARS-CoV-2 Delta (B.1.617.2) variant.

July 15, 2021—Announced the Company will host a conference call to discuss its financial results and business highlights for the full fiscal year 2021, on Wednesday, July 28, 2021, after the close of market.

June 22, 2021—IPA and Eurofins Discovery, the leading provider of products and services to the drug discovery industry and a Eurofins Scientific (EUFI.PA) company, announced a commercial collaboration. Leveraging complementary strengths in Eurofins Discovery's *in vitro* pharmacology services and IPA's *in vivo* characterization and discovery technologies, this collaboration provides greater access to solutions that empower scientists to pursue life-changing medicines in a diverse range of indications.

June 17, 2021—Announced additional results from its *in vivo* hamster challenge efficacy study of TATX-03a PolyTope™ Therapy, a four monoclonal antibody cocktail being developed for the potential prevention and treatment of SARS-CoV-2, demonstrating reduced bronchitis and tracheitis inflammation severity. The Company concurrently announced optimization results of TATX-03 cocktail components designed to improve clinical suitability of their PolyTope™ therapy.

June 15, 2021—Announced that results from *in vitro* characterizations investigating TATX-21, a novel potential first-in-class antibody for Atherosclerosis Cardiovascular Disease (ACVD), will be presented in partnering meetings at the 2021 BIO International Convention, June 14-18, 2021.

June 2, 2021—Announced that Dr. Yasmina Abdiche, Chief Scientific Officer, will resign effective July 1, 2021, to pursue other opportunities, and that the board of directors has appointed Dr. Ilse Roodink to take over the role of Chief Scientific Officer.

May 25, 2021—Announced that Dr. Dion Neame has joined the Company's Strategic Advisory Board (SAB). Dr. Neame joins at a significant time, as the Company continues to focus on building essential partnerships and expanding its rapidly growing share of the market. He will play a key role in supporting the strategic and scientific prioritization of partnerships and stakeholder communications. Dr. Neame is a clinical medicine and vaccine expert, focused on medical strategies for various indications and early pipeline products, as well as external medical and scientific stakeholder engagements.

May 20, 2021—Announced the completion of an efficacy-driven, preclinical study demonstrating further evidence of the *in vivo* efficacy of a four monoclonal antibody cocktail against non-overlapping epitopes, utilizing an optimized formulation and, for the first time, demonstrating therapeutic synergy of the cocktail components *in vivo*.

April 21, 2021—Announced that it selected and retained LifeSci Advisors as investor relations agent of record.

April 8, 2021—Announced that its subsidiary, Talem Therapeutics LLC, has advanced development of a candidate panel of vetted, novel, therapeutic antibodies, collectively referred to as TATX-112, against an undisclosed target, into formal lead candidate characterization.

March 25, 2021—Announced the identification of antibody 23-H7, which preclinical data obtained to date indicates provides strong, protective anti-viral effects in SARS-CoV-2 (COVID-19) infected Syrian hamsters via an uncommon mechanism of action.

March 17, 2021—Announced financial results for the third quarter of its 2021 fiscal year ended January 31, 2020.

March 16, 2021—Confirmed results of an additional PolyTope™ antibody interaction analysis against SARS-CoV-2 spike protein variants of concern. Twenty-seven extensively characterized, proprietary, lead candidate antibodies were generated and analyzed by IPA in its preclinical studies to reveal full interaction profiles against seventeen different SARS-CoV-2 variants. Results of the screening indicate that identified antibodies retain the ability to bind to emerging SARS-CoV-2 variants including U.K. (B.1.1.7 lineage), S. African (B.1.351 lineage) and Brazilian (P.1 lineage) strains.

March 4, 2021—Announced that it will be presenting at the H.C. Wainwright Global Life Sciences Conference being held virtually on March 9-10, 2021.

February 19, 2021—Announced preliminary, preclinical data in hamsters of IPA's proprietary TATX-03 PolyTope™ antibody cocktail program against SARS-CoV-2, the virus that causes COVID-19 disease. In a preclinical study using a SARS-CoV-2 hamster model, treatment with the Company's TATX-03 resulted in complete clearance of detectable replication-competent virus from the lungs and throat of SARS-CoV-2-infected animals.

February 10, 2021—Announced that the over-allotment option (the "Option") granted in connection with its previously announced bought deal offering of 1,616,293 common shares (the "Common Shares") in the capital of the Company (the "Offering"), has been fully exercised. H.C. Wainwright & Co. has purchased additional 242,443 shares of the Company (the "Additional Shares") at the public offering price of $13.45 per Additional Share for additional aggregate gross proceeds to the Company of approximately $3.3 million, less underwriting discounts and commissions.

February 8, 2021—Announced that it has closed its previously announced public offering (the "Offering") of 1,616,293 common shares of the Company (the "Common Shares"), at a price to the public of $13.45 per Common Share, less underwriting discounts and commissions, for gross proceeds to the Company of approximately $21.7 million.

February 3, 2021—Announced that, due to demand, the underwriter has agreed to increase the size of the previously announced public offering and purchase on a firm commitment basis 1,616,293 common shares of the Company (the "Common Shares"), at a price to the public of $13.45 per Common Share, less underwriting discounts and commissions, for gross proceeds to the Company of approximately $21.7 million. The closing of the offering is expected to occur on or about February 8, 2021, subject to satisfaction of customary closing conditions.

January 6, 2021—Announced that its board of directors has approved the grant of 25,000 stock options (the "Options") under its stock option plan to acquire up to an aggregate of 25,000 common shares in the capital of IPA ("Common Shares"). Each of the five non-executive directors of the Company has been granted 5,000 Options.

January 6, 2021—Announced that Dr. Jennifer Bath, IPA's Chief Executive Officer, will participate in a pre-recorded presentation through the H.C. Wainwright BioConnect 2021 Conference, and management will host one-on-one meetings with investors through the Stern IR Virtual Corporate Access Event, both taking place January 11-14, 2021.

Risks and Disclosures

This Executive Informational Overview® (EIO) has been prepared by ImmunoPrecise Antibodies Ltd ("IPA" or "the Company") with the assistance of Crystal Research Associates, LLC ("CRA") based upon information provided by the Company. CRA has not independently verified such information. Some of the information in this EIO relates to future events or future business and financial performance. Such statements constitute forward-looking information within the meaning of the Private Securities Litigation Act of 1995. Such statements can only be predictions and the actual events or results may differ from those discussed due to the risks described in IPA's statements on forms filed from time to time.

The content of this report with respect to IPA has been compiled primarily from information available to the public released by the Company through news releases and other filings. IPA is solely responsible for the accuracy of this information. Information as to other companies has been prepared from publicly available information and has not been independently verified by IPA or CRA. Certain summaries of activities and outcomes have been condensed to aid the reader in gaining a general understanding. CRA assumes no responsibility to update the information contained in this report. In addition, for year one of its agreement, CRA has been compensated by the Company in cash of thirty-nine thousand five hundred dollars and options to purchase forty-five thousand common shares of IPA for its services in creating this report and for quarterly updates.

Investors should carefully consider the risks and information about IPA's business, as described below. Investors should not interpret the order in which considerations are presented in this or other filings as an indication of their relative importance. In addition, the risks and uncertainties overviewed in the accompanying section are not the only risks that the Company faces. Additional risks and uncertainties not presently known to IPA or that it currently believes to be immaterial may also adversely affect the Company's business. If any of such risks and uncertainties develops into an actual event, IPA's business, financial condition, and results of operations could be materially and adversely affected.

This report is published solely for information purposes and is not to be construed as an offer to sell or the solicitation of an offer to buy any security in any state. Past performance does not guarantee future performance. For more complete information about the risks involved in an investment in the Company as well as for copies of this report, please contact IPA by calling (800) 620-4187.

RISKS RELATED TO THE BUSINESS OF THE COMPANY

Negative Operating Cash Flow and Going Concern

IPA has negative cash flow from operating activities and has historically incurred net losses. There is no assurance that it will generate sufficient revenues in the near future. To the extent that the Company has negative operating cash flows in future periods, it may need to deploy a portion of its existing working capital to fund such negative cash flows. IPA expects to need to raise additional funds through issuances of securities or through loan financing. There is no assurance that additional capital or other types of financing will be available if needed or that these financings will be on terms at least as favorable to the Company as those previously obtained, or at all.

The independent auditor's report on IPA's consolidated financial statements draws attention to the material uncertainty that may cast doubt on the Company's ability to continue as a going concern. Importantly, the inclusion in IPA's financial statements of a going concern opinion may negatively impact the Company's ability to raise future financing. If the Company is unable to obtain additional financing from outside sources and eventually generate enough revenues, IPA may be forced to sell a portion or all of the Company's assets, or curtail or discontinue its operations. If any of these events happen, investors may lose all or part of their investment.

Liquidity and Future Financing Risk

Although IPA is a going concern, the Company does not have cash reserves for funding future growth and expansion and therefore may require additional financing in order to fund future growth in operations and expansion plans. The ability to secure any required financing to sustain its operations will depend in part upon prevailing capital market conditions, as well as the Company's business success. There can be no assurance that IPA will be successful in its efforts to secure any additional financing or additional financing on terms satisfactory to the Company's management. If additional financing is raised by issuing shares of the Company, control of the Company may change, and shareholders may suffer additional dilution. If adequate funds are not available, or are not available on acceptable terms, the Company may be required to scale back its business plan.

Financial Position and Additional Needs for Liquidity and Capital

IPA is a biopharmaceutical company focused on the development of novel, therapeutic antibodies. Investment in biopharmaceutical product development is highly speculative as it involves significant upfront capital expenditures and substantial risk that a product candidate will fail to prove effective, gain regulatory approval, or become commercially viable.

The Company does not have any products approved by regulatory authorities and has not generated substantial revenues from collaboration and licensing agreements or clinical product sales to date, and has incurred significant research, development, and other expenses related to ongoing operations and expects to continue to incur such expenses. As a result, IPA has not been profitable and has incurred operating losses in every reporting period since its inception, with a significant accumulated deficit.

Operating costs are expected to increase in the near term as the Company continues product development efforts and expects to continue until such time as any future product sales, royalty payments, licensing fees, and/or milestone payments are sufficient to generate revenues to fund continuing operations. In addition, IPA's operating expenses are expected to increase compared to last year as a result of its U.S. public reporting company status. The Company is unable to predict the extent of any future losses or when this business section will become profitable, if ever. Even if the Company achieves profitability, it may not be able to sustain or increase profitability on an ongoing basis.

Strategic Alliances

The Company currently has, and may in the future enter into, strategic alliances with third parties that the Company believes will complement or augment its existing business. IPA's ability to enter into strategic alliances is dependent upon, and may be limited by, the availability of suitable candidates and capital. In addition, strategic alliances could present unforeseen integration obstacles or costs, may not enhance the Company's business, and may involve risks that could adversely affect the Company, including significant amounts of management time that may be diverted from operations in order to pursue and complete such transactions or maintain such strategic alliances.

Future strategic alliances could result in the incurrence of additional debt, costs, and contingent liabilities, and there can be no assurance that future strategic alliances will achieve, or that the Company's existing strategic alliances will continue to achieve, the expected benefits to IPA's business or that the Company will be able to consummate future strategic alliances on satisfactory terms, or at all. Any of the foregoing could have a material adverse effect on the Company's business, financial condition, and results of operation.

IPA may not be able to enter into collaboration agreements on terms favorable to the Company or at all. Furthermore, some of those agreements may give substantial responsibility over IPA's drug candidates to the collaborator. If the Company enters into collaboration agreements for one or more of its drug candidates, the success of such drug candidates will depend in great part upon IPA's and its collaborators' success in promoting them as superior to other treatment alternatives.

The Company believes that its drug candidates may be proven to offer disease treatment with notable advantages over other drugs. However, there can be no assurance that IPA will be able to prove these advantages or that the advantages will be sufficient to support the successful commercialization of its drug candidates.

Regulatory or Agency Proceedings, Investigations, and Audits

The Company's business requires compliance with many laws and regulations. Failure to comply with these laws and regulations could subject IPA to regulatory or agency proceedings or investigations and could also lead to damage awards, fines, and penalties. The Company may become involved in a number of government or agency proceedings, investigations, and audits. The outcome of any regulatory or agency proceedings, investigations, audits, and other contingencies could harm the Company's reputation, require the Company to take, or refrain from taking, actions that could harm its operations or require the Company to pay substantial amounts of money, harming its financial condition. There can be no assurance that any pending or future regulatory or agency proceedings, investigations, and audits will not result in substantial costs or a diversion of management's attention and resources or have a material adverse impact on the Company's business, financial condition, and results of operations.

Litigation Risk

The Company may become party to litigation from time to time in the ordinary course of business, including, but not limited to, in connection with its operations or pursuant to the terms of any of its commercial agreements, which could adversely affect its business. Should any litigation in which IPA becomes involved be decided against the Company, such a decision could adversely affect the Company's ability to continue operating and the value of the Securities and could use significant resources. Even if IPA is involved in litigation and wins, litigation can redirect significant Company resources, including the time and attention of management and available working capital. Litigation may also create a negative perception of the Company's brand.

Intellectual Property Protection

The Company's success will depend on its ability to obtain, protect, and enforce patents on its technology and products. Any patents that IPA may own or license in the future may not afford meaningful protection for its technology and products. The Company's efforts to enforce and maintain its intellectual property rights may not be successful and may result in substantial costs and diversion of management's time. In addition, others may challenge patents the Company may obtain in the future and, as a result, these patents could be narrowed, invalidated, or rendered unenforceable or it may be forced to stop using the technology covered by these patents or to license the technology from third parties. In addition, current and future patent applications on which IPA depends may not result in the issuance of patents.

Even if the Company's rights are valid, enforceable, and broad in scope, competitors may develop products based on similar technology that is not covered by the Company's patents. Further, since there is a substantial backlog of patent applications at the various patent offices, the approval or rejection of the Company and its competitors' patent applications may take several years.

In addition to patent protection, IPA also relies on copyright and trademark protection, trade secrets, knowhow, continuing technological innovation, and licensing opportunities. In an effort to maintain the confidentiality and ownership of the Company's trade secrets and proprietary information, IPA requires its employees, consultants, and advisors to execute confidentiality and proprietary information agreements. However, these agreements may not provide the Company with adequate protection against improper use or disclosure of confidential information and there may not be adequate remedies in the event of unauthorized use or disclosure. Furthermore, like many companies in its industry, IPA may, from time to time, hire scientific personnel formerly employed by other companies involved in one or more areas similar to the activities the Company conducts. In some situations, the Company's confidentiality and proprietary information agreements may conflict with, or be subject to, the rights of third parties with whom its employees, consultants, or advisors have prior employment or consulting relationships.

Although the Company require its employees and consultants to maintain the confidentiality of all confidential information of previous employers, IPA or these individuals may be subject to allegations of trade secret misappropriation or other similar claims as a result of their prior affiliations. Finally, others may independently develop substantially equivalent proprietary information and techniques, or otherwise gain access to its trade secrets. IPA's failure to protect its proprietary information and techniques may inhibit or limit its ability to exclude certain competitors from the market and execute its business strategies.

Regulatory Approval Processes

IPA's businesses are subject to certain laws, regulations, and guidelines. Although the Company intends to comply with all such laws, regulations, and guidelines, there is no guarantee that the governing laws and regulations will not change, which will be outside of IPA's control. Numerous statutes and regulations govern the preclinical and clinical development, manufacture and sale, and post-marketing responsibilities for non-therapeutic and human therapeutic products in the U.S., EU, Canada, Australia, and other countries that are the intended markets for current and future product candidates. Such legislation and regulation governs the approval of manufacturing facilities, the testing procedures, and controlled research that must be carried out, and the preclinical and clinical data that must be collected prior to marketing approval.

IPA's R&D efforts and the manufacturing and marketing of any products the Company may develop will be subject to and restricted by such extensive regulation. The process of obtaining necessary regulatory approvals is lengthy, expensive, and uncertain. The Company may fail to obtain the necessary approvals to commence or continue manufacturing or marketing potential products in reasonable time frames, if at all. In addition, governmental authorities may enact regulatory reforms or restrictions on the development of new therapies that could adversely affect the regulatory environment in which IPA operates or the development of any products the Company may develop.

Though the Company does not intend to conduct clinical trials itself, the aforementioned regulations may impact the further development of products by its partners or a third party who may license any of IPA's products. Completing clinical testing and obtaining required approvals is expected to take several years and to require the expenditure of substantial resources of IPA and that of its partners and third-parties who may license any of the Company's products.

There can be no assurance that clinical trials will be completed successfully within any specified period of time, if at all. Furthermore, clinical trials may be delayed or suspended at any time by the Company's partners or third-parties who may license IPA's products, or by the various regulatory authorities if it is determined at any time that the subjects or patients are being exposed to unacceptable risks.

No assurance can be given that IPA's current or future product candidates will prove to be safe and effective in clinical trials or that such product candidates will receive the requisite regulatory approval. Moreover, any regulatory approval of a drug which is eventually obtained may be granted with specific limitations on the indicated uses for which that drug may be marketed. Furthermore, product approvals may be withdrawn if problems occur following initial marketing or if compliance with regulatory standards is not maintained.

Publicly Announced Milestones

From time to time, IPA may announce the timing of certain events which are expected to occur, such as the anticipated timing of results from its research and manufacturing processes, or of clinical trials that may be conducted in respect of the Company's products by its partners and third-parties who may license such products. These statements are forward-looking and are based on the best estimates of management at the time. However, the timing of events, such as the initiation or completion of certain research or manufacturing endeavors, clinical trials, filing of applications to obtain regulatory approval, or announcements of additional research or clinical trials for a product candidate may ultimately vary from what is publicly disclosed.

These variations in timing may occur as a result of different events, including the nature of the results obtained during a research phase or clinical trial, problems with a **Contract Manufacturing Organization (CMO)** or CRO, or any other event having the effect of delaying the publicly announced timeline. IPA assumes no obligation to update or revise any forward-looking information, whether as a result of new information, future events or otherwise, except as otherwise required by law. Any variation in the timing of previously announced milestones could have a material adverse effect on the Company's business plan, financial condition, or operating results, and the trading price of the Common Shares.

Business Development and Marketing Strategies

IPA's future growth and profitability will depend on the effectiveness and efficiency of its national and international business development and marketing and sales strategy, including the Company's ability to grow brand recognition for its services internationally, determine appropriate business development, marketing and sales strategies, and maintain acceptable operating margins on such costs. There can be no assurance that business development, marketing, and sales costs will result in revenues for the Company's business in the future, or will generate awareness of IPA's products and services. In addition, no assurance can be given that the Company will be able to manage its business development, marketing, and sales costs on a cost-effective basis.

Competition

Although IPA believes that there are only a limited number of full-service, biologics, CRO firms, the Company may face strong competition in selling its products and services. Some competitors may have marketing, financial, development, and personnel resources which exceed those of IPA. As a result of this competition, the Company may be unable to maintain its operations or develop them as currently proposed on terms it considers acceptable or at all.

Increased competition by larger, better-financed competitors with geographic advantages could materially and adversely affect IPA's business, financial condition, and results of operations. To remain competitive, the Company believes that it must effectively and economically provide: products and services that satisfy partner demands, superior partner service, high levels of quality and reliability, and dependable and efficient distribution networks.

Increased competition may require the Company to reduce prices or increase spending on sales and marketing and partner support, which may have a material adverse effect on its financial condition and results of operations. Any decrease in the quality of the Company's products or level of service to partners or any occurrence of a price war among the Company's competitors may adversely affect its business and results of operations. Partner reach, service, and on-time delivery will continue to be a hallmark of IPA's ability to compete with other market participants. In addition, the Company has deployed a sales team tasked with continually sourcing and providing market intelligence as part of its activities.

Market Perception of Smaller Companies

Market perception of smaller companies may change, potentially affecting the value of investors' holdings and the ability of IPA to raise further funds through the issue of further Common Shares or otherwise. The share price of publicly traded smaller companies can be highly volatile. The value of the Common Shares may go down as well as up and, in particular, the share price may be subject to sudden and large falls in value given the restricted marketability of the Common Shares, results of operations, changes in earnings estimates or changes in general market, economic, and political conditions.

Research and Development and Product Development

IPA is a life science company that makes customized antibodies and is engaged in the research and product development of new antibodies, processes, procedures, and innovative approaches to the antibody production. The Company has been engaged in such research and development activities for over 30 years and has had significant success. Continued investment in retaining key scientific staff, as well as an ongoing commitment in research and development activities, is expected to be a cornerstone in the Company's development of new

services, processes, and competitive advantages, such as Rapid Prime®, B cell Select®, DeepDisplay™, and its methods for the production of human antibodies.

The Company realizes that such research and product development activities endeavor, but cannot assure, the production of new and innovative processes, procedures, or innovative approaches to antibody production or new antibodies. Furthermore, if it does not achieve sufficient market acceptance of its expansion of its commercialization of its products and services, it will be difficult for IPA to achieve consistent profitability. The Company's marketing and sales approach and external sales personnel continues to introduce a steady stream of new partners.

Management of Growth

The Company may be subject to growth-related risks, including pressure on its internal systems and controls. IPA's ability to manage its growth effectively will require it to continue to implement and improve its operational and financial systems and to expand, train, and manage its employee base. The inability of the Company to deal with this growth could have a material adverse impact on its business, operations, and prospects.

IPA may experience growth in the number of its employees and the scope of its operating and financial systems, resulting in increased responsibilities for the Company's personnel, the hiring of additional personnel and, in general, higher levels of operating expenses. In order to manage its current operations and any future growth effectively, the Company will also need to continue to implement and improve its operational, financial, and management information systems and to hire, train, motivate, manage, and retain its employees.

There can be no assurance that IPA will be able to manage such growth effectively, that its management, personnel, or systems will be adequate to support the Company's operations or that the Company will be able to achieve the increased levels of revenue commensurate with the increased levels of operating expenses associated with this growth.

Selection and Integration of Acquired Businesses and Technologies

IPA has expanded its business through acquisitions and may plan to continue to acquire businesses and technologies and form strategic alliances. However, businesses and technologies may not be available on terms and conditions the Company finds acceptable. IPA risks spending time and money investigating and negotiating with potential acquisition or alliance partners, but not completing transactions. Acquisitions and alliances, involve numerous risks, which may include:

- difficulties in achieving business and financial success;
- difficulties and expenses incurred in assimilating and integrating operations, services, products, technologies, or pre-existing relationships with the Company's partners, distributors, and suppliers;
- challenges in developing and operating new businesses, including those that are materially different from the Company's existing businesses and that may require the development or acquisition of new internal capabilities and expertise;
- potential losses resulting from undiscovered liabilities of acquired companies that are not covered by the indemnification the Company may obtain from the seller or the insurance acquired in connection with the transaction;
- loss of key employees;
- the presence or absence of adequate internal controls and/or significant fraud in the financial systems of acquired companies;
- diversion of management's attention from other business concerns;

- a more expansive regulatory environment;

- acquisitions could be dilutive to earnings, or in the event of acquisitions made through the issuance of the Company's common stock to the shareholders of the acquired company, dilutive to the percentage of ownership of the Company's existing shareholders;

- differences in foreign business practices, customs, and importation regulations, language and other cultural barriers in connection with the acquisition of foreign companies;

- new technologies and products may be developed that cause businesses or assets the Company's acquires to become less valuable; and

- disagreements or disputes with prior owners of an acquired business, technology, service, or product that may result in litigation expenses and diversion of the Company's management's attention.

If an acquired business, technology, or an alliance does not meet the Company's expectations, its results of operations may be adversely affected. Some of the same risks exist when the Company decides to sell a business, site, or product line.

In addition, divestitures could involve additional risks, including the following:

- difficulties in the separation of operations, services, products, and personnel;

- diversion of management's attention from other business concerns; and

- the need to agree to retain or assume certain current or future liabilities in order to complete the divestiture.

The Company continually evaluates the performance and strategic fit of its businesses (including specific product lines and service offerings) to determine whether any divestitures are appropriate. Any divestitures may result in significant write-offs, including those related to goodwill and other intangible assets, and which could have an adverse effect on the Company's results of operations and financial condition. In addition, the Company may encounter difficulty in finding buyers or alternative exit strategies at acceptable prices and terms, and in a timely manner. The Company may not be successful in managing these or any other significant risks that it encounters in divesting a business, site, or product line or service offering and, as a result, may not achieve some or all of the expected benefits of the divestiture.

Loss of Partners

IPA's partners may terminate their contracts with it upon 30 to 90 days' notice for a number of reasons or, in some cases, for no reason. Although the Company's partners are currently comprised of a number of small and larger pharma entities, IPA is making a strategic shift to increase the number of larger pharmaceutical and biotechnology partners, including the size of each service contract. If any one of the Company's major partners cancels its contract with ImmunoPrecise, its revenue may decrease.

Reduction in Demand

IPA's business could be adversely affected by any significant decrease in drug R&D expenditures by pharmaceutical and biotechnology companies, as well as by academic institutions, government laboratories, or private foundations. Similarly, economic factors and industry trends that affect the Company's partners in these industries also affect their R&D budgets and, consequentially, IPA's business as well. The Company's partners include researchers at pharmaceutical and biotechnology companies.

IPA's ability to continue to grow and win new business is dependent, in large part, upon the ability and willingness of the pharmaceutical and biotechnology industries to continue to spend on molecules in the non-clinical phases of

R&D and to outsource the products and services the Company provides. Furthermore, IPA's partners (particularly larger biopharmaceutical companies) continue to search for ways to maximize the return on their investments with a focus on lowering R&D costs per drug candidate. Fluctuations in the expenditure amounts in each phase of the R&D budgets of these researchers and their organizations could have a significant effect on the demand for IPA's products and services. R&D budgets fluctuate due to changes in available resources, mergers of pharmaceutical and biotechnology companies, spending priorities, general economic conditions, institutional budgetary policies, and the impact of government regulations, including potential drug pricing legislation. Available funding for biotechnology partners in particular may be affected by the capital markets, investment objectives of venture capital investors, and priorities of biopharmaceutical industry sponsors.

Reduction or Delay in Government Funding of R&D

A small portion of revenue is derived from partners at academic institutions and research laboratories whose funding is partially dependent on both the level and timing of funding from government sources in Canada, such as National Research Council (NRC), and the U.S., such as the National Institutes of Health (NIH), and international agencies, which can be difficult to forecast. Government funding of R&D is subject to the political process, which is inherently fluid and unpredictable. The Company's revenue may be adversely affected if its partners delay purchases as a result of uncertainties surrounding the approval of government budget proposals, included reduced allocations to government agencies that fund R&D activities. Government proposals to reduce or eliminate budgetary deficits have sometimes included reduced allocations to government agencies that fund R&D activities, or such funding may not be directed towards projects and studies that require the use of IPA's products and services, both of which could adversely affect the Company's business and financial results.

Public Company in the U.S.

As a public company in the U.S., IPA will incur additional legal, accounting, reporting, and other expenses that it did not incur as a public company in Canada. The additional demands associated with being a U.S. public company may disrupt regular operations of business by diverting the attention of some of the Company's senior management team away from revenue-producing activities to additional management and administrative oversight, adversely affecting IPA's ability to attract and complete business opportunities and increasing the difficulty in both retaining professionals and managing and growing its business. Any of these effects could harm IPA's business, results of operations, and financial condition. In general, the U.S. tends to be more litigious than Canada and being a public company in the U.S. may make it more likely that the Company is subjected, from time to time, to the types of lawsuits that affect public companies in the U.S.

Delivery and Performance Requirements in Partner Contracts

In order to maintain its current partner relationships and to meet the performance and delivery requirements in its partner contracts, IPA must be able to provide products and services at appropriate levels and with acceptable quality and at an acceptable cost. The Company's ability to deliver the products and provide the services it offers to its partners is limited by many factors, including the difficulty of the processes associated with its products and services, the lack of predictability in the scientific process, and the shortage of qualified scientific personnel. In particular, a large portion of IPA's revenue depends on producing biologics and the current rate at which the Company is producing them. Some of the Company's partners can influence when it will deliver products and perform services under their contracts. If the Company is unable to meet its contractual commitments, it may delay or lose revenue, lose partners, or fail to expand its existing relationships.

Patent and Other Intellectual Property Litigation

The drug research and development industry has a history of patent and other intellectual property litigation and these lawsuits will likely continue. Because IPA's produces and provides many different products and services in this industry, it faces potential patent infringement suits by companies that control patents for similar products and services. In order to protect or enforce the Company's intellectual property rights, IPA may have to initiate legal proceedings against third parties. In addition, others may sue the Company for infringing their intellectual property rights or IPA may initiate a lawsuit seeking a declaration from a court that it does not infringe the

proprietary rights of others. The patent positions of pharmaceutical, biotechnology, and drug discovery companies are generally uncertain and involve complex legal and factual questions. No consistent policy has emerged from the U.S. Patent and Trademark Office or the courts regarding the breadth of claims allowed or the degree of protection afforded under patents like those for which IPA has applied.

Legal proceedings relating to intellectual property would be expensive, take significant time, and divert management's attention from other business concerns, whether the Company wins or loses. The cost of such litigation could affect the Company's profitability. Further, if IPA does not prevail in an infringement lawsuit brought against it, the Company might have to pay substantial damages, including treble damages, and it could be required to stop the infringing activity or obtain a license to use the patented technology. Any required license may not be available to IPA on acceptable terms, or at all. In addition, some licenses may be nonexclusive, and therefore, the Company's competitors may have access to the same technology licensed to ImmunoPrecise. If the Company fails to obtain a required license or is unable to design around a patent, it may be unable to sell some of its products or services.

Key Personnel Risk

The Company's success will depend on its directors' and officers' ability to develop IPA's business and manage its operations, and on the Company's ability to attract and retain the Chief Executive Officer, management team, and other key technical, sales, public relations, and marketing staff or consultants to operate and grow the business. The loss of any key person or the inability to find and retain new key individuals could have a material adverse effect on the Company's business.

Competition for experienced scientists is intense. The Company competes with pharmaceutical and biotechnology companies, including its partners and collaborators, medicinal chemistry outsourcing companies, contract research companies, and academic and research institutions to recruit scientists. IPA's inability to hire additional qualified personnel may also require an increase in the workload for both existing and new personnel. The Company may not be successful in attracting new scientists or management or in retaining or motivating its existing personnel. The shortage of experienced scientists, and other factors, may lead to increased recruiting, relocation, and compensation costs for such scientists, which may exceed IPA's expectations. These increased costs may reduce the Company's profit margins or make hiring new scientists impracticable.

Pandemic Risk

The Company is currently unable to determine whether the ongoing COVID-19 pandemic will have a negative effect on its results and the future course and duration of the outbreak remain unknown. There has been minimal impact on IPA's operations and results to date, and the Company has not experienced negative impact on its sales or supply chain. IPA's sales, operations, and financial performance could suffer given a potential rapidly spreading virus.

Internally, the virus may infect its employees, resulting in operating at lower productivity levels or even a complete laboratory shutdown. The Company's business is dependent on its laboratories to produce its products and services, which if not operating, will impact the financial performance of the company and its ability to meet its obligations. The Company has diversified geographic locations with the ability to perform similar services at other sites. In addition, certain roles have the ability to work remotely and IPA has business interruption insurance, which may aid in the recovery of lost profits. External factors may also contribute to this risk, such as the impact of a pandemic on the Company's partners and suppliers.

Brand Awareness

IPA's expansion of its products and services depends on increasing brand awareness with respect to its products and services. There is no assurance that the Company will be able to achieve sufficient brand awareness. In addition, IPA must successfully develop a larger market for its services in order to increase the sales of its services. If it is not able to successfully develop a market for its services, then such failure will have a material adverse effect on the Company's business, financial condition, and operating results.

Conflicts of Interest Risk

Certain of the Company's directors and officers are also involved as advisors for other companies. Situations may arise in connection with potential acquisitions or opportunities where the other interests of these directors and officers conflict with or diverge from the Company's interests. In accordance with the Business Corporations Act (British Columbia) BCBCA, directors who have a material interest in any person who is a party to a material contract or a proposed material contract are required, subject to certain exceptions, to disclose that interest and generally abstain from voting on any resolution to approve the contract.

In addition, the directors and the officers are required to act honestly and in good faith with a view to the Company's best interests. However, in conflict of interest situations, IPA's directors and officers may owe the same duty to another company and will need to balance their competing interests with their duties to the Company. Circumstances, including with respect to future corporate opportunities, may arise that may be resolved in a manner that is unfavorable to IPA.

Outsourcing Trend in Non-Clinical Discovery Stages of Drug Discovery

Over the past decade, pharmaceutical and biotechnology companies have generally increased their outsourcing of nonclinical research support activities, such as antibody discovery. While many industry analysts expect the outsourcing trend to continue to increase for the next several years (although with different growth rates for different phases of drug discovery and development), decreases in such outsourcing may result in a diminished growth rate in the sales of any one or more of IPA's service lines and may adversely affect the Company's financial condition and results of operations.

Competition and Obsolescence

The pharmaceutical and biotechnology industries are characterized by rapid and continuous technological innovation. IPA competes with companies around the world that are engaged in the development and production of products and services, including pharmaceutical companies, biotechnology companies, and contract research companies. Academic institutions, governmental agencies, and other research organizations also are conducting research and developing technologies in areas in which the Company provides services, either on its own or through collaborative efforts. IPA's pharmaceutical and biotechnology company partners have internal departments that provide products and services that directly compete with the Company's products and services. Many of IPA's competitors offer a broader range of products and services and have greater access to financial, technical, scientific, business development, recruiting, and other resources than the Company does, and some of its competitors may also operate with a lower cost structure.

IPA anticipates that it will face increased competition in the future as it expands its operations and its products and services and as new companies enter the market and advanced technologies become available. The Company's products, services, and expertise may become obsolete or uneconomical due to technological advances or entirely different approaches developed by the Company, its partners, or one or more of its competitors. For example, advances in databases and molecular modeling tools that predict how effectively compounds will treat a targeted disease may render some of its technologies obsolete. While the Company plans to develop technologies that will give it a competitive advantage, it may not be able to develop the technologies necessary for it to successfully compete in the future.

Additionally, the existing approaches of IPA's competitors or new approaches or technologies developed by its competitors may be more effective than those it develops. The Company may not be able to compete successfully with existing or future competitors. Other competitive factors could force IPA to lower prices or could result in reduced sales. In addition, new products developed by others could emerge as competitors to the Company's drug candidates. If IPA is not able to compete effectively against current and future competitors, its business will not grow and its financial condition and operations will suffer.

Global Economic Conditions

Current global economic conditions could have a negative effect on the Company's business and results of operations. Market disruptions have included extreme volatility in securities prices, as well as severely diminished liquidity and credit availability. The economic crisis may adversely affect IPA in a variety of ways. Access to lines of credit or the capital markets may be severely restricted, which may preclude the Company from raising funds required for operations and to fund continued development. It may be more difficult for IPA to complete strategic transactions with third parties. The financial and credit market turmoil could also negatively impact suppliers, partners, and banks with whom the Company does business. Such developments could decrease IPA's ability to source, produce, and distribute its products or obtain financing and could expose it to risks that one of its suppliers, partners, or banks will be unable to meet their obligations under agreements with the Company.

Limited Number of Suppliers

The Company currently purchases animals and certain key components of biological and chemical materials that it uses in its products and services from a limited number of outside sources. IPA's reliance on its suppliers exposes it to risks, including: (1) the possibility that one or more of its suppliers could terminate their services at any time without penalty; (2) the potential inability of its suppliers to obtain required materials; (3) the potential delays and expenses of seeking alternative sources of supply; and (4) reduced control over pricing, quality, and timely delivery due to the difficulties in switching to alternative suppliers. Consequently, if materials from the Company's suppliers are delayed or interrupted for any reason, IPA may not be able to deliver its products and perform its services on a timely basis or in a cost-efficient manner.

Uninsured or Uninsurable Risk

IPA may become subject to liability for risks against which it cannot insure or against which the Company may elect not to insure due to the high cost of insurance premiums or other factors. The payment of any such liabilities would reduce the funds available for IPA's usual business activities. Payment of liabilities for which the Company does not carry insurance may have a material adverse effect on its financial position and operations.

Restricted Use of Scientific Information

The Company's ability to improve the efficiency of the CRO services it provides by, among other things, developing an effective database designed to predict how chemical compounds interact with a targeted disease-related protein, depends in part on the Company's generation and use of information that is not proprietary to its partners and that it derives from performing these services. However, IPA's partners may not allow it to use this information with other partners, such as the general interaction between types of chemistries and types of drug targets that the Company generates when performing drug discovery services for its partners. Without the ability to use this information, IPA may not be able to develop a database, which may limit its ability to improve the efficiency of the drug discovery services it provides.

Failure of Laboratory Facilities

IPA's operations could suffer as a result of a failure of its laboratory facilities. The Company's business will be dependent upon a laboratory infrastructure to produce products and services. These systems and operations are vulnerable to damage and interruption from fires, earthquakes, telecommunications failures, and other events. Any such errors or inadequacies in the software that may be encountered could adversely affect operations, and such errors may be costly or difficult to correct in a timely manner.

Further, many of the Company's operations are comprised of complex mechanical systems that are subject to periodic failure, including aging fatigue. Such failures are unpredictable, and while IPA has made significant capital expenditures designed to create redundancy within these mechanical systems, strengthened biosecurity, improved operating procedures to protect against such contaminations, and replaced impaired systems and equipment in advance of such events, failures and/or contaminations may still occur.

The production of monoclonal and polyclonal antibodies requires state-of-the art laboratory facilities and the success of these laboratory services depends on the recruitment and retention of highly qualified technical staff to maintain the level and quality of standard of the Company's products and services expected from partners. There is no assurance that IPA will be able to expand and operate such state-of-the art laboratory services and recruit and retain qualified staff.

The Company produces and supplies antibodies and there is no guarantee that such production will be successful and produce the desired results. As a result, the Company continues to be exposed to potential liability that may exceed any insurance coverage that it may obtain in the future. As a result, IPA may incur significant liability exposure, which may exceed any insurance coverage that the Company may obtain in the future. Even if IPA elects to purchase such insurance in the future, it may not be able to maintain adequate levels of insurance at reasonable cost and/or reasonable terms. Excessive insurance costs or uninsured claims may increase the Company's operating loss and affect its financial condition.

Contaminations in Animal Populations

Animals that the Company uses must be free of certain infectious agents, such as certain viruses and bacteria, because the presence of these contaminants can distort or compromise the quality of research results and could adversely impact animal health. The presence of these infectious agents in IPA's animal facility and certain service operations could disrupt its animal service businesses, harm the Company's reputation, and result in decreased sales. Contaminations are unanticipated and difficult to predict and could adversely impact the Company's financial results. If they occur, contaminations typically require cleaning up, renovating, disinfecting, retesting, and restarting production or services. Such clean-ups result in inventory loss, clean-up and start-up costs, and reduced sales as a result of lost orders and potentially credits for prior shipments. Contaminations also could expose IPA to risks that partners will request compensation for damages in excess of the Company's contractual indemnification requirements.

Unauthorized Access into Information Systems

The Company operates large and complex information systems that contain significant amounts of partner data. As a routine element of IPA's business, the Company collects, analyzes, and retains substantial amounts of data pertaining to the non-clinical research it conducts for its partners. Unauthorized third parties could attempt to gain entry to such information systems to steal data or disrupt the systems. The Company has taken measures to protect them from intrusion.

IPA's contracts with its partners typically contain provisions that require the Company to keep confidential the information generated from the research conducted. In the event the confidentiality of such information is compromised, whether by unauthorized access or other breaches, IPA could be exposed to significant harm, including termination of customer contracts, damage to its customer relationships, damage to its reputation, and potential legal claims from customers, employees, and other parties. In addition, the Company may face investigations by government regulators and agencies as a result of a breach.

Further, the Company is required to comply with the data privacy and security laws in many jurisdictions. For example, IPA is required to comply with the European Union General Data Protection Regulation ("GDPR"), which became effective on May 25, 2018 and imposes heightened obligations and enhanced penalties for noncompliance (including up to four percent [4%] of global revenue). The cost of compliance, and the potential for fines and penalties for non-compliance, with GDPR may have a significant adverse effect on IPA's business and operations.

Also, the California legislature passed the California Consumer Privacy Act ("CCPA"), which became effective January 1, 2020. The CCPA creates new transparency requirements and grants California residents several new rights with regard their personal information. Failure to comply with the CCPA may result in, among other things, significant civil penalties and injunctive relief, or potential statutory or actual damages. IPA has made changes to, and investments in, its business practices and will continue to monitor developments and make appropriate changes to help attain compliance with these evolving and complex regulations.

Enforcement of Civil Liabilities

While IPA is organized under the laws of the Province of British Columbia with its registered place of business in Canada, some of its directors and officers reside outside the U.S. and the majority of the Company's assets and all or a substantial portion of the assets of these persons may be located outside the U.S. Consequently, it may be difficult for investors who reside in the U.S. to effect service of process in the U.S. upon the Company or upon such persons who are not residents of the U.S., or to realize upon judgments of courts of the U.S. predicated upon the civil liability provisions of the U.S. federal securities laws.

Foreign Private Issuer

The Company is a "foreign private issuer" as such term is defined in Rule 405 under the U.S. *Securities Act of 1933*, and is permitted, under a multijurisdictional disclosure system adopted by the U.S. and Canada, to prepare its disclosure documents filed under the U.S. Exchange Act in accordance with Canadian disclosure requirements. Under the U.S. Exchange Act, the Company is subject to reporting obligations that, in certain respects, are less detailed and less frequent than those of U.S. domestic reporting companies.

As a result, IPA will not file the same reports that a U.S. domestic issuer would file with the SEC, although it will be required to file or furnish to the SEC the continuous disclosure documents that it is required to file in Canada under Canadian securities laws. In addition, the officers, directors, and principal shareholders of the Company are exempt from the reporting and "short swing" profit recovery provisions of Section 16 of the U.S. Exchange Act. Therefore, the Company's shareholders may not know on as timely a basis when the officers, directors, and principal shareholders of the Company purchase or sell shares, as the reporting deadlines under the corresponding Canadian insider reporting requirements are longer.

As a foreign private issuer, the Company is exempt from the rules and regulations under the U.S. Exchange Act related to the furnishing and content of proxy statements. It is also exempt from Regulation FD, which prohibits issuers from making selective disclosures of material non-public information. While the Company expects to comply with the corresponding requirements relating to proxy statements and disclosure of material non-public information under Canadian securities laws, these requirements differ from those under the U.S. Exchange Act and Regulation FD and shareholders should not expect to receive in every case the same information at the same time as such information is provided by U.S. domestic companies.

In addition, as a foreign private issuer, the Company has the option to follow certain Canadian corporate governance practices, provided that the Company discloses the requirements that are not being followed and describes the Canadian practices being followed instead. The Company plans to rely on this exemption. As a result, the Company's shareholders may not have the same protections afforded to shareholders of U.S. domestic companies that are subject to all U.S. corporate governance requirements.

Foreign Exchange Rates

The Company may conduct business with partners, distributors, suppliers, other service providers, and affiliates in currencies other than Canadian Dollars. Therefore, the Company's business could be adversely affected by fluctuations in domestic or foreign currencies.

Glossary

Affinity Maturation—The process whereby the immune system generates antibodies of higher affinities during a response to antigen.

Antibody—Also known as an immunoglobulin (Ig), is a large, Y-shaped protein produced mainly by plasma cells that is used by the immune system to identify and neutralize pathogens, such as bacteria and viruses.

Antibody Affinity—Refers to the tendency of an antibody to bind to a specific epitope at the surface of an antigen, i.e., to the strength of the interaction.

Antibody Specificity—Can either be viewed as a measure of the goodness of fit between the antibody-combining site (paratope) and the corresponding antigenic determinant (epitope), or the ability of the antibody to discriminate between similar or even dissimilar antigens.

Antigen—Any substance (such as an immunogen or a hapten) foreign to the body that evokes an immune response either alone or after forming a complex with a larger molecule (such as a protein) and that is capable of binding with a product (such as an antibody or T cell) of the immune system.

Atherosclerosis Cardiovascular Disease (ACVD)—A type of cardiovascular disease caused by high levels of bad cholesterol (LDL-C) in the blood. This leads to the buildup of plaque on the walls of the arteries, which over time can lead to a heart attack or stroke.

Autoantigens—Usually a normal protein or complex of proteins (and sometimes DNA or RNA) that is recognized by the immune system of patients suffering from a specific autoimmune disease. See also heteroantigen.

B cell—A type of white blood cell that makes antibodies. B cells are part of the immune system and develop from stem cells in the bone marrow. Also called B lymphocyte.

Biologics—A subset of pharmaceuticals that are composed of a mixture of sugars, proteins, nucleic acids, or complex compositions, and may be made from biological sources.

Bispecific antibodies (BsAbs)—Antibodies that can simultaneously bind two separate and unique antigens (or different epitopes of the same antigen). The primary application of BsAbs have been to redirect cytotoxic immune effector cells for enhanced killing of tumor cells by antibody-dependent cell-mediated cytotoxicity (ADCC) and other cytotoxic mechanisms mediated by the effector cells.

Chimeric monoclonal antibodies—A type of antibody made in the laboratory by combining a human antibody with a small part of a mouse or rat monoclonal antibody. The mouse or rat part of the antibody binds to the target antigen, and the human part makes it less likely to be destroyed by the body's immune system.

Clinical trial—Research studies performed in people that are aimed at evaluating a medical, surgical, or behavioral intervention.

Complementarity-determining region (CDR)—Part of the variable chains in immunoglobulins (antibodies) and T cell receptors, generated by B-cells and T-cells respectively, where these molecules bind to their specific antigen. A set of CDRs constitutes a paratope. As the most variable parts of the molecules, CDRs are crucial to the diversity of antigen specificities generated by lymphocytes.

Conformational epitopes (CE)—A sequence of sub-units (usually amino acids) composing an antigen that comes in direct contact with a receptor of the immune system.

Contract manufacturing organization (CMO)—Sometimes called a contract development and manufacturing organization (a "**CDMO**"), is a company that serves other companies in the pharmaceutical industry on a contract basis to provide comprehensive services from drug development through drug manufacturing.

Contract research organization (CRO)—A company focused on providing research and development services to companies in the pharmaceutical and agrochemical markets.

Current Good Manufacturing Practice (cGMP)—A quality system imposed on pharmaceutical firms to ensure that products produced meet specific requirements for identity, strength, quality and purity, and enforced by public agencies, for example the U.S.' Food and Drug Administration or the European Medicines Agency.

Customer relationship management (CRM)—A process in which a business or other organization administers its interactions with customers, typically using data analysis to study large amounts of information.

Dendritic cells—A type of antigen-presenting cell (APC) that forms an important role in the adaptive immune system. The main function of dendritic cells is to present antigens and the cells are therefore sometimes referred to as "professional" APC.

Deoxyribonucleic acid (DNA)—A molecule that carries most of the genetic instructions used in the development, functioning, and reproduction of all known living organisms and many viruses.

Drug discovery—The process through which potential new medicines are identified and may involve a wide range of scientific disciplines, including biology, chemistry, and pharmacology.

Enterprise resource planning (ERP)—The integrated management of main business processes, often in real time and mediated by software and technology.

Epitope—Also known as antigenic determinant; the part of an antigen that is recognized by the immune system, specifically by antibodies, B cells, or T cells. The epitope is the specific piece of the antigen to which an antibody binds. The part of an antibody that binds to the epitope is called a paratope.

G-protein-coupled receptors (GPCRs)—Also known as seven-(pass)-transmembrane domain receptors, 7TM receptors, heptahelical receptors, serpentine receptors, and G protein-linked receptors (GPLR), form a large group of evolutionarily-related proteins that are cell surface receptors which detect molecules outside the cell and activate cellular responses.

Heteroantigens—A foreign antigen. See also autoantigen.

Human monoclonal antibodies—A fully human antibody derived from a human.

Humanized monoclonal antibodies—An originally non-human antibody which amino acids have been replaced by human counterparts to avoid rejection of a therapeutic antibody from the human body.

Hybridomas—Hybrid cells produced by the fusion of an antibody-producing lymphocyte with a tumor cell and used to culture continuously a specific monoclonal antibody.

Immunoassay—A biochemical test that measures the presence or concentration of a macromolecule or a small molecule in a solution through the use of an antibody or an antigen.

Immunogen—An antigen or any substance that may be specifically bound by components of the immune system (antibody, lymphocytes). The term antigen arises from its ability to induce generation of antibodies. Despite the fact that all antigens are recognized by specific lymphocytes or by antibodies, not every antigen can evoke an immune response. Those antigens that are capable of inducing an immune response are said to be immunogenic and are called immunogens.

***in silico*—**An expression used in systems biology to mean "performed on a computer or via computer simulation."

***in vitro*—**Latin for "in glass;" studies *in vitro* are conducted using components of an organism that have been isolated from the usually biological surroundings, such as microorganisms, cells, or biological molecules.

***in vivo*—**Studies that are *in vivo* (Latin for "within the living") are those in which the effects of various biological entities are tested on whole, living organisms or cells, usually animals, including humans and plants.

Lymphocytes—A type of white blood cell in the immune system of jawed vertebrates. Lymphocytes include natural killer cells, T cells, and B cells. They are the main type of cell found in lymph, which prompted the name "lymphocyte."

Macrophages—Specialized cells involved in the detection, phagocytosis, and destruction of bacteria and other harmful organisms. In addition, they can also present antigens to T cells and initiate inflammation by releasing molecules (known as cytokines) that activate other cells.

Messenger RNA (mRNA)—A single-stranded RNA molecule that is complementary to one of the DNA strands of a gene. The mRNA is an RNA version of the gene that leaves the cell nucleus and moves to the cytoplasm where proteins are made. During protein synthesis, an organelle called a ribosome moves along the mRNA, reads its base sequence, and uses the genetic code to translate each three-base triplet, or codon, into its corresponding amino acid.

Monoclonal antibody—A monoclonal antibody (mAb) is an antibody made by cloning a unique white blood cell. All subsequent antibodies derived this way trace back to a unique parent cell (see also polyclonal antibody).

Oncology—The study and treatment of tumors.

Paratope—Also known as an antigen-binding site, paratope is the part of an antibody which recognizes and binds to an antigen. It is a small region at the tip of the antibody's antigen-binding fragment and contains parts of the antibody's heavy and light chains.

Pathogen—A bacterium, virus, or other microorganism that can cause disease.

Peptide—Small fragments of proteins, composed of amino acids.

Phage display—A laboratory technique that uses bacteriophages (viruses that infect bacteria); the phage "displays" the protein of interest on its outside while containing the gene for the protein on its inside. In this way, large libraries of proteins can be screened and amplified in a process called in vitro selection.

Polyclonal antibody—Polyclonal antibodies (pAbs) bind to multiple epitopes and are usually made by several different antibody secreting plasma cell lineages (see also monoclonal antibody).

Preclinical—Of or relating to a stage preceding a clinical stage.

Recombinant—Of or reacting to the combination of genetic materials from more than one origin.

Recombinant proteins—Specifically engineered proteins, which are produced from recombinant DNA within living cells, typically bacteria or mammalian cells such as HEK (Human Embryonic Kidney cells) or CHO.

SARS-CoV-2—The virus that causes a respiratory disease called coronavirus disease 19 (COVID-19). SARS-CoV-2 is a member of a large family of viruses called coronaviruses. These viruses can infect people and some animals. SARS-CoV-2 was first known to infect people in 2019. The virus is thought to spread from person to person through droplets released when an infected person coughs, sneezes, or talks. It may also be spread by touching a surface with the virus on it and then touching one's mouth, nose, or eyes, but this is less common.

Single chain fragment variable (scFv)—A single-chain variable fragment is a fusion protein of the variable regions of the heavy (VH) and light chains (VL) of immunoglobulins, connected with a short linker peptide of ten to about 25 amino acids.

Small molecule—Within the fields of molecular biology and pharmacology a low molecular weight (<900 Da) organic compound that may regulate a biological process, with a size in the order of 1 nm. Many drugs are small molecules.

Somatic Hypermutation (SHM)—A cellular mechanism by which the immune system adapts to the new foreign elements that confront it (e.g. microbes), as seen during class switching.

Synthesis—The production of chemical compounds by reaction from simpler materials.

Transcytosis—A type of transcellular transport in which various macromolecules are transported across the interior of a cell. Macromolecules are captured in vesicles on one side of the cell, drawn across the cell, and ejected on the other side.

Transgenic animals—Animals (most commonly mice, but also other species) that have had a foreign gene deliberately inserted into their genome. Such animals are most commonly created by the microinjection of DNA into the pronuclei of a fertilized egg, which is subsequently implanted into the oviduct of a pseudopregnant surrogate mother. In the context of this Executive Informational Overview a transgenic animal is usually an animal producing antibodies with human variable domains.

VHH—A VHH antibody (or nanobody) is the antigen binding fragment of heavy chain only antibodies.

Vivarium—An indoor enclosure for keeping and raising living animals and plants and observing them under natural conditions.

Wild-type animals—Is the phenotype of the typical form of a species as it occurs in nature.

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