# Ligand

# **NON-DEAL ROADSHOW**

40%

SEPTEMBER 2021



# SAFE HARBOR STATEMENT

The following presentation contains forward-looking statements by Ligand and its partners that involve risks and uncertainties and reflect Ligand's and it's partners' judgment as of the date of this presentation. Words such as "plans," "believes," "expects," "projects," "could," "anticipates," and "will," and similar expressions, are intended to identify forward-looking statements. These forward-looking statements include, without limitation, expectations regarding research and development programs, the timing of the initiation or compilation of preclinical studies and clinical trials by Ligand and its partners, expectations regarding product approvals and potential for future revenue growth, and launches by Ligand or its partners and the timing thereof, total addressable market for antibodies. Actual events or results may differ from Ligand's expectations due to risks and uncertainties inherit in Ligand's business, including the inherit risks of clinical development and regulatory approval of product candidates, including that FDA or foreign regulatory authorities may not agree with our or our partners' conclusions regarding the results of clinical trials; Ligand may be unable to successfully integrate operations from acquired businesses or may face other difficulties as a result of acquisitions such as strain on operational resources; the total addressable market for antibodies or other therapeutics may be smaller than estimated; we face competition with respect to our technology platforms, including OmniAb, which may demonstrate greater market acceptance or superiority; partnered commercial products may not perform as expected; Ligand relies on collaborative partners for milestone and royalty payments. royalties, materials revenue, contract payments and other revenue projections; Ligand does not have contractual relationships with certain parties identified as partners and is dependent on WuXi Biologics Ireland Limited to enforce any contractual rights such as payment of royalties or milestones; the possibility that Ligand's and its partners' drug candidates might not be proved to be safe and efficacious and uncertainty regarding the commercial performance of Ligand's and/or its partners' products; and other risks and uncertainties described in its public filings with the Securities and Exchange Commission, available at www.sec.gov. Additional risks may apply to forward-looking statements made in this presentation. Information regarding partnered products and programs comes from information publicly released by our partners. This presentation describes the typical roles and responsibilities of Ligand and our partners and is not intended to be a complete description in all cases. Our trademarks, trade names and service marks referenced herein include Ligand, Captisol, Pelican Expression Technology, OmniAb, OmniChicken, OmniRat, OmniMouse, OmniFlic, OmniClic and OmniTaur. Each other trademark, trade name or service mark appearing in this presentation belongs to its owner.

The process for reconciliation between the non-GAAP adjusted financial numbers presented on slide 12 and the corresponding GAAP figures is shown in the earnings press release for the second quarter ended June 30, 2021 available at https://investor.ligand.com/press-releases. However, other than with respect to total revenues, the Company only provides financial guidance on an adjusted basis and does not provide reconciliations of such forward-looking adjusted measures to GAAP due to the inherent difficulty in forecasting and quantifying certain amounts that are necessary for such reconciliation. Ligand disclaims responsibility for any statement by a person other than its employees and the views expressed by persons other than Ligand employees do not necessarily reflect the views of Ligand.

Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect our good faith beliefs (or those of the indicated third parties) and speak only as of the date hereof. All forward-looking statements are qualified in their entirety by this cautionary statement, and Ligand undertakes no obligation to revise or update this presentation to reflect events or circumstances or update third party research numbers after the date hereof. This caution is made under the safe harbor provisions of Section 21E of the Securities Exchange Act of 1934.

# **ABOUT LIGAND**

Medical research and technology company discovering medicines, improving safety and reducing manufacturing costs

**TECHNOLOGY PEOPLE & INNOVATION** INNOVATION DRIVING VALUE 

PARTNERS

Robust platform of discovery tools and technologies needed to solve industry challenges

High growth and strong cash flow driven by diverse and growing portfolio of partnerships

**FINANCIALS** 



Superior support and engagement with pharmaceutical partners for a wide range of medical and health needs

# LIGAND ADDS VALUE . . .

### ... JUST ASK OUR MORE THAN 130 PARTNERS

### Our research and technology help partners...



### **Discover medicines**



## Improve safety

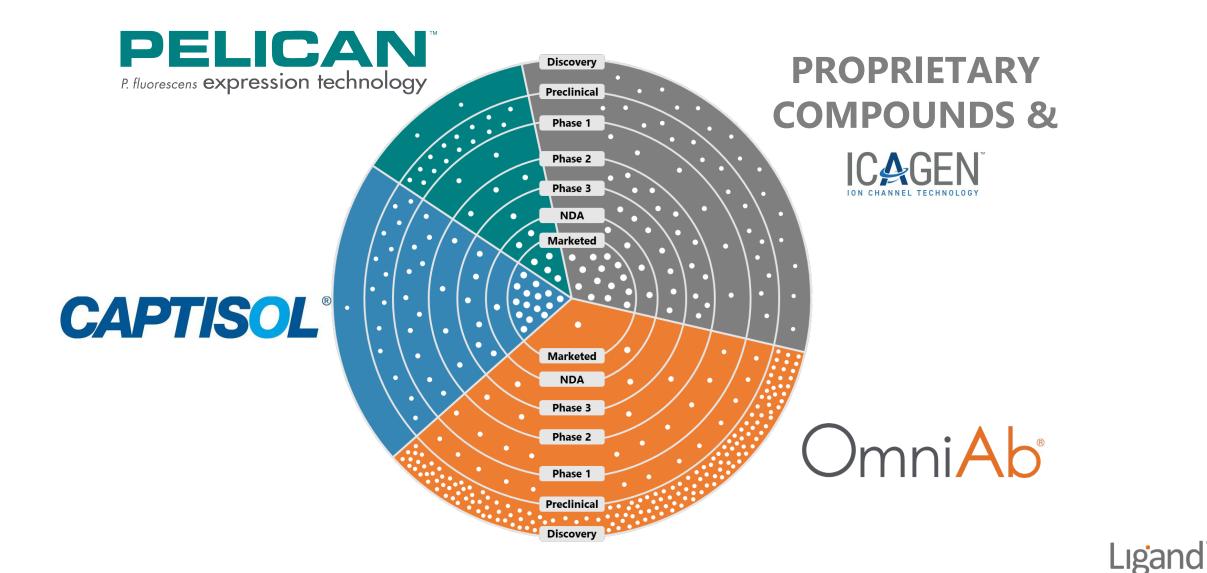


Ligand's technology and R&D support entitles us to share in revenue of partners through royalties





## **PARTNERED PIPELINE** BROAD PORTFOLIO WITH OVER 130 DIFFERENT PARTNERS



# **PARTNERED PIPELINE SNAPSHOT**

Partner	Program	Therapy Area	Technology	Preclinical	Phase 1	Phase 2	Phase 3	Approved
AMGEN	Kyprolis®	Oncology	Captisol					
ACROTECH"	<b>EVOMELA</b> ®	Oncology	Captisol					
🚺 GILEAD	Veklury®	Infection	Captisol					
Alvogen	Teriparatide	Osteoporosis	Pelican					
	<b>P</b> neumosil®	Infection	Pelican					
Jazz Pharmaceuticals	<i>Rylaze</i> ™	Oncology	Pelican					
Sector Merck	Vaxneuvance™	Infection	Pelican					
<b>gloric</b> 誉衡生物 <sup>(1)</sup>	Zimberelimab	Oncology	OmniAb					
Multiple Additional Partner	Multiple Additional Partners and Programs			Includes: ZULRESSO	(Sage), MINNEBRO (Dai	ichi-Sankyo), NEXTERO	NE (Baxter), DUAVEE (F	fizer), and 22 Others
TRAVERE	Sparsentan	Kidney Disease	NCE					
呈目 基石药业 <sup>(1)</sup> ISTONE PH/RRMCEUTICALS	Sugemalimab	Oncology	OmniAb					
ARCUS	Zimberelimab	Oncology	OmniAb					
PHARMACEUTICALS	Ganaxolone-IV	CNS	Captisol					
Verona Pharma	Ensifentrine	Respiratory	NCE					
NOVAN	SB206	Infection	NCE					
Multiple Additional Partners and Programs			Includes 17 additional Phase 3 or Pivotal assets					
Multiple Partners and Programs			26 Phase 2 assets					
Multiple Partners and Prog	Multiple Partners and Programs			29 additional Phase 1 assets				

Partnered pipeline also includes >200 preclinical and discovery programs Status of partnered programs from information released by our partners and from clinicaltrials.gov





# **FIVE RECENT APPROVALS**

OUR PROPRIETARY PLATFORMS ARE ENABLING IMPORTANT APPROVALS AND POSITIONING LIGAND FOR SUBSTANTIAL GROWTH OF ROYALTY REVENUE





# WE EXPECT A SUBSTANTIAL CALENDAR OF LATE-STAGE EVENTS

### **Next Six Quarters of Potential Events**

Approvals	NDA Sub	missions	Major Data Events			
Sugemalimab Approval (China) 译石药业 EHARMAGE ITERALS	Sparsentan NDA Submissions	Sugemalimab NDA Submission (US) 部語 基石 哲 聖 医 西 西 聖 王 王 王 王 王 王 王 王 王 王 王 王 王 王 王 王 王	Ensifentrine Phase 3 data	VK2809 Phase 2 data		
Teriparatide	Erwinia asparaginase	Vaxneuvance™	Verona Pharma Ganaxalone-IV	Lasofoxifene		
TE (US)	MAA Submission Jazz Pharmaceuticals	Pediatric Submission	Phase 3 data	Phase 2 data		

Based on clinicaltrials.gov or partner disclosures



# **RECENT RYLAZE™ APPROVAL**

### APPROVED IN U.S. ON JUNE 30, 2021



RYLAZE<sup>™</sup> asparaginase erwinia chrysanthemi (recombinant)-rywn for injection 10mg/0.5mL per vial

### **RELY ON RYLAZE**—THE ONLY RECOMBINANT *ERWINIA* ASPARAGINASE APPROVED FOR THE TREATMENT OF ALL/LBL<sup>1</sup>

- Recombinant Erwinia asparaginase for ALL/LBL, enabled by the Pelican Expression Technology
  - High quality, reliable supply for a major unmet need
  - \$>200 M market potential in US alone
- Approved on June 30; launch on July 15, 2021
  - 1+ year supply available
- Jazz launch focused on pediatric oncologist; majority of ALL incidence in children
  - Education and awareness campaigns on-going
- National Comprehensive Cancer Network<sup>®</sup> added Rylaze<sup>™</sup> to ALL Clinical Practice Guidelines
- EU filing anticipated in 2022; Japan submission to follow



# **CRM197 - PELICAN PARTNERSHIP**



### VAXNEUVANCE<sup>™</sup> PNEUMOCOCCAL VACCINE APPROVAL

- Vaxneuvance<sup>™</sup> approved July 16, 2021, for the prevention of pneumococcal disease in adults
  - 15-valent pneumococcal vaccine utilizing Ligand's CRM197 vaccine carrier protein produced using the Pelican Expression Technology platform
- Vaxneuvance will compete directly with Pfizer's Prevnar13<sup>®</sup> (2020 worldwide sales of \$5.9 B) and recently-approved Prevnar20<sup>™</sup>
- Vaxneuvance sBLA for pediatric population anticipated by year-end, 1-2 years ahead of estimated Prevnar20 pediatric submission
  - If approved, market opportunity expected to more than double
- Merck's follow-on pneumococcal vaccine candidate V116, currently in Phase 2, also uses CRM197 produced using Pelican Expression Technology™

### NOW APPROVED Vaxneuvance<sup>TM</sup> Pneumococcal 15-valent

Pneumococcal 15-valent Conjugate Vaccine



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# **DISCOVERY & MANUFACTURING PLATFORMS**

#### CUTTING-EDGE, ROYALTY-BEARING TECHNOLOGIES THAT MAKE MAJOR LIFE-SAVING GLOBAL DRUGS POSSIBLE



Making production possible

Delivering fully human antibodies

Ligand's business model is based on providing drug discovery platforms, completing early-stage drug development and partnering



## **2021 FINANCIAL REVIEW** GUIDANCE GIVEN AT Q2 EARNINGS RELEASE



Note: Financial information taken from guidance provided in Q2 earnings release and discussed on Q2 earnings call



# **PELICAN EXPRESSION TECHNOLOGY**

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Overview

# SOLVING OUR INDUSTRY'S PROTEIN PRODUCTION CHALLENGES

Our Pelican Expression Technology<sup>™</sup> Platform uniquely enables complex protein drug production with quality and efficiency

- Global therapeutic protein market estimated at **\$100B+** and growing
- Clinical and commercial success achieved with protein therapeutics is increasing demand for technologies that deliver competitively positioned products with desired properties
- Protein therapeutics are often of a physical size that is orders of magnitude larger than small-molecule drugs and exhibit complex secondary, tertiary and quaternary structures that must be maintained in production





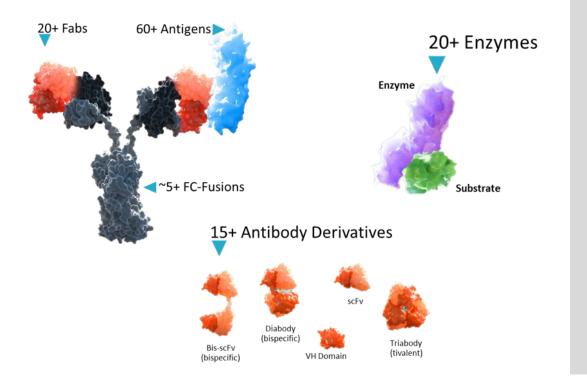
Ligand

# **A UNIQUE VALUE-DRIVING PLATFORM**

- Industrial legacy from Mycogen Corp, Dow Chemical and Pfenex
- Platform delivers significant competitive advantages to our partners, including:
  - $\checkmark$  Speed to identifying production strain
  - ✓ Success rates resulting in minimization of time/cost of development
  - ✓ Efficient production
  - ✓ Decreased long-term cost-of-goods
- Significant institutional knowledge of protein production developed over three decades

PELICAN P. fluorescens expression technology

Pelican Expression Platform<sup>™</sup> has given rise to approved products and has maintained a **success rate of over 80%** in expressing a variety of "lead" protein candidates

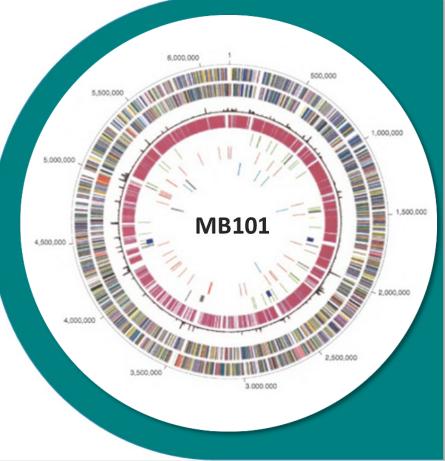


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# PELICAN: THE INDUSTRY'S DEEPEST PROKARYOTIC PROTEIN PRODUCTION PLATFORM

**P. fluorescens:** A GRAM-NEGATIVE, NON-PATHOGENIC, METABOLICALLY VERSATILE ORGANISM

- Genomic, RNAseq, and proteomics data leveraged to engineer host strains and design expression plasmids
- Animal origin-free and used with antibiotic-free processes
- High-throughput growth and test methods
- Rapid, effective, fermentation and purification development/scale-up expedite program timelines



Clinically and **recently commercially validated** with approved therapeutics and vaccines



# PELICAN EXPRESSION TECHNOLOGY PLATFORM

#### COMPETITIVE ADVANTAGE

#### Pelican Expression Technology Platform Has a Legacy of Success and Value Creation



Platform has long history of successful production strain identification with unprecedented speed, while maintaining a success rate of >80% with complex proteins

#### **Technology Platform Benefits**



Toolbox diversity and automation enables rapid and broad exploration of expression strategies, enabling success with even the most challenging and complex proteins



Speed and success rate have direct impact on development cost and time



Significant reduction of long-term cost-of-goods



Platform has enabled integration and improved productivity of several modifications via genetic manipulation (e.g., site-specific pegylation (Ambrx), pasylation (XL-protein), fusions (teriparatide))



Track record of successful expression of novel modalities positions the platform to potentially enable *state-of-the-art* drugs relevant to the industry today and in the future



# OmniAb

# **BUSINESS OVERVIEW**

SEPTEMBER 2021

## **OMNIAB** MEETING A GLOBAL INDUSTRY NEED AND POISED FOR MASSIVE GROWTH

ONE OF THE LARGEST GREENFIELDS IN THE PHARMA INDUSTRY >\$250 BILLION TOTAL ADDRESSABLE MARKET FOR ANTIBODIES BY 2025

#### LEADING AND PROVEN TECH

GROWING ROSTER OF GLOBAL PARTNERS 19 CLINICAL-STAGE ANTIBODIES FIRST PRODUCT APPROVAL THIS YEAR

GLOBALLY-RECOGNIZED SCIENCE AND TEAM HISTORY OF FIRSTS IN GENETIC ENGINEERING EXPANDING TEAM OF 25 SCIENTISTS (15 PHDs)



OMNIAB OUR PHILOSOPHY AND APPROACH LEVERAGING OUR TECH STACK TO SERVE A FAST-GROWING AND CRITICALLY IMPORTANT INDUSTRY

We apply proprietary, AI-powered antigen generation techniques to highly-optimized next-generation transgenic animals.

We then tap into the unparalleled powers of **biological intelligence**<sup>™</sup> and *in vivo* maturation to generate massive numbers of target-specific antibodies.

Those antibodies are efficiently mined with validated state-of-the-art high-throughput screening technologies designed to deliver highest quality therapeutic candidates for a wide range of human diseases.

#### THE OMNIAB TECH STACK

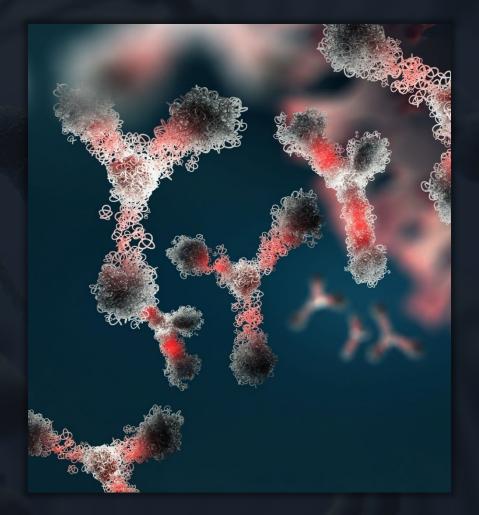
Ablnitio Antigen OmniRat®, OmniMouse® and OmniChicken® OmniFlic® and OmniClic™ OmniTaur™ xPloration® and GEM Discovery and Antibody Optimization algorithm technologies and services

A Validated Platform: 19 OmniAb antibodies are in clinical development (with 1 approved and 1 awaiting approval)

OmniAb partners enjoy access to the **most comprehensive and cutting-edge** stack of antibody discovery technologies available



We believe screening the best and broadest antibody repertoires available with the most cuttingedge and highest-throughput validated screening technologies available will deliver high quality drug candidates for a wide range of programs...

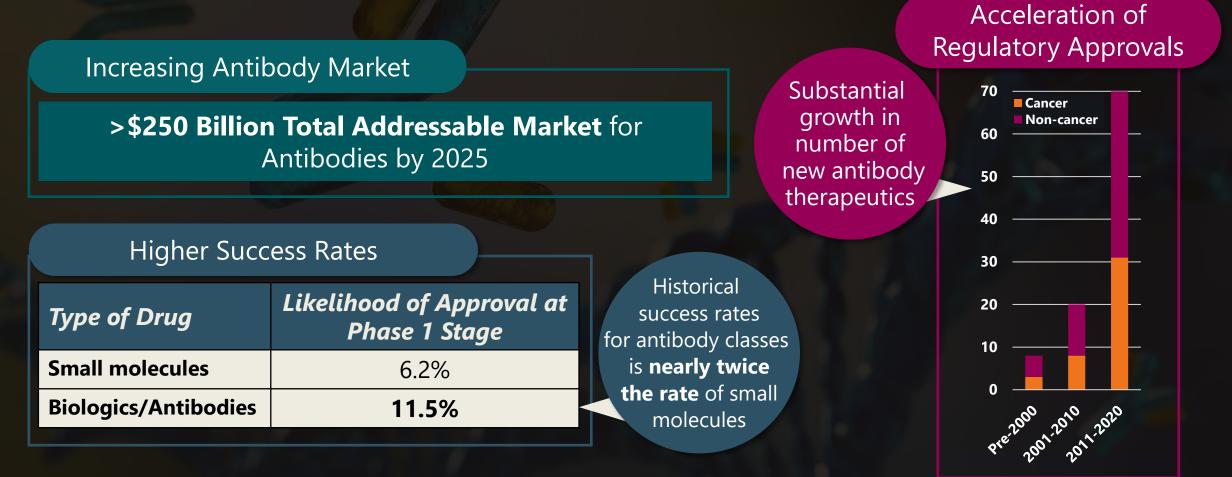




# OmniAb

# ANTIBODY MARKET AND OPPORTUNITY MINING ONE OF THE LARGEST GREENFIELDS IN A GROWING INDUSTRY

## ANTIBODIES AND INDUSTRY DEMAND HIGHER SUCCESS RATES FOR ANTIBODY MEDICINES DRIVE OUR INDUSTRY'S NEED FOR DISCOVERY TECHNOLOGY



OmniAb

# **SELECT OMNIAB PARTNERS**

**50 COMPANIES CURRENTLY HAVE ACCESS TO OMNIAB ANTIBODIES** 













symphogen a Servier Company

Boehringer Ingelheim

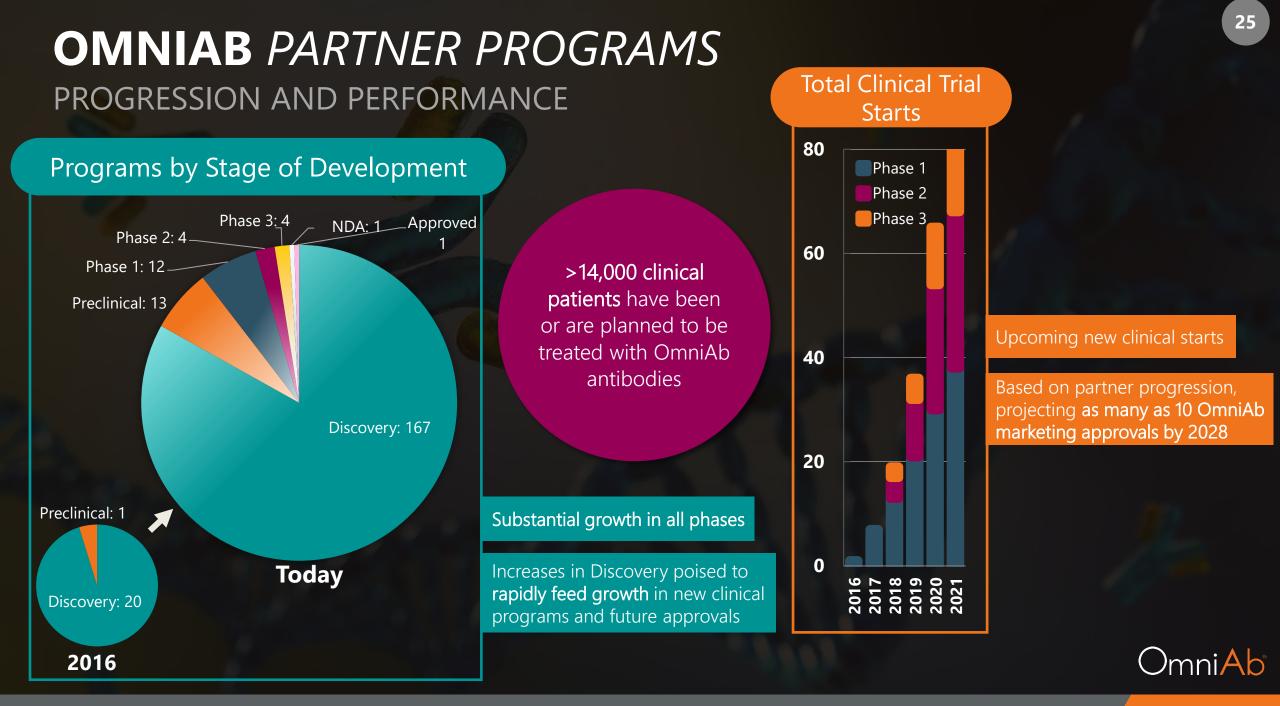
基石药业 내비 CSTONE PHARMACEUTICALS











## **OMNIAB** PARTNER PROGRAMS

#### LATE-STAGE PIPELINE POISED FOR GROWTH AND TWO APPROVALS IN 2021

Partner	Program	Therapy Area	Preclinical	Phase 1	Phase 2	2 Pha	se 3	BLA	Approved
<b>gloric</b> 營衡生物	Zimberelimab	Oncology	Approved for R/R classi	ical Hodgkin's lymphom	a in China				
基石药业 cstone PHARMACEUTICALS	Sugemalimab	Oncology	NMPA filed for NSCLC, approval expected in Q4'21						
	Batoclimab	Autoimmune	Phase 2/3 completion	n in TED and ITP Q1 '23	3				
ARCUS Ø GILEAD	Zimberelimab	Oncology	Interim Phase 2 comp	pletion Q2' 22					
HANAL	Batoclimab	Autoimmune	Initiation of pivotal st ASCEND-GO2 and AS	udy in MG H1′22. Rest SCEND-WAIHA in ′22	art of				
janssen 🕇	Teclistamab	Oncology	Phase 2 data expected	d in '23					
Genmab	GEN1046	Oncology	Data expected Q4 '22				1	9 Clinical	
Merck	M6233	Oncology	Data expected Q3 '22	,				Omni <i>A</i> Antiboo	
Therapettics	APVO436	Oncology	Data expected in '22					AILIDOU	
Multiple	Multiple	Multiple	10 additional Phase 1	1					
Multiple	Multiple	Multiple	180 additional Preclinical & Discover	ry					



## **ZIMBERELIMAB APPROVED** FIRST OMNIAB ANTIBODY APPROVAL



- On August 30, zimberelimab (GLS-010), an OmniAb-derived fully human anti-PD-1 mAb, was approved in China for the treatment of recurrent or refractory classical Hodgkin's lymphoma
  - Marks the first approval of an OmniAb-derived mAb
- In 2015, GloriaBio contracted with WuXi Biologics to discover and develop zimberelimab in China using Ligand's transgenic rat platform, OmniRat®
  - Zimberelimab entered clinic in March 2017, and NDA was submitted to China NMPA in February 2020
- GloriaBio is also investigating zimberelimab in advanced solid tumors, and was granted Breakthrough Therapy Designation for treatment of patients with recurrent/metastatic cervical cancer in March 2021
- Zimberelimab is being developed by Arcus Bioscience, in collaboration with Gilead, in North America, Europe, Japan and certain other territories through a 2017 license agreement



# OmniAb

# BUSINESS MODEL AND TECH STACK

MINING ONE OF THE LARGEST GREENFIELDS IN A GROWING INDUSTRY

# **OMNIAB** BUSINESS MODEL

#### OUR BEST-IN-CLASS TECH STACK ALLOWS US TO SHARE IN THE SUCCESS OF OUR PARTNERS

## License partnerships designed to include:

- Technology access and collaboration/service fees
- Milestones
- Royalties on commercial sales

We have nearly **\$1 billion in contracted milestones** (for over 300 events) with active OmniAb programs today, with continued efficient growth expected as partners expand use of the platform and as we add new partners



## **OMNIAB STRATEGY** *NEXT THREE YEARS* TECHNOLOGY CONTRIBUTING SIGNIFICANTLY TO GLOBAL HUMAN HEALTH

#### Innovation and Technology

- Continued investment in R&D to drive our innovation
- Develop new technologies and platforms to expand our offer and current partnerships

#### Mergers and Acquisitions

 Explore tech bolt-on acquisitions to further transform the business and enter more licenses

#### Portfolio Growth

- Continued expansion of use by current partners and addition of new partners
- Multiple commercial products contributing royalty revenue

#### Stakeholders Are Our Foundation



**Team:** Strong culture; hire, develop, motivate the best



service



#### Investors: Superior business execution to create value

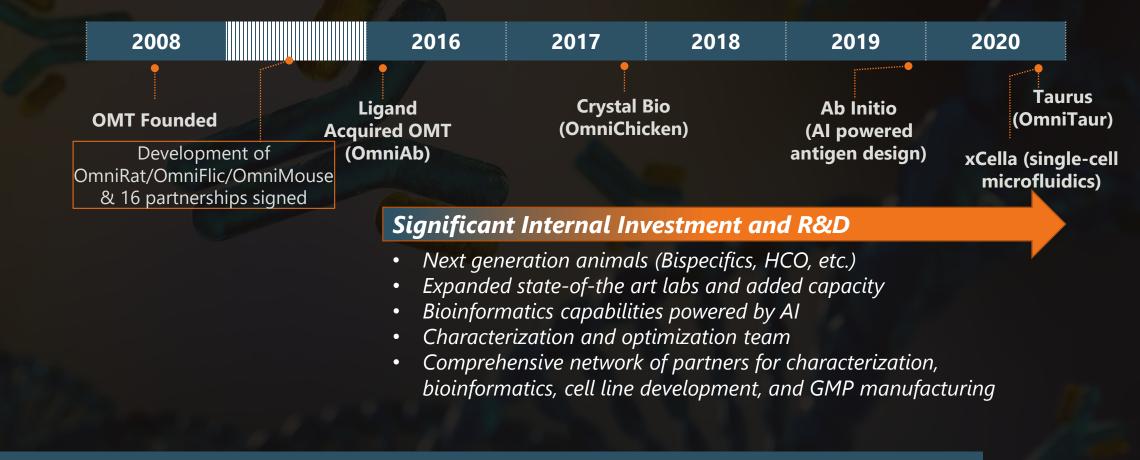


**Community:** Lead with integrity and responsibility



# **OMNIAB** *HISTORY*

### OVER 12 YEARS OF INVESTMENT BUILT OUR BEST-IN-CLASS PLATFORM



Strategically built tech stack to optimally harness the unparalleled power of *BIOLOGICAL INTELLIGENCE*<sup>™</sup>

OmniAb

## THE OMNIAB OFFERING CONTINUUM OUR *BEST-IN-CLASS* TECH STACK AND CAPABILITIES



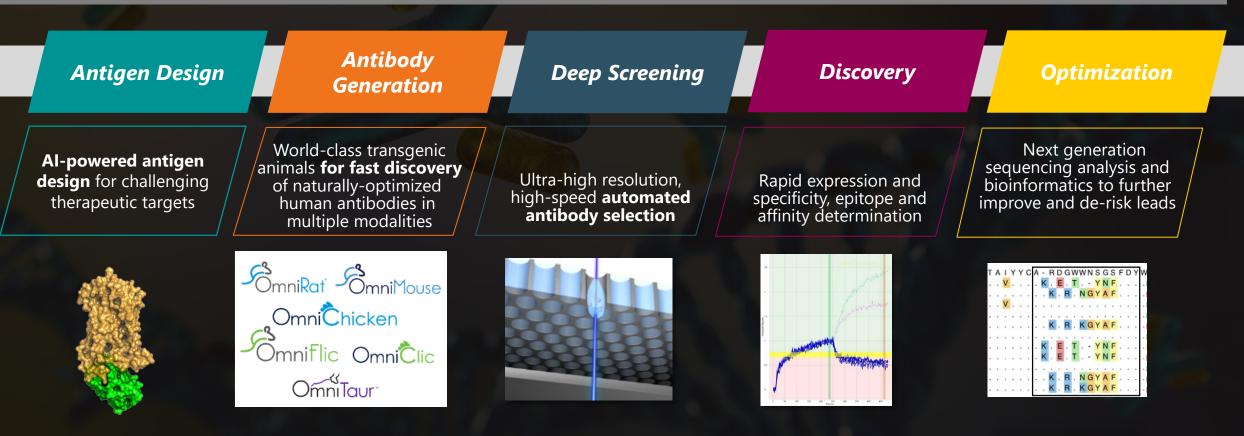
Technology offering addresses critical industry needs and is paired with our highly specialized and efficient operation

We leverage our proprietary and differentiated technologies rather than commoditized industry services that are widely available from CROs or built into big pharma



## THE OMNIAB OFFERING CONTINUUM OUR *BEST-IN-CLASS* TECH STACK AND CAPABILITIES

Our capabilities, investment and innovation position OmniAb for near and long-term success





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# THE POWER OF OMNIAB PARTNER CASE STUDIES

#### Partner A Emerging Biotech



**Novel multi-transmembrane target** for triple negative breast cancer

All previously-known antibodies to target could only bind to denatured or fixed form, **therefore unsuitable for therapeutic use** 

**Our antigen tech** was applied to deliver mg-scale quantities of purified receptor **in native conformation** for immunization and screening

OmniChicken immunization then led to discovery of a large and diverse panel of fully-human antibodies capable of binding target on live tissues Partner B *Big Pharma* 



- Growth factor target, **highly** conserved among mammals
- Human version of target nonimmunogenic in other rodents; no titer achieved despite numerous immunization attempts at partner
- Genetic knockout of target gene attempted in mice <u>but was lethal</u>
- OmniChicken immunization led to robust titers and diverse fully-human antibody panels

>90% of sequences recovered had excellent developability profiles based on multi-parameter *in-silico* analysis Partner C Established Biotech



- Partner has history of success in firstin-class and best-in-class antibodies, with large discovery group and expanding novel biology
- Need flexible fully-human antibody discovery toolbox to start dozens of new programs every year
- Deep collaboration including parallel pilot testing of next-gen rodents on active novel programs
- Clinical candidates identified with Phase 1 and 2 data readouts in next 18 months, and multiple candidates to enter clinical development in the coming years

Partner D Global Pharma



- Asia-based global pharma player
- Establishing new and substantial presence in antibody space with large investment and expansion of global antibody team
- Selected OmniAb as core technology to feed robust discovery and development efforts
- Developed three-way collaboration with deep repertoire analysis to rapidly identify best binders for bispecific antibodies



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# OmniAb

# INTELLECTUAL PROPERTY

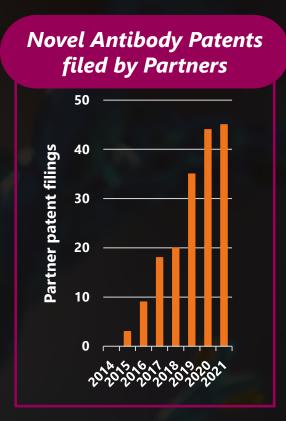
MINING ONE OF THE LARGEST GREENFIELDS IN A GROWING INDUSTRY

## **OMNIAB** *PERFORMANCE AND IP*

PARTNERS FILING PATENTS ON OMNIAB ANTIBODIES CREATE DURABLE ROYALTY STREAMS AND A LENGTHY INTELLECTUAL PROPERTY TAIL

- We maintain a broad intellectual property estate with multiple long duration patent families covering each major element of our tech stack
- Licenses are structured so that royalties are linked to the patents for the antibodies discovered with OmniAb, thereby creating a lengthy coverage "tail"

Now approaching **50 patent filings by our partners** claiming an OmniAbderived antibody as primary invention, with expiries up to 2041





# OmniAb

# OUR TEAM

MINING ONE OF THE LARGEST GREENFIELDS IN A GROWING INDUSTRY

# **OMNIAB** ESTABLISHED SCIENTIFIC LEADERSHIP



Bill Harriman, PhD SVP, Antibody Discovery

Co-Founder/CSO Crystal Bioscience Trellis, Roche, Abgenix UCSF-Immunology, Haas MBA



#### Marie-Cecile Van De Lavoir, PhD, DVM VP, Operations

Co-Founder/COO Crystal Bioscience Origen Therapeutics, Inventor germ cell technology Fulbright Scholar, UCSF, Utrecht, Guelph, Cornell



#### Christel Iffland, PhD VP, Antibody Technology

Co-inventor Avelumab EMD Serono Dana Farber, Albert Einstein College



Shelley Izquierdo, PhD Director, Antibody Discovery Crystal Bioscience, Trellis UC Berkeley



Princeton, UCSF

Bob Chen, PhD Director, Systems Engineering Co-Founder and CTO xCella Bio Stanford Bioengineering

#### Ellen Collarini, PhD Sr. Director, Cell Biology

Crystal Bioscience, Trellis, Roche Univ. Michigan, Univ. College-London



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