Delivering Innovation for Major Medical Needs
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Follow Ligand on Twitter

• Find us at @Ligand_LGND

• Over 70 pipeline and corporate events tweeted in 2019

• Over 25 tweets of pipeline and corporate events posted in first 10 weeks of 2020

A great source for latest events and partnered program updates
**Ligand: Operational Excellence; Superior Growth Potential**

We are a biotech company focused on **financial growth** driven by licensing drug-enabling **technologies** and investing to support our **partnered portfolio**

**Employees**
- 115 including 49 PhDs

**Facilities**
- 4 U.S.
- 1 England

**2019 Revenues**
- $120 million

**Market cap today**
- $1.6 billion
# Ligand: Creating Shareholder Value

## Our Business
- Financial Growth
- Technologies
- Portfolio

## Our Focus
- Deploying Capital
- Customer Service
- Operational Excellence

## Our Team
- Strong Company Culture
- Diverse and Experienced Board of Directors
- Focused on ESG/Corporate Governance
2019 Revenue: $120.3 million
Outstanding performance, highly diversified

**Royalties**
- Significant royalties currently driven by top two products
- 11 other products contributing

**Contract Payments**
- 70 distinct payments
- More than 6 times the revenue of 2015

**Material Sales**
- Over 100 distinct customer orders
Current 2020 Financial Guidance
Strong margins and earnings growth

Total Revenue
$133 million
25% growth w/o Q119 Promacta

Gross Margin
91%
EBITDA margin 50%

Cash Expenses
$56 to $58 million
Including Icagen pro forma

Adjusted EPS*
$3.62
43% growth w/o Q1’19 Promacta


Two Major, Best-in-Class Technologies Driving Value For Shareholders

- Partners are continuing to invest heavily in programs and make clinical progress
- Ligand has received $114 million in payments related to OmniAb
- Royalties projected to come online for Ligand sooner than projected three years ago, due to quality of data and aggressive investment by our partners
- New deal flow remains strong, fueling expanded R&D investment and potential royalties on major new antibodies

- Enabling important medicines for cancer, CNS diseases and infection
- Since acquisition in 2011 for $35 million, Ligand has booked over $350 million in revenue related to Captisol
- 2019 was highest year of Captisol revenue to date, projected to increase in 2020
Partnered Pipeline – Bullseye Diagram
Over 200 programs with over 120 different partners

- Diagram shows distribution of partnered assets by underlying technology and stage of development

- OmniAb is largest, most valuable component of business
  - At acquisition, no OmniAb programs were clinical-stage
  - Today, a rapidly growing number are in and entering clinic

- VDP segment is new from acquisition ~18 months ago

- More than 40 clinical and regulatory events this year

High-value antibody programs rapidly growing in number and continuing to progress to and through clinical trials
M&A Opportunities

Focused on Four Primary Investment Strategies

<table>
<thead>
<tr>
<th>Technologies</th>
<th>Shots on Goal</th>
<th>Revenue / Earnings</th>
<th>Product Financings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buying tools the industry needs, investing in them to generate new deals; a Ligand strength</td>
<td>Acquiring partnered programs to drive growth; acquiring unpartnered assets to be outlicensed</td>
<td>Cash-flow positive companies with Ligand-like business models; commercial stage royalty buys</td>
<td>Funding product development in exchange for royalties and milestones</td>
</tr>
</tbody>
</table>

Note: Capital deployment number excludes CVRs
Icagen Overview

• Icagen is a biotechnology company headquartered in Durham, NC focused on drug discovery and collaborations that include access to their ion channel technologies
  – Provides ion channel screening and assays along with custom drug discovery support for their collaborators and customers

• Two key partnered programs with Roche and Cystic Fibrosis Foundation (CFF)
  - Deal focused on Neurological Diseases
  - Deal focused on Cystic Fibrosis

• Six novel unpartnered programs applicable to a range of therapy areas
Primary Acquisition Terms

• Purchase consideration:
  – $15 million cash at close
  – Earnout of 15% of milestones and royalties, capped at $25 million

• Acquired assets:
  – Ion channel technologies
  – Two Shots on Goal with Roche and CFF
  – 6 novel unpartnered programs
  – Scientific team and resources to drive work going forward

• Transaction projected to close in April 2020
## Icagen Opportunity

### Proven Business Model
- Profitable, cash-flow positive company; expected to be immediately accretive
- Two potentially lucrative partnered programs
- Strong science and established technology

### Excellent Strategic Fit
- Technology licensing business similar to Vernalis, OmniAb and Captisol models
- Minimal cash requirements expected to manage business, partnered programs and licensing

### Strengthens Ligand’s deal making
- Expands proprietary technology base
- Potential for new partnering of novel assets
- Existing Ligand partners are seeking ion channel technology to address some of their needs
The Importance of Ion Channels

- Ion channels are **key components** in a wide variety of biological processes that involve rapid changes in cells
  - Examples include cardiac and smooth muscle contraction, transport of nutrients and ions, T-cell activation and others

- Ion channels have **broad therapeutic applicability** including cancer, metabolic disease, pain, neurological diseases, infectious diseases, others

- Discoveries concerning ion channels have been the subject of **Nobel Prizes** in Chemistry and in Physiology and Medicine

- Recent publications highlight the importance of ion channels in both **small molecule and antibody research**

In the search for novel drugs, ion channels are frequently viewed as high-value targets

References:
MAbs. 2019 11(2):265-296
J Cancer. 2020 11(2):374-387
Physiol Rev. 2019 99(2):1079-1151
Icagen and Ligand’s Technologies

- Icagen has deep biological expertise with ion channels and transporters and a strong track record in ion channel drug discovery from screening to lead optimization.

Icagen’s medicinal chemistry, *in silico* and computational chemistry (including AI) applications and x-ray fluorescence assays can integrate into/expand the drug-discovery work at Vernalis.

Icagen’s novel reagent generation and assays can support novel OmniAb antibody discovery when targeting high-value ion channels and transporter targets.

Ion channel targets are frequently a focus of current and prospective Vernalis and OmniAb partners.
Two Valuable Partnered Programs

Collaboration Focused on Neurological Diseases

- Executed December 2018
- $9 million committed for research funding
- Icagen responsible for preclinical activities up to advanced lead
- $274 million in remaining milestones
- Tiered royalty

Collaboration Focused on Cystic Fibrosis and Nonsense Mutations

- Executed May 2018
- $11 million committed for research funding
- Icagen responsible for preclinical activities up to advanced lead
- $59 million in remaining milestones
- Tiered royalty
Pipeline and Technologies Highlights
# Partnered Pipeline Snapshot (March 2020)

<table>
<thead>
<tr>
<th>Partner</th>
<th>Program</th>
<th>Therapy Area</th>
<th>Technology</th>
<th>Preclinical</th>
<th>Phase 1</th>
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<tr>
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**Partnered pipeline also includes >100 preclinical programs**

Pipeline includes >10 additional Phase 3 or Pivotal assets

Pipeline includes >15 additional Phase 2 assets

Includes: ZULRESSO (Sage), MINNEBRO (Daiichi-Sankyo), NEXTERONE (Baxter), DUAVEE (Pfizer), Others

Information regarding partnered programs comes from information released by our partners and from clinicaltrials.gov
### Major Potential Pipeline Events

<table>
<thead>
<tr>
<th>Program</th>
<th>Partner</th>
<th>2020</th>
<th>2021</th>
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<td>Takeda</td>
<td>U.S. filing, Phase 3 data</td>
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<td>Palvella</td>
<td>Pivotal data</td>
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<td>Zimberelimab</td>
<td>Gloria</td>
<td>China filing</td>
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<td>Remdesivir</td>
<td>Gilead</td>
<td>Phase 3 data</td>
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<td>BMS986231</td>
<td>BMS</td>
<td>Phase 2b data</td>
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<td>IMVT-1401</td>
<td>Immunovant</td>
<td>Phase 2 data</td>
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<td>CS1001</td>
<td>C-Stone</td>
<td>China filing, Phase 2/3 data</td>
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<td>Sutimlimab</td>
<td>Sanofi</td>
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<td>Lasofoxifene</td>
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<td>Verona</td>
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<td>Kyprolis</td>
<td>Amgen</td>
<td>sNDA approval, Geographic expansion</td>
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<td>Sparsentan</td>
<td>Retrophin</td>
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<tr>
<td>VK-2809</td>
<td>Viking</td>
<td>Phase 2b data</td>
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Most substantial calendar of events for a 12-month outlook in Ligand’s history

Based on clinicaltrials.gov or partner disclosures
Partner Progress: 1-year Update

Four partners presented at Ligand’s last Analyst Day March 2019

Genmab  
VIKING THERAPEUTICS  
palvella THERAPEUTICS  
Verona Pharma

All four have reported significant progress in last 12 months and all are poised for upcoming events
### March 2019, reported ...

- High success rates using OmniRat platform against 38 targets
- Diverse antibody panels with high affinities and broad epitope coverage, helping GenMab tap into differentiated product opportunities

### Progress 12-months Later

- Continued to further expand use of OmniAb platform in successful discovery efforts
- Started joint Phase 1/2a study with BioNTech in solid tumors with DuoBody **PD-L1x4-1BB**. First patient dosed (May ‘19), readout expected in 2021

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**OmniAb program now highlighted as one of GenMab’s key priorities for 2020**
Nebulized *ensifentrine* improved lung function as monotherapy or add-on to double/triple in initial Phase 2 studies in COPD

End-of-Phase 2 meeting planned in Q2, followed by potential initiation of Phase 3 trials in Q3

Repeat doses of DPI formulation of *ensifentrine* met all endpoints in Phase 2 COPD trial (August ‘19)

Statistically significant improvements in lung function and health-related quality-of-life with nebulized *ensifentrine* added on to SPIRIVA (tiotropium) therapy in 4-week Phase 2b study in COPD (January ‘20)
Viking Therapeutics

March 2019, reported ...

- 91% of NAFLD patients dosed with **VK2809** at 10 mg experienced ≥30% liver fat reduction after 12 weeks in Phase 2 study

Progress 12-months Later

- New data demonstrating 100% of patients receiving 5 mg showed liver fat reductions of ≥ 30% at 12-weeks (April ‘19)
- Initiated Phase 2b VOYAGE study in biopsy-confirmed NASH (November ‘19)

Enrollment of Phase 2b VOYAGE study underway, top-line data expected 1H 2021
Initiated pivotal Phase 2/3 VALO study with **PTX-022** (QTORIN™ 3.9% rapamycin anhydrous gel) for the treatment of patients with pachyonychia congenita

**March 2019, reported ...**

**Progress 12-months Later**

Commencement of Phase 3 pivotal portion of VALO Study (November ‘19)

Phase 3 enrollment complete (March ‘19)

Initiated open-label extension program for patients to continue receiving PTX-022

Phase 3 **VALO** study top-line data now expected November 2020
Captisol Technology

• Significant momentum for Captisol technology
  – Enabling drugs for significant medical needs, with new drug and market approvals in 2019
  – Added 9 new clinical and commercial stage partnerships last year, with active licensing activity in 2020

• Ligand continues to invest in expansion of Drug Master Files in U.S., Canada, Japan and China and into manufacturing and distribution efficiencies
  – Launch of Liquid Captisol expected to create manufacturing benefits for partners

• Captisol also being used for investigational evaluation of remdesivir, which is being actively assessed in Phase 2 and Phase 3 trials to potentially treat COVID-19*

* Remdesivir is not yet approved anywhere globally and has not been demonstrated to be safe or effective for any use, including for the treatment of COVID-19.
Biology of Antibodies

The Power of the Immune System

- Antibody therapy leverages an animal’s ability to generate proteins that bind very selectively to specific molecules

- It is possible to create an antibody that is specific to almost any cell target

Antibodies can influence the biology of target cells:

- As agonists or antagonists
- Influencing signaling
- Even facilitating the selective killing of diseased cells
Likelihood of Approval at Phase 1

Industry is recognizing higher success rates for biologics

- Success rates for antibody classes is nearly twice the rate of small molecules
- Industry continues to make substantial investment in novel antibodies

<table>
<thead>
<tr>
<th></th>
<th>Likelihood of Approval at Phase 1:</th>
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<tbody>
<tr>
<td>Small molecules</td>
<td>6.2%</td>
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<tr>
<td>Biologics/Antibodies</td>
<td>11.5%</td>
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</table>

“Over the past 15 years, it has become clear that antibody therapeutics are both versatile and successful. The industry continues to be very interested in antibody-based therapeutics development, because they work.”

Janice Reichert, PhD
President, The Antibody Society
New Antibody Target Approvals

The power of the science of antibodies has been developing for over 2 decades.

Given higher success rates, industry investment in antibodies has expanded and fueled an increase in new approvals.

The emergence of immunoncology and cell therapy are also beginning to contribute to growth.

Source: Antibodysociety.org, 2020, reference https://antibodysociety.org/resources/approved-antibodies/
Antibodies: Major R&D and Sales Growth

The number of antibodies in the clinic has more than quadrupled since 2008.

Global sales of biologics estimated to approach $400 billion in 2024, more than doubling in 10 years.
Antibody-Based Research Has Created Blockbuster Medicines

<table>
<thead>
<tr>
<th>Product</th>
<th>2019 Sales</th>
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<tbody>
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<td>Humira</td>
<td>$19.7 b</td>
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<tr>
<td>Keytruda</td>
<td>$11.1 b</td>
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<tr>
<td>Opdivo</td>
<td>$8.0 b</td>
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<td>Eylea</td>
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<td>Avastin</td>
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<td>Enbrel</td>
<td>$7.2 b</td>
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<tr>
<td>Rituxan</td>
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<td>Stelara</td>
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<td>Herceptin</td>
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<tr>
<td>Remicade</td>
<td>$5.3 b</td>
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</table>

All top 10 antibodies had 2019 revenue greater than $5 billion

Source: 2020 La Merie Publishing
OmniAb: A Best-in-Class Technology

Our Animal Platforms

An industry-leading patented, validated human antibody rat

Added species yields additional antibodies and increased epitope coverage

Rat with single common light chain, designed for bispecific human antibodies

3rd species with unique epitope coverage

OmniClic™ launched in 2019

Four animal platforms & three species create one of the broadest antibody repertoires available

Additionally, common light chain OmniChicken for bispecifics (OmniClic™) launched in 2019
OmniAb Technology

- 2019 was the most productive year for new licenses in OmniAb’s history, adding 9 new partners including large multinational players.

- Viewed as a best-in-class technology for antibody discovery.

- Continued innovation and investment, with launch of new animals and acquisition of Ab Initio antigen technology.

Since acquisition, Ligand has nearly tripled the number of partners leveraging OmniAb, and the number of programs in development is accelerating.
Delivering Innovation for Major Medical Needs

Ligand®

NASDAQ: LGND