2018 and Beyond

Analyst Day
New York – November 14, 2017

NASDAQ: LGND

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Today's Agenda

Business Overview and Commercial Assets	John Higgins, *CEO*
OmniAb Technology Overview	Roland Buelow, Ph.D., *VP, Antibody Technologies*
Pipeline and Technology Highlights	Matt Foehr, *President and COO*
Partner Presentations:	
Sermonix Pharmaceuticals Lasofoxifene	David Portman, M.D., *CEO*
Melinta Therapeutics Baxdela	Lyn Baranowski, *SVP, Corp Dev & Strategy*
Viking Therapeutics VK5211(SARM) and VK2809(TR-β)	Brian Lian, Ph.D., *CEO*
GRA Diabetes Program	Eric Vajda, Ph.D., *VP, Preclinical R&D*
Financial Overview and Outlook	Matt Korenberg, *CFO*

Shots-on-Goal Business Model

The "LIGAND MODEL"

- Realities of the pharmaceutical industry
  - Most drug research programs fail, but not all
  - Programs are not all of equal value – different time to market, risk, economics
- BUT, the more quality programs you have, the higher likelihood of success
  - Diversified across a full range of industry partners
  - Diversified across a broad spectrum of therapeutic indications
- A shot-on-goal for Ligand is a fully funded partnership
  - Backed by license to Ligand's patents, know-how and/or data
  - Sharing of future economics based on partner's success

The "LIGAND MODEL"

The Balance in Our Business

What We Do:

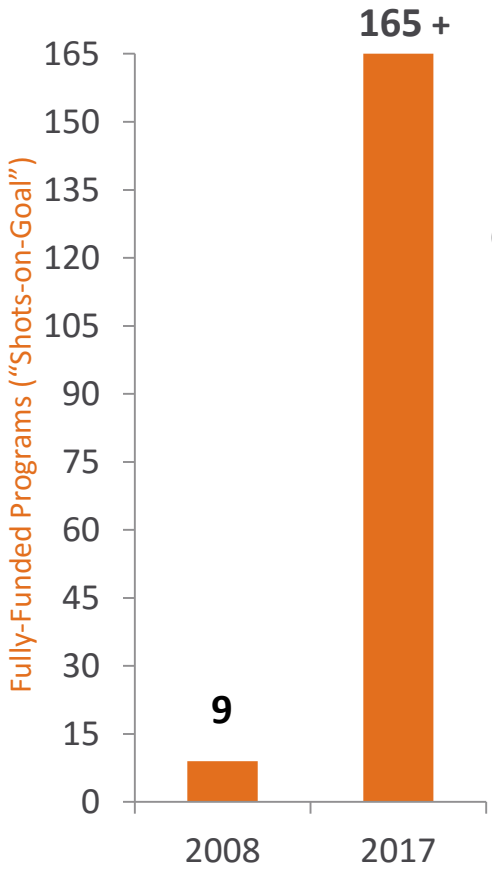
- Conduct early research, discover drugs
- Provide tools that make drugs possible
- License data and patents
- Acquire new technologies and assets
- Operate with low costs and maintain lean sharecount

What Our Partners Do:

- Decide which indications to pursue
- Design studies; manage regulatory work
- Price drugs and secure reimbursement
- Market drugs
- Fund all development and commercialization

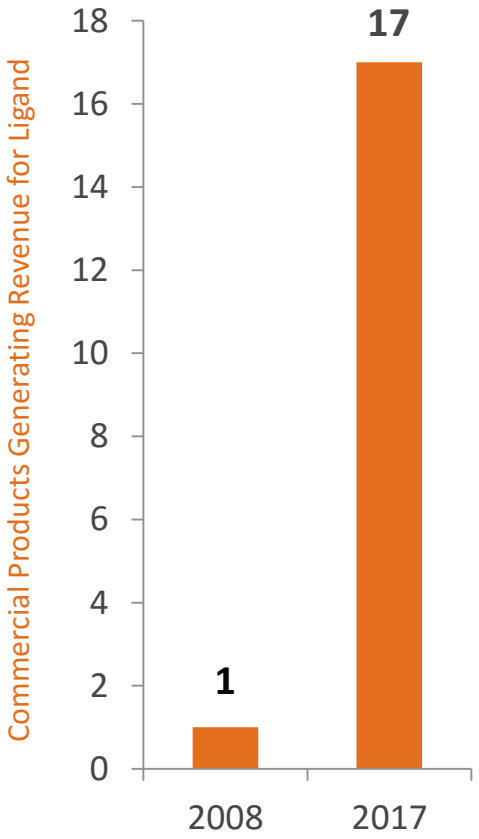
Ligand's Portfolio Continues to Grow

Ligand's Achievement: Portfolio Expansion



Excellent record as drug researcher, innovator and licensor

Partners' Achievement: Approved Products



Our partners are doing their job getting new products to the market

Latest product approvals include Baxdela and Bryxta

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RPT – Ligand's Foundation of Value

Revenue

Pipeline

Technology

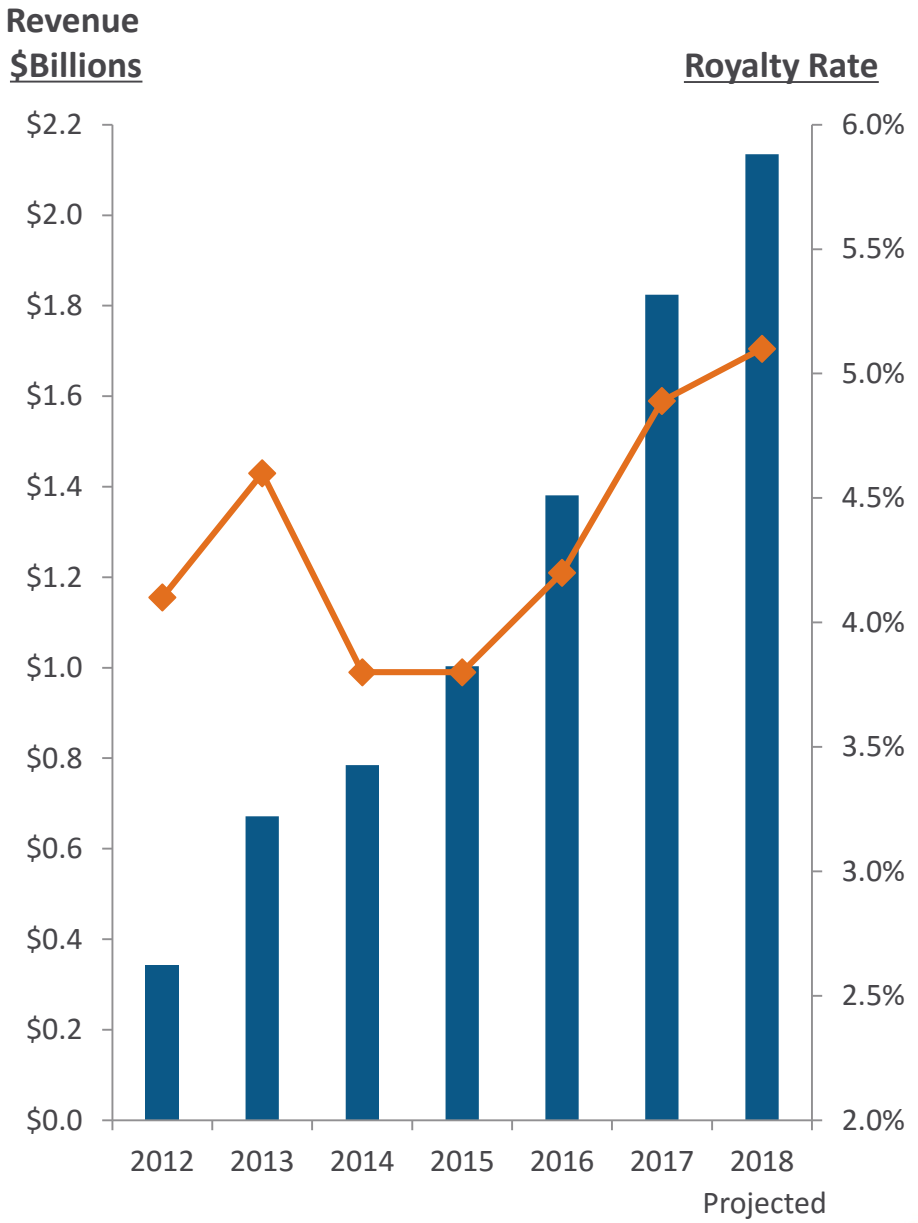
RPT – Ligand's Foundation of Value

Revenue →
- *High Growth*
- *High Margin*
- *Strong Protection*

Pipeline →
- *Large and Growing*
- *High Quality*
- *Many Late Stage*

Technology →
- *Best-in-Class*
- *Leverageable*
- *Strong IP*

Underlying Revenue & Effective Royalty Rate



- New approvals and increasing sales of existing partnered products are major drivers for underlying revenue growth
- Average royalty rate increasing due to mix of sales and royalty tiering

Current 2018 outlook, underlying revenue will exceed $2 billion and average royalty will be ~5%

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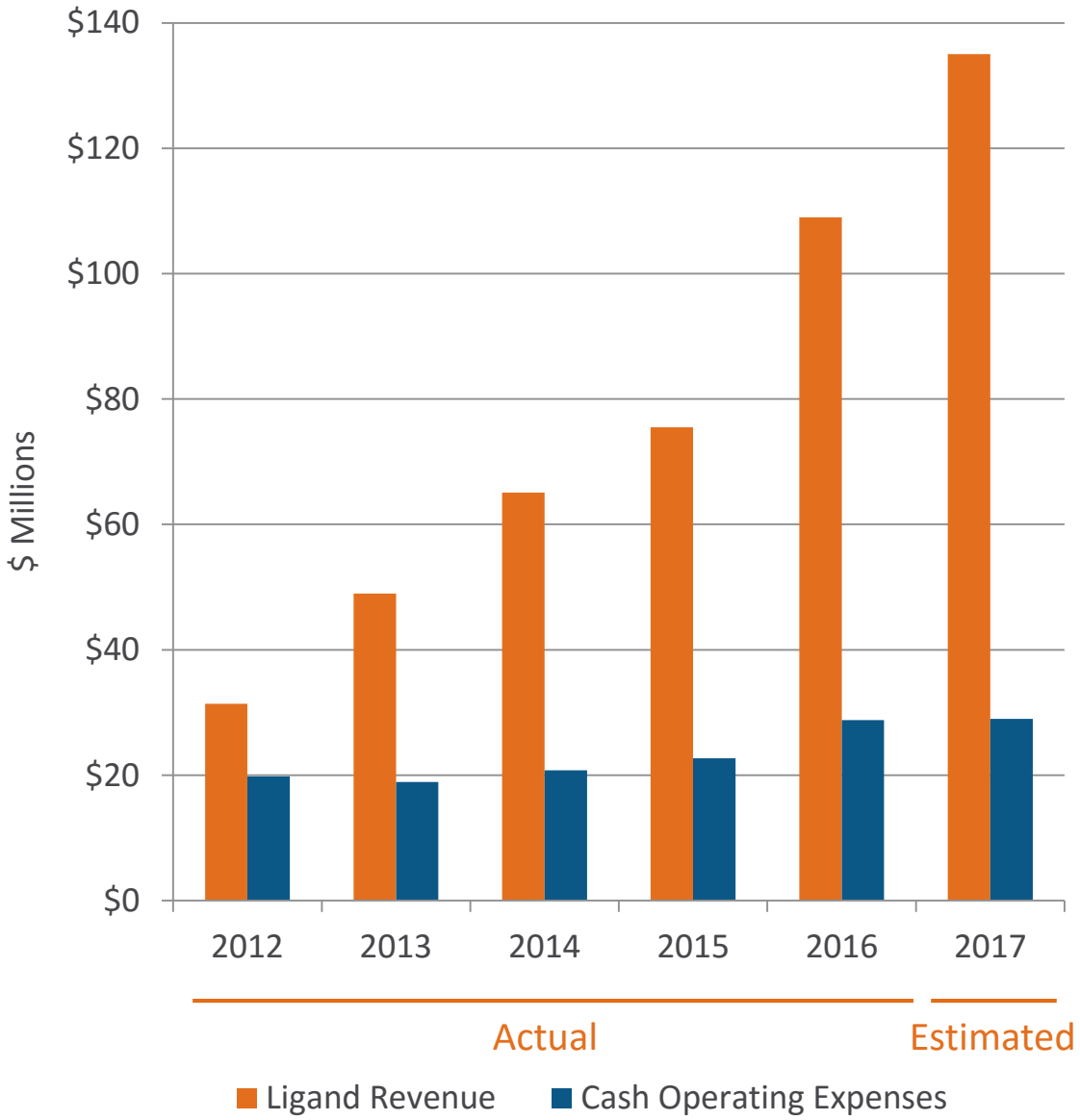
Ligand's Cash Generation is Increasing



- Strong revenue growth
  - 95% gross margins
- Cash operating expense levels low and relatively flat
- Significant increase in annual cash flow

Intellectual Property at Ligand

- Over 800 worldwide issued patents
- Significant investment in intellectual property supports licensing and helps further protect existing programs
  - Highly diverse patent portfolio
  - Many programs have layers of IP protection: NCE, formulation, use, etc.
  - Current and emerging programs are well-protected
- Innovation and acquisitions have continued to yield substantial growth in Ligand's patent portfolio

RPT – Ligand's Foundation of Value

Revenue	→	*High Growth* *High Margin* *Strong Protection*
Pipeline	→	***Large and Growing*** ***High Quality*** ***Many Late Stage***
Technology	→	*Best-in-Class* *Leverageable* *Strong IP*

Pipeline

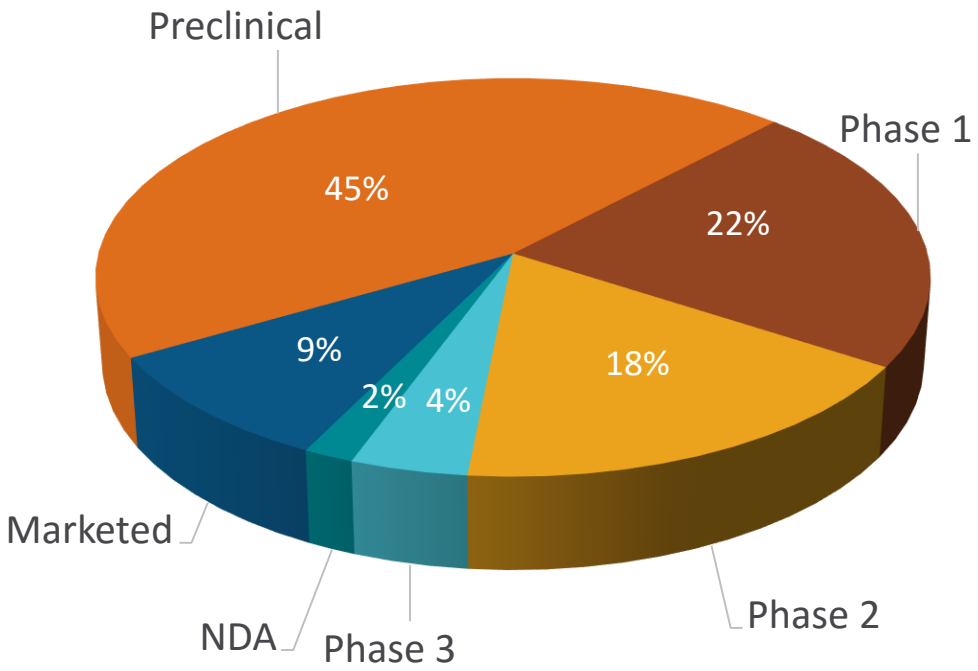
Why is Ligand's Pipeline Valuable?

- In pharmaceuticals, most programs fail; but not ***ALL*** programs
- Ligand's pipeline is:
  - Large and growing
  - Highly diversified
  - Many programs have top-tier sponsorship
- Unique economic structure of Ligand's pipeline:
  - Our deals are fully funded
  - Ligand is not generating big annual losses OR diluting shareholders to finance its pipeline
- Many of Ligand's major assets are still development-stage

Ligand's Portfolio Continues to Grow

Over 165 Partnered Programs

- Portfolio remains diversified across development stages
- Over 95 different partners
- Nearly 55% of programs in clinical development or later
- 11% marketed or NDA stage



Ligand Portfolio Highlights

- We estimate our partners will conduct over 200 studies and spend over **$2 billion** in 2018 on R&D to advance our programs

- Total potential payments under existing contracts for our more than 165 partnerships **exceed $2 billion**

- Ligand is partnered with major companies for some of the industry's most important potential medicines

- Ligand-based programs are major assets for partners

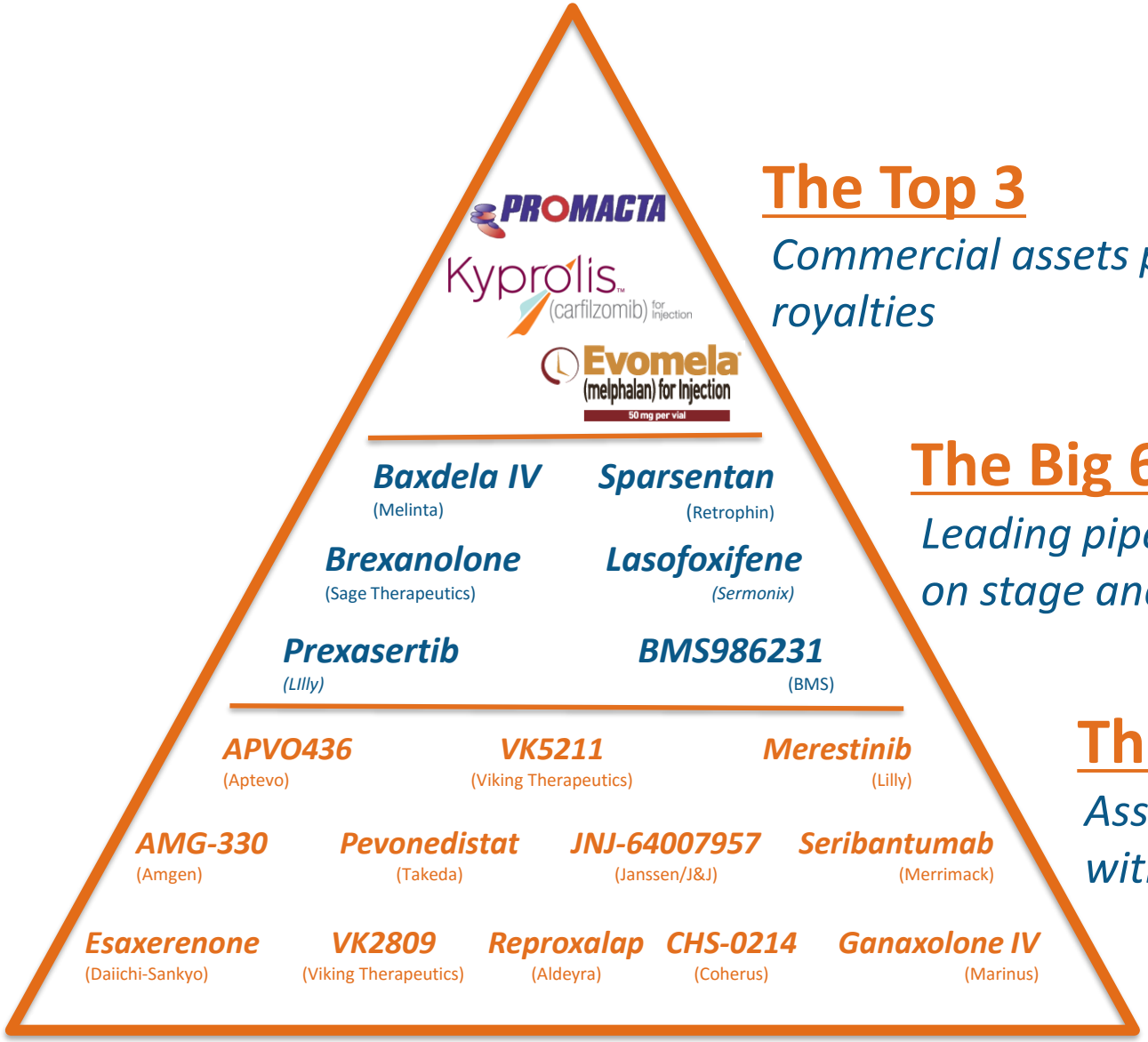
  Foundational for mega-acquisitions

  – e.g., Novartis with GSK-Oncology (Promacta), Amgen with Onyx (Kyprolis), BMS with Cardioxyl

  Foundational for IPO, reverse mergers or important financings

  – e.g., Melinta, Viking, Aldeyra, Retrophin, Sermonix, Marinus, others

Portfolio Pyramid



The Top 3

Commercial assets paying significant royalties

The Big 6

Leading pipeline assets based on stage and/or potential value

The Next 12

Assets emerging as next class with high revenue potential

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Portfolio Pyramid

Power of our Pipeline

What the Pyramid Represents

- **18 companies** with **over 100 trials** conducted and in-progress in 2017
- Estimated **>$500 million** spent funding the programs partnered with Ligand in 2017 alone
- Leading assets for Ligand ⟷ Leading assets for partners
  - — Discussed on most quarterly conference calls
  - — For many partners, Ligand program is the leading/main program
  - — Highly diversified indications and drug types
- Ligand typically contributed drug and technology inventions, and shares in meaningful program economics

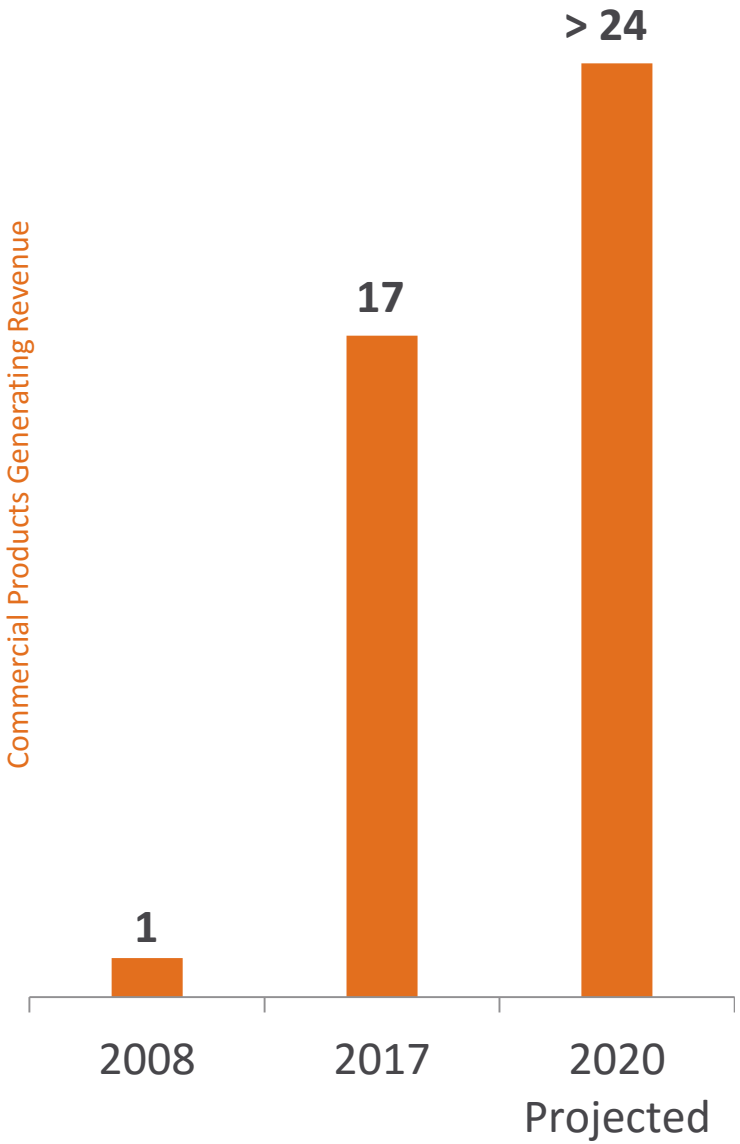
24 Commercial Products by 2020

Published Industry Success Rates

- Drug development success rates have been tracked and published through the years
- *BIO* published average rates of success by stage of development as follows:
  - 85% probability of success for compounds with a submitted NDA
  - 50% probability of success for Phase 3 compounds
  - 15% probability of success for Phase 2 compounds
  - 10% probability of success for Phase 1 compounds
  - 7% probability of success for Preclinical compounds
- Applying these current rates of success to Ligand's current portfolio, Ligand projects having over 24 revenue bearing products by 2020

Reference: *Biotechnology Innovation Organization (BIO)* 2016 published averages rates of success by stage of development

24 Commercial Products by 2020



- **> 24 products** projected to be generating commercial revenue for Ligand by the end of this decade
- These revenue-generating assets expected to come from ***existing*** portfolio; future deals could be additive to this outlook

RPT – Ligand's Foundation of Value

Revenue	→	*High Growth* *High Margin* *Strong Protection*
Pipeline	→	*Large* *High Quality* *Many Late Stage*
Technology	→	***Best-in-Class*** ***Leverageable*** ***Strong IP***

Two Major Technology Platforms

Market Leading, Best-in-Class

CAPTISOL®

- *Highly-pure, pharmaceutical grade ingredient with reliable supply*
- *Broad, global patent protection*
- *Large Drug Master Files*
- *Now with most pharma partners, most approved products*

OmniAb®

- *Only antibody discovery platform with three species*
- *Platform with the most partners*
- *Strong market protection and long patent coverage for products*
- *Fast-growing number of drug candidates moving to the clinic*

Antibodies: Major Opportunities

Last year, Ligand made a MAJOR strategic investment into antibody discovery by acquiring OMT, Inc. for ~$178 million

Ligand's continued investment in 2017 has solidified its position with the Best-in-Class antibody discovery platform

Antibody Technologies

Like with Captisol, Ligand has made a "right time" investment into a major technology platform to deliver significant returns for the next 20 years

Antibodies: Major Opportunities

Antibody treatments are the fastest-growing segment of the pharmaceutical industry

WHY?

- *"Because they work"*[1]
- Many of the largest drugs on the market are antibodies
- Significant allocation of R&D resources toward antibodies

[1] *Janice Reichert, PhD - President, The Antibody Society, 2017*

Antibodies: Major Opportunities

Success rates for antibody drug candidates have been nearly *DOUBLE* the rate for small-molecule drug candidates…

WHY?

Antibodies can be *highly-targeted* and bind *very selectively* to specific molecules

Clinical Development success rates 2006-2015 (Bio, Biomedtracker and Amplion)

Antibodies: Major Opportunities

There is a large and growing demand for antibody research tools

- More companies, more dollars than ever
- No signs of slowing, given research investments
- Industry is shifting to biological-based research

Ligand is at the right place and right time with a highly-valuable technology platform

The OmniAb Platform

OmniAb®

"Three Species – One License"

OmniRat naturally optimized human antibodies™

OmniMouse naturally optimized human antibodies™

OmniChicken

By 2025, platform projected to generate:

- >$300 million of contract revenue
- > 40 clinical-stage programs
- > 150 research-stage candidates
- OmniAb products on the market

Roland Buelow, Ph.D.

VP, Antibody Technologies

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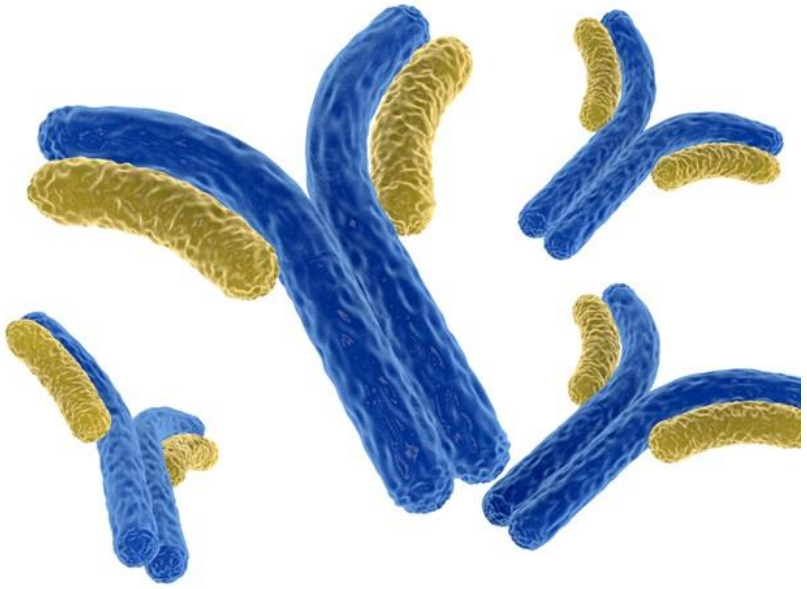
OmniAb® Technology

Topics

1. The biology, history and success of antibodies
2. OmniAb: A best-in-class technology
3. Our partners' perspectives
4. Future outlook for OmniAb platform

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**

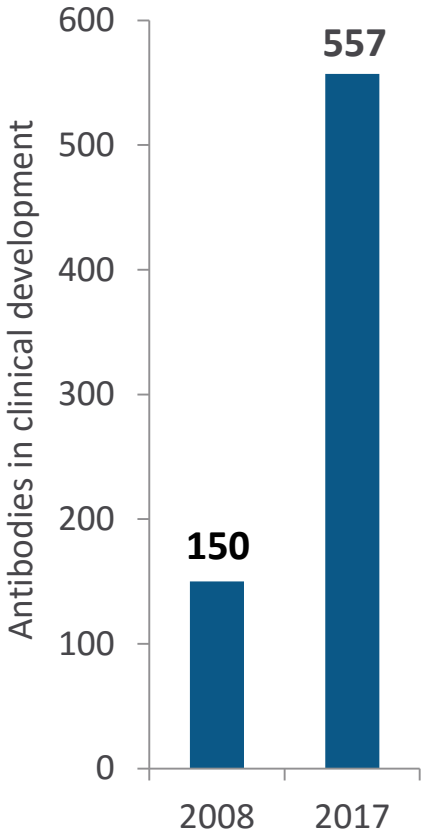
- Antibodies can **influence the biology** of target cells:
  - As agonists or antagonists
  - Influencing signaling
  - Even facilitating the selective killing of diseased cells

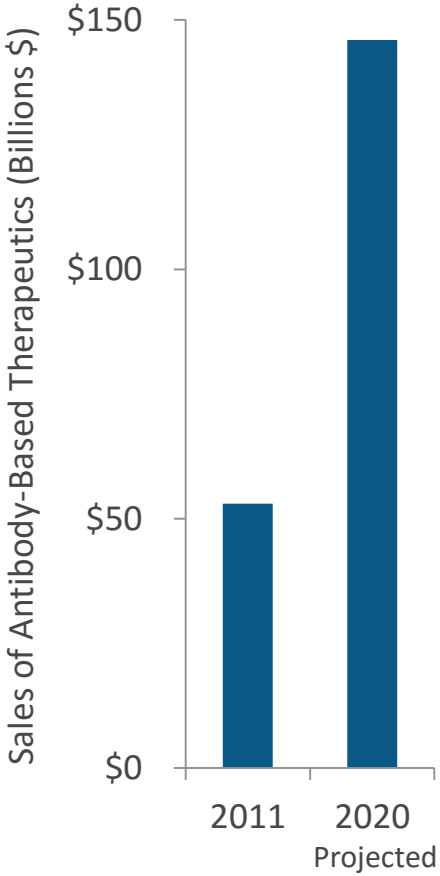
Antibody Discovery and Research

History and Facts

- Display technologies using Phage or Yeast have been used for the discovery of antibodies
  - Lack selectivity that can be achieved with in vivo animal systems
  - It's well established that antibodies from Phage libraries often run into problems with stability, aggregation and other "manufacturability" challenges
- Newer, cutting-edge and the most successful antibody discovery platforms are animal-based technologies that yield fully-human antibodies
  - Antibodies derived from animal systems are optimized *in vivo* and can be referred to as ***naturally optimized human antibodies™***
- Superiority of animal-derived antibodies is clearly illustrated by the fact that the vast majority of antibodies now approved and on the market come from animals

Antibodies: Major R&D and Sales Growth





- The number of antibodies in clinical development has **more than tripled** since 2008
- Global sales of antibodies in 2020 estimated to approach **$150 billion in 2020**

Nelson et al., Nature Reviews, 2010
Reichert Antibody Society, 2017
BioPharm Insight, March 2016

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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

Type of Drug	*Likelihood of Approval at Phase 1 Stage*
Small molecules	6.2%
Biologics/Antibodies	**11.5%**

*"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

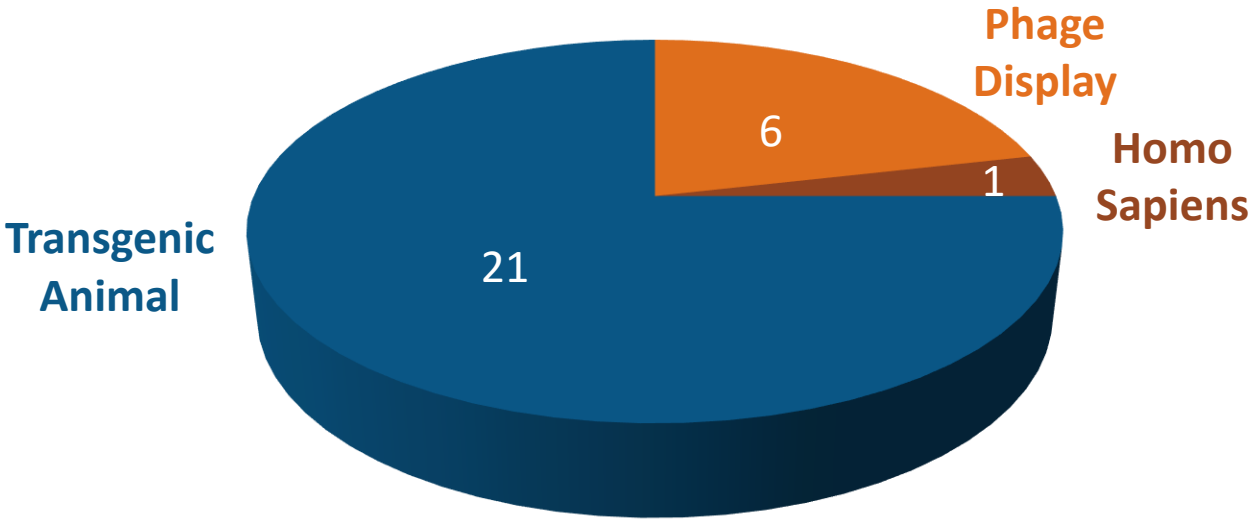
President, The Antibody Society

Clinical Development success rates 2006-2015 (Bio, Biomedtracker and Amplion)
Reichert Antibody Society, 2017

Discovering Therapeutic Antibodies

Success of Genetically-Engineered Animals

Genetically-engineered animals have been more successful in development

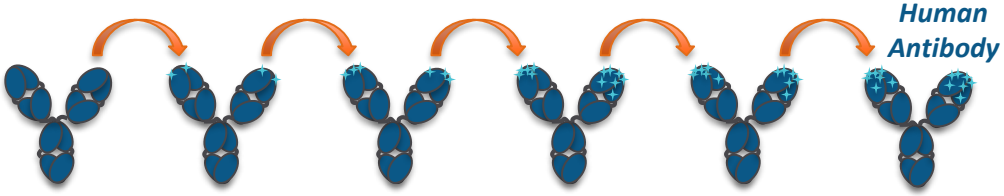


28 FDA-approved fully human antibodies

Reichert Antibody Society, 2017

Discovering Human Antibodies

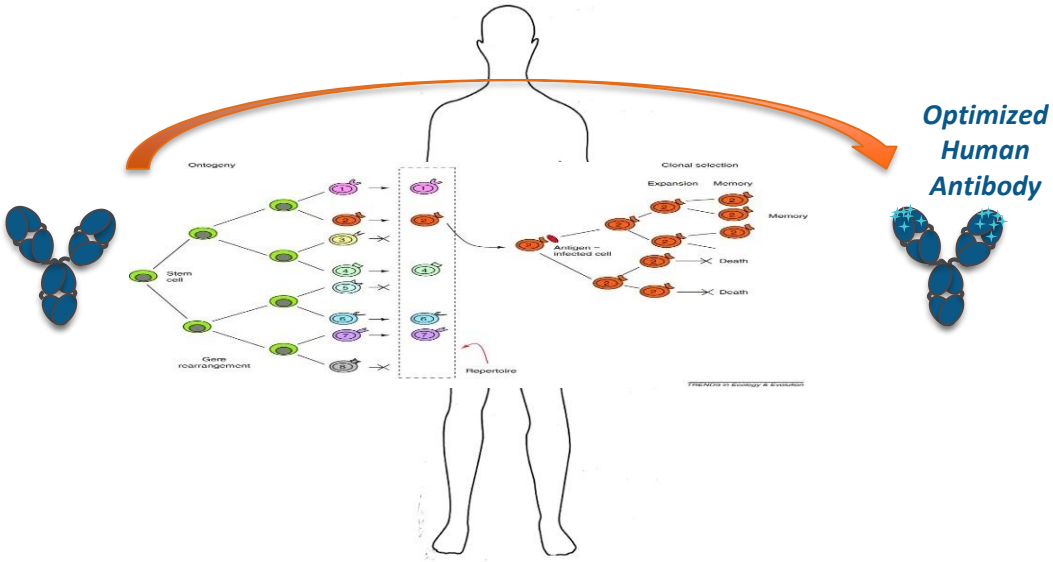
The Immune System is Faster than Bioengineering



Optimization by Bioengineering

6-12 months (or longer)

- Multi-step, iterative process
- Possible gain/loss of activity
- Labor intensive
- Costly
- Time consuming



Optimized Naturally by Immune System

7-14 days

- No further engineering required
- Significant time efficiency

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Extreme Competition

Partners Want Newest and Best Technologies

Antibody research is highly competitive

- Multiple companies pursuing similar targets, making efficiency and speed to market **critical**
- Partners want **the best**
- Partners want **OmniAb**

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

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

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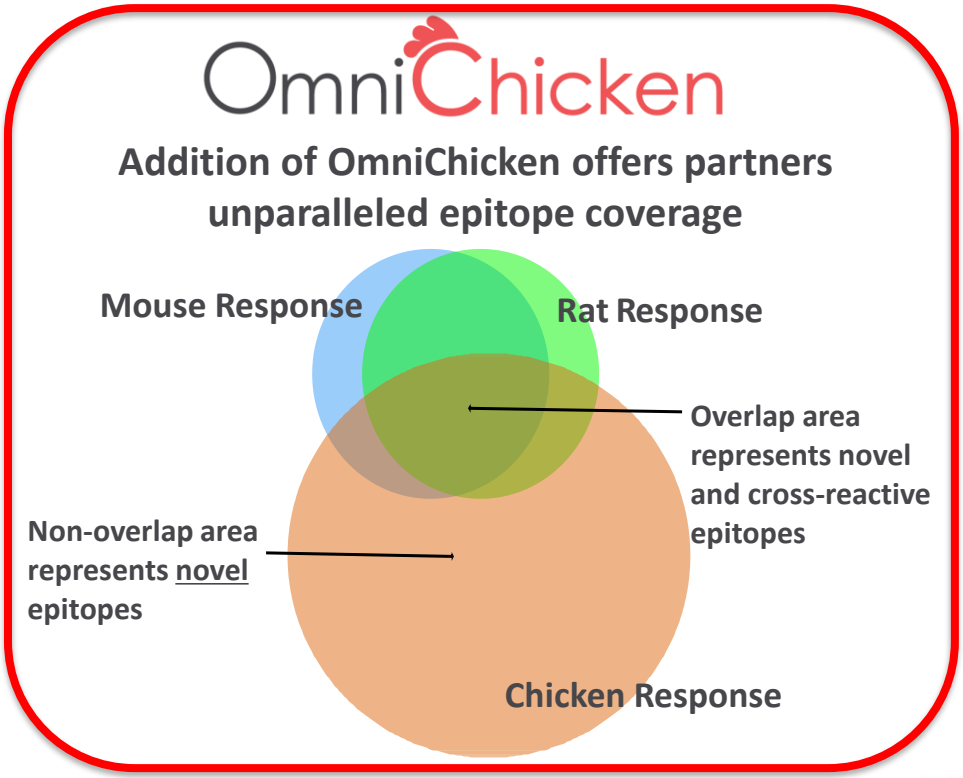
OmniAb: A Best-in-Class Technology

Acquisition of OmniChicken™ Solidified Leadership Position

- Because of evolutionary distance between birds and mammals, chickens enable the generation of novel antibodies against targets that are not immunogenic in rodents



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OmniAb: A Best-in-Class Technology

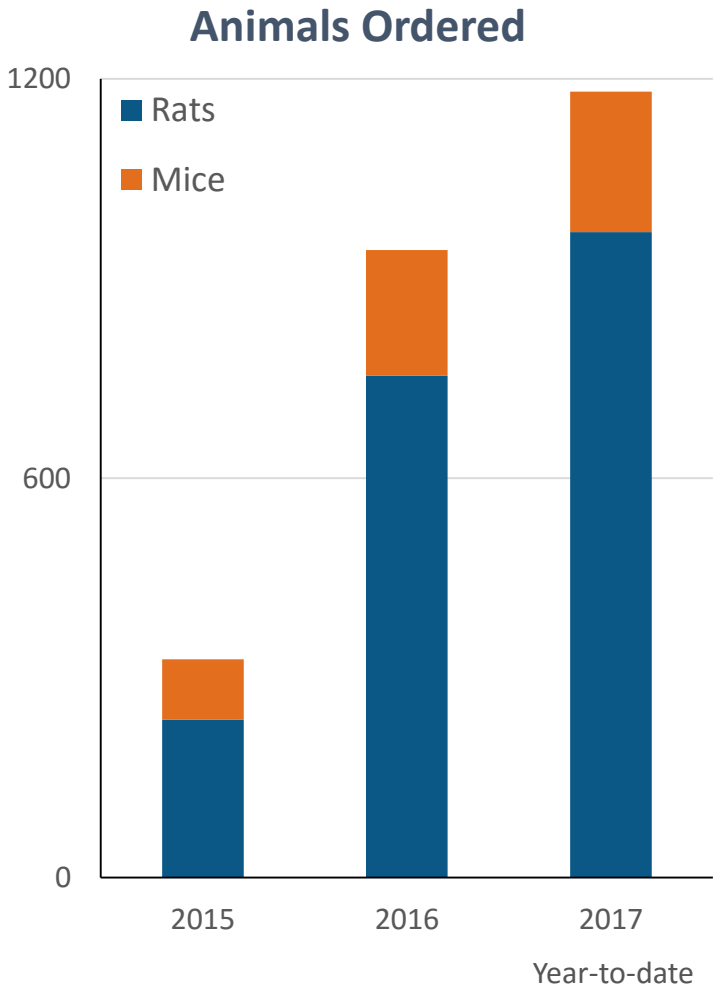
- OmniAb is the industry's only antibody platform with genetically engineered **rats, mice and chickens**

- **Combining three species results in:**
  1. *Increased antibody diversity*
  2. *Increased success of antibody lead discovery, especially for more complex targets (e.g. Ion Channels, G Protein Coupled Receptors)*

OmniAb: A Best-in-Class Tecnology

Demand for Omni Rodents is Growing

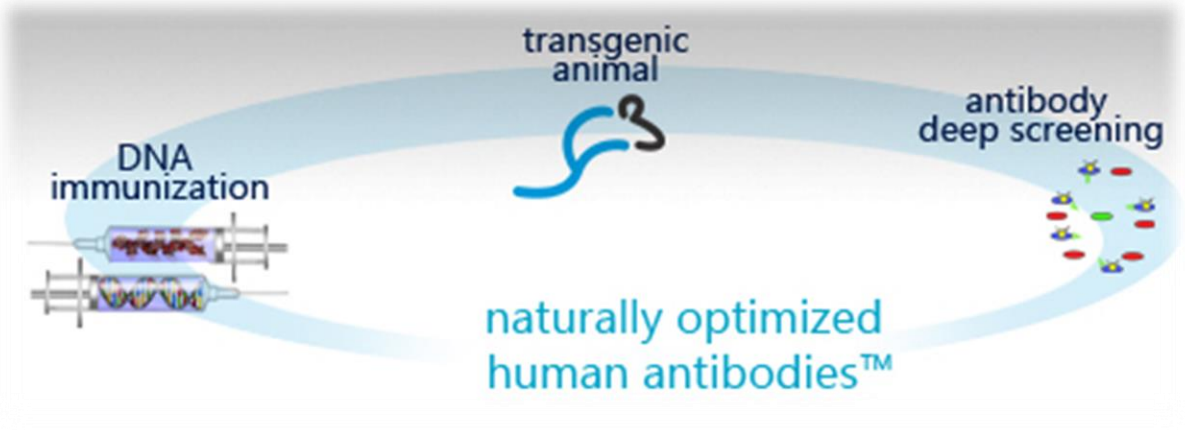
- Partners are ordering more OmniRats and OmniMice following Ligand's acquisition of OmniAb in early 2016



OmniAb: A Best-in-Class Technology

Broad Use

We estimate that over 300 antibody targets have been or are being pursued by OmniAb partners



Partners report that they have obtained the highest quality antibodies for the most difficult targets when using OmniAb

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OmniAb: A Best-in-Class Technology

Intellectual Property

- **Broad protection** exists under issued OmniAb patents, with Freedom-to-Operate for all indications worldwide
- Key **internal know-how** further protects assets
- Other discovery technologies have been subject of significant complexity relating to Freedom-to-Operate

Publications

- *Science* publication of OmniRat created **global visibility** for OmniAb technology
- Partner clinical progress creates **continued visibility and clinical validation**
- **Recent publications** describing *OmniChicken* have continued visibility

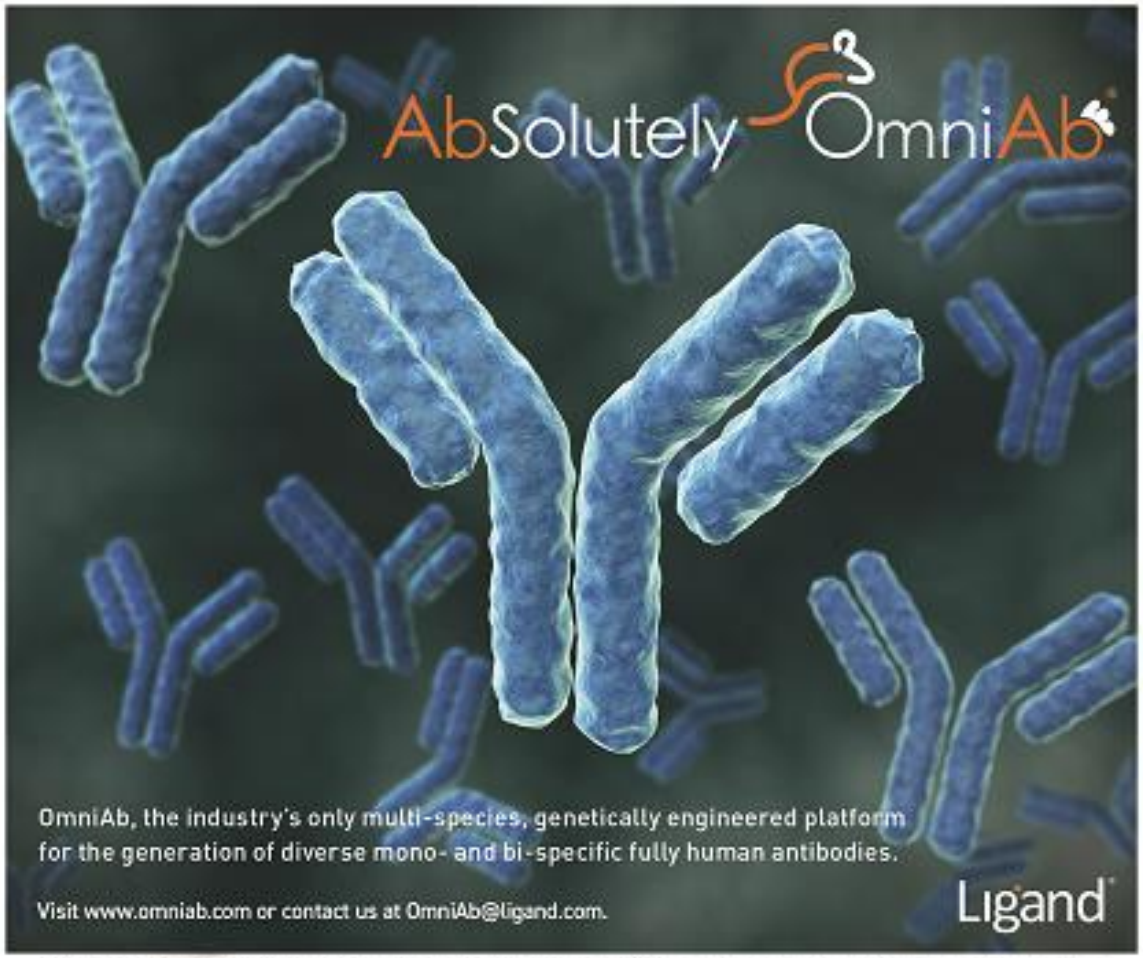
Innovation & Customer Service

- **Next generation animals**, launching in 2018, keep OmniAb on cutting edge
- Ligand's renowned customer service creates **optimal partner experience**
- Have recently added OmniChicken **collaboration services**

Science 2009, July 24, 325: 433
mAbs 2017, 942: 0870

OmniAb: A Best-in-Class Technology

Active Initiatives Create Broad Awareness with Targeted Audience



Three Species.
One License.

Naturally Optimized Human Antibodies®

OmniRat

OmniMouse

OmniFlic

OmniChicken

Ligand

OmniAb: Our Partners' Perspectives

Time and Productivity Gains

Time Savings

*"We are getting high-affinity antibodies **in a rapid period of time** … this improves our cycle times for antibody discovery substantially"*

*"For us, this saves significant time as **we do not need to humanize**"*

Productivity/Efficiency of Animal-based System, High Antibody Quality with OmniAb

"There are major benefits to leveraging the in vivo selection pressure of an animal to select an antibody for you"

*"**15 out of 15 targets** we have pursued with the technology have yielded high-quality antibodies"*

"The animal-based approach is best for identifying quality antibodies"

*"With the OmniAb technology, **your hit is your lead**"*

OmniAb: Our Partners' Perspectives

Freedom-to-Operate and Comparison to Other Technologies

Freedom-to-Operate

*"Freedom to operate was **very clear** to us"*

"Having a rat and a mouse available was a big selling point for us"

As Compared to Competition and Other Technologies

*"We ran OmniRat **head-to-head versus Phage Display and OmniRat won … the OmniRat will beat Phage Display any day"***

*"OmniRat gets us there in **half the time** as compared to another technology we've used"*

OmniAb: A Best-in-Class Technology

"Three Species – One License"

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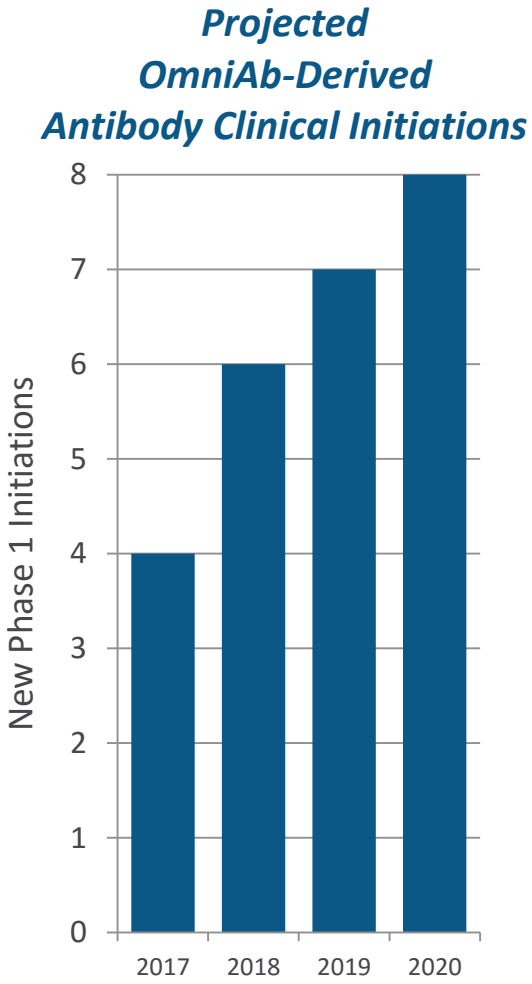
OmniAb: Future Outlook

Potential New Clinical Starts by Year

- There are **4 OmniAb-discovered antibodies** in the clinic today
  - — Increased frequency and depth of interaction with our partners provides insights into potential new clinical starts
- We now estimate a total of ~25 clinical-stage programs using OmniAb-discovered antibodies by 2020



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OmniAb: Future Outlook

OmniAb
Today

- **Growing list** of partners following acquisition by Ligand
  - 7 new partners in 2017, 4 OmniAb antibodies in clinical phase
- **>300 antibody discovery projects** have been initiated by partners
- **OmniChicken further established OmniAb's leadership position**
  - Expanded epitope coverage

OmniAb
Tomorrow

- **The global leader in antibody discovery space, estimating:**

Parameter	*2020*	*2025*
Number of OmniAb Partners	45	*60*
Clinical-stage OmniAb Antibodies	25	*>40*
Approved Drugs	-	*1-3*

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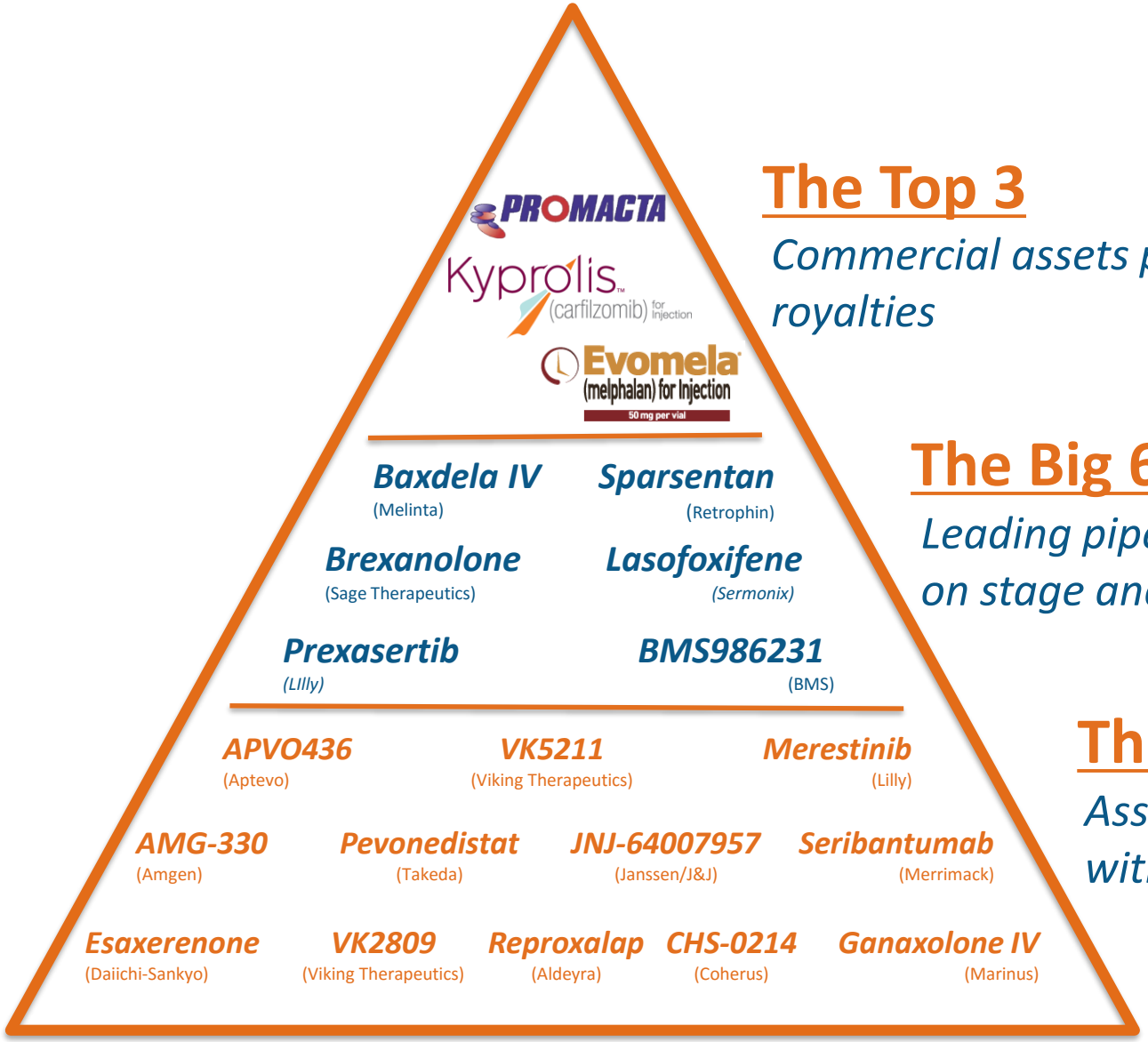
Portfolio Pyramid

Matt Foehr

Ligand®

Portfolio Pyramid



The Top 3

Commercial assets paying significant royalties

The Big 6

Leading pipeline assets based on stage and/or potential value

The Next 12

Assets emerging as next class with high revenue potential

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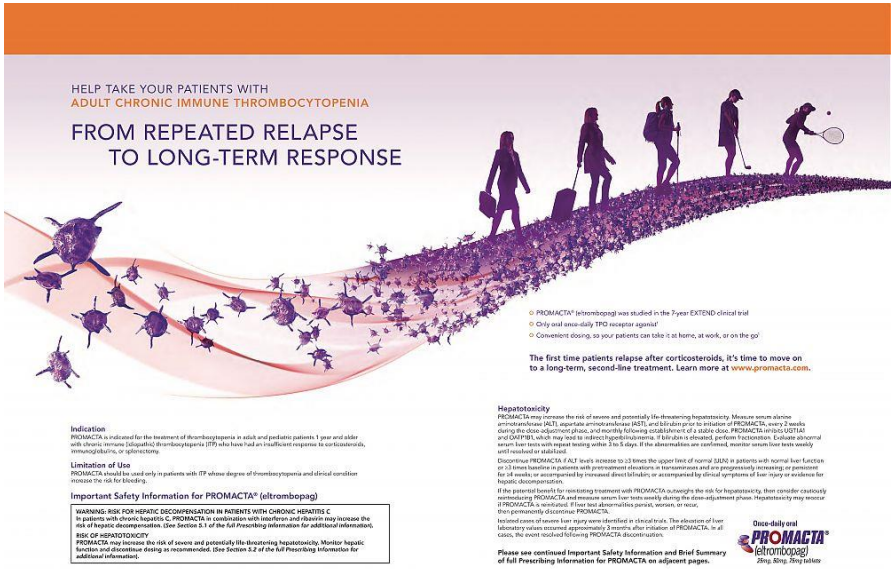
Promacta®

Ligand®

Promacta®: Blockbuster Commercial Potential

- Oral medicine that boosts platelets in patients with thrombocytopenia, or low-platelets
- Partnered with Novartis worldwide
- Long patent protection with Orange Book patent expiration 2027
- Sales trending to **~$850 million** for 2017; Consensus third-party analyst estimates project **$1.3 billion** in 2021
- Approved for numerous indications involving low platelets, and multiple trials underway to support label expansion

Once-daily oral
PROMACTA®
(eltrombopag)
25mg, 50mg, 75mg tablets



Sources: Third party analyst reports, Novartis public disclosures, www.promacta.com

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Promacta: Label Expansion

- 36 ongoing clinical trials
- Recent data and events have continued to demonstrate the significant potential for and interest in Promacta
- Novartis conducting or supporting studies to expand label
  - ***First-line Severe Aplastic Anemia (SAA)***: *Phase 2 SOAR and Phase 3 RACE studies in combination with immunosuppressive therapy (cyclosporine +/- horse ATG)*
  - ***Low to intermediate risk MDS***: *Phase 2 studies underway conducted by NIH/NHLBI (US) and Associazione Qol-one (EU)*
  - ***CIT***: *Phase 2 study of thrombocytopenia associated with tyrosine kinase therapy in CML or myelofibrosis*

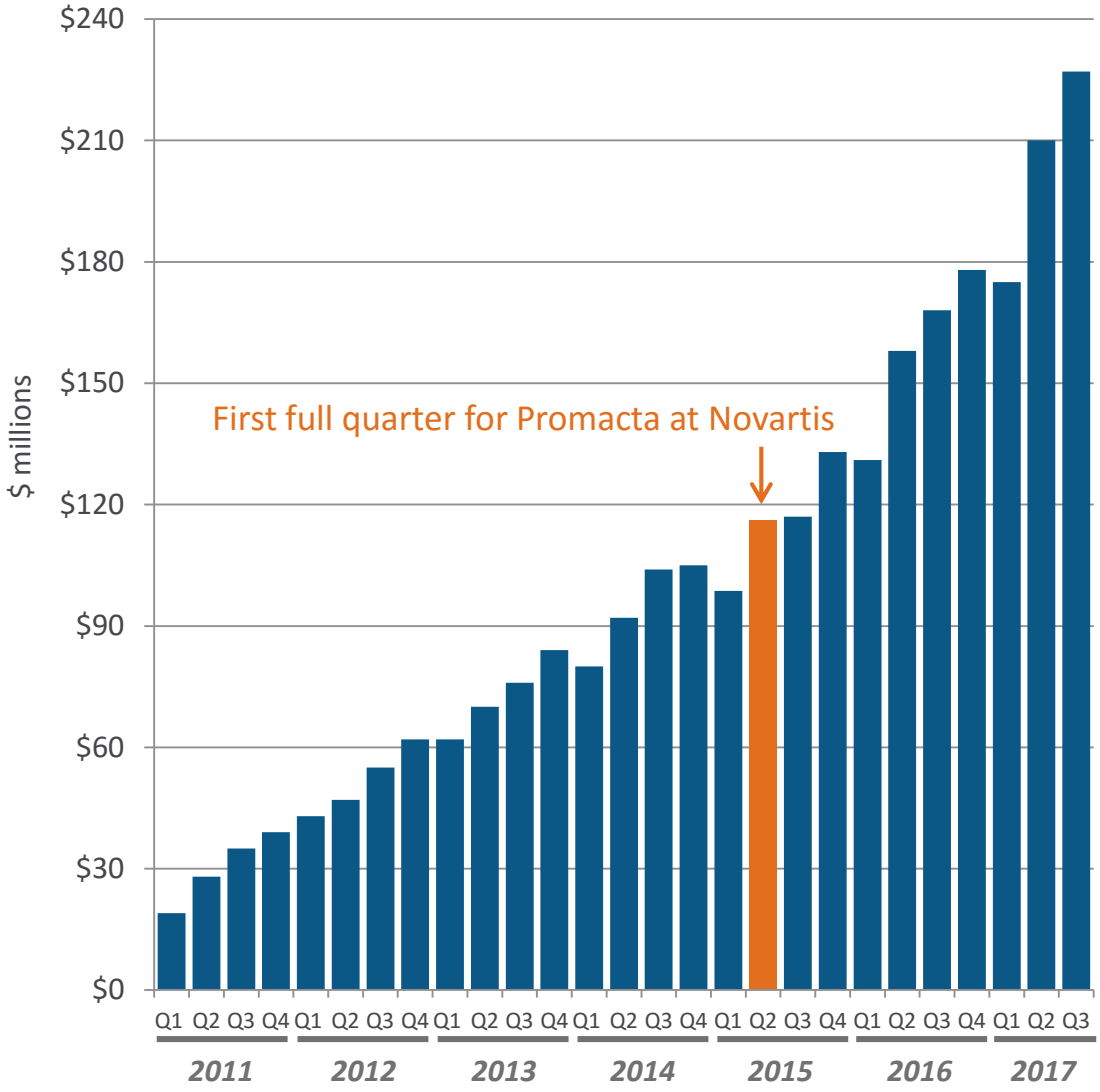

Articles

Eltrombopag versus placebo for low-risk myelodysplastic syndromes with thrombocytopenia (EQoL-MDS): phase 1 results of a single-blind, randomised, controlled, phase 2 superiority trial

- Novartis plans global regulatory filings for first-line SAA in 2018
- Low-to-intermediate risk-1 MDS data recently published in *Lancet Haematology*

Source: clintrials.gov and Novartis public management commentary

Promacta: Quarterly Revenue



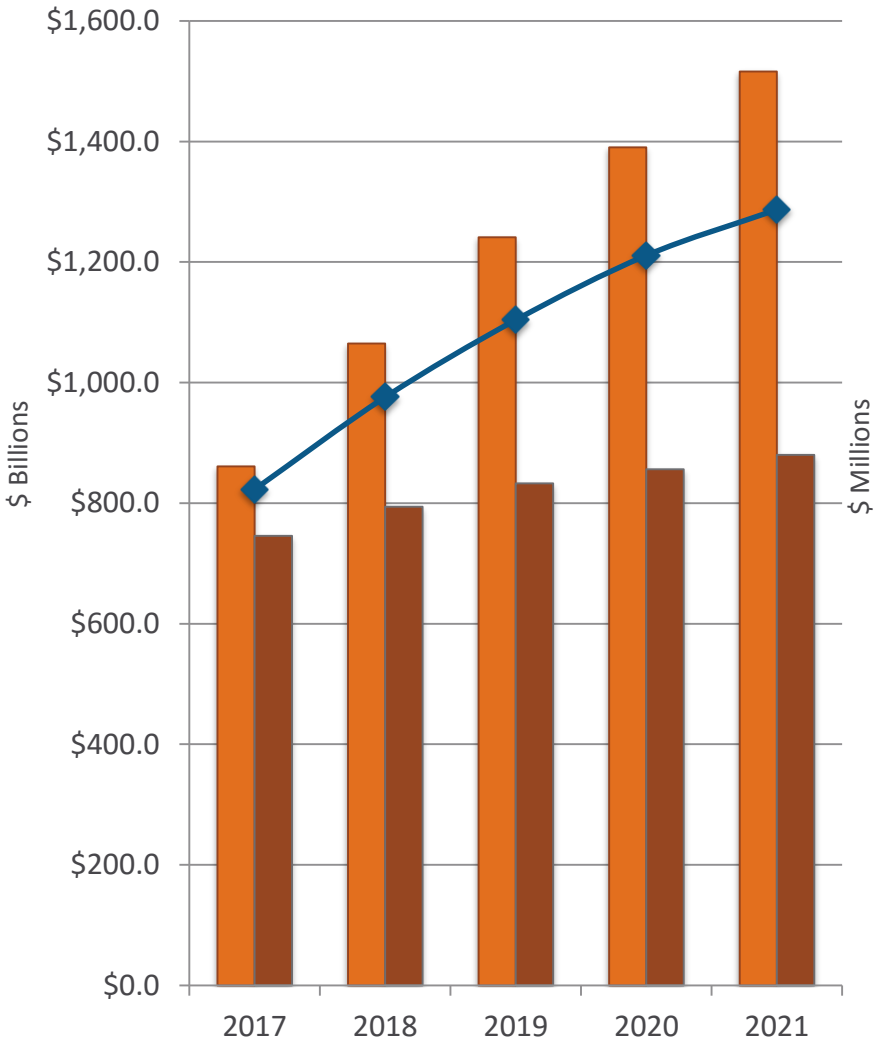
- Q3'17 revenue was $227 million, a $59 million increase (35%) over Q3'16
- Sales now annualize to over $900 million
- Considered by Novartis as one of their global ***"key growth drivers"***

GSK/NOVN (post Q1'14) reported quarterly sales.
GSK figures converted from GBP to USD at then current exchange rates

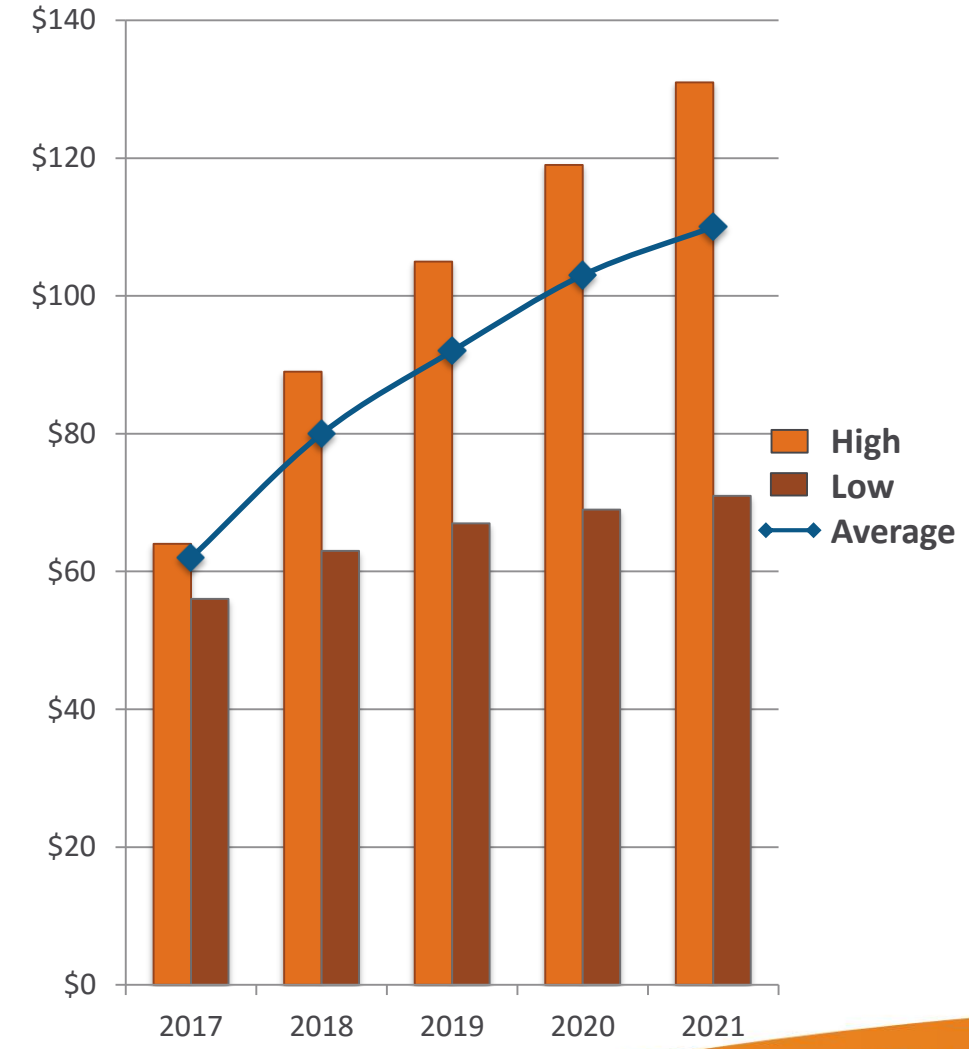
Ligand®

Promacta Projections: NVS Sell-Side Analysts

These Revenue Projections …



…Yield these Royalty Projections



Source: Thomson Reuters Cortellis and analyst reports - 13 Novartis covering analysts as of 11/3/17
2017 royalties calculated on a one quarter lag
Beginning Q1 2018, royalties will be recognized in the same quarter in which sales occurred

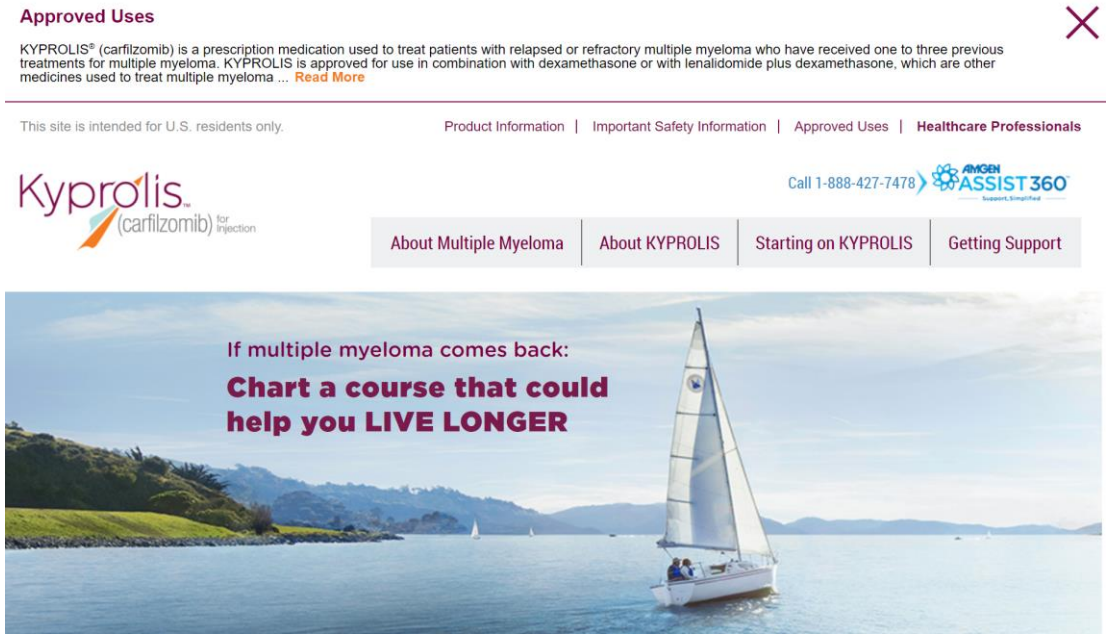
Ligand®

Kyprolis®

Ligand®

Kyprolis

- Kyprolis viewed as best-in-class proteasome inhibitor for multiple myeloma (MM)
- Developed and marketed by Amgen
  - Utilizes Ligand's Captisol technology



- Approved for relapsed or refractory MM in the US, EU and Japan (Ono)[1]
  - As single agent, or in combination with dexamethasone or Revlimid and dexamethasone
- In the last 8 months, Kyprolis has demonstrated overall survival improvement in both the Phase 3 ***ENDEAVOR*** and Phase 3 ***ASPIRE*** studies, bolstering the value proposition for the drug in a competitive space

[1] KYPROLIS is also approved in Argentina, Australia, Bahrain, Canada, Hong Kong, Israel, Kuwait, Lebanon, Macao, Mexico, Thailand, Colombia, S. Korea, Qatar, Switzerland, Singapore, Taiwan, Jordan, Egypt, Saudi Arabia, United Arab Emirates, Turkey, Russia, Brazil, India and Oman. Additional regulatory applications for KYPROLIS are underway and have been submitted to health authorities worldwide.

Sources: Amgen public disclosures, www.kyprolis.com

Ligand®

Kyprolis

Amgen Public Commentary - ASPIRE and ENDEAVOR Phase 3 Data

AMGEN

"In each case, KYPROLIS reduced the risk of death by 21%, and improved survival by approximately eight months, ***a very meaningful clinical result that reinforces the role for KYPROLIS in driving deep and durable responses****."*

Sean E. Harper, MD
Executive Vice President, Research & Development

"With these two new sets of overall survival data, our message to physicians is simple and powerful: ***When multiple myeloma relapses, don't put your patient's survival at risk****."*

Anthony C. Hooper
Executive Vice President, Global Commercial Operations

"We completed two pivotal studies showing an overall survival benefit for KYPROLIS patients with relapsed disease, ***underscoring our confidence in this molecule as the new standard of care for these patients****."*

Robert A. Bradway
Chairman & Chief Executive Officer

Source: Amgen Q2'17 earnings call, July 25, 2017
Kyprolis is developed and marketed by Amgen

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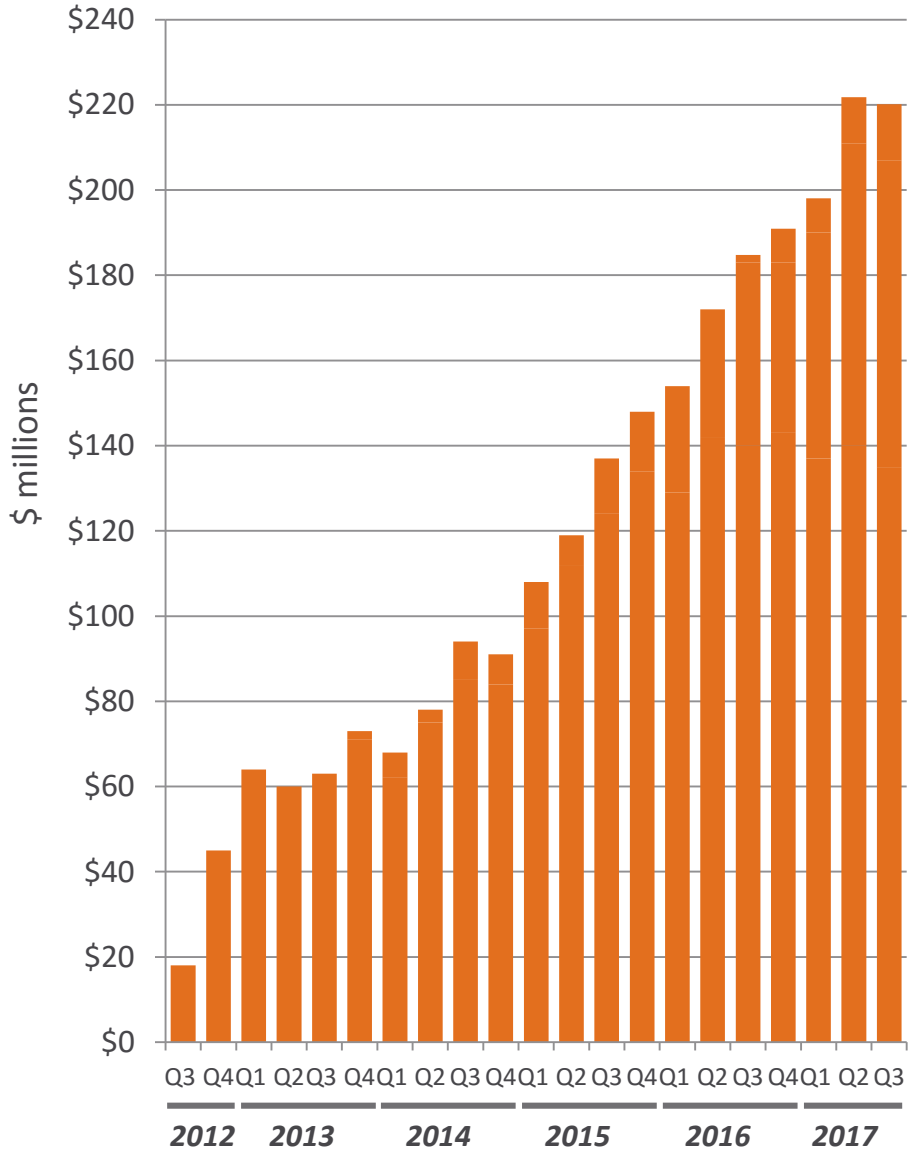
Kyprolis: Quarterly Revenue



- Amgen/Ono reported combined Q3 revenue of $220 million
- Rest-of-world contribution becoming more substantial

Sources: Onyx, Amgen and Ono financial reports

Ligand®

Kyprolis

Status

- Third-party analysts estimate product on track to exceed **$830 million** in global revenue in 2017

- Factors supporting potential revenue growth:
  1. *New or recently-launched territories*
  2. *Label expansion potentially supported from ongoing trials*
  3. *Use in combination with other medications*

Source: Third party analyst reports, see slide 61
Kyprolis is developed and marketed by Amgen

Kyprolis

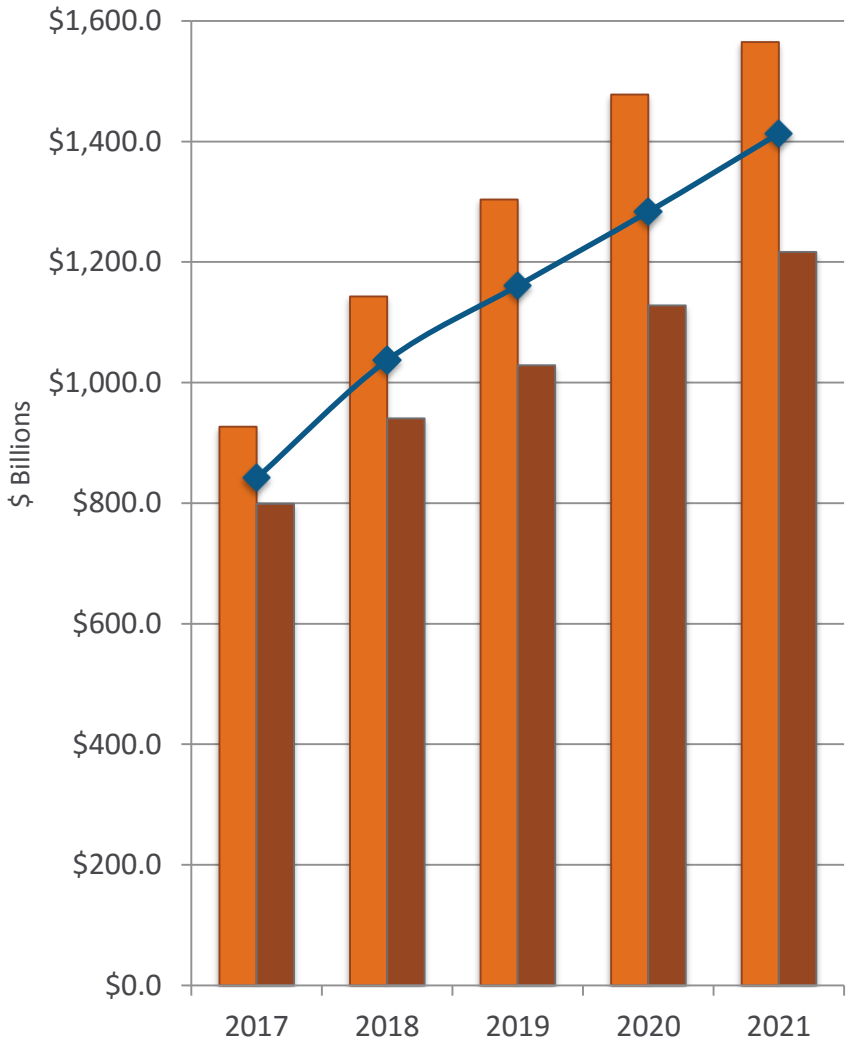
Status and Plans

- Amgen is very active with clinical and regulatory activities for Kyprolis
  - Submitted sNDA to include Overall Survival data from ***ENDEAVOR*** study
    - Under review at FDA, with target action date of **April 30, 2018**
  - Regulatory submissions in preparation for ***ASPIRE*** Overall Survival data
  - ***Once-Weekly Dosing***: Interim analysis of Phase 3 ***ARROW*** trial showed superior efficacy and comparable safety
  - ***Relapsed/Refractory Multiple Myeloma:*** Phase 3 trial in combination with Janssen's *Darzalex®* began in Q2 2017
  - ***Front-Line Multiple Myeloma***: Designing Phase 3 study in combination with Revlimid and dexamethasone

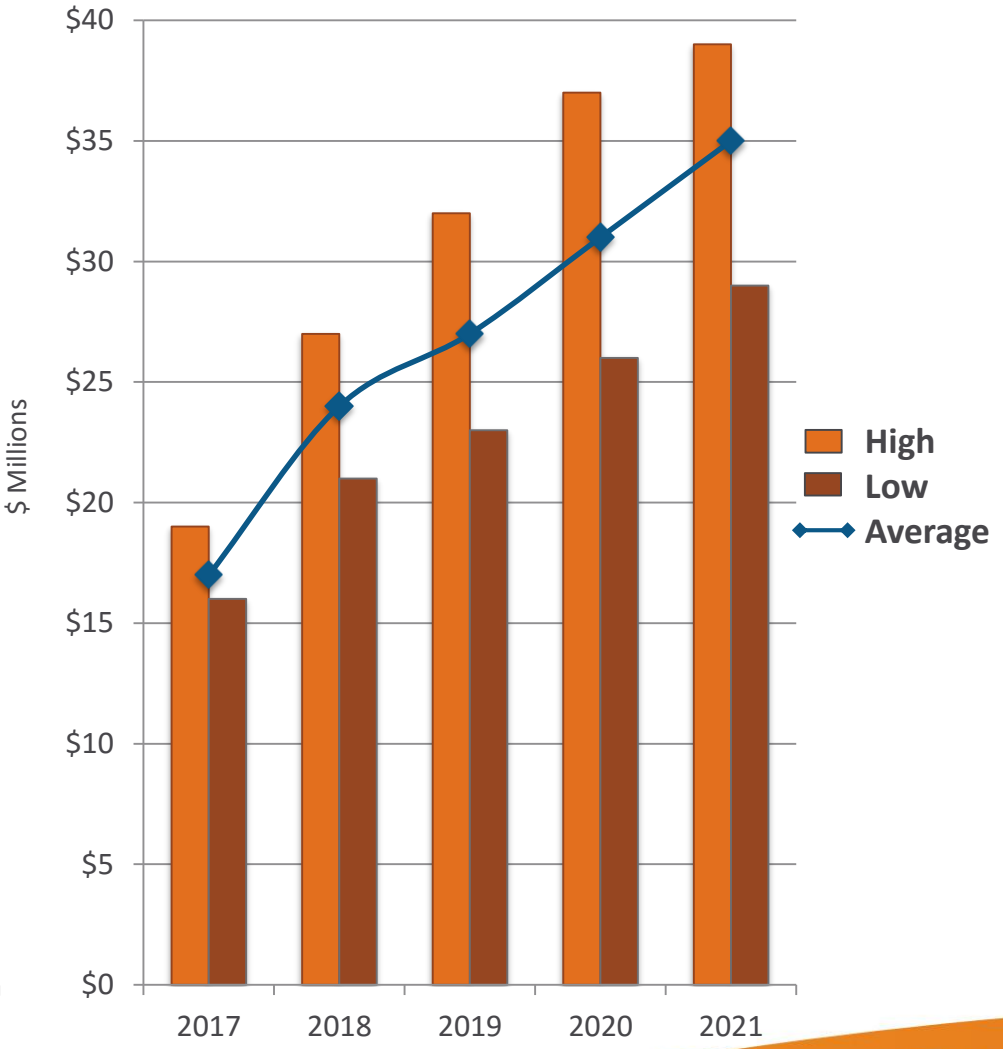
Source: Amgen public disclosures dated July 25, 2017 and October 25, 2017, www.clinicaltrials.gov – www.kyprolis.com
Kyprolis is developed and marketed by Amgen

Kyprolis Projections: Sell-Side Analysts

These Revenue Projections …



…Yield these Royalty Projections



Source: Thomson Reuters Cortellis and analyst reports, 12 Amgen and Ono Pharmaceuticals covering analysts as of 11/3/17
Excluding highest/outlier analyst
2017 royalties calculated on a one quarter lag
Beginning Q1 2018, royalties will be recognized in the same quarter in which sales occurred

Ligand®

EVOMELA®

Ligand®

EVOMELA®

- Captisol-enabled formulation of chemotherapy drug used for stem cell transplant conditioning in MM, approved by FDA in 2016
  - Stem cell transplant is an important course of therapy in MM, increasing in total number as patients are living longer

- Captisol improves product stability and enables the removal of propylene glycol, which is associated with renal and cardiac toxicities

- Product licensed globally to Spectrum Pharmaceuticals, who completed development and launched
  - 20% royalty on net sales to Ligand
  - Sub-licensee partner in China (CASI) recently announced priority review for approval for the product in China

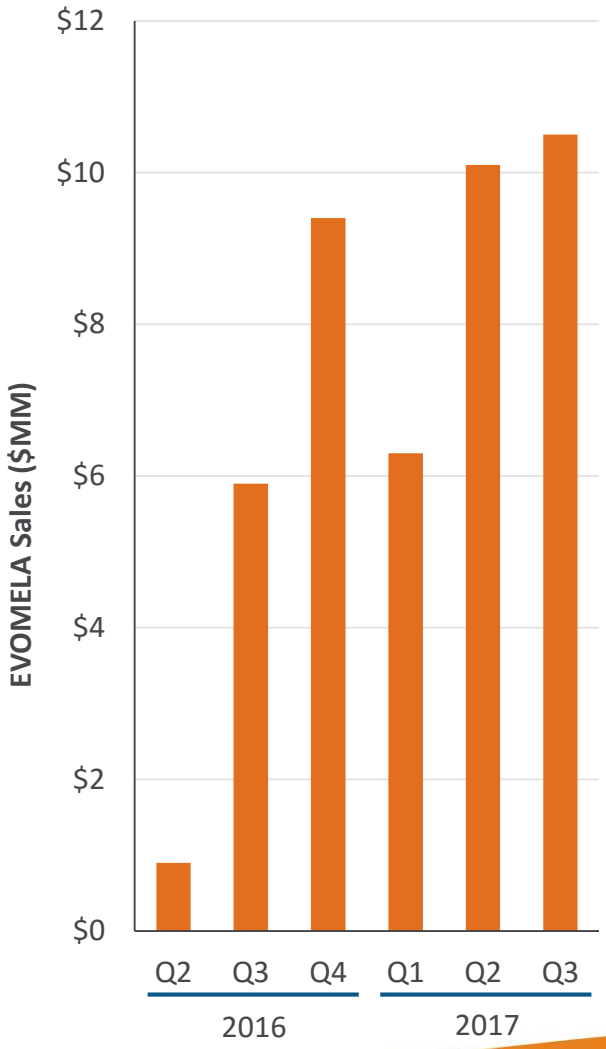
Sources: Spectrum and CASI public disclosures

EVOMELA: Launch Performance

- Initial adoption strong given label and clear benefits
- Product on track to do $33 - $38 million in 2017
- Third-party analyst outlook indicates revenue potential of $50 - $60 million in 2020
- Factors supporting potential revenue growth:
  1. *International sales from licensees*
  2. *Further US market expansion*
  3. *New labeled indications*

*"Regarding EVOMELA, we are thrilled with the performance. We are the **market leader** and the market has spoken on the differentiation of the product."*

Tom Riga
Chief Commercial Officer



Source: Thomson Reuters Cortellis and analyst reports
Spectrum November 2, 2017 earnings call

The Big 6: Major Pipeline Assets

Leading pipeline assets based on stage and/or potential value

Partner	Program (Therapy Area)	Stage	Royalty Rate	Upcoming Events
Melinta Therapeutics	**Baxdela-IV** *(Infection)*	Approved	*2.5%*	**Product Launch**
Sage Therapeutics	**Brexanolone** *(Neurology)*	Pre-NDA	*3.0%*	**NDA Filing for PPD**
Retrophin	**Sparsentan** *(FSGS- Kidney Disease*	Phase 2/3	*9.0%*	**Phase 3 Initiation**
Sermonix Pharmaceuticals	**Lasofoxifene** *(Oncology/Women's Health)*	Phase 2/3	*6.0-10.0%*	**Phase 2 Start**
Bristol-Myers Squibb	**BMS986231** *(Cardiovascular Disease)*	Phase 2/3	*2.0-3.0%*	**Phase 2b Data**
Lilly	**Prexasertib** *(Oncology)*	Phase 2	*1.5-3.0%*	**Phase 2 Data in various advanced cancers**

The Big 6: Neurology

Brexanolone (Pre-NDA)

- Brexanolone (SAGE-547) IV is Sage's proprietary, Captisol-enabled, formulation of allopregnanolone
  - Allosteric $GABA_A$ receptor modulator
- In development as an acute interventional treatment for post-partum depression (PPD)
- Announced positive top-line data on November 9, 2017 from two Phase 3 HUMMINGBIRD trials in severe and moderate PPD
  - Brexanolone provided rapid and durable reduction over 30 days in depressive symptoms as measured by HAM-D in both placebo-controlled multi-center trials

SAGE THERAPEUTICS

"In these studies, brexanolone provided a profound and durable effect over the study period that could be an important step in potentially changing the way health care providers think about treating this disorder."

– Dr. Samantha Meltzer-Brody, M.D., M.P.H., associate professor and director of UNC Perinatal Psychiatry Program of the UNC Center for Women's Mood Disorders

Nov. 9, 2017

Source: Sage Therapeutics public disclosures

The Big 6: Kidney Disease

Sparsentan (Phase 2/3)

- In development for treatment of focal segmental glomerulosclerosis (FSGS), a rare kidney disorder that often leads to end-stage renal disease
  - Could be first FDA-approved therapy for FSGS
  - IgA nephropathy identified as added potential indication
- Met primary efficacy endpoint in Phase 2 DUET study, demonstrating >2-fold reduction in proteinuria compared to Irbesartan after 8-week, double-blind treatment period
  - Progressive reduction in proteinuria, combined with stable kidney function (eGFR), during 40-week open label period
- Retrophin plans to initiate pivotal Phase 3 in FSGS in 2018

Retrophin®

*"These [*open-label extension*] findings … underscore the potential of sparsentan to be a* ***durable approach to treating FSGS****."*

– Bill Rote, PhD, Sr. VP and Head of R&D, Retrophin, *November 3, 2017*

Source: Retrophin public disclosures, and Retrophin data on file November 2017

The Big 6: Cardiovascular

Bristol-Myers Squibb

*"Overall, these preliminary findings are encouraging. Therefore, further large-scale testing is **strongly encouraged** to assess the effect of this drug on outcomes in this patient population."*

- ***Editorial Comment, European Journal of Heart Failure***
October 2017

BMS986231 (Phase 2b)

- Captisol-enabled, novel, intravenous nitroxyl (HNO) donor
  - In development for acute decompensated heart failure
  - BMS acquired from Cardioxyl in late 2015 for $2 billion, including milestone payments
- In a Phase 2a study recently published in the *European Journal of Heart Failure*, 6-hour infusion was safe with preliminary efficacy in advanced heart failure patients
  - Improved heart function and reduced pulmonary blood pressure without increasing heart rate or oxygen consumption
- Phase 2b study underway of continuous 48-hour infusion in hospitalized heart failure patients

Sources: BMS public disclosures, European Journal of Heart Failure

The Big 6: Oncology

Prexasertib (Phase 2)

- Captisol-enabled, small molecule checkpoint kinase 1 (CHK1) and CHK2 inhibitor
  - CHK inhibitors induce DNA double-strand breaks, increased replication stress and cancer cell death
- Highlighted as a "***Priority Internal Development Program***" by Lilly for focused internal R&D investment
- Demonstrated promising activity in Phase 2 trial in platinum-sensitive and resistant, high-grade ovarian cancer
  - 35% of BRCA*wt+* ovarian cancer patients achieved partial response; ~2x higher than historical controls
- Ongoing trials in small cell lung cancer, head and neck cancer, and advanced metastatic cancer

"Prexasertib is a first-in-class agent. … We look forward to continued development of prexasertib in ovarian and other cancer types"

- Dr. Levi Garraway, SVP, Oncology Global Development & Medical Affairs

July 25, 2017

Source: Lilly public disclosures

The Next 12

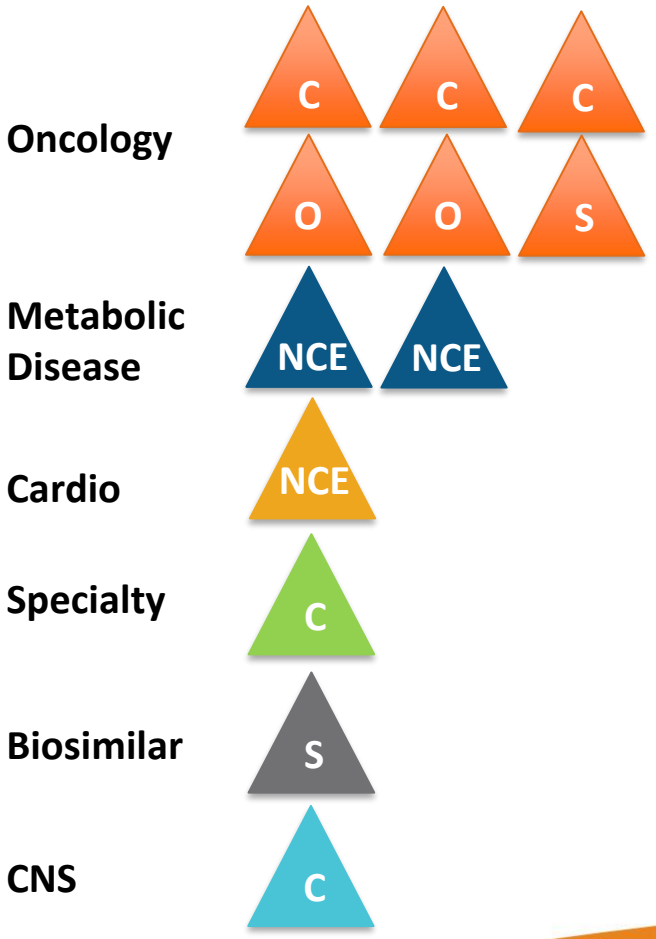
Ligand®

The Next 12: Composition

Assets emerging as next class with high revenue potential

- 12 additional pipeline programs continue to expand the breadth and diversity of Ligand's growing portfolio
- Diverse partners and indications
- Diversity of underlying technology/IP
  - 5 Captisol-enabled programs **(C)**
  - 3 New Chemical Entity programs **(NCE)**
  - 2 Selexis program **(S)**
  - 2 OmniAb programs **(O)**
- Increasing number are large molecules
- All are well-resourced programs with highly-committed partners
  - Emerging data and progress
  - Potential to contribute meaningfully to Ligand's future growth

Composition of The Next 12



Ligand

The Next 12: Oncology

Merestinib (Phase 2)

- Captisol-enabled, small molecule MET kinase inhibitor
  - Reversible type II ATP-competitive inhibitor of MET
- Phase 1 and Phase 2 trials underway in advanced cancer and biliary tract cancer
  - Trials expected to complete in 1H and 2H 2018, respectively

Pevonedistat (MLN4924, Phase 2)

- Captisol-enabled, novel NEDD8 activating enzyme inhibitor
- Previous studies have indicated effectiveness in melanoma patients who were resistant to other therapies
- Currently being investigated in high-risk MDS
  - Phase 2 in advanced MDS estimated completion Dec. 2017
  - Phase 3 PANTHER study in high-risk MDS to begin Nov. 2017

Source: Public information published by partners/licensees

The Next 12: Oncology

AMG-330 (Phase 1)

- Captisol-enabled, anti-CD33 x anti-CD3 bispecific T-cell engager (BiTE®) antibody, for treatment of acute myeloid leukemia (AML)
- Phase 1 study in relapsed/refractory AML underway
  - Data read-out estimated 2018 (clinicaltrials.gov)

Seribantumab (MM-121, Phase 2)

- First-in-class, HER3 mAb targeting heregulin (HRG) positive cancers; a Selexis technology program
  - Granted orphan drug designation for HRG-positive NSCLC in October 2017 and Fast Track designation in July 2016
- Two Phase 2 studies in NSCLC and breast cancer in-progress
  - Phase 2 NSCLC study data expected 2H 2018
  - Phase 2 breast cancer trial started August 2017

Sources: Public information published by partners/licensees, www.clinicaltrials.gov

The Next 12: Antibodies

APVO436 (Preclinical)

- Bispecific anti-CD123 and anti-CD3 OmniAb-derived mAb
  - CD123 is highly expressed in several hematological malignancies (e.g. AML, ALL and MDS)
- Designed to simultaneously target CD123 and CD3 and redirect T-cell cytotoxicity against CD123-expressing tumors
  - Preclinical data presented at AACR-NCI-EORTC Molecular Targets and Cancer Therapeutics annual meeting in October

JNJ-64007957 (Phase 1)

- Novel, bispecific anti-BCMA x CD3 OmniAb-derived mAb being developed for multiple myeloma (MM)
  - Binds validated target B Cell Maturation Antigen (BCMA) and CD3, with potent activity demonstrated in MM models
- Phase 1 underway in patients with multiple myeloma
  - Estimated primary completion Nov. 2018 (clinicaltrials.gov)

Source: Public information published by partners/licensees, www.clinicaltrials.gov

The Next 12: CNS and Biosimilar

Ganaxolone IV (Phase 2)

- Captisol-enabled, positive allosteric modulator of $GABA_A$
- Completed Phase 1 study in status epilepticus (SE), and plan to initiate Phase 2 SE study in 2017
  - Received FDA orphan drug designation for the treatment of SE
- Initiated Phase 2 MAGNOLIA trial in June 2017 in women with severe PPD

CHS-0214 (Phase 3)

- Biosimilar etanercept (Enbrel); Selexis technology program
  - Successfully completed five clinical studies, including:
    - Three comparative PK studies
    - Two Pivotal Phase 3 studies (psoriasis and rheumatoid arthritis)
- Guidance on EU filing expected 1H 2018

Source: Public information published by partners/licensees

The Next 12: Ophthalmology and Hypertension

Reproxalap (ADX-102, Phase 3)

- Captisol-enabled eye-drop formulation of ADX-102
  - Novel, small-molecule aldehyde trap for ocular diseases
- In 2017, positive Phase 2 results announced in allergic conjunctivitis and in dry eye
- Multiple Phase 3 studies to begin in 1H 2018
  - Allergic conjunctivitis, noninfectious anterior uveitis, and Sjogren-Larsson Syndrome

Esaxerenone (CS-3150, Phase 3)

- Oral, non-steroidal, selective mineralocorticoid receptor antagonist for hypertension and congestive heart failure
- In September 2017, positive Phase 3 top-line results announced from pivotal ESAX-HTN trial in Japanese patients with essential hypertension
  - Filing planned in Japan in 1Q 2018

Source: Public information published by Aldeyra and Daiichi-Sankyo

The Next 12: Emerging Assets

Partner	Program (Therapy Area)	Technology	Stage	Royalty Rate	Upcoming Events
Lilly	Merestinib (Oncology)	Captisol	Phase 2	*1.5-3.0%*	Phase 2 Data (Advanced Cancer)
Takeda Millennium The Takeda Oncology Company	Pevonedistat (Oncology)	Captisol	Phase 2	**	Phase 2 Data (High Risk MDS)
Amgen	AMG-330 (Oncology)	Captisol	Phase 1	**	Phase 1 Data (AML)
merrimack	Seribantumab (Oncology)	Selexis	Phase 2	*<1%*	Phase 2 Data (NSCLC)
Aptevo Therapeutics	APVO436 (Oncology)	OmniAb	Preclinical	**	IND Filing
janssen	JNJ-64007957 (Oncology)	OmniAb	Phase 1	**	Phase 1 Data (Multiple Myeloma)
Marinus Pharmaceuticals	Ganaxolone IV (CNS)	Captisol	Phase 2	**	Phase 2 Data (PPD)
Coherus Biosciences	CHS-0214 (Etanercept Biosimilar)	Selexis	Phase 3	**	EU Filing
Aldeyra Therapeutics	Reproxalap (Ophthalmology)	Captisol	Phase 3	Low single digit	Phase 3 Data (Allergic Conjunctivitis)
Exelixis Daiichi-Sankyo	Esaxerenone (Hypertension)	NCE	Phase 3	**	Japan NDA Filing
Viking Therapeutics	VK5211 (Metabolic)	NCE	Phase 2	*7.25-9.25%*	Phase 2 Data (Hip Fracture)
Viking Therapeutics	VK2809 (Metabolic)	NCE	Phase 2	*7.25-9.25%*	Phase 2 Data (Hyperlipidemia)

*** Royalty rate currently undisclosed*

Note: Janssen OmniAb license includes all payments in form of development and commercial milestones.

Ligand®

CAPTISOL®

Matt Foehr

Ligand®

CAPTISOL®

The leading cyclodextrin technology

- Captisol is a patented cyclodextrin designed to:
  - Maximize safety
  - Improve solubility, stability and bioavailability
  - Lessen the volatility, irritation, smell or taste of drugs

- Supported with highly reliable supply and world-class technical service
  - Multisite and multi-metric-ton cGMP supply chain using highest-quality partner
    - *2.5 metric ton batch size, validated to pharmaceutical standards*
  - Globally-recognized solubility experts on Ligand team

Ligand®

CAPTISOL®

A Successful Platform - Five Initiatives Building for the Future

1. Recently extended manufacturing agreement with Hovione **through 2024**

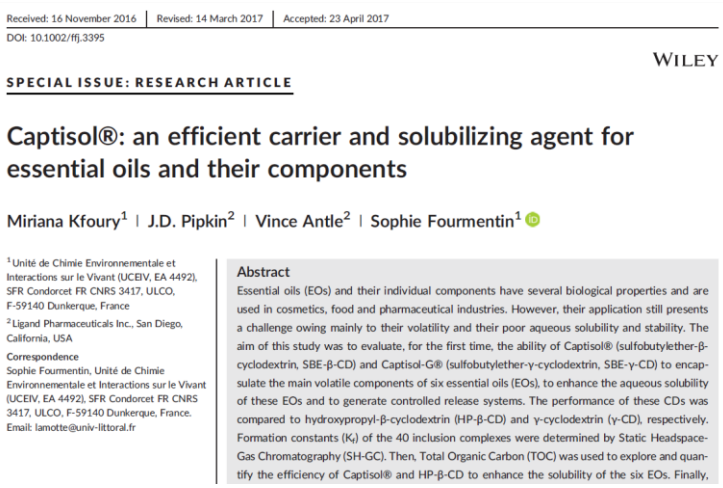
   — Captisol partners value high product quality and stability of supply

Hovione

2. Adding new European distribution center, further supporting global nature of our partners' manufacturing plans and driving business efficiencies

3. Continuing to discover new use settings for Captisol to expand and diversify our customer base

   — Recent peer-reviewed publications



Received: 16 November 2016 | Revised: 14 March 2017 | Accepted: 23 April 2017
DOI: 10.1002/rfj.3395

WILEY

SPECIAL ISSUE: RESEARCH ARTICLE

Captisol®: an efficient carrier and solubilizing agent for essential oils and their components

Miriana Kfoury[1] | J.D. Pipkin[2] | Vince Antle[2] | Sophie Fourmentin[1]

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[2] Ligand Pharmaceuticals Inc., San Diego, California, USA

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Abstract
Essential oils (EOs) and their individual components have several biological properties and are used in cosmetics, food and pharmaceutical industries. However, their application still presents a challenge owing mainly to their volatility and their poor aqueous solubility and stability. The aim of this study was to evaluate, for the first time, the ability of Captisol® (sulfobutylether-β-cyclodextrin, SBE-β-CD) and Captisol-G® (sulfobutylether-γ-cyclodextrin, SBE-γ-CD) to encapsulate the main volatile components of six essential oils (EOs), to enhance the aqueous solubility of these EOs and to generate controlled release systems. The performance of these CDs was compared to hydroxypropyl-β-cyclodextrin (HP-β-CD) and γ-cyclodextrin (γ-CD), respectively. Formation constants (K_f) of the 40 inclusion complexes were determined by Static Headspace-Gas Chromatography (SH-GC). Then, Total Organic Carbon (TOC) was used to explore and quantify the efficiency of Captisol® and HP-β-CD to enhance the solubility of the six EOs. Finally,

Ligand®

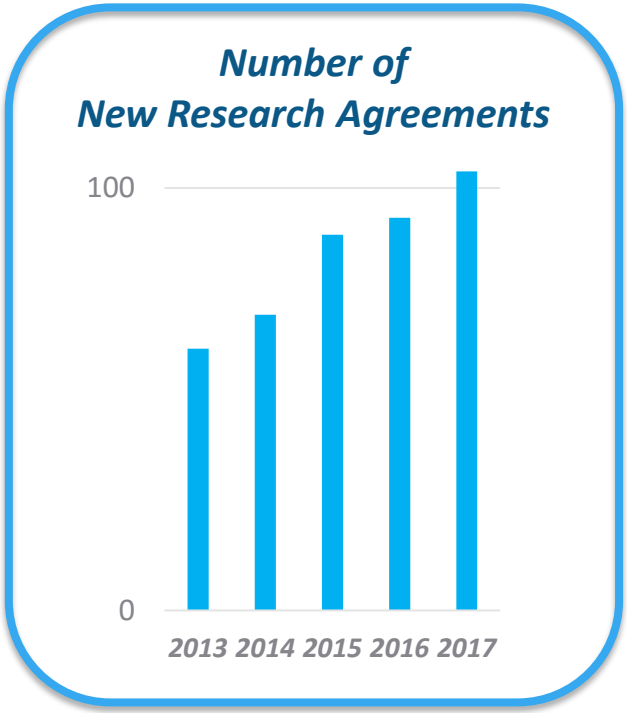
CAPTISOL®

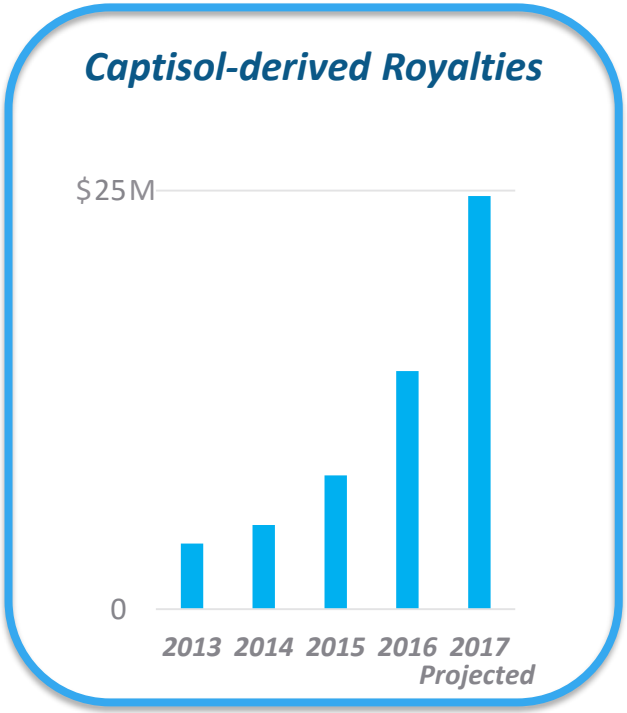
A Successful Platform - Five Initiatives Building for the Future

4. Investing in a global intellectual property estate with composition, process and product-specific patent families
   - — Issued patents in over 60 countries
   - — Patent coverage through 2033 in major markets

5. Our expanding Drug Master File (DMF) safety package is a key value-driver, BOTH strengthening and accelerating regulatory filings for our partners
   - — Vast safety and clinical database with >200 clinical and safety studies maintained with FDA
   - — Key toxicology studies expanding dose and use in specific patient populations added recently

CAPTISOL®





- The number of new Research Agreements continues to grow
  - Indicative of interest and use
  - Not included in Shots-on-Goal count
- With an increasing number of commercial assets, Captisol-related royalties have also grown substantially
  - Captisol royalties have increased more than 6x in the last four years

Ligand®

CAPTISOL®

The Leading Cyclodextrin Technology

aaps®
American Association of Pharmaceutical Scientists

- The AAPS annual meeting is the world's top gathering of pharmaceutical scientists
  - — AAPS includes >10,000 of the top formulators and pharmaceutical scientists

- 2017 Captisol partner event on November 13th had largest turnout ever
  - — Recognized major partner achievements at evening awards ceremony

2017 AAPS Annual Meeting

November 12-15, 2017

San Diego Convention Center

CAPTISOL® A Ligand TECHNOLOGY 007

Ligand®

Glucagon Receptor Antagonist Program

Eric Vajda, Ph.D.
VP, Preclinical R&D

Ligand®

Diabetes

A serious and growing epidemic

30 million Americans have diabetes

84 million Americans have prediabetes

$407 billion spent on diabetes care annually

Diabetes also significantly increases risks of other serious heath problems:

Heart Disease	Stroke	Kidney Failure
Neuropathy	Lower-Limb Amputations	Blindness

Centers for Disease Control and Prevention, National Diabetes Statistics Report, 2017;
Rowley, et al., Diabetes 2030: Insights from Yesterday, Today, and Future Trends.
Population Health Management. 2017 Feb 1; 20(1)6-12.
American Diabetes Association "Fast Facts" 2017

Existing Diabetes Therapies are Blockbusters

But many patients still not meeting glycemic goals

	Marketer	Drug	Reduction in HbA1c (%)[1]	Global Sales[2]
DPP-IV	MERCK	Januvia® (sitagliptin)	0.7	$6.1 B
	Lilly / Boehringer Ingelheim	Tradjenta® (linagliptin)	0.6	$1.5 B
	AstraZeneca	Onglyza® (saxagliptin)	0.7 - 0.8	$720 M
SGLT-2	Lilly / Boehringer Ingelheim	Jardiance® (empagliflozin)	0.3 - 0.8	$600 M[3]
	Johnson & Johnson	Invokana® (canagliflozin)	0.6 - 0.8	$1.4 B
	AstraZeneca	Farxiga® (dapagliflozin)	0.4-0.5	$835 M
GLP-1	novo nordisk	Victoza® (liraglutide)	1.1	$3.0 B
	Lilly	Trulicity® (dulaglutide)	0.9 - 1.1	$926 M
	AstraZeneca	Byetta/Bydureon® (exenatide)	0.5 - 0.9	$254 M/$578 M

[1]*Placebo corrected. Source: Prescribing information. Clinical trials with novel drug as add-on therapy to metformin*

[2]*Global sales according to company full year 2016 financial reports unless otherwise noted*

[3]*Glabal sales are estimated from Eli Lilly 2016 report and Boehringer Ingelheim 2015 report*

Glucagon Receptor Research

- Glucagon receptor physiology remains an active field of research in 2017

"The human glucagon receptor, GCGR, belongs to the class B G-protein-coupled receptor family and plays ***a key role in glucose homeostasis and the pathophysiology of type 2 diabetes****"*

Source: Nature, Jun 8;546(7657):259-264, 2017

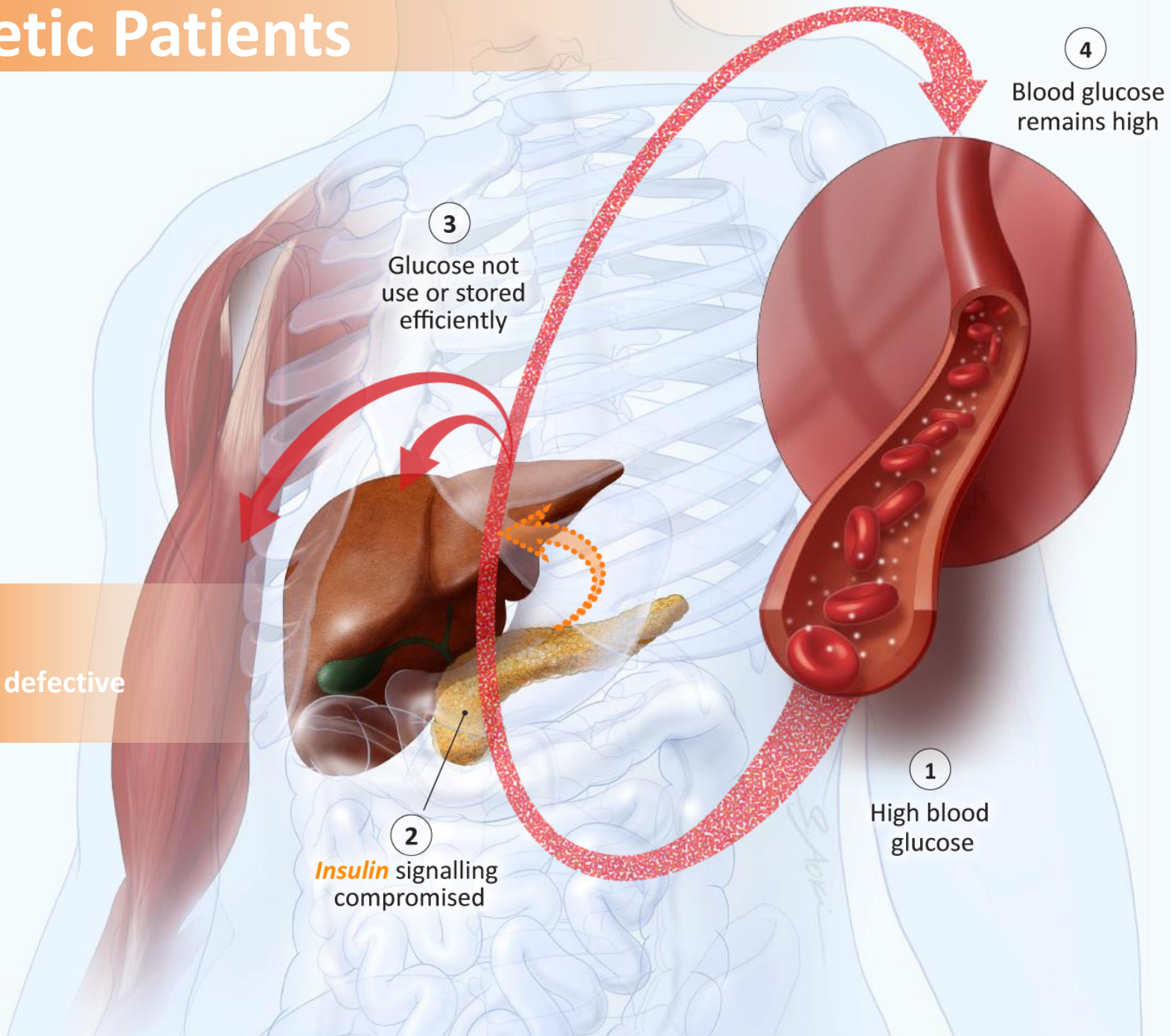
Need for Novel Therapies

Advantages of a Potent GRA

- Product profile and recent clinical data suggest significant market advantages for a safe, highly potent, oral GRA

Existing Class	*Product Profile*	*GRA Advantage*	*GRA Potentially Competitive with Class*	*Potential GRA Combo with Class*
DPP-IV	*Modest reduction of plasma glucose*	 ***Higher glucose reduction***	***√***	***√***
SGLT-2	*Contraindicated for renally impaired patients, safety considerations*	 ***Potentially effective in renally impaired***	***√***	***√***
GLP-1	*Only available as injectables*	 ***Oral***	***√***	***√***

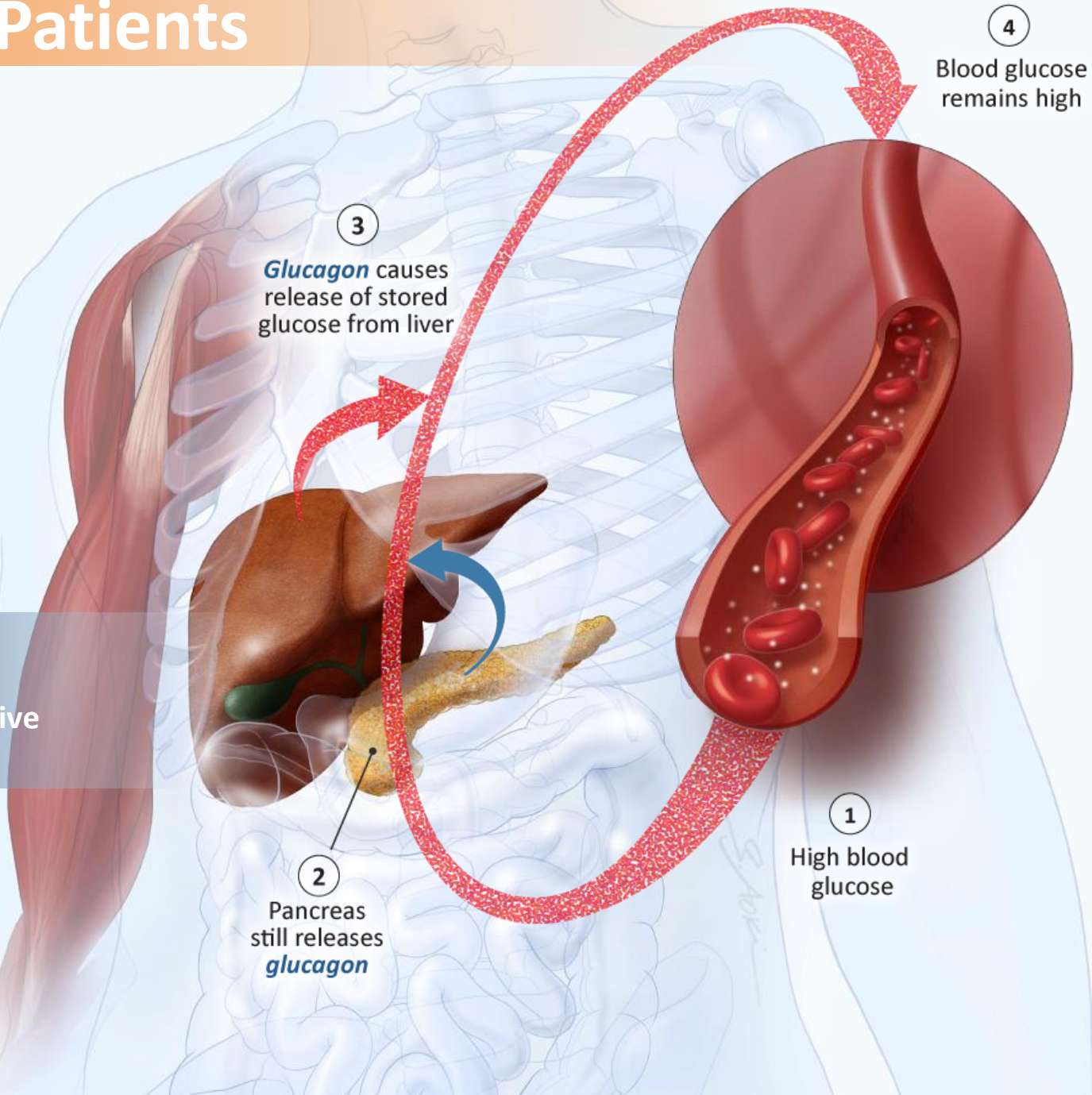
Diabetic Patients



Insulin

Signalling is **defective**

Diabetic Patients

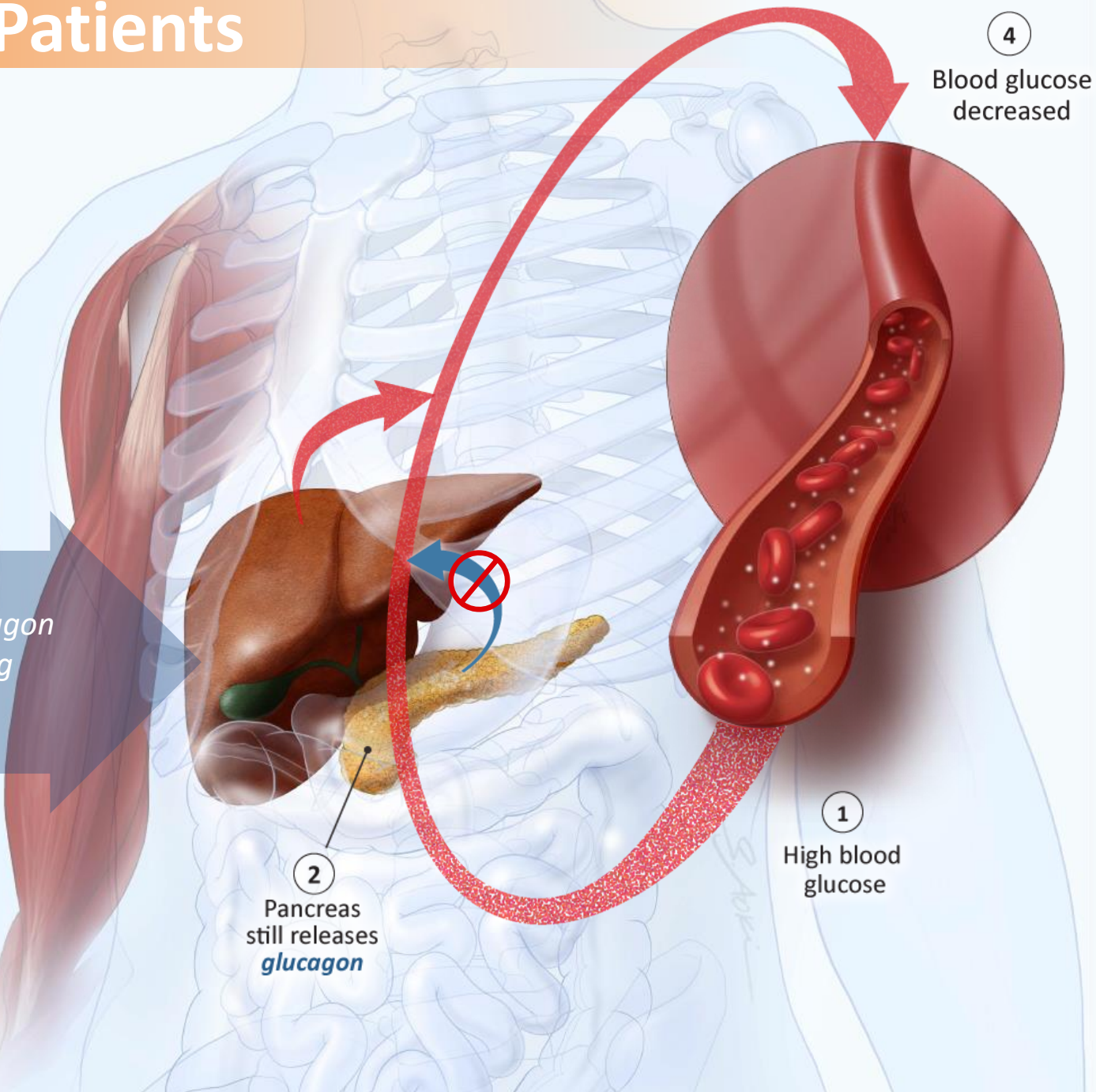


Glucagon

Signalling remains **active**

Diabetic Patients

LGD-6972 *blocks glucagon action in liver, reducing glucose release*



Ligand's GRA: LGD-6972

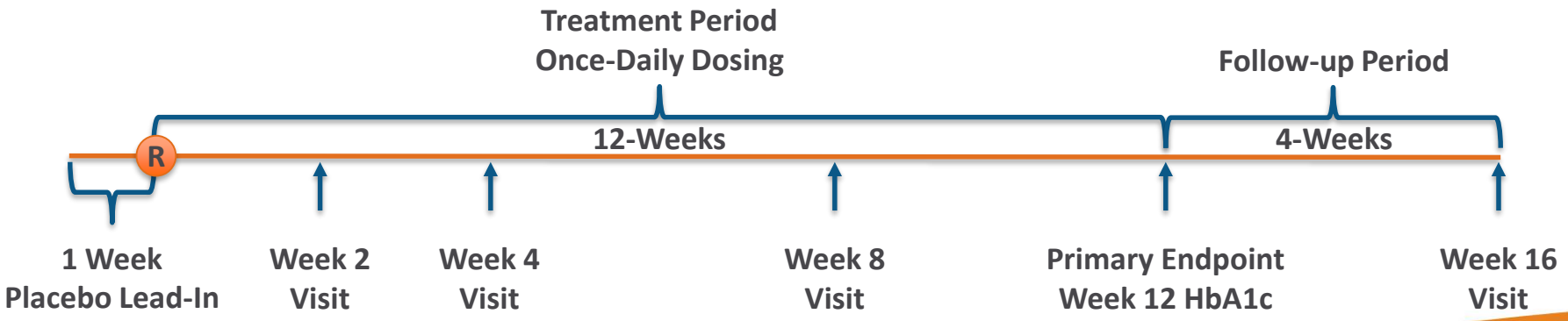
- LGD-6972 is an oral small molecule that potently binds to the glucagon receptor *in vitro* and competitively antagonizes the actions of glucagon
  - Glucose reduction has been demonstrated in animal models of both type 1 and type 2 diabetes
- Clinical trials have demonstrated favorable efficacy and safety profiles
- LGD-6972 has **novel chemistry and strong drug-like properties**
- Global patents, if granted, would not be expected to expire **until 2035**

Reference WO 2015/191900

GRA Phase 2 Study

Summary of Study Design

- Subjects with type 2 diabetes on a stable dose of metformin treated with one of three doses of LGD-6972 (5 mg, 10 mg or 15 mg) or placebo once daily for 12 weeks
  - Primary endpoint was change from baseline in hemoglobin A1c (HbA1c) after 12 weeks of treatment compared to placebo
  - A total of 166 subjects were randomized among 29 clinical sites



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GRA Phase 2 Study

Top-Line Results - Announced in Q3

- LGD-6972 treatment for 12 weeks achieved high statistical significance ($p < 0.0001$) at all doses tested in the primary endpoint of change from baseline in HbA1c compared to placebo
  - — Demonstrated a robust, dose-dependent reduction in HbA1c

ITT Population	*Placebo (n = 41)*	*5 mg (n = 43)*	*10 mg (n = 39)*	*15 mg (n = 40)*
Baseline HbA1c % (SD)	8.16 (0.99)	8.23 (1.06)	8.27 (0.93)	8.19 (0.89)
Change from Baseline[1]	**-0.15 (0.11)**	**-0.90 (0.11)**	**-0.92 (0.12)**	**-1.20 (0.11)**
p-value *vs.* Placebo	-	<0.0001	<0.0001	<0.0001

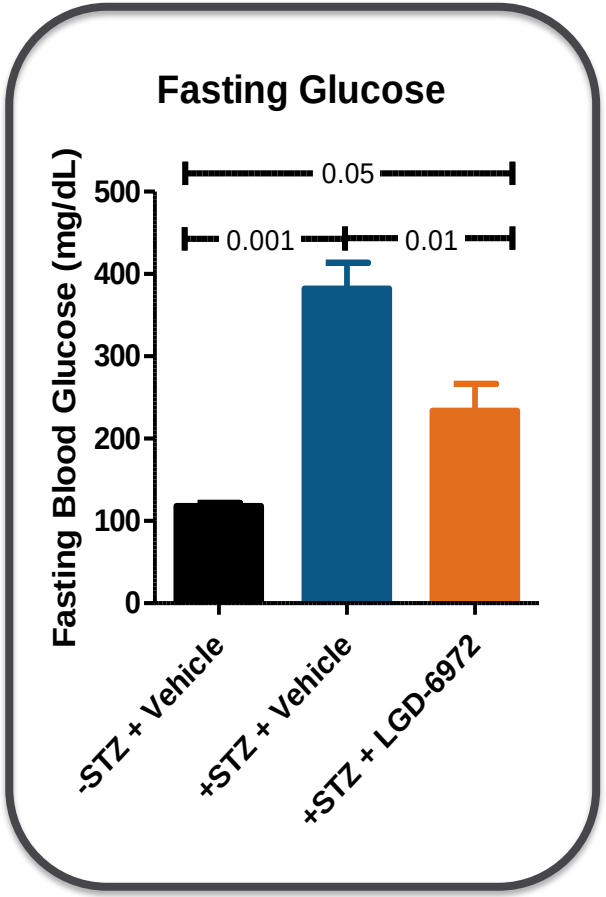
[1]LS-mean (SE) Change from Baseline to Week 12 with LOCF

- LGD-6972 was safe and well-tolerated with **no drug-related SAEs** and **no dose-dependent changes in lipids, body weight or blood pressure**

GRA

Additional Potential Oral Application in Type 1 Diabetes

- Type 1 diabetes represents another potential indication for LGD-6972
  - — Approximately 1.25 million American adults and children have type 1 diabetes
- Recent research suggests that a GRA could ***reduce daily insulin requirements and glucose volatility*** in patients with type 1 diabetes
- LGD-6972 reduced fasting glucose and glucose volatility in mouse type 1 diabetes model



Source: American Diabetes Association "Fast Facts" 2017
Vajda, et al., American Diabetes Assoc. Scientific Sessions 2015

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Financial Overview and Outlook

Matt Korenberg

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Strong Financial Performance and Outlook

- 2017 continues Ligand's track record of annual growth in revenues, cash flow and profits
- Financial outlook for 2018 and beyond expected to show continued growth and the leverage in our model
- Substantial long-term growth potential from existing commercial assets and robust pipeline
- Certainty and longevity of growth profile provides attractive opportunity for investors

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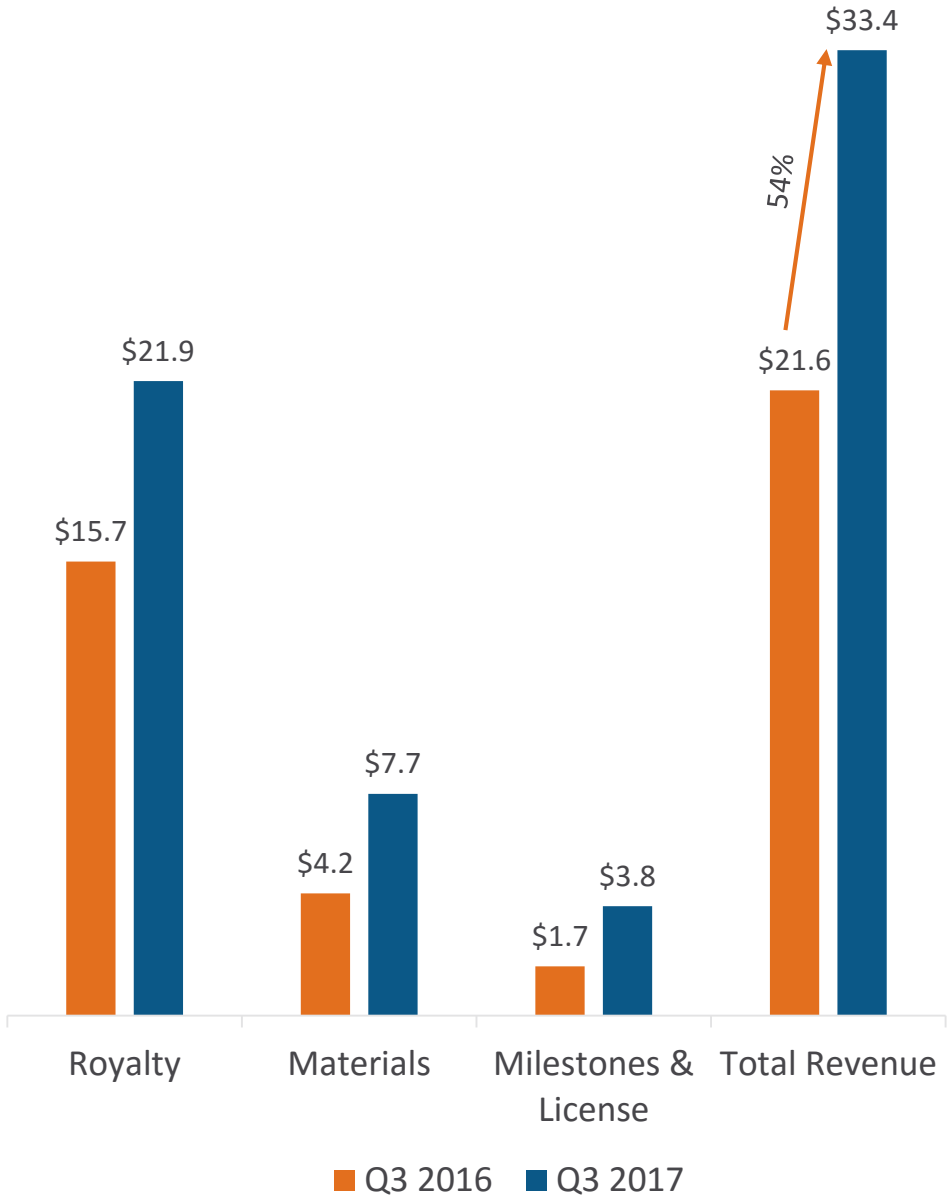
Q3 Revenue Review



- Overall revenue increase of 54% over Q3 2016
- Royalty revenue grew 40% year-over-year, driven by Promacta, Kyprolis and EVOMELA

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Q3 Results Review

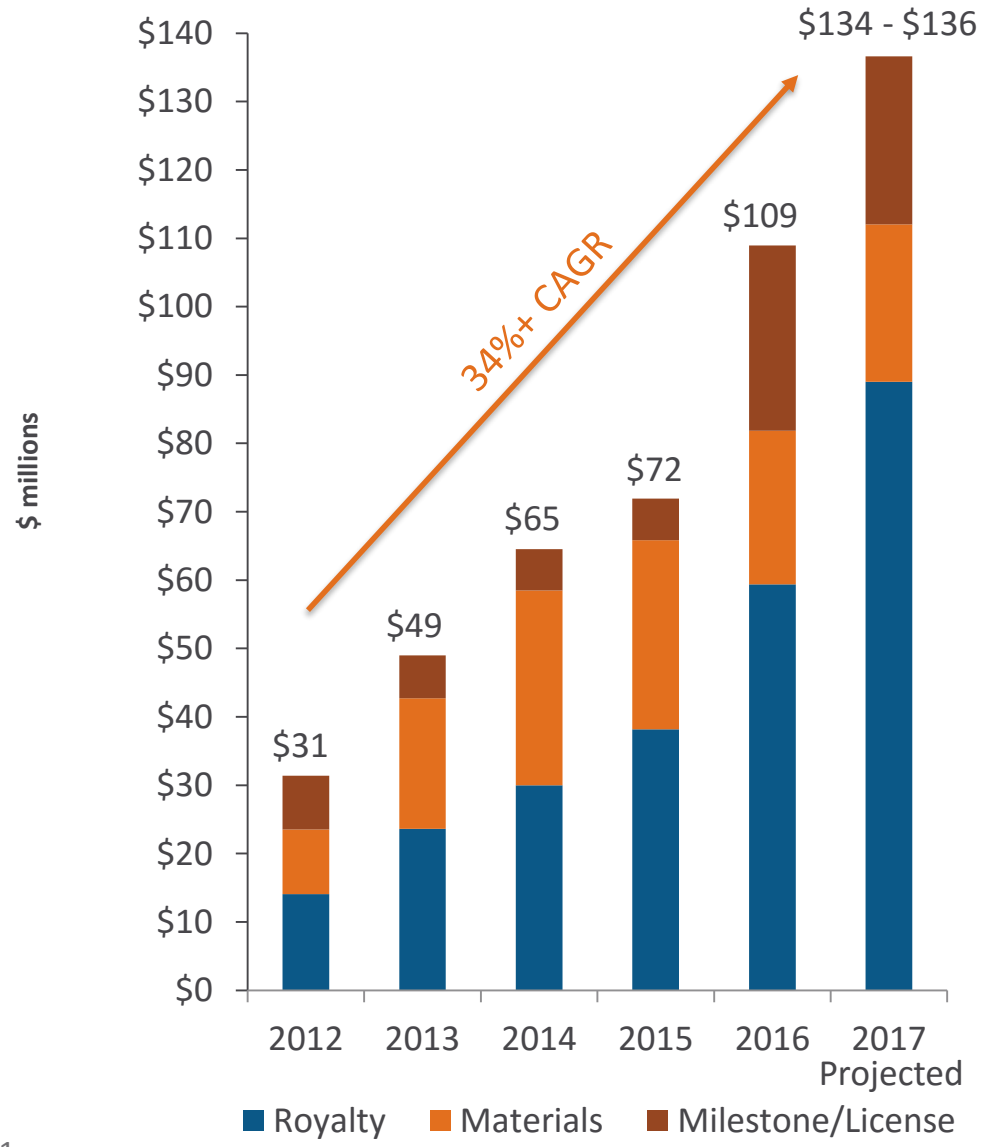
- Corporate gross margin at 93% for Q3 2017 reflecting mix of revenue
- Cash operating expenses ~$6.5M with full year on track for $30M to $31M – up slightly due to expected Q4 Crystal integration and operating expenses
- Income tax expense for GAAP of $3.6M, effective tax rate 30%; cash tax rate to remain <1%
- GAAP Net Income of $8.4M or $0.36 per share compared to $1.1M or $0.05 per share a year ago. Adjusted Net Income of $15.3M or $0.69 per share compared to $9.6M or $0.44 per share a year ago
- Finished the quarter with cash and equivalents of $202M, and now have $175M net of Crystal acquisition, as of November 14, 2017

Reconciliation of GAAP EPS to Adjusted EPS

Q3'17 GAAP Earnings Per Share	**$0.36**
Stock-based compensation expense	0.22
Non-cash interest expense	0.12
Amortization related to acquisitions	0.08
Increase in contingent liabilities	0.06
Loss from Viking	0.04
Other	(0.02)
Income tax effect of adjusted reconciling items	(0.18)
Excess tax benefit from stock-based compensation	(0.04)
2019 Senior Convertible Notes share count adjustment	0.04
Q3'17 Adjusted Earnings Per Share	**$0.69**

GAAP Shares	**23.55**
Dilutive potential common shares issuable of redeemable convertible notes	(1.33)
Adjusted Shares*	**22.22**

Sustained Revenue Growth



- Consistent, strong annual revenue growth driven by:
  - High royalty growth
  - Increasing contribution from milestones
  - Consistent contribution from material sales
- 2017 Adjusted EPS guidance recently increased to $2.95 to $3.00

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Commentary on 2018 Revenue Outlook

- Formal guidance will be given in early 2018
- Royalty:
  - Partner revenue reports of Q4 product sales will impact outlook
- Materials:
  - Timing of orders at year end may shift revenue between 2017 and 2018
- Milestone/License:
  - Timing of milestones at year end may shift revenue between 2017 and 2018

2018 Royalty Commentary

$ in millions

Underlying revenue expected to surpass $2 billion in 2018 with royalty tiering pushing average royalty rate above 5% for the first time in Ligand's history

Illustrative 2018 Royalty Table Based on Sell-side Analyst Projections

Product	Q3 Sales	Q3'17 Annualized	Sell-side Estimates Low	Sell-side Estimates High	Implied Royalties Low	Implied Royalties High
Promacta	$227	$908	$794	$1,065	$64	$89
Kyprolis	$221	$883	$892	$1,078	$19	$25
Evomela	$11	$42	$30	$40	$6	$8
Other (13 marketed products that generate royalty for Ligand)					$1	$2
Total					**$90 - $124**	

- Management will continue to refine our 2018 estimate based on Q4 results from partners, but based on the table above, we see 2018 royalty growth of 15% to 25%

Note: Evomela low and high projections based on approximately 15% decrease/increase from last 4 quarters

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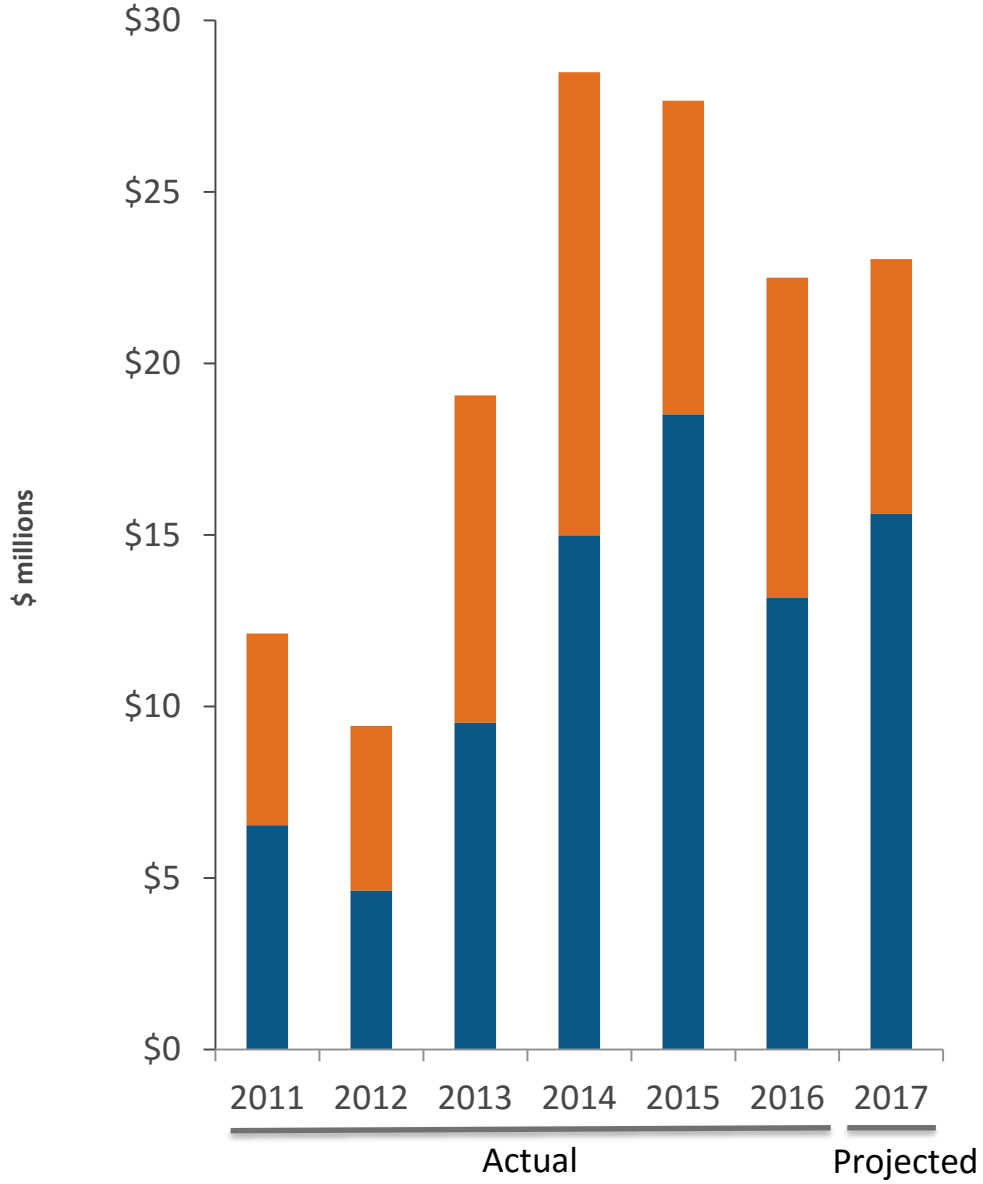
2018 Materials Revenue Commentary



- 2018 outlook generally in line with 2017 projected revenue

Clinical

Commercial

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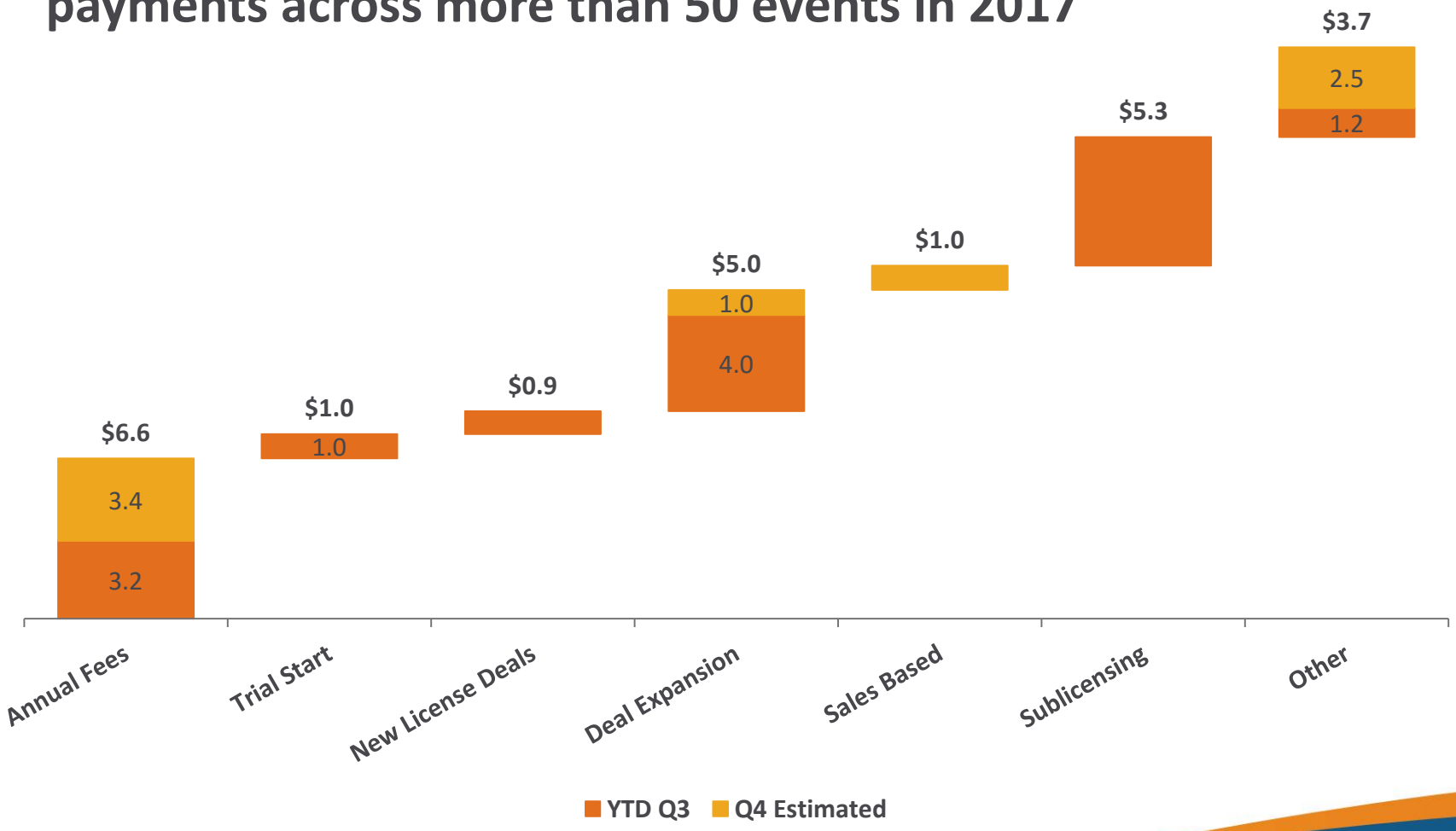
Summary of 2017 Milestone/License

Expecting $23 - $24 million in milestone/license payments across more than 50 events in 2017



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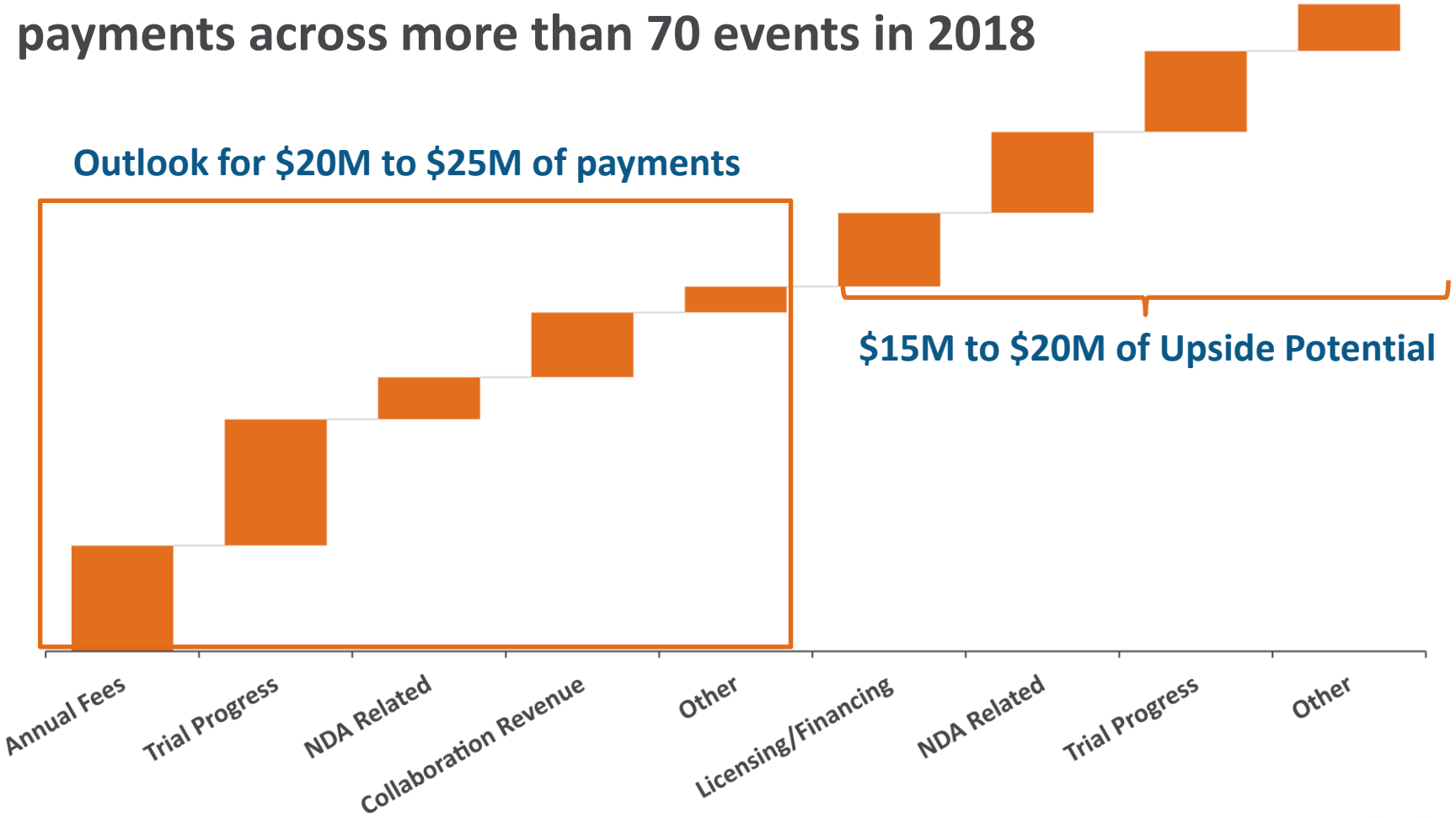
2018 Milestone Commentary

Potential for $40+ million in milestone/license payments across more than 70 events in 2018



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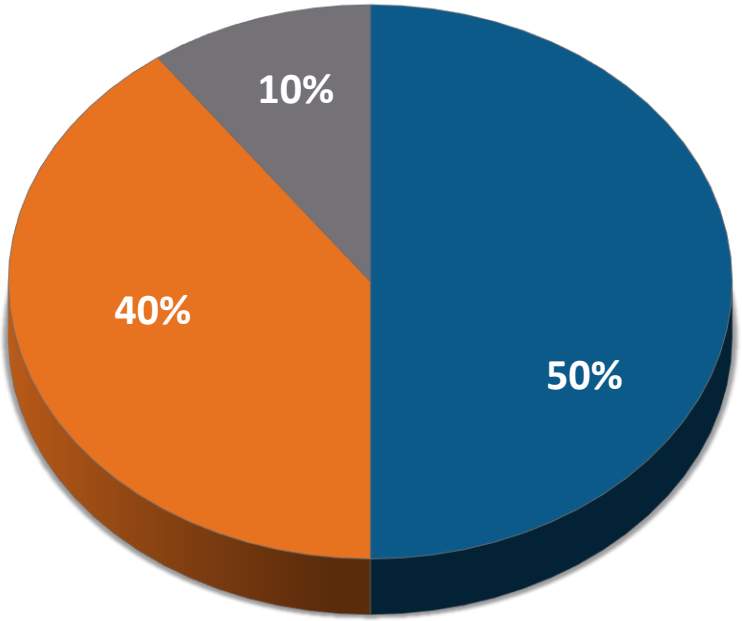
2018 Projected Cost Structure

- Cash expenses of $30 to $32 million, similar to expected 2017 expenses
- Efficient cost structure that supports activities to further expand the "Shots-on-Goal" portfolio

Public Company Costs
Audit, public filing costs, legal, Board costs



Pipeline Costs
Research & development, business development and patent maintenance costs

Company Operations
Facilities, insurance, taxes and administrative expenses

2018 Preliminary Outlook

	2018 Outlook
Revenue	• **Royalty** Q4 will inform; sell-side analyst research shows $90M to $124M centering around 15% to 25% growth • **Materials** 2018 demand expected to be in line with 2017 demand of ~$23M • **Milestone/License** initial analysis shows $20M to $25M with $15M to $20M potential upside
Corporate gross margins	• 94% - 96%
Cash operating expense	• Expected to be relatively flat to 2017 at $31M
Fully-diluted share count	• Approximately 22.3M at year end with no 2018 issuance expected beyond stock based compensation
Adjusted EPS tax rate	• Expected range of 36% to 39%
Cash tax rate	• <1%

2018 Revenue Impact from ASC 606

Royalties

- Previously recognized our royalties one quarter after the underlying product revenue was realized by partners
- Under ASC 606, we expect to recognize our royalties in the same quarter as the underlying product revenue is realized

Materials

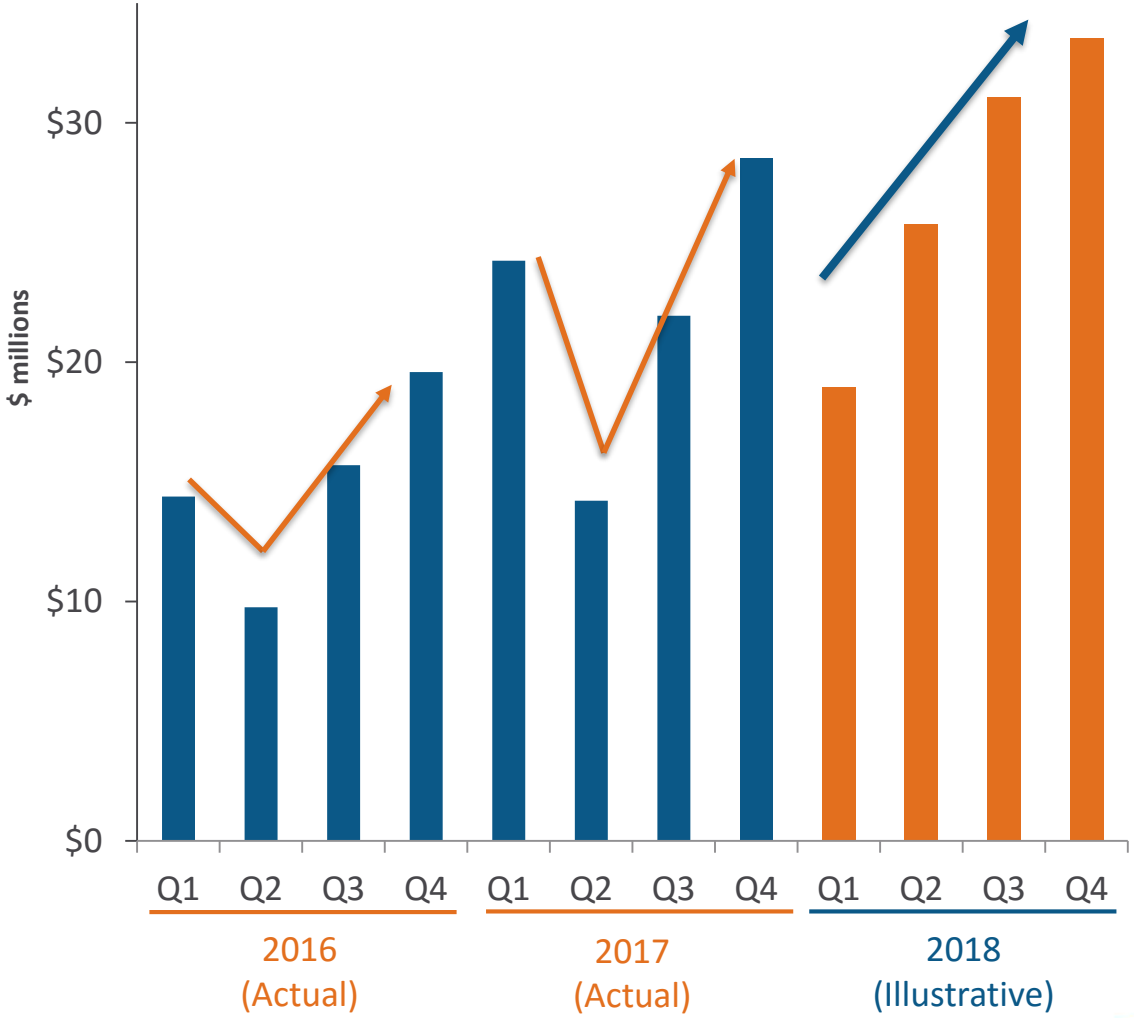
- No expected impact

Milestone/License

- Previously recorded revenue primarily upon occurrence of an event (trial start, IND filing, FDA approval, etc.)
- Under ASC 606, required to asses the probability of each event occurring and book revenue when deemed probable
- Based on Ligand experience, significant majority of our milestones, if not all, are not probable until event occurs

Quarterly Royalty Revenue Pattern

Quarterly revenue patterns starting in 2018 will differ from historical trends, due to ASC 606



- Prior to 2018, royalties were reported on a lag and Q2 saw a dip due to the annual resetting of royalty tiers
  - Royalties will now be reported in the quarter they are earned, moving annual reset one quarter earlier

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Mergers and Acquisitions Philosophy

- Ligand is interested in a wide variety of assets that add to the diversity of our portfolio
- In evaluating potential company and asset acquisitions, there are several key characteristics we look for:
  - Minimal operational requirement, low associated spend and cash flow positive
  - Technology that can be out-licensed to generate additional fully-funded Shots on Goal
  - Assets with long patent life that will contribute peak revenue to Ligand in 10+ years
- Most assets will not share all of these characteristics, but we focus on finding assets that can be made to fit our model

Upcoming Potential Partner/Licensee Events

Potential milestones for Ligand and partners in coming quarters

Company	***Program***	***Milestone***
Lundbeck	Carnexiv	US Launch
Melinta Therapeutics	BAXDELA	US Launch
Novartis	Promacta	FDA Filing (1st line SAA)
Coherus Biosciences	CHS-0214	MAA Filing
Daiichi Sankyo	Esaxerenone/CS-3150	Japanese regulatory filing (Hypertension)
Sage Therapeutics	SAGE-547	NDA submission (Postpartum Depression)
Retrophin	Sparsentan	Phase 3 start
Amgen	Kyprolis	PDUFA for ENDEAVOR Overall Survival data addition to label
Amgen	Kyprolis	Phase 3 start (NDMM in combo with REVLIMID®/Dex)
Takeda	Pevonedostat	Phase 3 start (High-risk MDS)
Takeda	Pevonedostat	Phase 2 completion (Advanced MDS)
Marinus	Ganaxolone IV	Phase 2 completion
Internal Program	GRA	Phase 2 full dataset presentation (Type 2 Diabetes)
VentiRx	VTX-2337	Phase 2 completion (Ovarian cancer; Head & Neck cancer)

Upcoming Potential Partner/Licensee Events

Potential milestones for Ligand and partners in coming quarters

Company	***Program***	***Milestone***
Lilly	Merestinib	Phase 2 completion (Biliary Tract Cancer)
Lilly	Prexasertib	Phase 2 completion (Small Cell Lung Cancer)
Viking Therapeutics	VK5211	Phase 2 completion (Hip Fracture)
Viking Therapeutics	VK2809	Phase 2 completion (Hypercholesterolemia/NASH)
Aldeyra Therapeutics	Reproxalap (ADX-102)	Phase 2 completion (Allergic Conjunctivitis)
GSK	GSK2894512	Phase 2 completion (Atopic Dermatitis)
CURx Pharma	IV-Topiramate	Phase 2 start (Epilepsy)
Sermonix	Lasofoxifene	Phase 2 start (Breast Cancer)
Bristol Meyers Squibb	CXL-1427/BMS-986231	Phase 2 completion (Heart Failure)
Precision Biologics	NPC-1C	Phase 1/2 completion (Pancreatic Cancer)
GSK	GSK2816126	Phase 1 completion (DLBCL)
Aptevo Therapeutics	APVO436	IND filing (AML)
Vireo Health	Cannabinoids	IND for Captisol-enabled Formulations


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