



# Writing the Future

EMILY LEPROUST, PH.D., CEO and CO-FOUNDER



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This presentation contains forward-looking statements. In particular, statements regarding Twist Bioscience Corporation's ("Twist," "we" or "our") expectations regarding its future financial performance, the impact of the COVID-19 pandemic on Twist's future financial performance, Twist's ability to address the challenges posed by the business and economic impacts of COVID-19 pandemic, diversification and revenue growth across all product categories, introduction of new products, the use of our products by the healthcare sectors for the potential detection and treatment of diseases, expectations regarding newly announced partnerships and expectations and objectives of management constitute forward-looking statements. Forward-looking statements can be identified by the fact that they do not relate strictly to historical facts and generally contain words such as "believes," "expects," "may," "will," "should," "seeks," "approximately," "intends," "plans," "estimates," "anticipates," and other expressions that are predictions of or indicate future events and trends and that do not relate to historical matters. Although the forward-looking statements contained in this presentation are based upon information available at the time the statements are made and reflect management's good faith beliefs, forward-looking statements inherently involve known and unknown risks, uncertainties and other factors, which may cause the actual results, performance or achievements to differ materially from anticipated future results. Important factors that could cause actual results to differ materially from expectations include, among others: the risks and uncertainties of the duration, extent and impact of the COVID-19 pandemic, including any reductions in demand for Twist's products (or deferred or canceled orders) globally or in certain regions; the ability to attract new customers and retain and grow sales from existing customers; risks and uncertainties of rapidly changing technologies and extensive competition in synthetic biology could make the products Twist is developing obsolete or non-competitive; uncertainties of the retention of a significant customer; supply chain and other disruptions caused by the COVID-19 pandemic or otherwise; risks of third party claims alleging infringement of patents and proprietary rights or seeking to invalidate Twist's patents or proprietary rights; and the risk that Twist's proprietary rights may be insufficient to protect its technologies. You should not place undue reliance on these forward-looking statements, which speak only as of the date hereof. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. Factors that may cause actual results to differ materially from any future results expressed or implied by any forward-looking statements include the risks described in the "Risk Factors" section of our Annual Report on Form 10-K for the year ended September 30, 2019, and our Quarterly Report on Form 10-Q for the three months ended March 31, 2020, as well as those set forth from time to time in our other SEC filings, available at <http://www.sec.gov>. We do not undertake to update or revise any forward-looking statements after they are made, whether as a result of new information, future events, or otherwise, except as required by applicable law. We do not undertake to update or revise any forward-looking statements after they are made, whether as a result of new information, future events, or otherwise, except as required by applicable law.

This presentation also contains estimates and other statistical data made by independent parties and by us relating to market size and growth and other data about our industry. This data involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates. Neither we nor any other person makes any representation as to the accuracy or completeness of such data or undertakes any obligation to update such data after the date of this presentation. In addition, projections, assumptions and estimates of our future performance and the future performance of the markets in which we operate are necessarily subject to a high degree of uncertainty and risk.

By attending or receiving this presentation you acknowledge that you will be solely responsible for your own assessment of the market and our market position and that you will conduct your own analysis and be solely responsible for forming your own view of the potential future performance of our business.

**DNA is Changing the World**

# Synthetic DNA Is the Future of Everything



**CHEMICALS**  
Sustainability



**FOOD**  
Food Security



**THERAPEUTICS**  
Health



**DIAGNOSTICS**  
Precision Medicine



**DATA STORAGE**  
Preserving Heritage

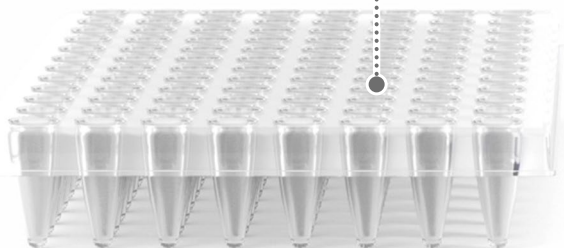


# Twist DNA Writing on Silicon Platform

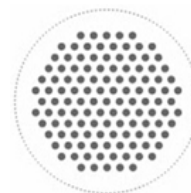


## Everyone else

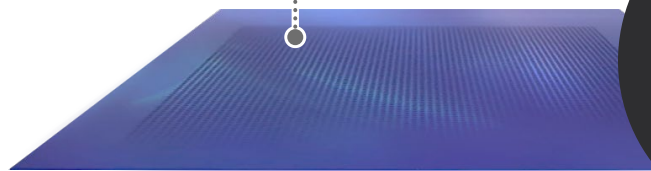
1 oligo per well



96 Well Plate  
makes 1 gene



1M oligos per chip



TWIST Silicon Platform  
can make 9,600 genes

Up to  
**10,000x**  
more scale &  
throughput



**State of the  
art commercial  
infrastructure**

.....

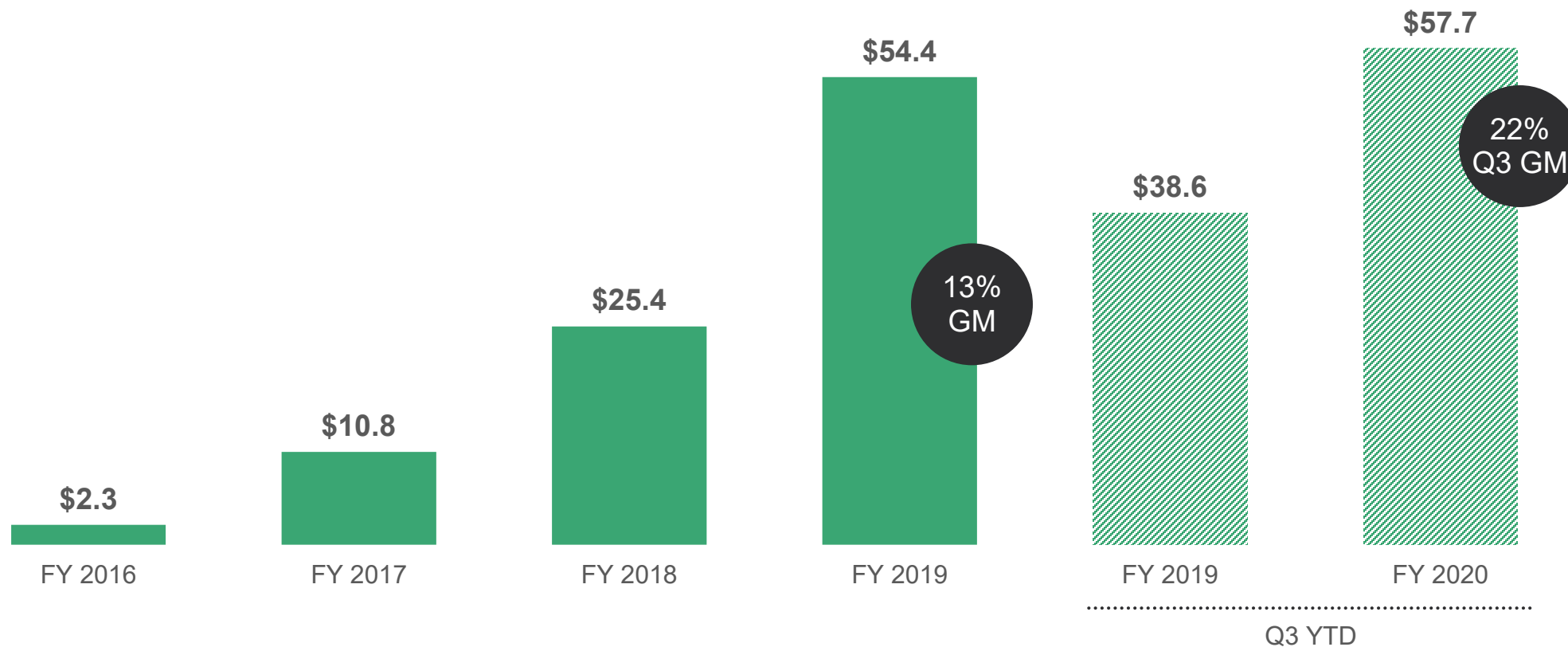
Proprietary software

Robotics

Integrated  
ecommerce platform

Manufacturing  
execution system

# Strong Revenue Growth and Increasing Gross Margin





# We are Building a Diverse Portfolio of Businesses



Drug  
Discovery

Data  
Storage

**High-value  
solutions**  
Future upside

**Tools**  
High-growth  
revenue today

Synthetic  
Biology

Next-Gen  
Sequencing



# Highlights YTD 2020



COVID-19 antibodies  
and pharma  
validation

IARPA project  
and funding

**High-value  
solutions**  
Future upside

Data  
Storage

Drug  
Discovery

**Tools**  
High-growth  
revenue today

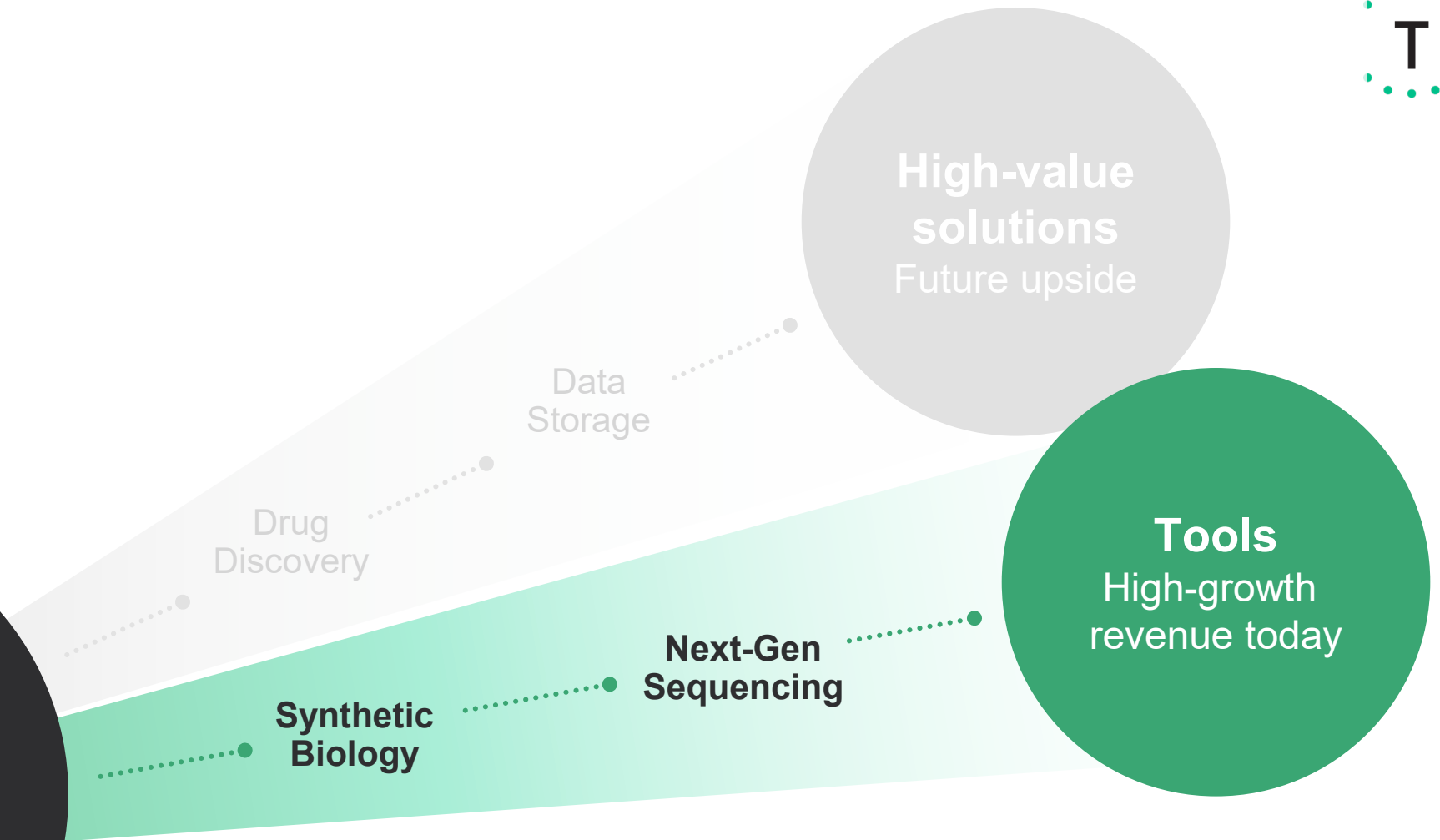
Next-Gen  
Sequencing

Synthetic  
Biology

Infectious disease  
panels and synthetic  
controls

Product line  
expansion



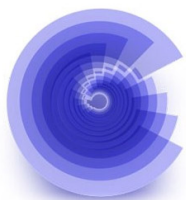


# Synthetic Bio: Largest Selection of DNA Offered



## Innovative Online Ordering

**TODAY**



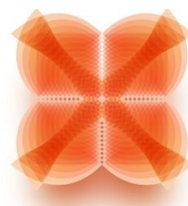
**Genes**

Clonal  
Non-clonal fragments



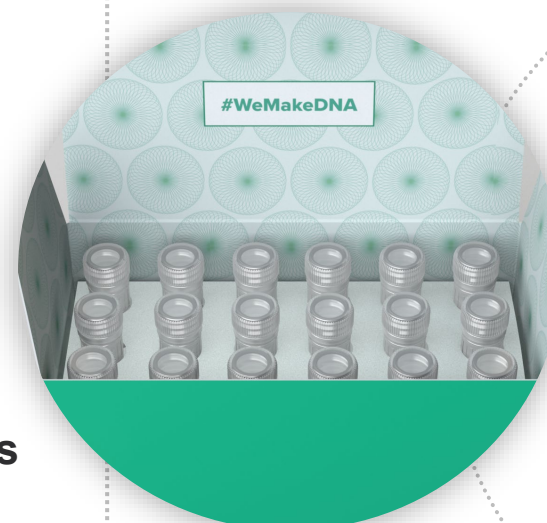
**Oligo Pools**

sgRNA



**Variant Libraries**

Site saturation  
Combinatorial



## ROADMAP

DNA preps\*

IgG

Clonal-ready  
gene fragments

\* Recently launched

# Innovative Online Ordering



T

M

CLONAL GENES

My Genes Project

OVERVIEW > GENE IMPORT > PRICING & SCORE

Change Vector

+ Flanks

Optimize

+ Genes

+ Custom Vector

#

☐

NAME ↓

SEQUENCE

BP

VECTOR

SCORE ⓘ

PRICE

1

☐

gene-001

ACTCGACTGACTAGC...

1264

Select Vector ▼

\$113.76

2

☐

gene-002

ACTCGACTGACTAGC...

1014

Select Vector ▼

\$91.26

3

☐

gene-003

ACTCGACTGACTAGC...

978

Select Vector ▼

\$88.02

4

☐

gene-004

ACTCGACTGACTAGC...

848

Select Vector ▼

[Fix it](#)

5

☐

gene-005

ACTCGACTGACTAGC...

1200

Select Vector ▼

\$108.00

6

☐

gene-006

ACTCGACTGACTAGC...

1124

Select Vector ▼

\$101.16

7

☐

gene-007

ACTCGACTGACTAGC...

1200

Select Vector ▼

[Fix it](#)

8

☐

gene-008

ACTCGACTGACTAGC...

1087

Select Vector ▼

\$97.83

9

☐

gene-009

ACTCGACTGACTAGC...

1200

Select Vector ▼

\$108.00

32 GENES • 26,400 BP

All (240)

Easy (24)

Difficult (4)

Error (2)

Not Possible (2)

PRICING SUMMARY ⓘ

NAME	QTY	COST
Easy Genes	24	\$2,376.00
Cloning Fee	24	\$1,300.00

DELIVERY FORMAT

☒ Plate: 96 Well, Horizontal

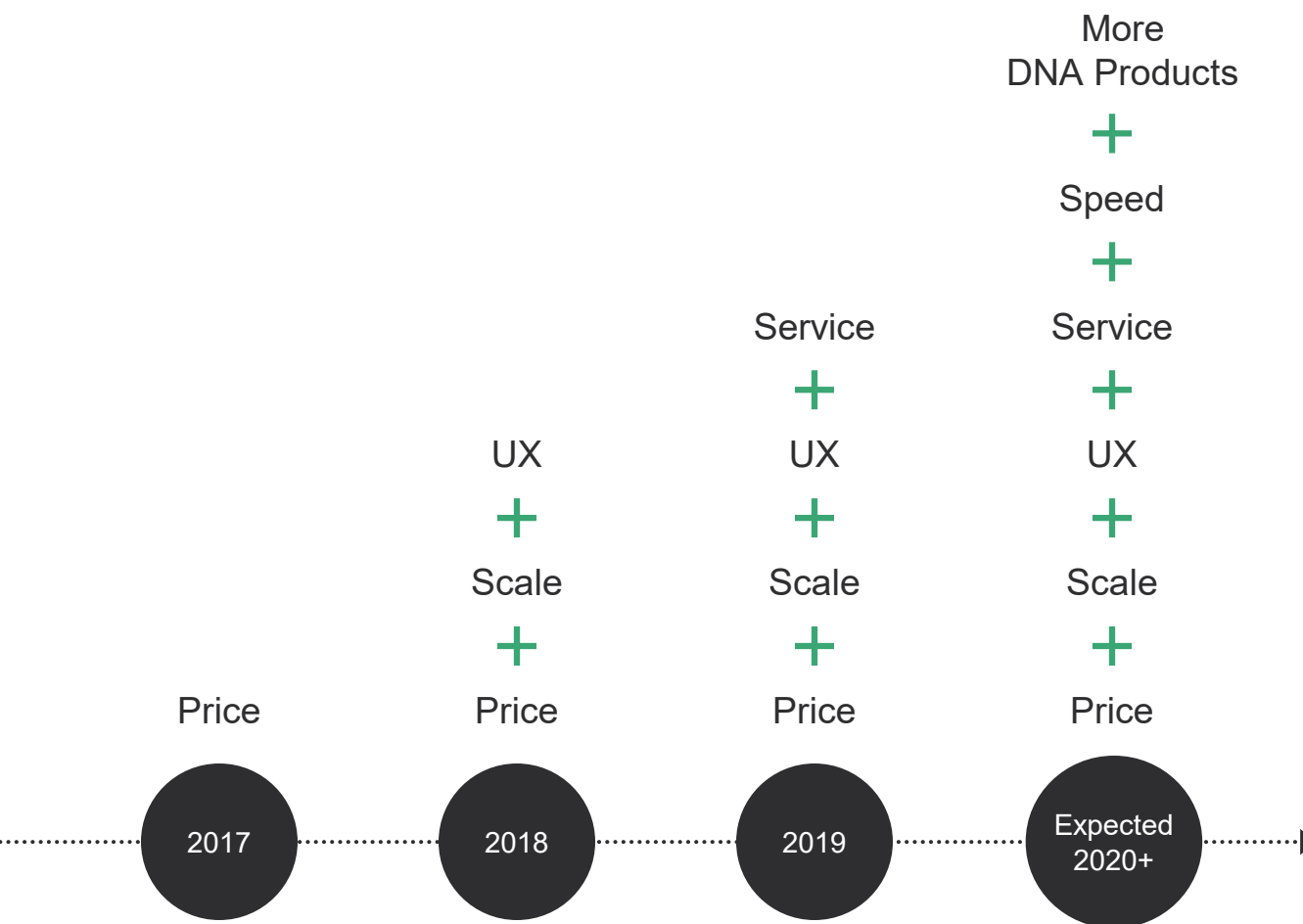
☐ Tube [Edit](#)

Total

\$3,676

Checkout

# Synthetic Bio: Why We Win



## We Deliver

- High quality DNA
- Competitive turnaround
- Affordability
- Fast throughput
- Unique customer experience
- Innovation



VANDERBILT  
UNIVERSITY  
MEDICAL  
CENTER

“Twist’s very high-throughput platform allowed us to quickly and efficiently examine thousands of possible antibodies in order to select the best results faster than ever before.”

Robert Carnahan, Associate Director,  
Vanderbilt Vaccine Center

# Synthetic Bio: Continued Growth



## FY20 Proof Points (9 mos)

1403

Customers

11B

Bases shipped

252K

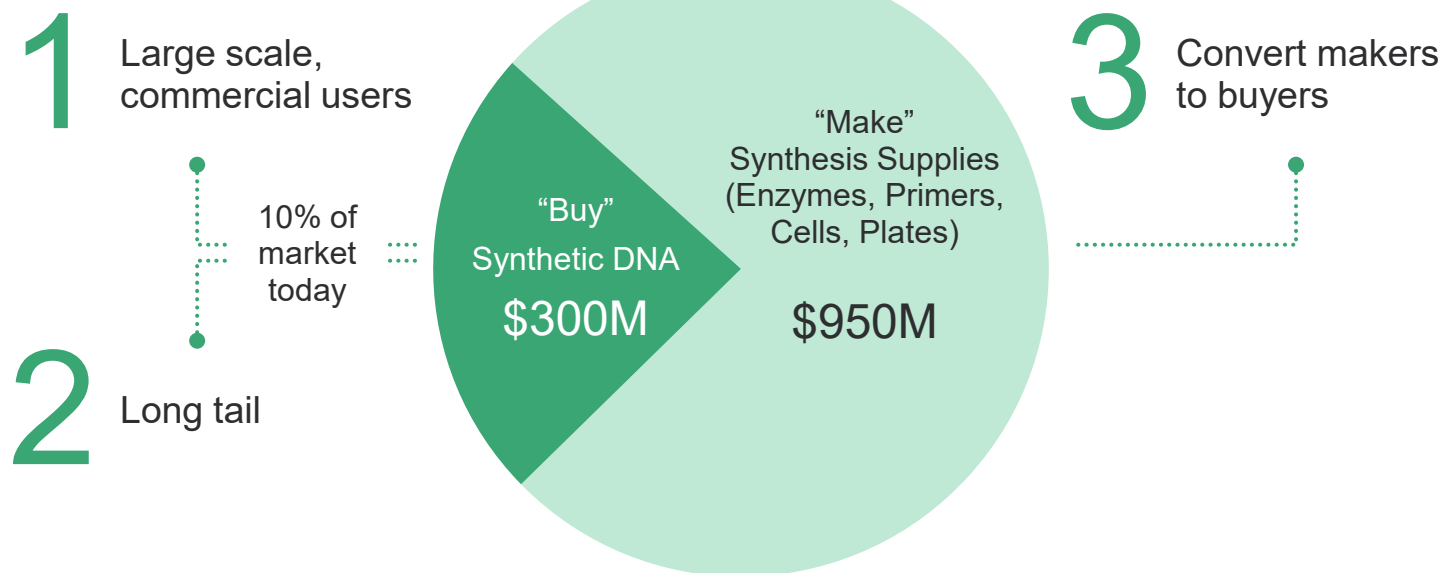
Genes shipped

98%

Orders via ecommerce

## Strategy for Large Market

\$1.3B / year









Source: BCC Research, Markets and Markets Report, Twist internal estimates

# NGS: Broad Offering to Meet Expanding Applications



## Today

-  Human Core Exome
-  Fixed Panels
-  Custom Panels
-  Library Preparation
-  Reagents and Kits
-  Synthetic Viral Controls

## ROADMAP

Targeted Methylation\*

Oncology

SNP Microarray  
conversion to NGS

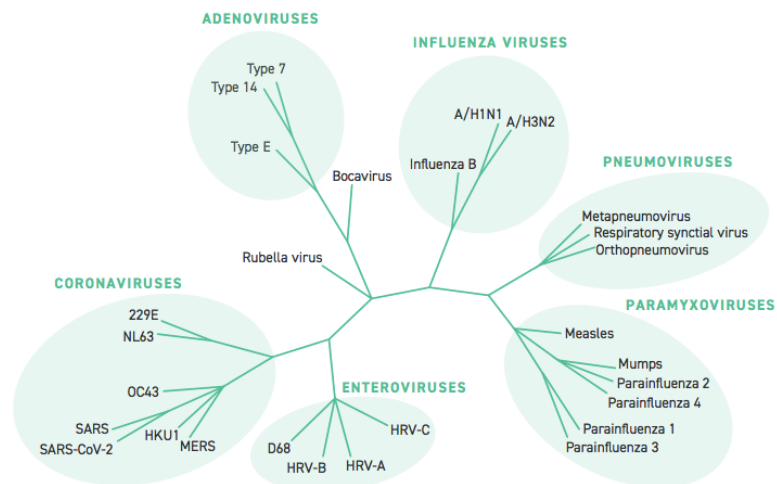
## Targeted Sequencing

is powering new applications

- Liquid biopsy
- Rare disease
- Oncology
- Population genetics
- Infectious diseases

\* Recently launched

## 7 Synthetic SARS-CoV-2 Controls



- Positive controls: NGS and (RT-PCR) assays
- QC for the development, verification and ongoing validation of diagnostic tests
- Included on the FDA website as reference materials for SARS-CoV-2

## Research Panels for SARS-CoV-2 and Respiratory Viral Infections

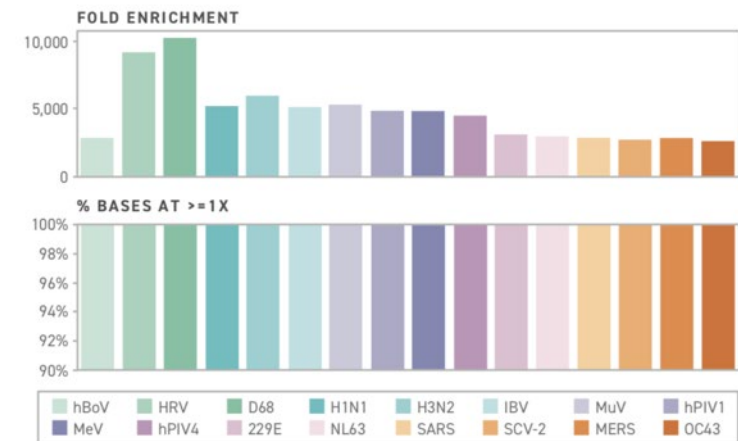
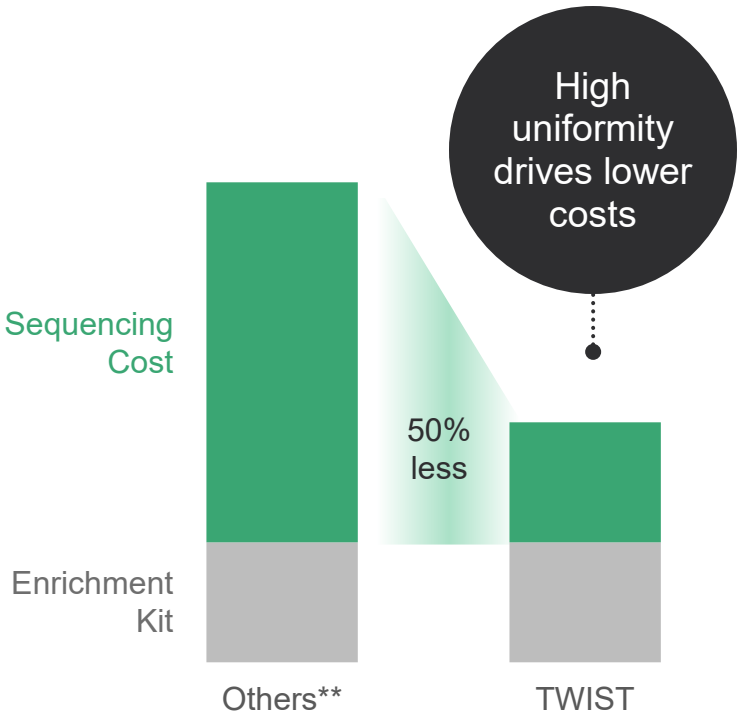


Figure 1: Fold-enrichment and percent of genome covered at 1x for viral controls after target enrichment. Full names for abbreviated viruses are present in Table 1.

- Target enrichment panel for viral detection and characterization of SARS-CoV-2
- Environmental monitoring and surveillance testing
- Track viral evolution and strain origin



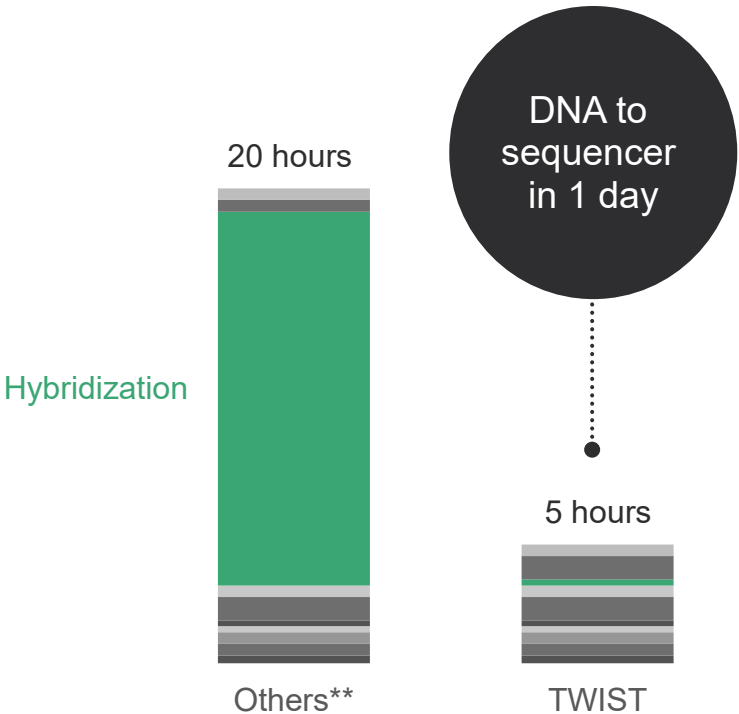
## Low Cost per Sample



## Rapid Customization



## Fast Throughput\*



\*Includes pooling 1 & 2, pre-hybridization, hybridization, binding, wash steps, amplification, purification, target environment QC, and NGS prep  
\*\*Illustrative models based on Twist's knowledge of competing technologies.



## FY20 Proof Points (9 mos)

781

Customers shipped

47

In production

9

OEM partners

2

SNP microarray conversion

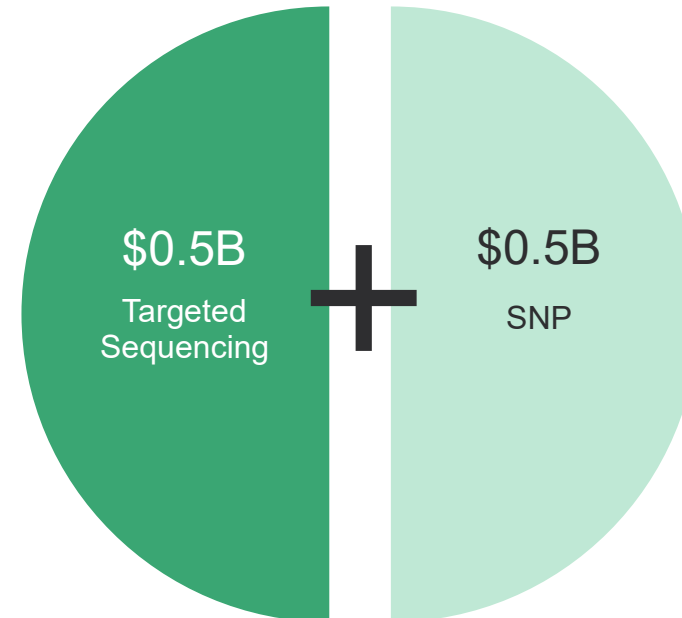
## Strategy for Expanding Market to \$1B

1

More pilots

2

Drive conversion



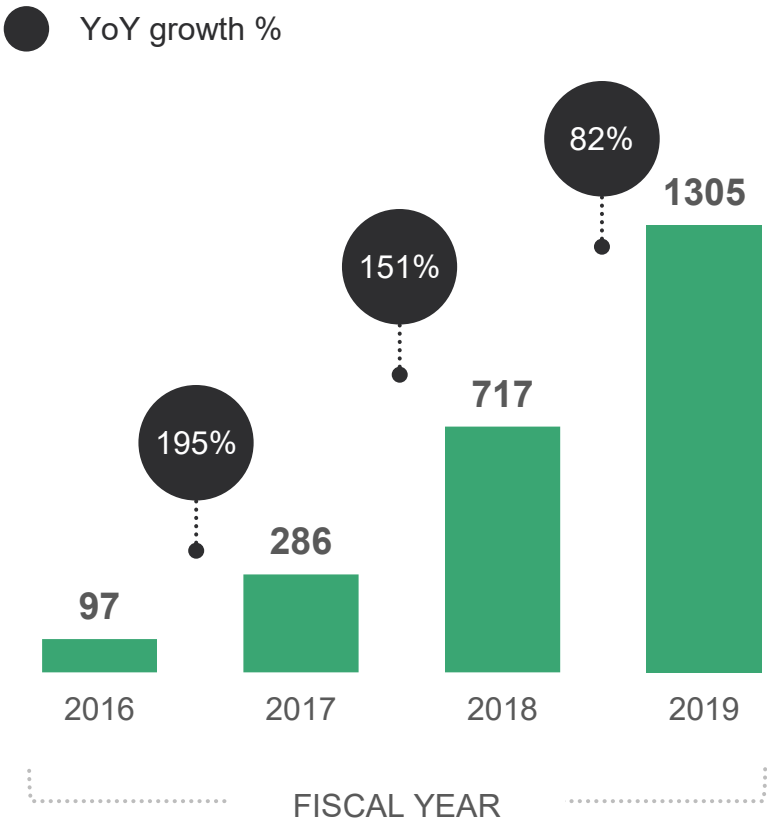
3

Add applications

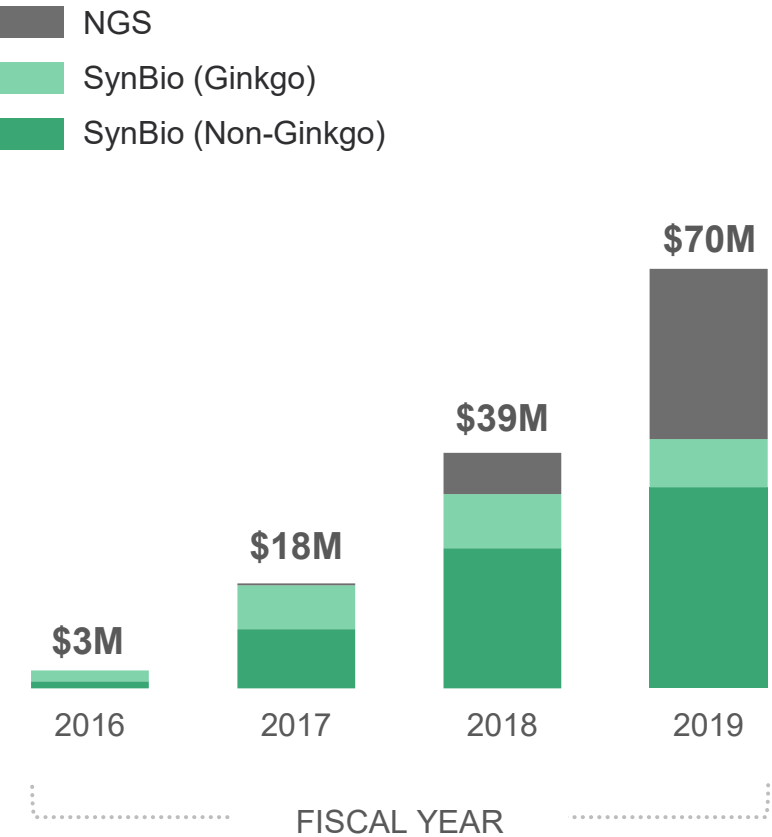
# Core Business Growth



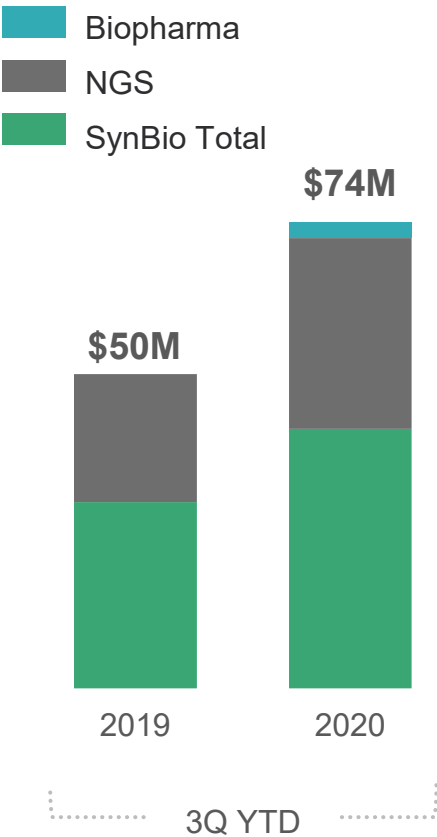
## Total Customers (SynBio & NGS)



## Orders



## Orders





# We are Building a Diverse Portfolio of Businesses



Drug  
Discovery

Data  
Storage

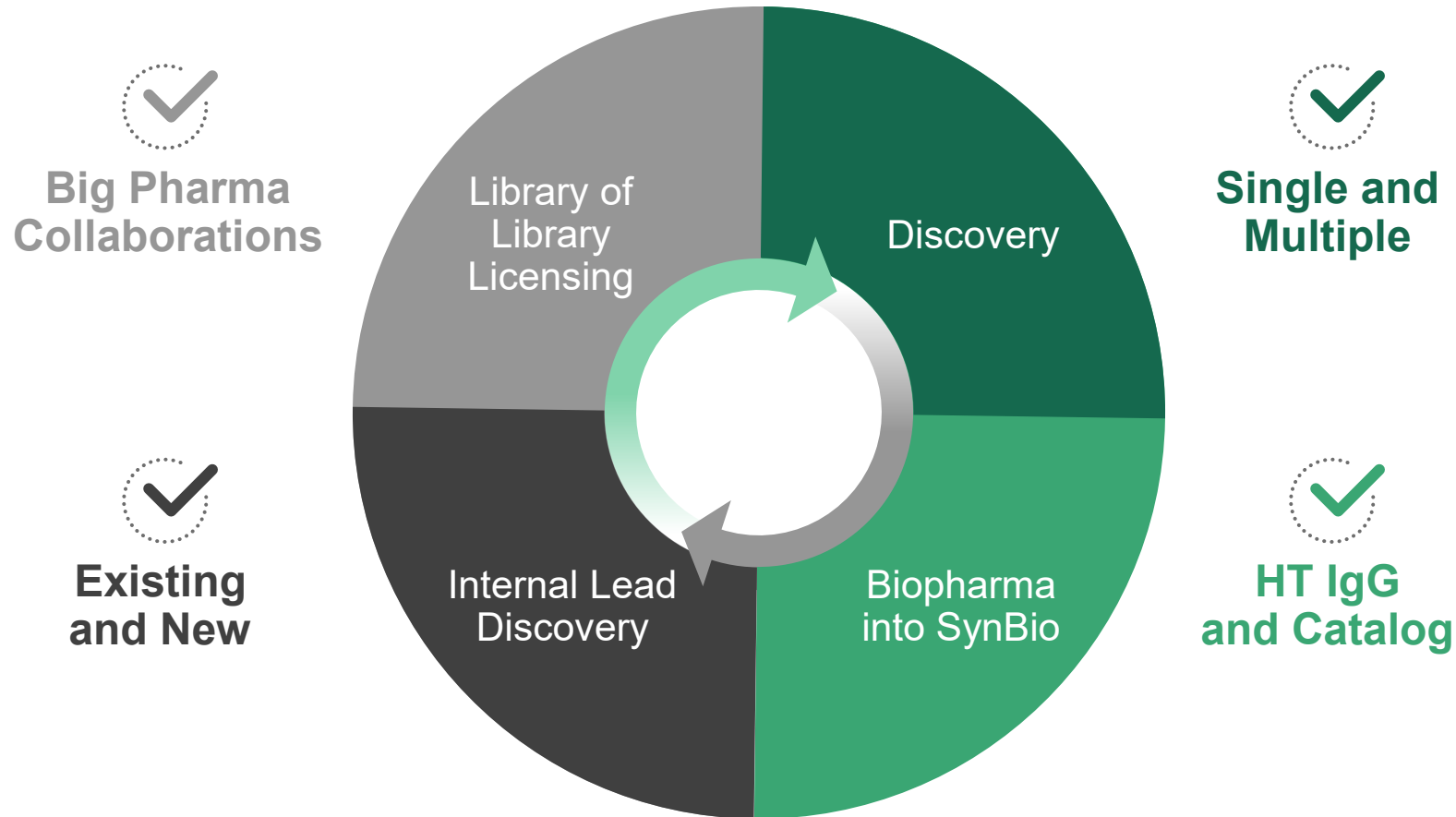
**High-value  
solutions**  
Future upside

**Tools**  
High-growth  
revenue today

Synthetic  
Biology

Next-Gen  
Sequencing

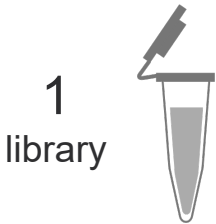
# Biopharma: Validated and Expanding Offering



We are advancing our business model with partners and for Twist development



Everyone else



Twist

Pan hundreds  
of antibody libraries  
against every target

LIBRARY  
OF  
**LIBRARIES**

Random	DNA	Human repertoire
Low	SCALE	High
Manual	PROCESS	Automatic
100s	STAFF	10

# Biopharma: SARS-CoV-2 Antibodies for Diagnostic and Therapeutic Applications



## Twist's Broad Approach

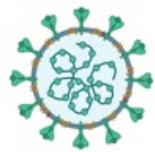
#1

Spike Protein  
Neutralizing Ab

#2

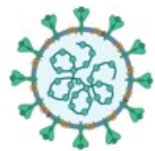
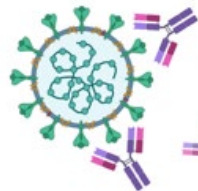
Anti-ACE2  
Blocking Ab

SARS-CoV-2 Virus



Infection

Anti-S1 Protein Antibody



Anti-ACE2 Antibody



Epithelial Cell

ACE2

**RAPID DISCOVERY**

Dozens of mAbs Identified

**DATA VALIDATION**

Pseudo-virus

**LIVE VIRUS TESTING**

In Process

# Biopharma: Pipeline of Functional Monoclonal Antibodies



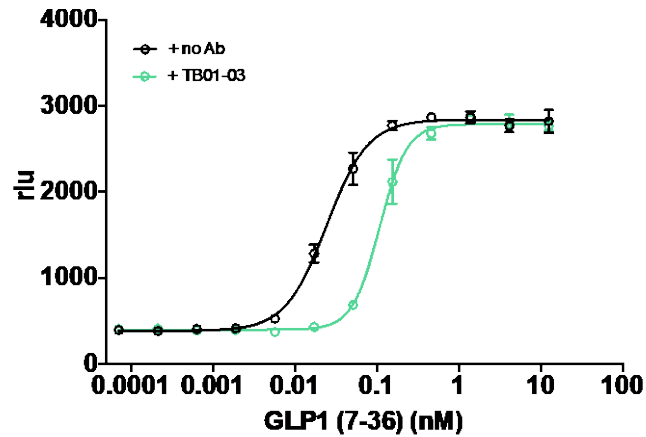
GPCR TARGET	INDICATION
ADORA2A	Cancer
CRTH2	Asthma / inflammation
CXCR4	Cancer
CXCR5	Asthma / inflammation
FSHR	Infertility
GLP1R	Diabetes / rare metabolic diseases
V2R	Cancer

We are working  
to optimize these leads  
and leverage our  
platform for partnering  
discussions

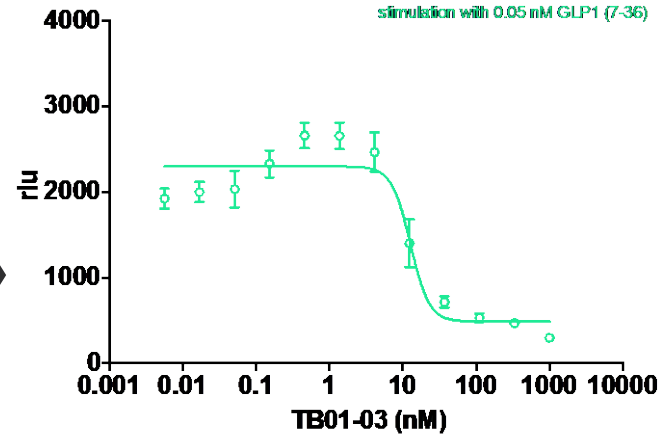
# GPCR Development Candidate: TBO1-3 is Potent GLP1R Antagonist



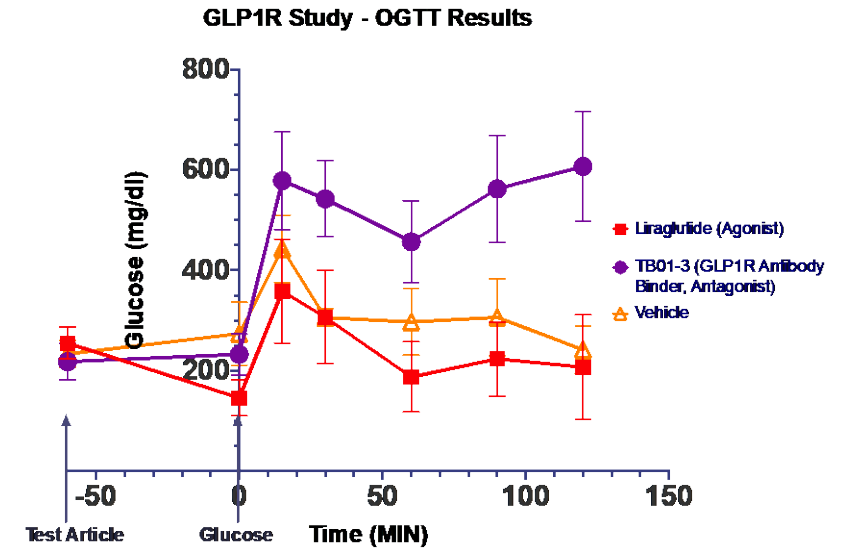
## TBO1-3 Inhibits GLP1:GLP1R Signaling



## Complete Inhibition at Higher Concentrations



## In Vivo Efficacy with Glucose Tolerance Mouse Study



TBO1-3 dosed animals maintain sustained high glucose levels after glucose administration, indicating GLP1:GLP1R signal blockade

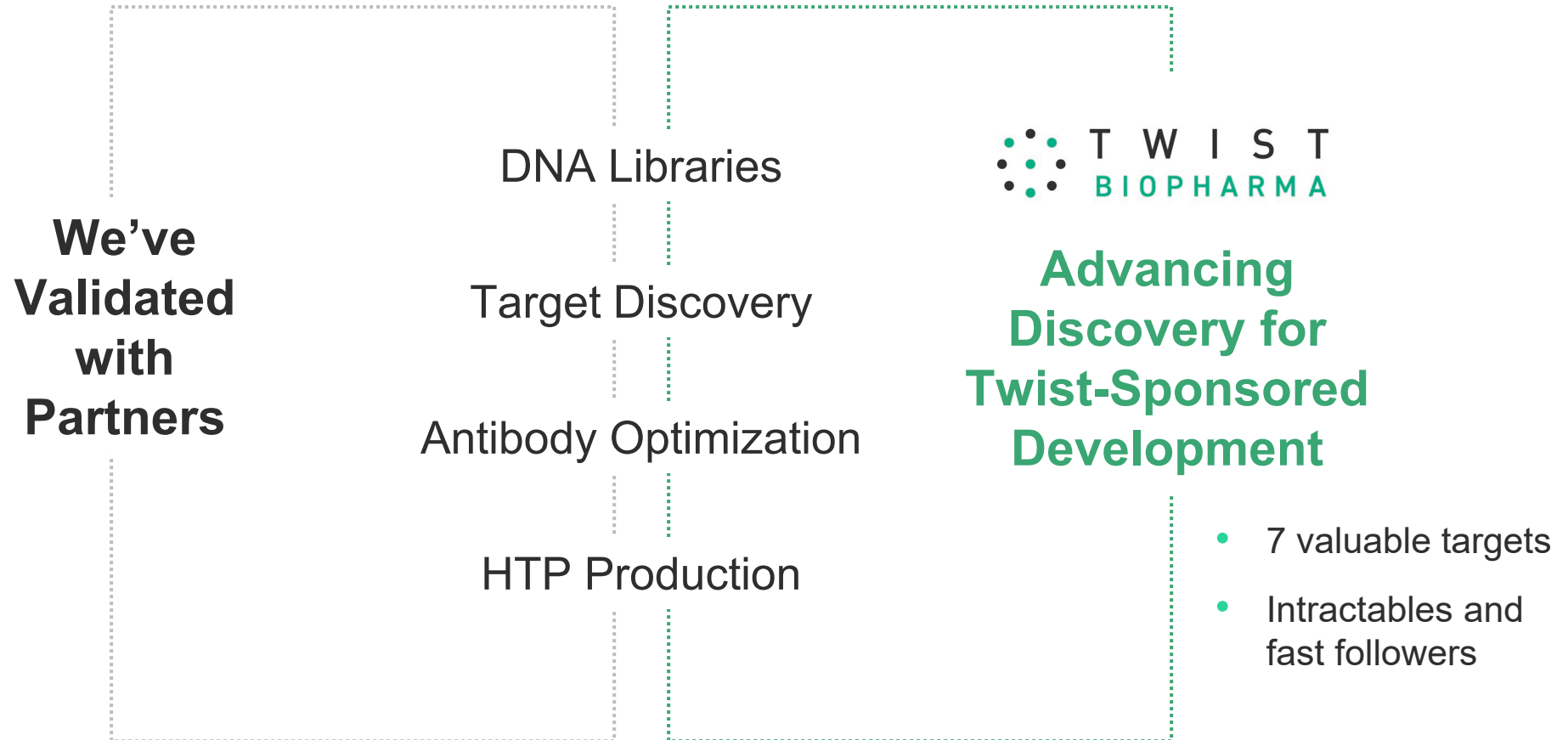
Potential application for rare diseases such as severe hypoglycemia



# Biopharma: Advancing Business Models with Partners



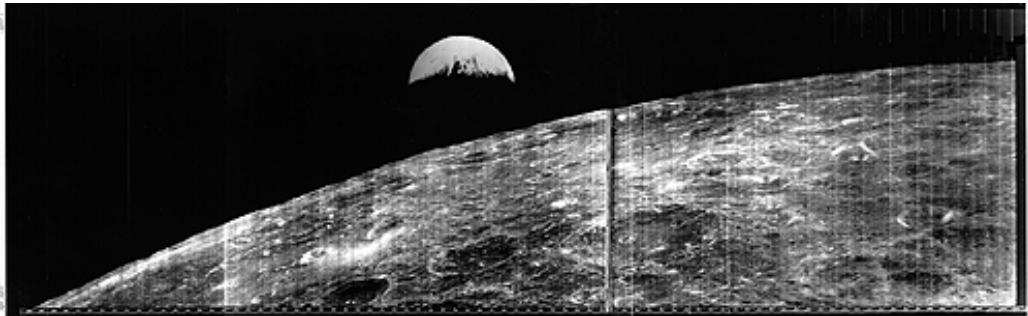
SHARED ECONOMICS	PER PROJECT	MILESTONES AND/OR ROYALTIES			COMMERCIAL COLLABORATION	
LakePharma	Pandion	Invetx	Takeda	Seismic Bio	Undisclosed	Schrodinger
Co-marketing Twist services to their customers	Optimization of bispecific antibodies for autoimmune and inflammatory disease	Optimization of cat and dog therapeutics	Antibody discovery for range of applications	Immuno-oncology	Cancer therapeutics Neuroscience Industrial enzymes	Technology collaboration



# Data Storage in DNA



Recovered from Lunar Orbiter 1 Tapes



**DNA for  
Archival Storage of  
Digital Information**

**Permanence**

**Density**

**Random access**

**Universal format**

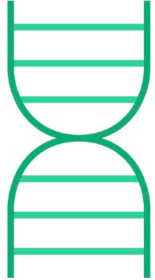
# Data Storage in DNA: How It Works



**1 Coding**

00	→	A
01	→	G
10	→	C
11	→	T


**2 Synthesis**



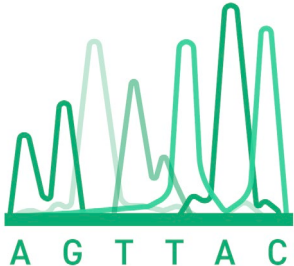
**3 Storage**



**4 Retrieval**



**5 Sequencing**



**6 Decoding**

A	→	00
G	→	01
C	→	10
T	→	11

# Data Storage: Non-Dilutive Funding



## Twist Selected as DNA Synthesis Provider Under The Intelligence Advanced Research Project Agency (IARPA)

### Collaborators



- Twist may receive up to \$9.15M
- Additional \$5.5 million designated to bolster DNA synthesis through new chip design, commercial implementation at Twist
- Significantly reduce the size, weight and power required for archival data storage
- Synthesize enough DNA per day to allow the cost of storing digital data to be as low as \$1/gigabyte
  - Ultimate Twist goal: Drive cost down to \$100/terabyte
- Bolster DNA synthesis through new chip design



I A R P A

NON-DILUTIVE  
FINANCING

# Data Storage: Estimated Roadmap



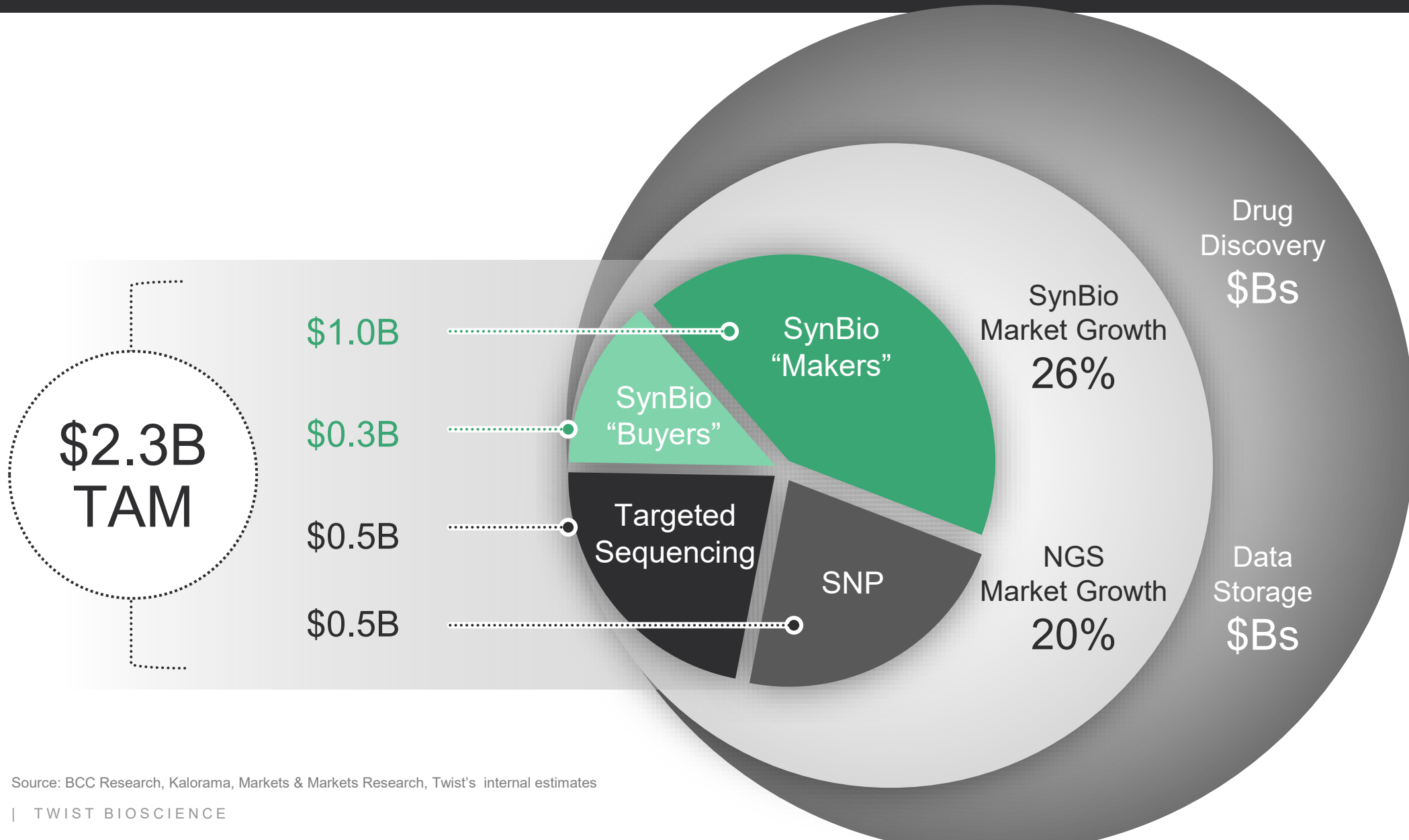
				vs. HARD DRIVE
Commercial Goal	\$1000 / Mb	\$1000 / Gb	\$100 / Tb	\$125 / \$25 / Tb
Engineering Goal	50µm	1µm	50-100nm	2nm / 3nm



## Funding

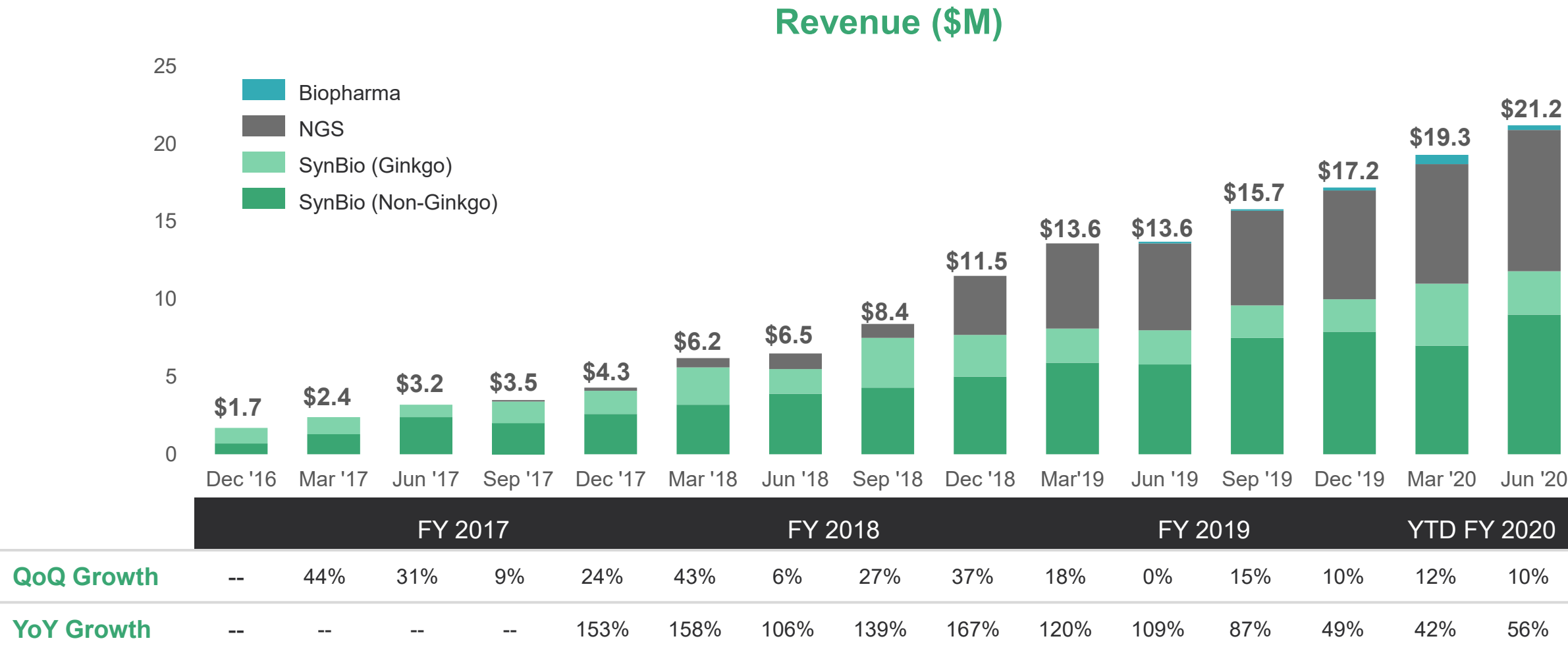
Non-dilutive IARPA \$2.5M / yr  
+  
Twist \$2.5M / yr +

# Large and Expanding Addressable Market



Source: BCC Research, Kalorama, Markets & Markets Research, Twist's internal estimates

# Quarterly Revenue Growth



FY Ends September 30








# Delivering on Our Plan



2019

## What we said we'd do

- 5Kb gene, Twist API revenue diversification 
- ISO certification, ecommerce platform, pilot conversion to full production 
- Early POC, 2 collaborations 
- Proof-of-concepts, increase density, CMOS chip 
- Positive gross margin 

**SYNBIO**

**NGS**






**BIOPHARMA**

**DATA STORAGE**

**OPERATIONS**

2020

## Goals for 2020

-  Revenue growth and diversification, new products, enhanced ecommerce
-  Continued pilot, SNP conversion, products for liquid biopsy, oncology
-  Continued POC data packages, results for collaborators, 5-10 new collaborators
-  Execute on IARPA
-  Increased gross margin, completion of new writer introductions, improved TAT on genes



# Writing the Future



**Platform** for writing DNA on silicon

**Large, growing** markets

**Differentiated** value proposition

**Portfolio** of high growth businesses

**Validated** business models

**High** revenue growth

**Track record** of execution and innovation





# Writing the Future

EMILY LEPROUST, PH.D., CEO and CO-FOUNDER

