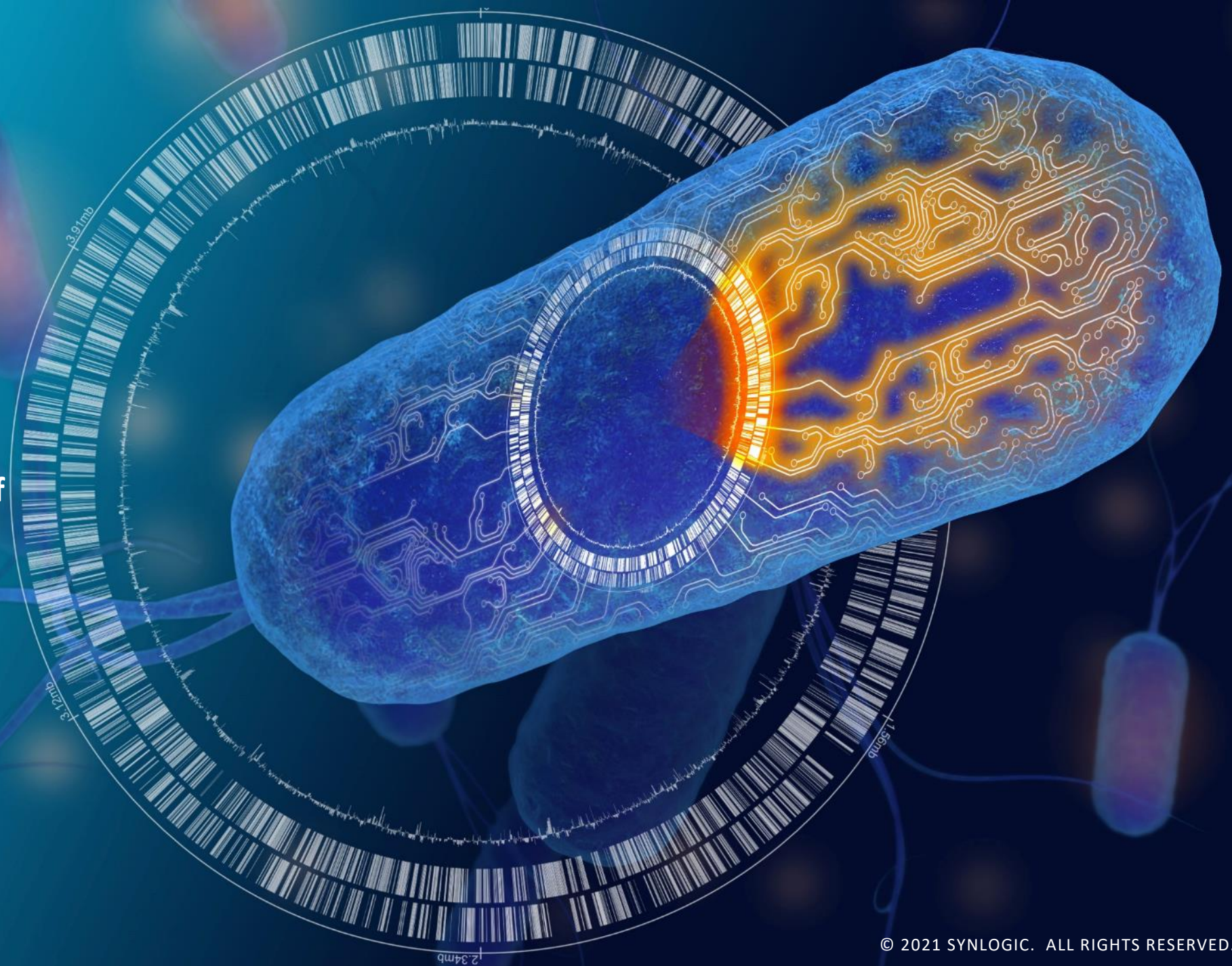


# synlogic

**Bringing the  
Transformative Power of  
Synthetic Biology to  
Medicine**

Corporate Presentation  
May 2021



# Forward Looking Statements

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This presentation contains “forward-looking statements” that involve substantial risks and uncertainties for purposes of the safe harbor provided by the Private Securities Litigation Reform Act of 1995. All statements, other than statements of historical facts, included in this presentation regarding strategy, future operations, future financial position, future revenue, projected expenses, prospects, plans and objectives of management are forward-looking statements. In addition, when or if used in this presentation, the words “may,” “could,” “should,” “anticipate,” “believe,” “estimate,” “expect,” “intend,” “plan,” “predict” and similar expressions and their variants may identify forward-looking statements. Examples of forward-looking statements include, but are not limited to, the approach we are taking to discover and develop novel therapeutics using synthetic biology; statements regarding the potential of our platform to develop therapeutics to address a wide range of diseases, including: metabolic diseases, inflammatory and immune disorders, and cancer; the future clinical development of Synthetic Biotic medicines; the potential of our technology to treat phenylketonuria and cancer; and the expected timing of our anticipated clinical trial initiations and availability of clinical data; the benefit of orphan drug and fast track status; the adequacy of our capital to support our future operations and our ability to successfully initiate and complete clinical trials; the results of our collaborations; and the difficulty in predicting the time and cost of development of our product candidates. Actual results could differ materially from those contained in any forward-looking statement as a result of various factors, including, without limitation: the uncertainties inherent in the preclinical development process; our ability to protect our intellectual property rights; and legislative, regulatory, political and economic developments, as well as those risks identified under the heading “Risk Factors” in our filings with the SEC. The foregoing review of important factors that could cause actual events to differ from expectations should not be construed as exhaustive and should be read in conjunction with statements that are included herein and elsewhere, including the risk factors included in our annual report on Form 10-K filed with the SEC on March 25, 2021, and in any subsequent filings we make with the SEC. The forward-looking statements contained in this presentation reflect our current views with respect to future events. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements in the future, we specifically disclaim any obligation to do so. These forward-looking statements should not be relied upon as representing our view as of any date subsequent to the date hereof.



# Clinical proof of concept data expected across multiple programs in 2021

## Metabolic programs: Two PoC opportunities

### **SYNB1618 in Phenylketonuria (PKU)**

Proof of mechanism demonstrated in Phase 1 with healthy volunteers

Phase 2 SynPheny patient data expected second half of 2021

### **SYNB8802 in Enteric Hyperoxaluria**

Proof of mechanism demonstrated in Phase 1A with dietary hyperoxaluria induced in healthy volunteers

Phase 1B patient data expected second half of 2021

## Immunomodulation

### **SYNB1891 in Solid Tumors**

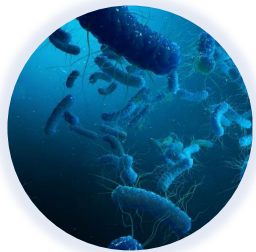
Monotherapy target engagement, meaningful pharmacodynamic effects, good safety

Combination with anti-PDL1 and dose escalation ongoing

**2021 data with potential to demonstrate clinical benefit of the Synthetic Biotic platform**

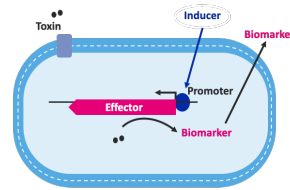
# A new class of medicines

## Synthetic Biotic platform



Non-pathogenic  
bacterial chassis

+



Programmable,  
engineering

Targeted & controllable, **patient friendly** treatment

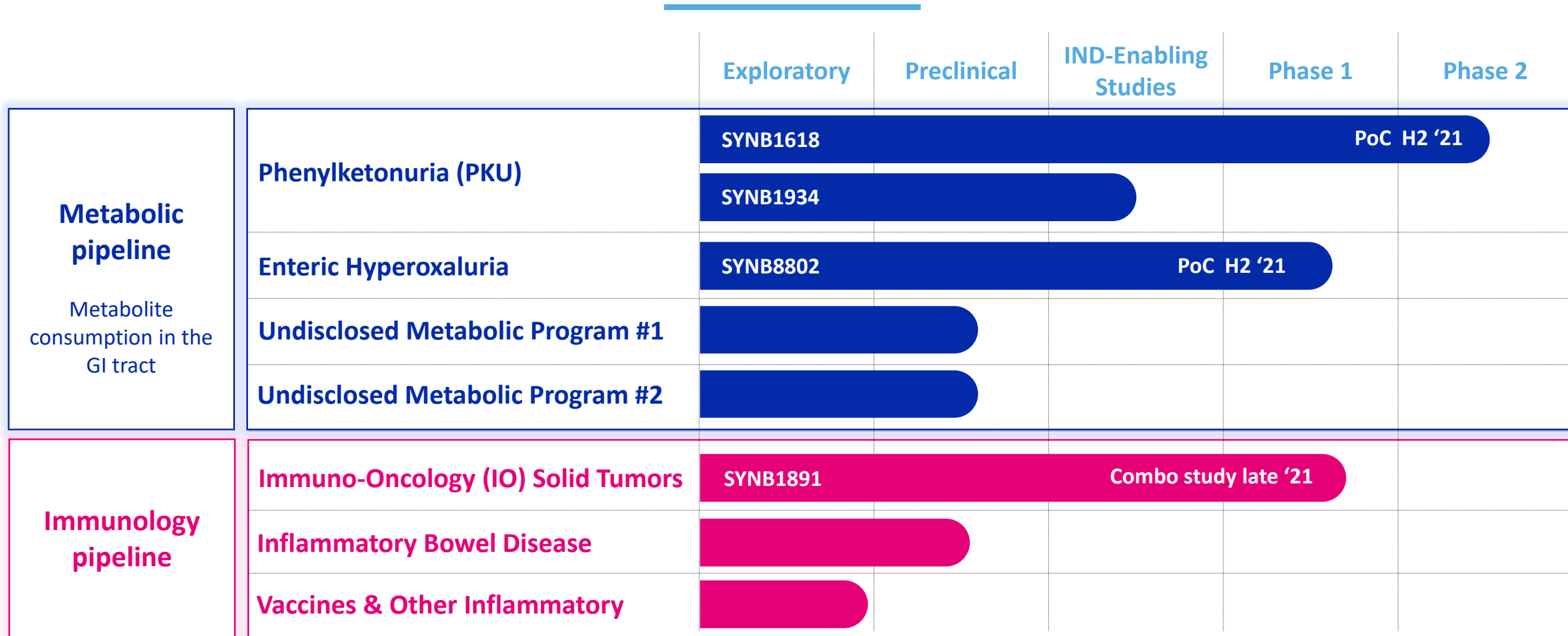
## Robust pipeline

Rare metabolic therapies that  
**consume toxic metabolites**  
from the GI tract

Therapies that leverage the  
ability of **bacteria to interact**  
**with the immune system**

Enabling engine of synthetic biology, manufacturing and translational capabilities  
Creates multiple product opportunities

# Robust pipelines with meaningful catalysts



# Synthetic Biotic medicines: a novel approach to metabolic disease

## Why metabolic disease?

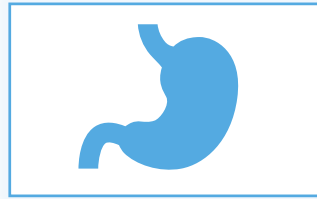


### Unmet Medical Need

#### Rationale

High **unmet need** across inherited and acquired metabolic diseases

Multiple **large and underserved markets**

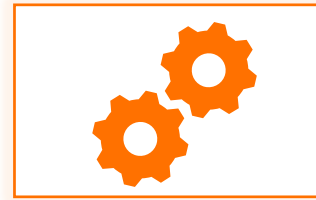


### Validated Biology

Diseases with **known pathophysiology**

Dietary intervention **validates GI approach**

## Why Synthetic Biotic medicine?



### Unique Advantages

Bacteria **evolved to survive in the GI tract**

Ability to deploy multiple enzyme pathways

Drug-like approach without genetic drift or colonization



### Proof of Mechanism

Multiple programs **demonstrate** SYNB compounds can **consume toxic metabolites** in the human GI tract

# Applying Synthetic Biotic medicines to PKU and Enteric Hyperoxaluria

## Phenylketonuria (PKU)

## Enteric Hyperoxaluria (HOX)



### Unmet Medical Need

Many patients unable to control Phe  
~70% pts do not respond to BH4 oral therapy

High kidney disease risk  
No effective interventions or treatments



### Validated Biology

Lower dietary Phe intake = lower plasma Phe levels = improved cognitive outcomes

Lower dietary oxalate intake = lower urinary oxalate = improved kidney outcomes



### Unique Advantages

Modality able to consume Phe in the GI tract before it can cause damage

Modality able to consume oxalate throughout GI tract, including colon



### Platform Proof of Mechanism

SYNB1618 consumes Phe and produces the TCA biomarker in both HVs and patients

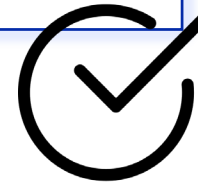
SYNB8802 consumes oxalate in healthy volunteers at clinically meaningful levels

# Phenylketonuria (PKU)

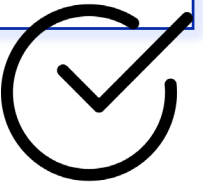
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**Current and emerging treatment options leave many patients behind**

**SYNB1618 demonstrates potential to lower Phe in PKU patients**



**Phase 2 Phe-lowering trial initiated**





# Patient need: parents expect their children to reach full potential

## Historically



Prospect of severe mental disability and institutionalization.

Parents wanted PKU child to avoid institutionalized care before adulthood.

## Today



**Julia,  
living with PKU**

**Early diagnosis and strict diet control enables better Phe management.**

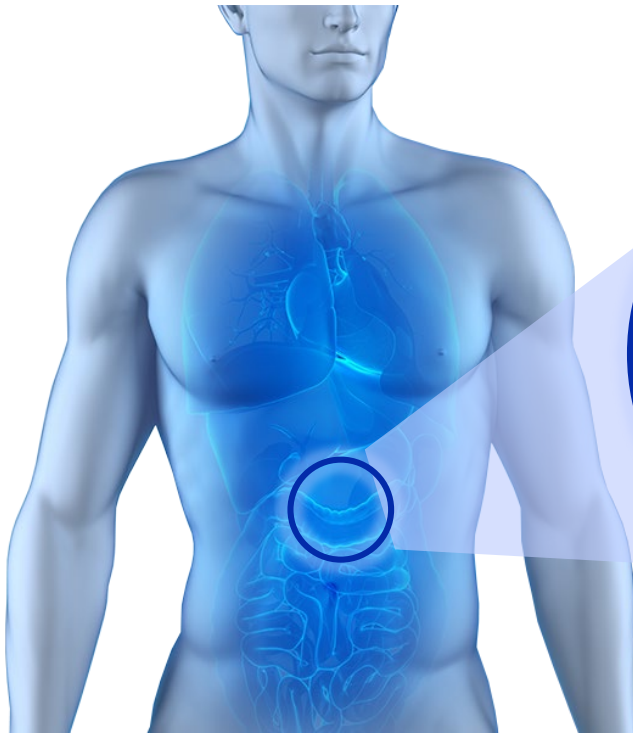
**Parents expect PKU child to achieve full potential.**

**Reality: 25% – 65% of patients still struggle to maintain blood Phe within target range**

# An innovative approach in area of high unmet medical need

## Our approach

Oral therapy,  
3 x day with meals



Consume Phe  
in the GI Tract



Reduce plasma  
Phe

## Meaningful biomarker-driven outcomes



Increase Phe-metabolites  
such as TCA



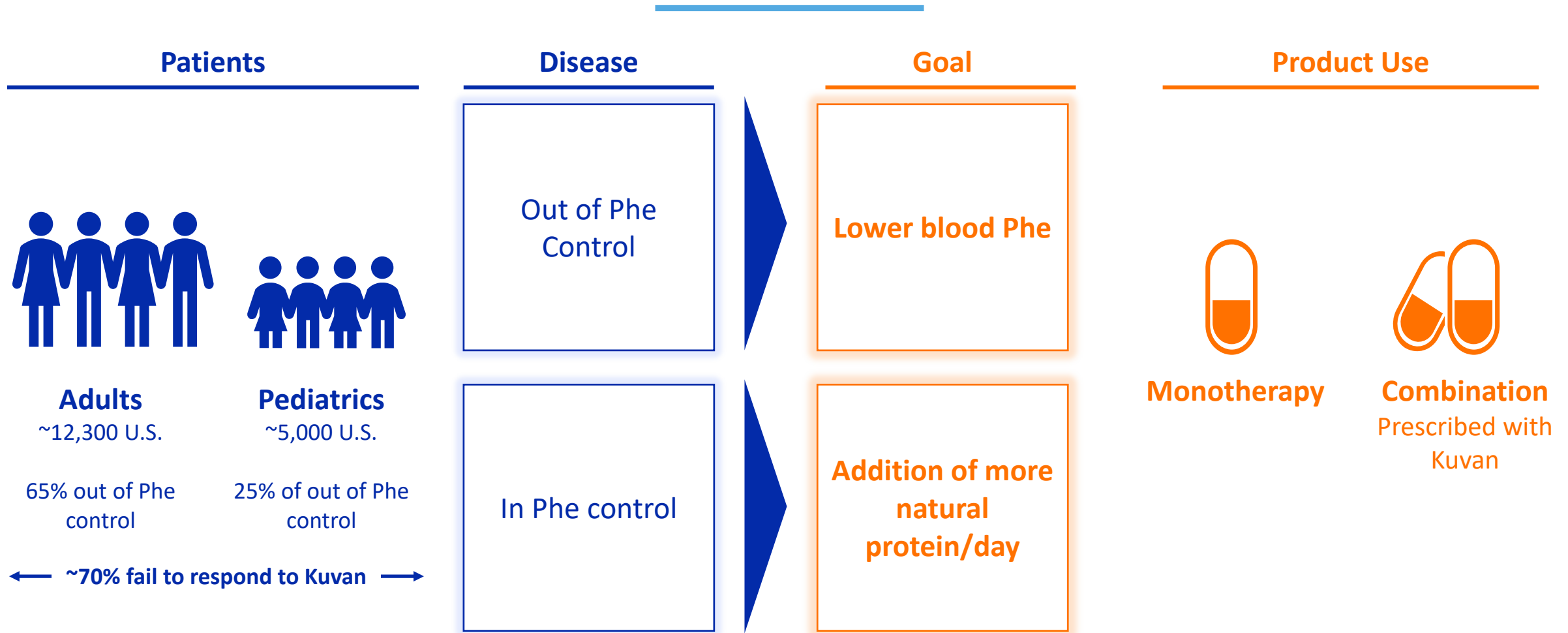
Lower blood Phe



Addition of more natural  
protein into the diet

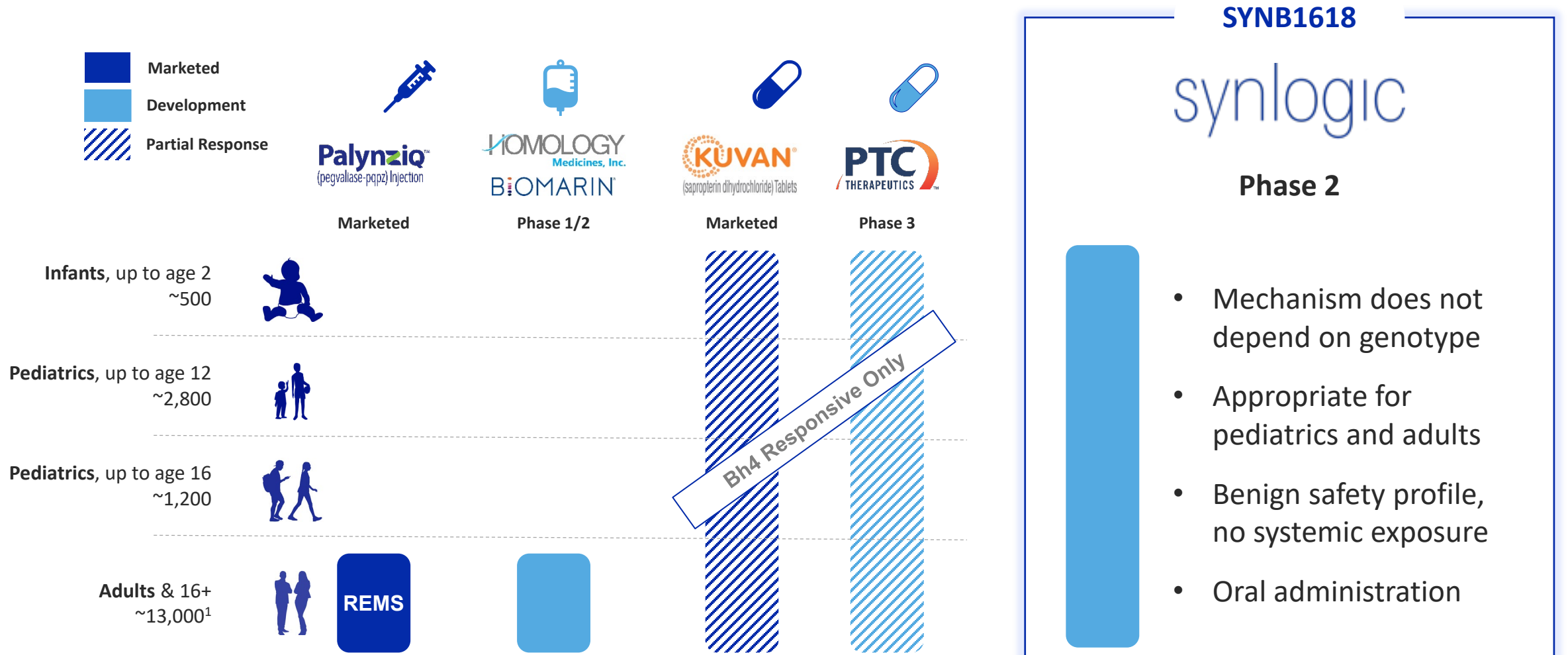
Synlogic has initiated a Ph2 Study in PKU patients (SynPheny)

# Multiple areas of unmet need continue across PKU patient types



**Significant market opportunity, large unmet need, with potential for new products to capture share**

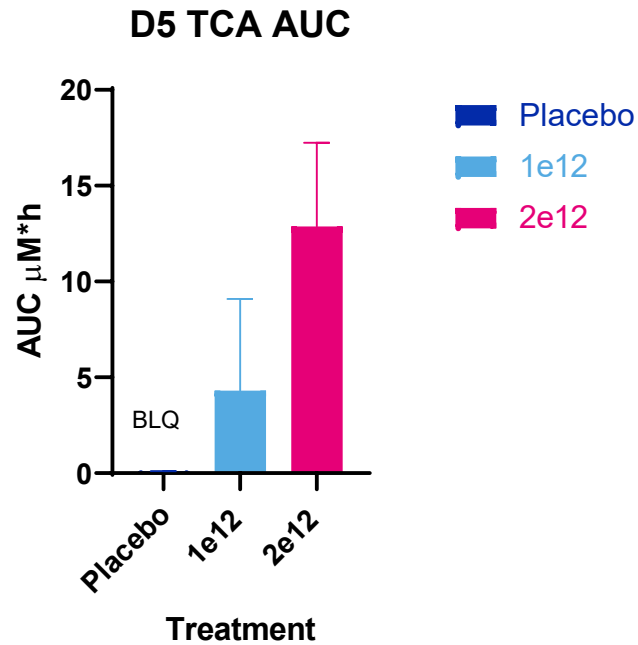
# SYNB1618 is uniquely positioned to address those needs



1. Includes 7,500 "lost to follow up"

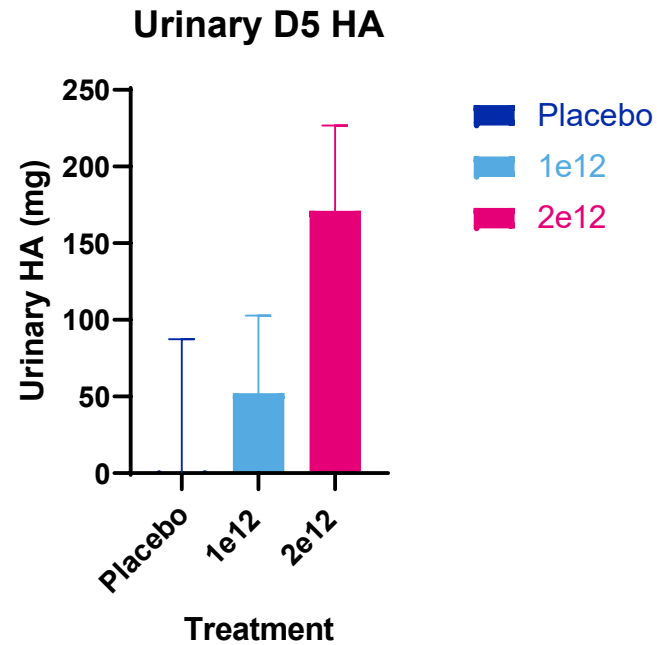
# Solid oral SYN1618 reduced Phe and elevated biomarkers in Ph1

## D5 Phe Converted to D5 TCA

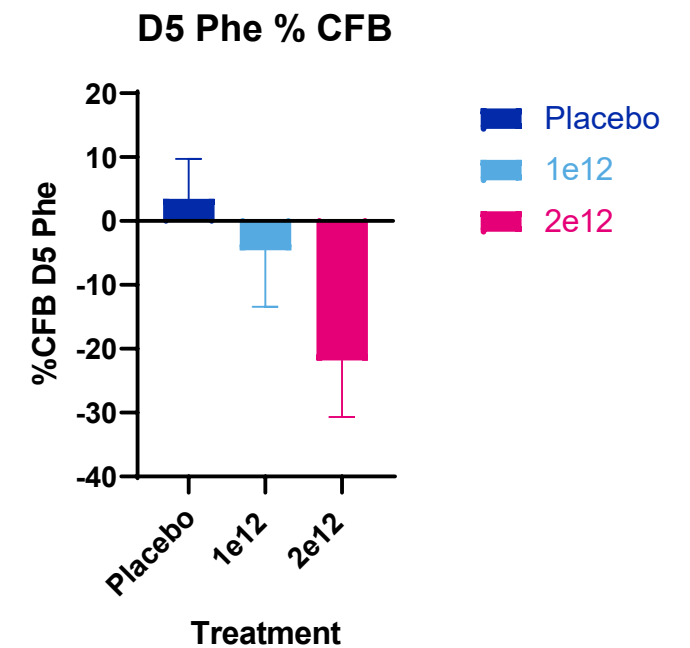


Data are means and 90% CI

## D5 TCA Converted to D5 HA



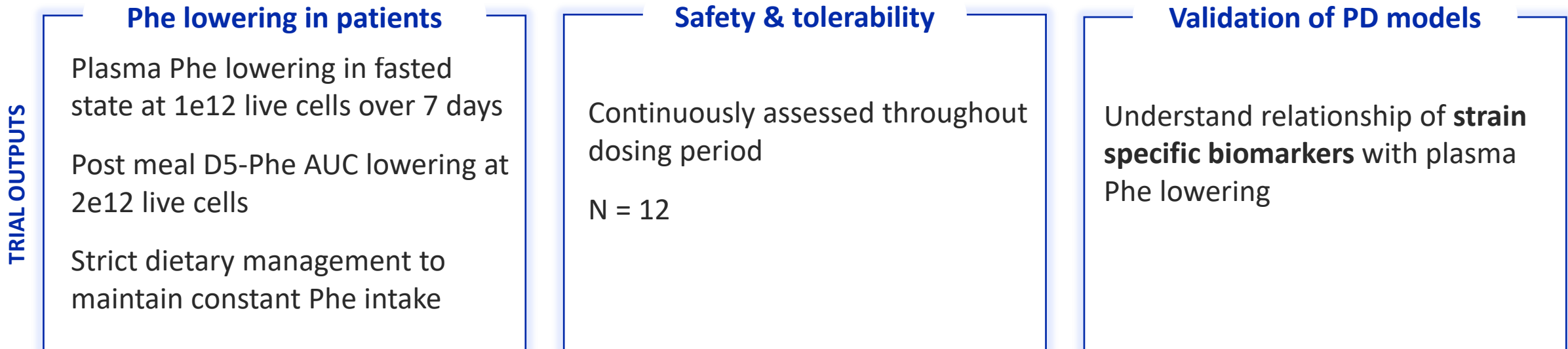
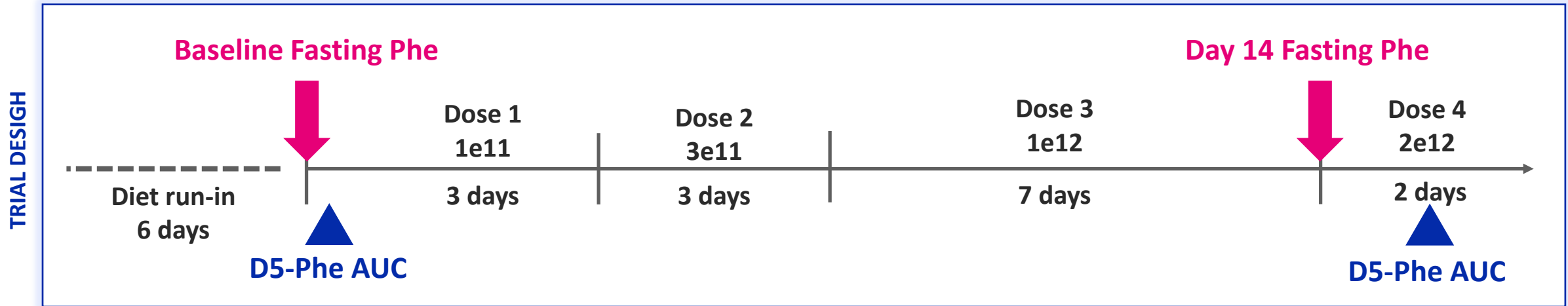
## Plasma D5 Phe Blunted



**Achieved Proof of Mechanism: SYN1618 consumed D5 Phe in GI tract & lowered plasma D5 Phe**



# SynPheny-1 design enables Proof of Concept



# Opportunity for multiple clinically relevant outcomes



Reduction in **labelled plasma Phe**  
after a meal challenge, not  
influenced by diet



Reduction in **fasting plasma Phe**  
(on treatment relative to  
baseline, holding diet steady)



**Consistency in response:**  
Responder population or  
consistent response across subjects

**Learning Opportunities in current SynPheny study**

**Study powered for 20% reduction in labelled plasma Phe,  
providing clinically meaningful endpoint for patients without other treatment options**

# Enteric Hyperoxaluria (HOX)

---

**Enteric Hyperoxaluria  
results in significant,  
irreversible, and  
progressive kidney  
damage**

**SYNB8802 offers potential  
for best-in-class urinary  
oxalate lowering**

**SYNB8802 proof of  
mechanism established:  
proof of concept on track  
for 2021 data read out**

# Hyperoxaluria: Primary vs. Enteric

## Primary Hyperoxaluria

## Enteric Hyperoxaluria

### Pathology

Rare genetic condition

Dietary oxalate hyperabsorption

### Onset

Pediatric

Adult

### Trigger

Genetic liver enzyme deficiency

Underlying insult to bowel: including IBD, bariatric surgery, other chronic GI conditions

### UOx. Levels

90 – 500 mg / 24 hrs (~10x normal)

45 – 130 mg / 24 hrs (~3x normal)

### U.S. Patients

~5,000 – 8,000

~200,000 – 250,000

### Key Players



### Clinical consequences

**Limited ability to manage with diet | Nephrocalcinosis |  
Recurrent, chronic kidney stones | Impaired renal function | Systemic Oxalosis**

# Enteric Hyperoxaluria: An important cause of renal failure

## 33-Year-Old Female with Crohn's

- 33 yo woman with bowel resection resulting in severe hyperoxaluria (135 mg/day)
- Clinical course punctuated by:
  - Recurrent kidney stones
  - Progressive renal failure
  - Hemodialysis
  - Renal transplant x 1
  - Recurrent renal failure
  - Hemodialysis
  - Renal transplant x 2

## 48-Year-Old Male with Crohn's

- 48 yo man with Crohn's requiring two bowel resections with severe hyperoxaluria (110 mg/day)
- Clinical course punctuated by:
  - Recurrent kidney stones
  - Nephrocalcinosis
  - Progressive renal failure
  - Hemodialysis
  - Renal transplant

## 47-Year-Old Female with Crohn's

- 47 yo woman with Crohn's requiring extensive bowel resections with severe hyperoxaluria (114 mg/day)
- Clinical course punctuated by:
  - Recurrent kidney stones
  - Recurrent obstructive nephropathy
  - Progressive renal failure
  - Bilateral nephrectomies due to stone-related infections
  - Hemodialysis
  - Renal transplant
  - Recurrent renal failure

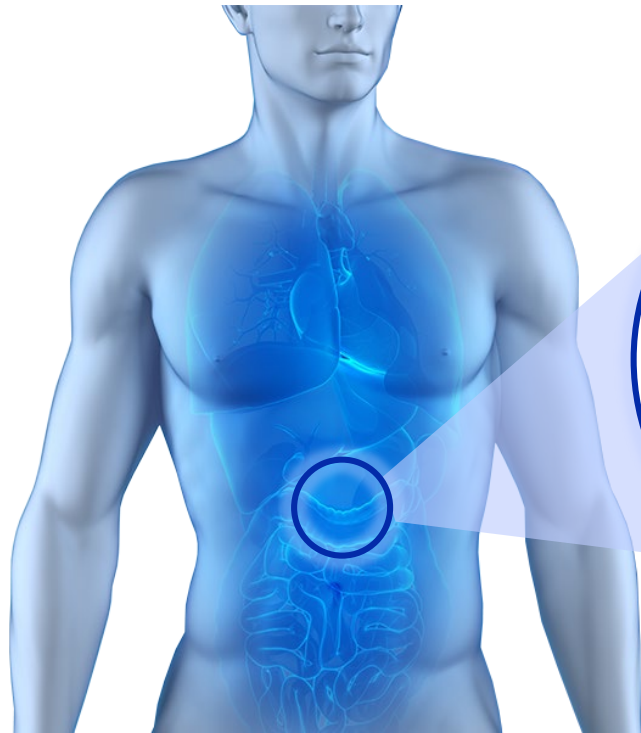
**Urinary oxalate levels remain markedly elevated in all patients, despite aggressive medical regimen**



# An innovative approach in area of high unmet medical need

## Our approach

### Oral therapy

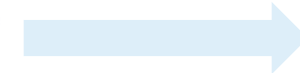


**Consume Oxalate  
the GI Tract**

**Reduce Oxalate in  
the urine**

## Differentiation from other approaches

**Stomach**



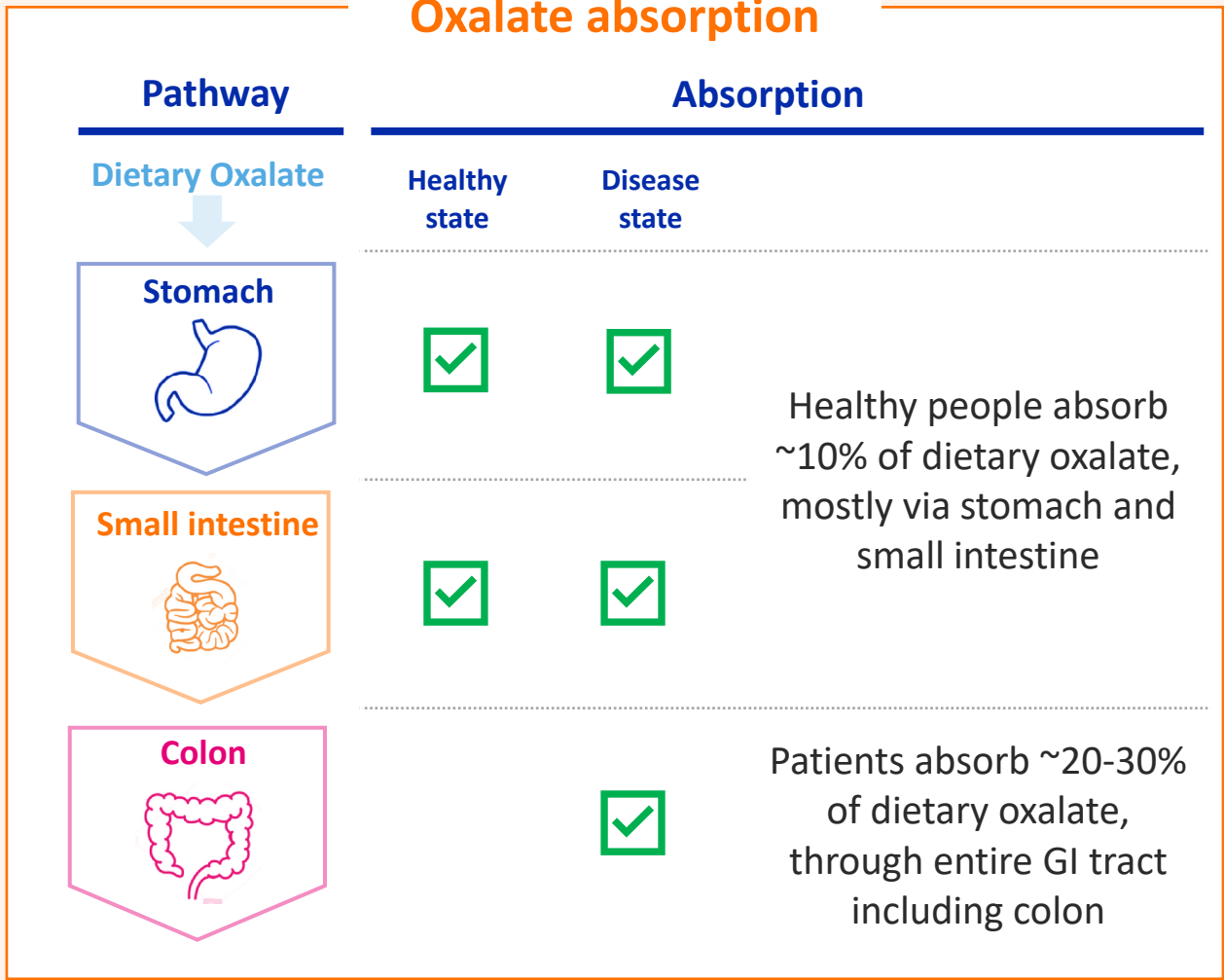
**Colon**



**Consumes oxalate throughout GI tract**

**Ph 1B Proof of Concept in Enteric Hyperoxaluria patients (Roux-en-Y population) initiated**

# SYNB8802 consumes Oxalate throughout the GI tract

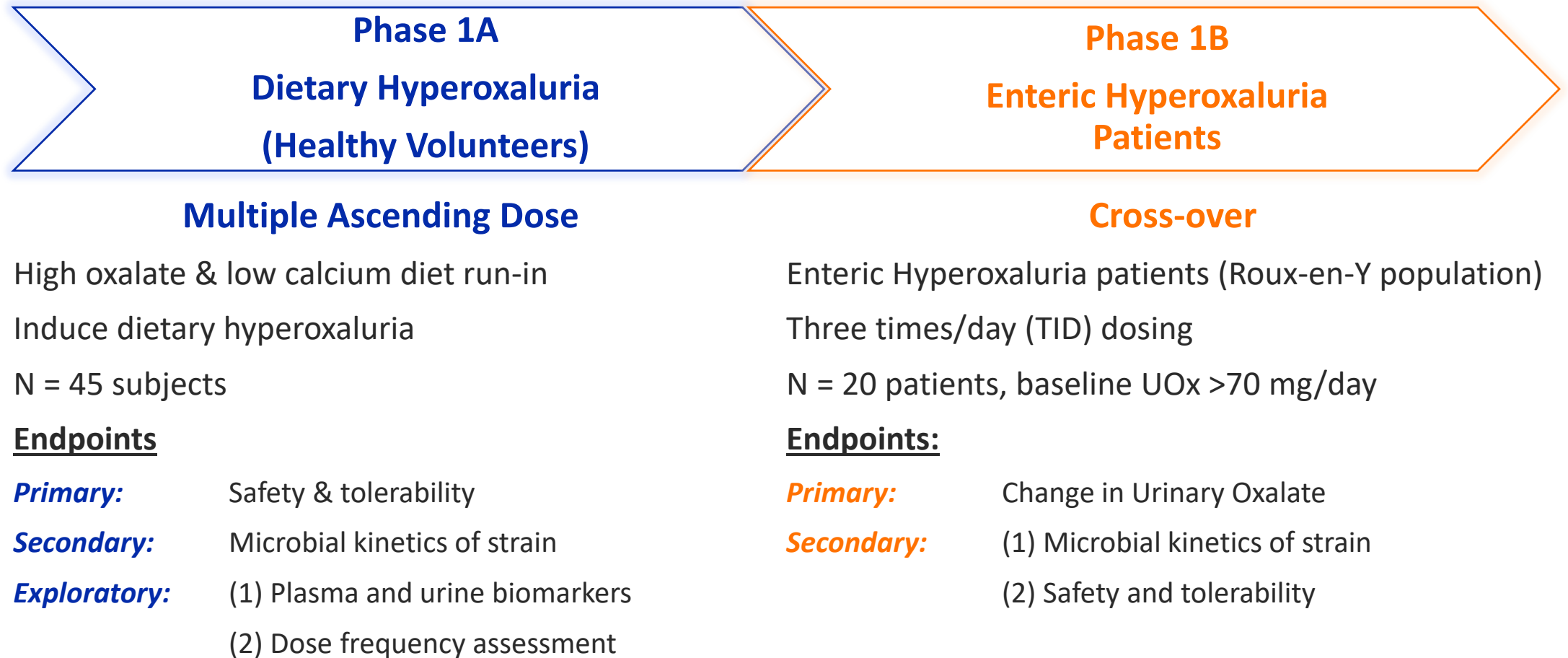


**Optimal treatment**

synlogic	Oral enzyme	Oxalobacter formigenes
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Absorbs oxalate throughout GI tract, esp. in colon

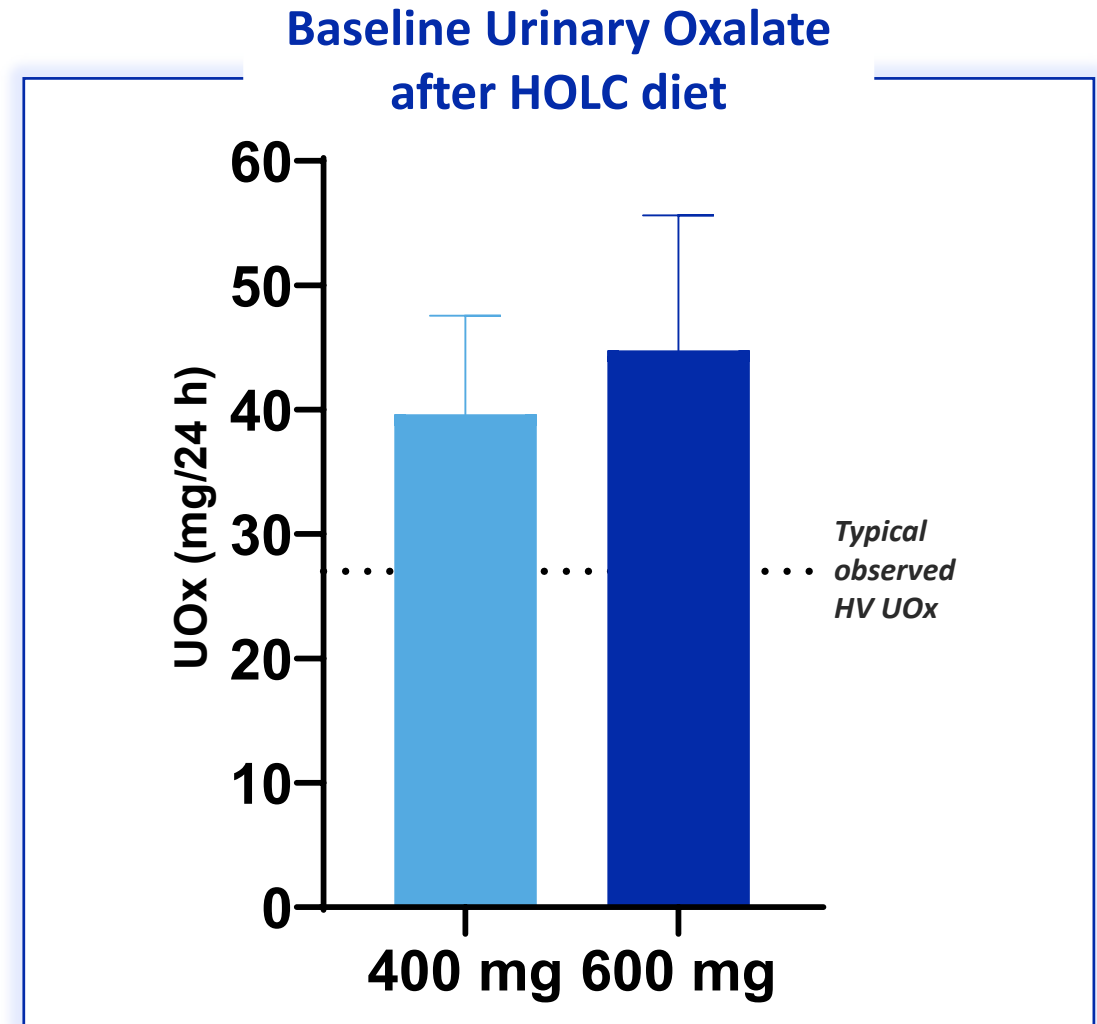
# Ph1 design provides POC opportunity in 2021



**Dietary hyperoxaluria model is translationally relevant to patient population**

# High oxalate diet successfully elevated UOx levels in HV

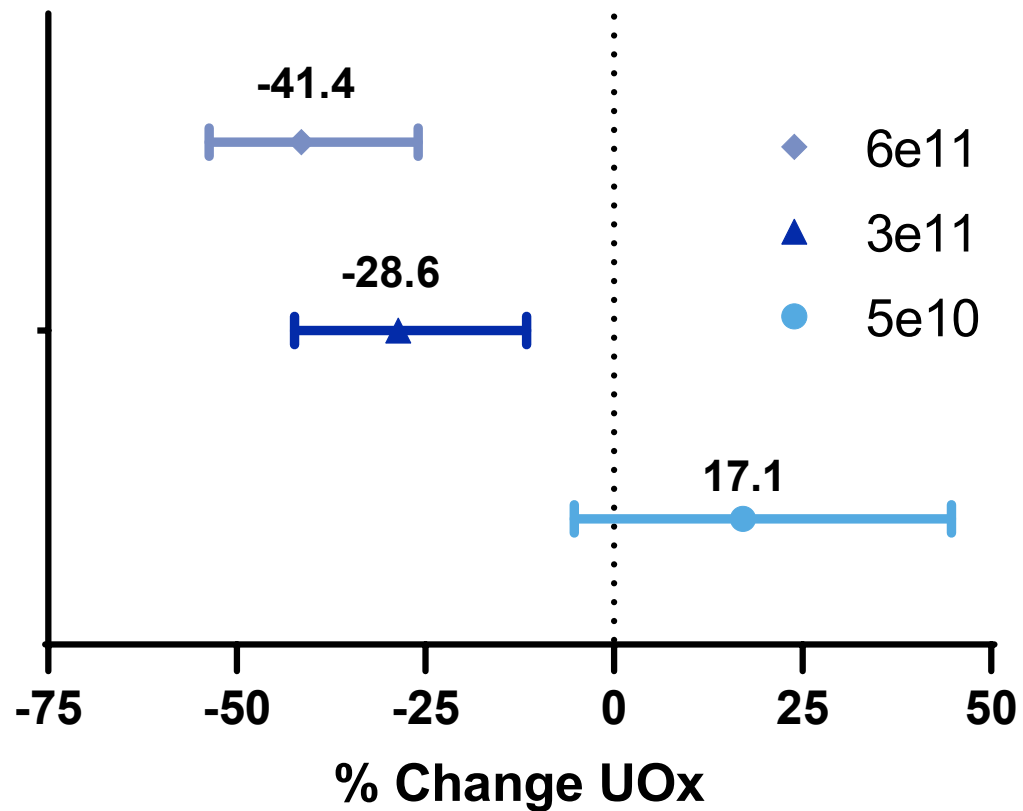
- American diet contains approx. 200-250 mg oxalate/day
- HV subjects were given a high oxalate, low calcium diet (HOLC) during the diet run-in and treatment phases of the study
- HV subjects absorb approx. 10% of dietary oxalate
- Urinary oxalate levels elevated to >1.5X typically observed in healthy volunteers
- Dietary intake carefully measured on in-patient unit, incl. weighing of meals consumed



# Dose-responsive and reproducible Uox lowering demonstrated

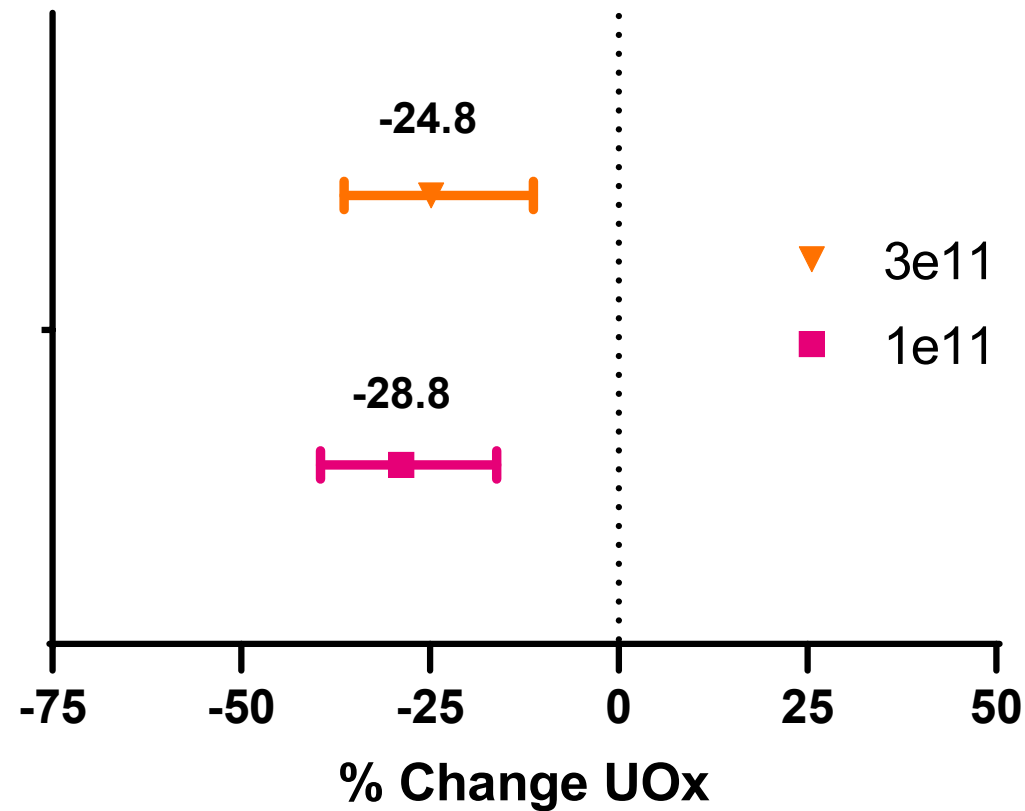
Efficacy Analysis (% Change from Baseline in 24h UOx over Pbo)

## 600mg Daily Oxalate



Lower is better

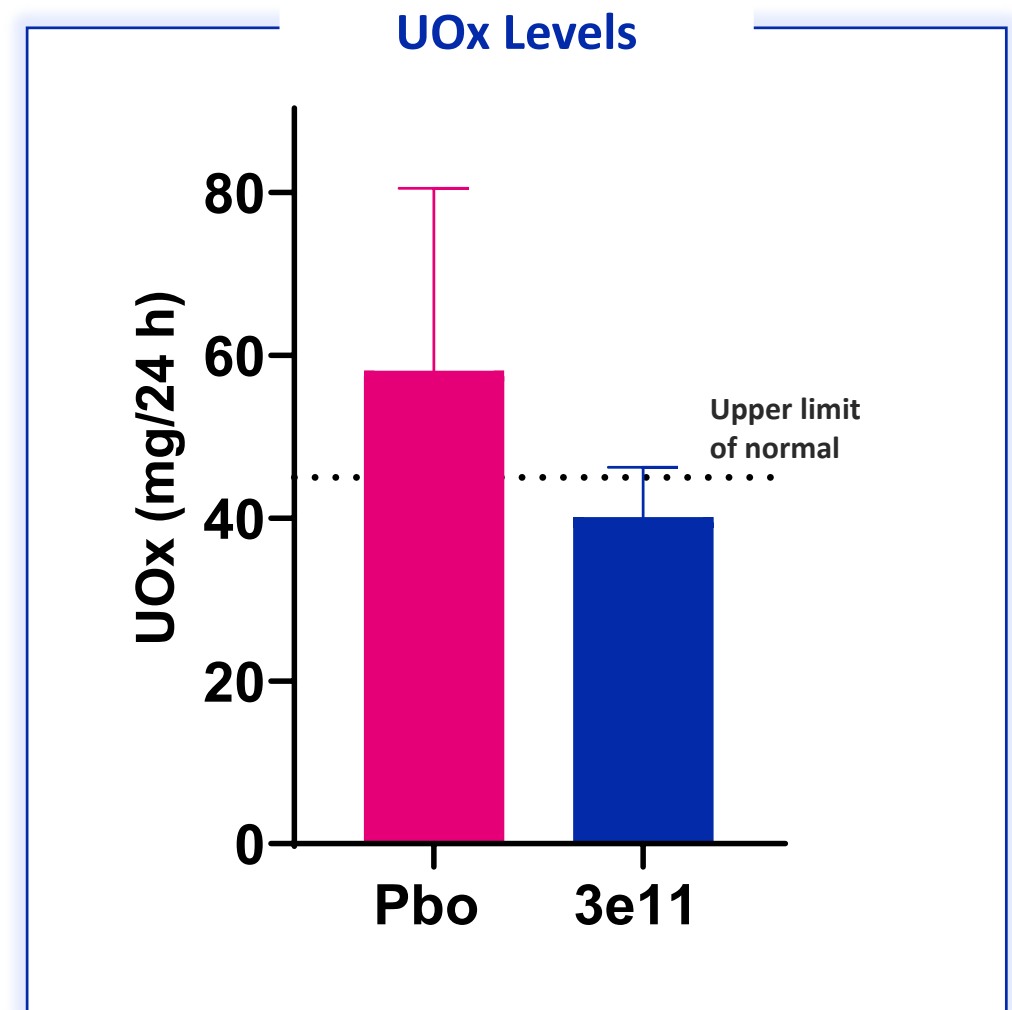
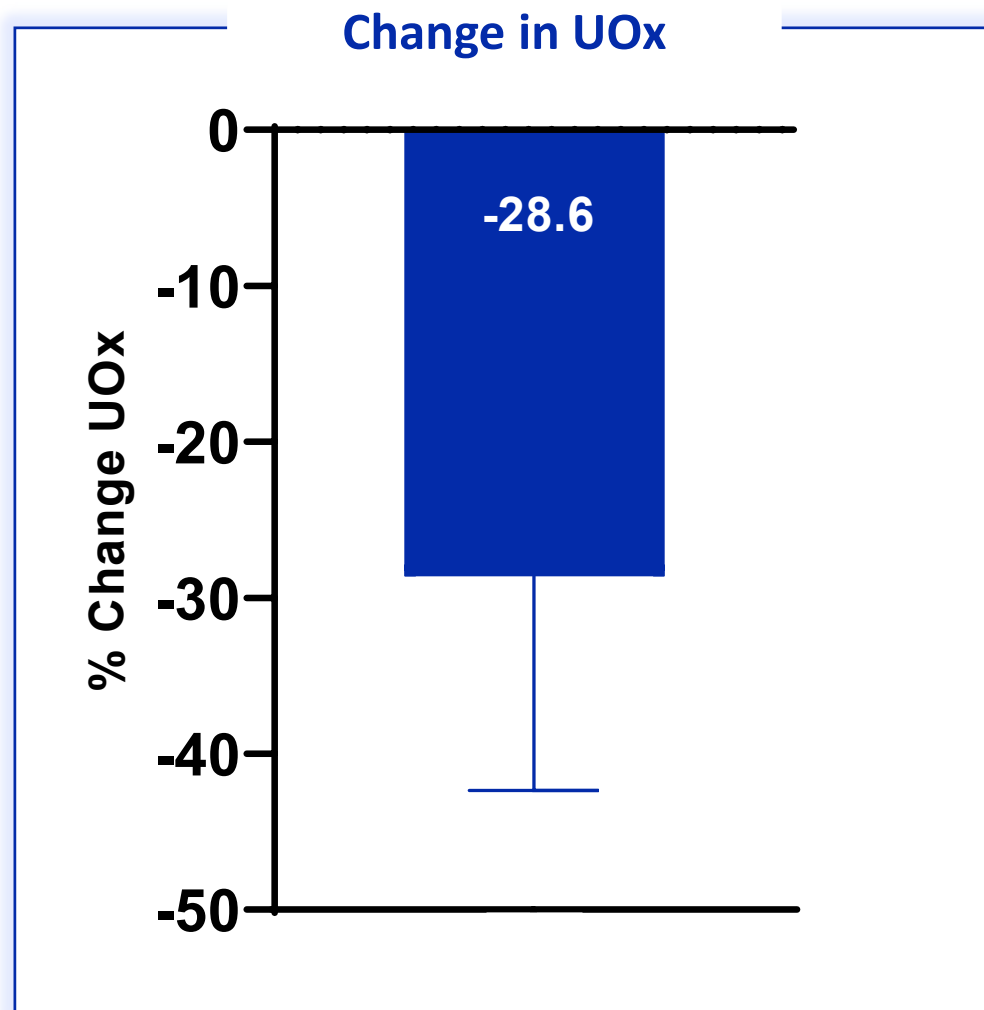
## 400mg Daily Oxalate



Lower is better



# SYNB8802 3e11 live cells dose advancing to Ph1B in patients



**Clinically meaningful lowering of urinary oxalate demonstrated at a well tolerated dose**

# Opportunity for multiple clinically relevant outcomes in Phase1B



SYNB8802 has established **urinary oxalate lowering** in Dietary Hyperoxaluria (HV) model



Potential for **urinary oxalate lowering** in Enteric Hyperoxaluria population (Roux-en-Y)



Degree of **colonic activity** of SYNB8802 and potential for less frequent dosing

Learning opportunities in Phase 1

Potential to demonstrate meaningful urinary oxalate lowering in patients with active disease

# SYNB8802 Summary: 3e11 live cells moving into patients



SYNB8802 was generally well tolerated in healthy volunteers. No serious or systemic adverse events. Most frequent AEs mild or moderate, transient, and GI-related



Dose responsive changes in urinary oxalate levels were observed with a significant reduction in urinary oxalate relative to placebo across three dose levels



Baseline urinary oxalate reduction of 28.6% compared to placebo



Mean 24-hour urinary oxalate level of 40.1 mg for subjects, compared to 58.1 mg for placebo, at the end of dosing



3e11 live cells dose will advance to patient studies

# Synlogic is entering a data rich period in the clinic

		H1 2021	H2 2021
<b>PKU</b>  <b>Enteric Hyperoxaluria</b>	Ph2 SynPheny proof of concept read-out		SYNB1618
	Ph1A study in HV read-out	SYNB8802	
	Initiate Ph1B study in patients	SYNB8802	
	Ph1B proof of concept read-out		SYNB8802
<b>Immuno-Oncology</b>	Ph1 Arm 2 combination read-out		SYNB1891

**Robust portfolio with significant clinical readouts in 2021**

# 1<sup>st</sup> Quarter 2021

## Summary Results

### Balance Sheet (unaudited)

Cash, Cash Equivalents, and Marketable Securities

31 March 2021

\$94.4 M

31 Dec 2020

\$100.4M

### Statement of Operations (unaudited)

R&D Expenses

\$11.2 M

\$12.7 M

G&A Expenses

\$3.9 M

\$3.8 M

Net Loss

\$(15.0 M)

\$(15.8 M)

Net loss per share – basic and diluted\*

\$(0.36)

\$(0.46)

*Weighted Average Shares Outstanding\**

41.5 M

34.2 M

### Three Months Ended

31 March 2021

31 March 2020



# Experienced leadership team and Board

## Leadership Team



**Aoife Brennan, MB ChB**  
**President & CEO**



**Dave Hava, PhD**  
**Chief Scientific Officer**



**Caroline Kurtz, PhD**  
**Chief Development Officer**



**Richard Riese, MD PhD**  
**Chief Medical Officer**



**Antoine Awad**  
**Chief Operating Officer**



**Daniel Rosan**  
**Head of Finance &  
Investor Relations**

## Board of Directors

**Peter Barrett, Chair**  
Atlas Venture

**Chau Khuong**  
Orbimed Advisors

**Mike Burgess**  
Turnstone Biologics

**Nick Leschly**  
Bluebird Bio

**Michael Heffernan**  
Collegium

**Ed Mathers**  
NEA

**Patricia Hurter**  
Lyndra Therapeutics

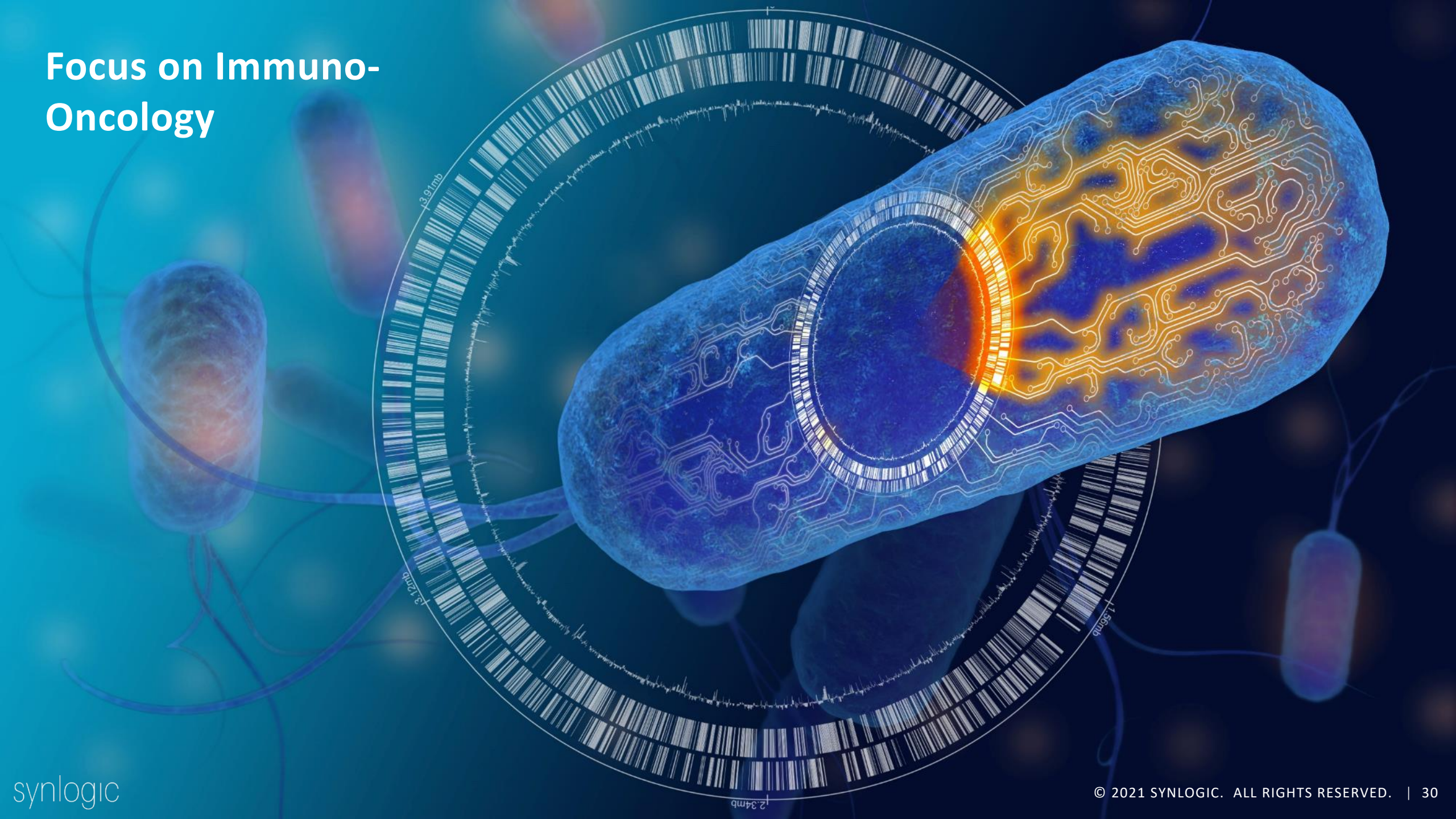
**Richard Shea**  
Syndax

**Lisa Kelly-Croswell**  
Boston Medical Center Health System

## Collaborators



# Focus on Immuno-Oncology





# Synthetic Biotic medicines are well-suited to regulating the immune system

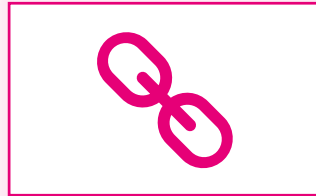
## Why immunology?



### Unmet Medical Need

#### Rationale

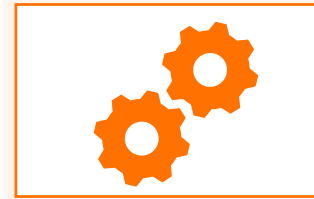
Need for **novel treatments which upregulate (I/O) or downregulate (IBD)** immune responses



### Cross-talk between bacteria and Immune System

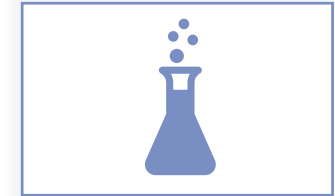
**Immune system** has evolved to recognize bacteria  
Bacteria have **evolved mechanisms** to control the immune response

## Why Synthetic Biotic medicine?



### Unique Advantages

Multiple effectors can be **delivered to site of disease** from single strain  
Targeted efficacy and improved safety



### Platform attributes

Preclinical **POC for both immune stimulation and immunoregulation**  
Multiple approaches (small molecules, peptides, human cytokines) available

# Immuno-Oncology

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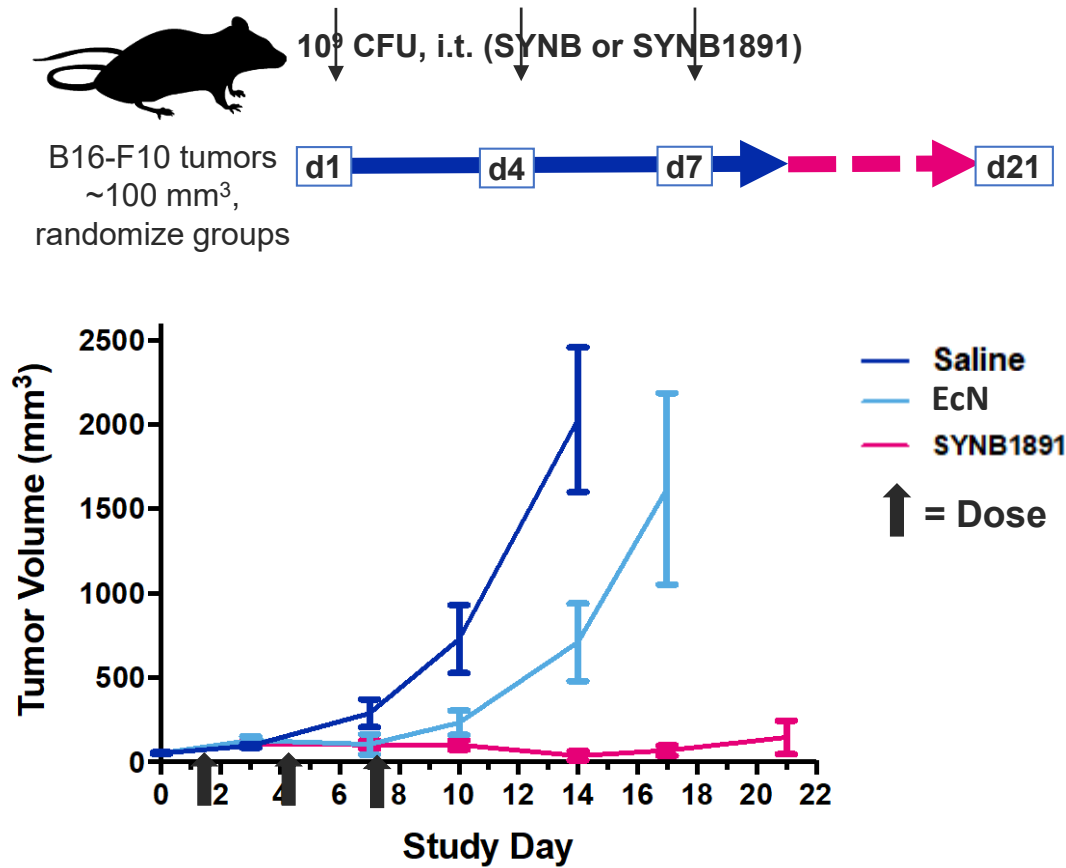
**SYNB1891 potential for improved efficacy relative to other STING approaches**

**SYNB1891 monotherapy demonstrated meaningful pharmacodynamic effects**

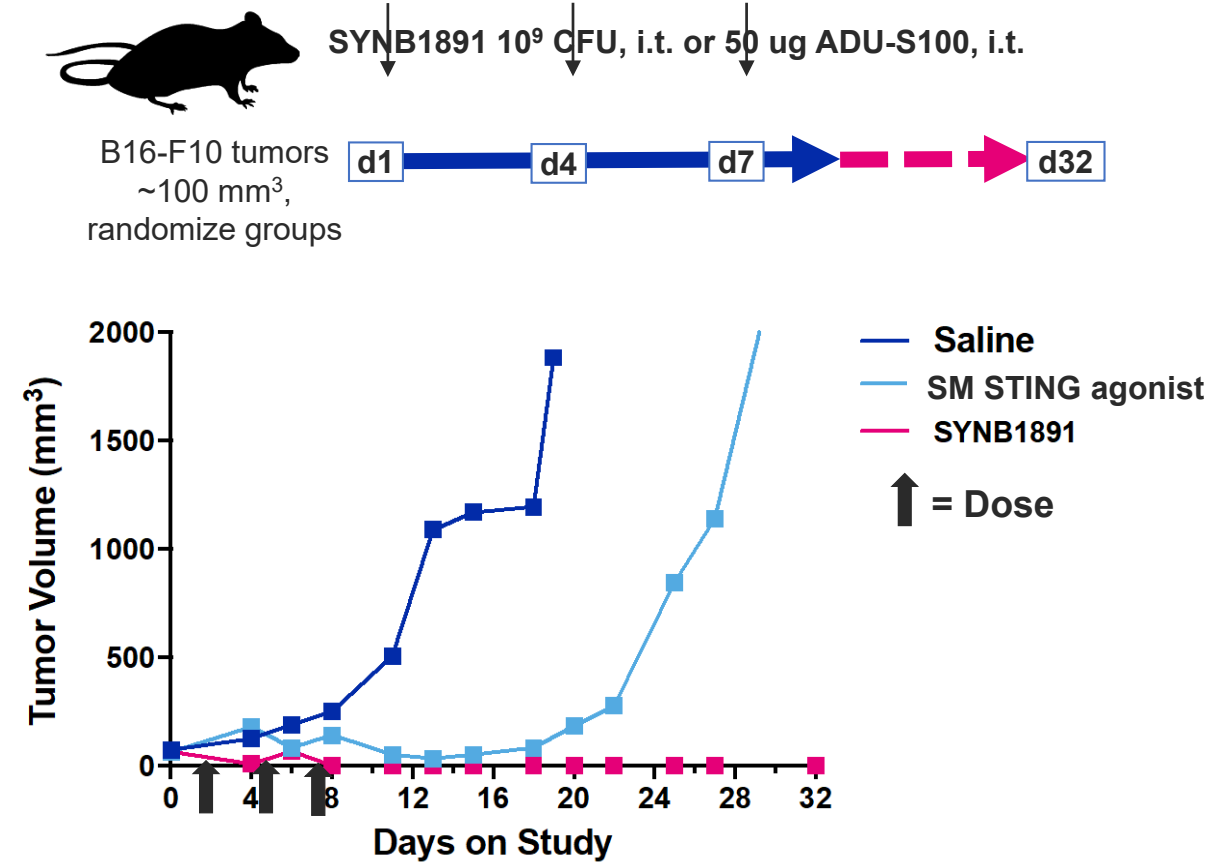
**Phase 1 in combination with Tecentriq initiated:  
Data will be available in 2021**

# SYNB1891 induces potent anti-tumoral effects

## SYNB1891 superior to wild type EcN



## SYNB1891 superior to small molecule STING

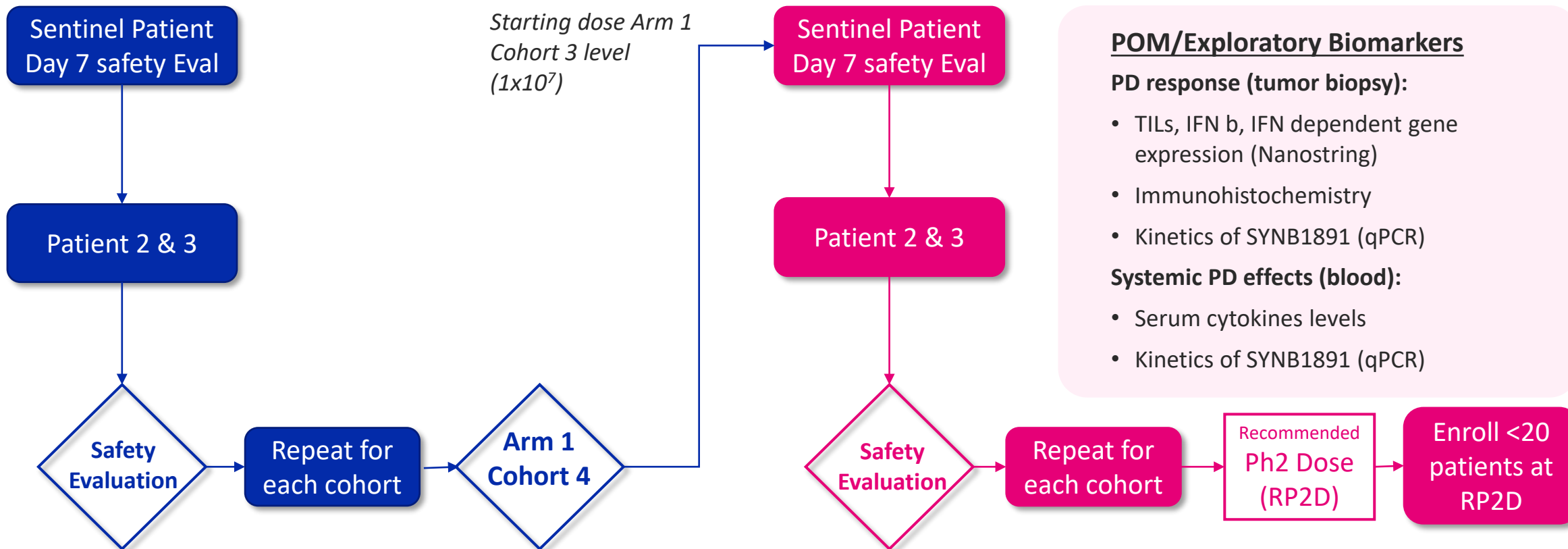


# Phase 1 design: multidose tolerability, IT mono and combo

Proof of mechanism: exploratory biomarkers in advanced solid tumors or lymphomas

## Arm 1: Monotherapy Cohorts

## Arm 2: Combination Cohorts - Atezolizumab



Combination with PD-1 will identify Phase 2 dose, provide evidence of target engagement, safety, and support for target tumor type

# SYNB1891 advanced into combo. therapy arm of Ph. 1 with Tecentriq



SYNB1891 is **safe and well-tolerated** as an intratumoral injection with no dose limiting toxicities or infections to date



SYNB1891 **demonstrates target engagement** as assessed by upregulation of IFN-stimulated genes and T-cells



SYNB1891 demonstrates **meaningful pharmacodynamic effects** including systemic cytokine responses observed in two subjects



Evidence of **durable stable disease** was observed in two patients



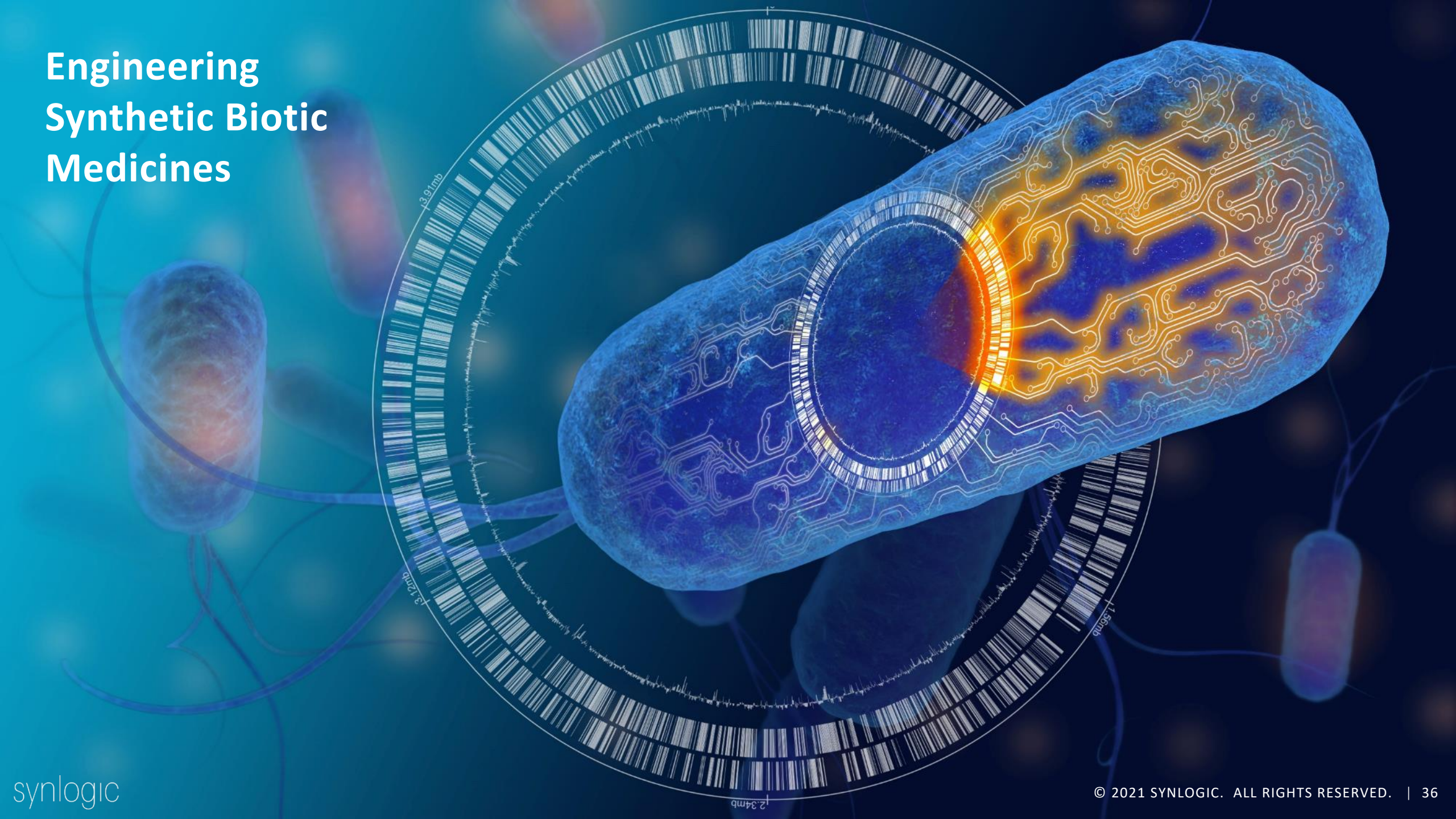
**Monotherapy dose escalation will continue in parallel to combination dose** escalation of SYNB1891 with fixed dose of Atezolizumab (Tecentriq)



Combination therapy **data will be available in late 2021**



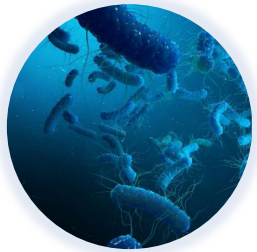
# Engineering Synthetic Biotic Medicines





# A new class of medicines

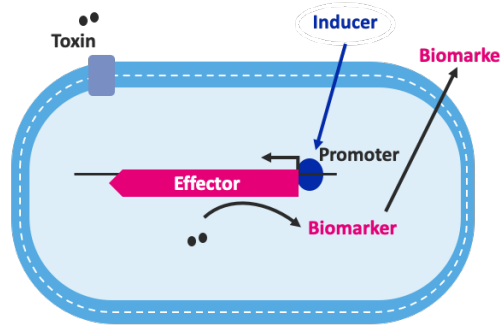
Non-pathogenic  
bacterial chassis



E. coli Nissle



Programable, controllable  
engineering



Inducer-Promoter Switch

Effector Design

Safety Features



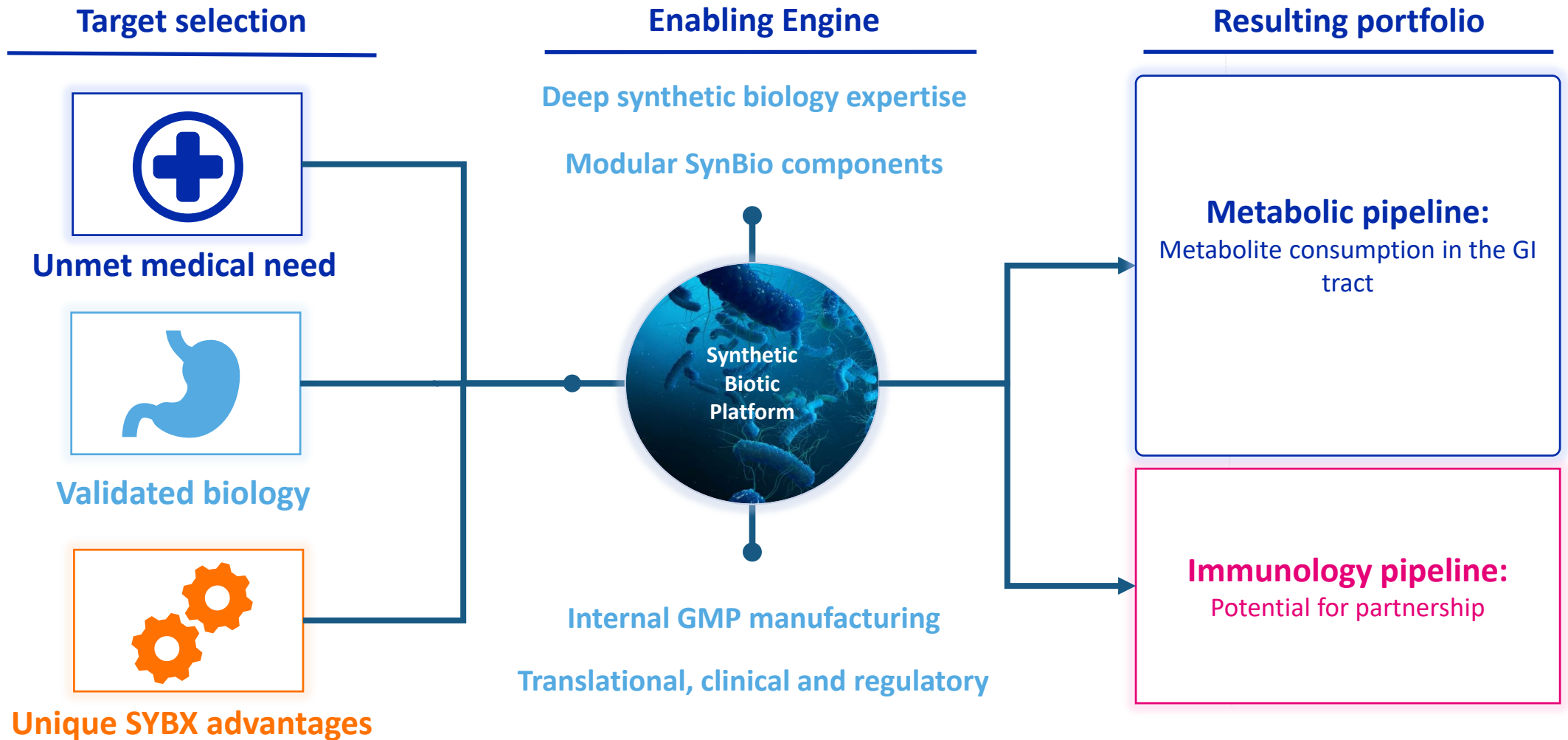
Synthetic Biotic Medicine

synlogic

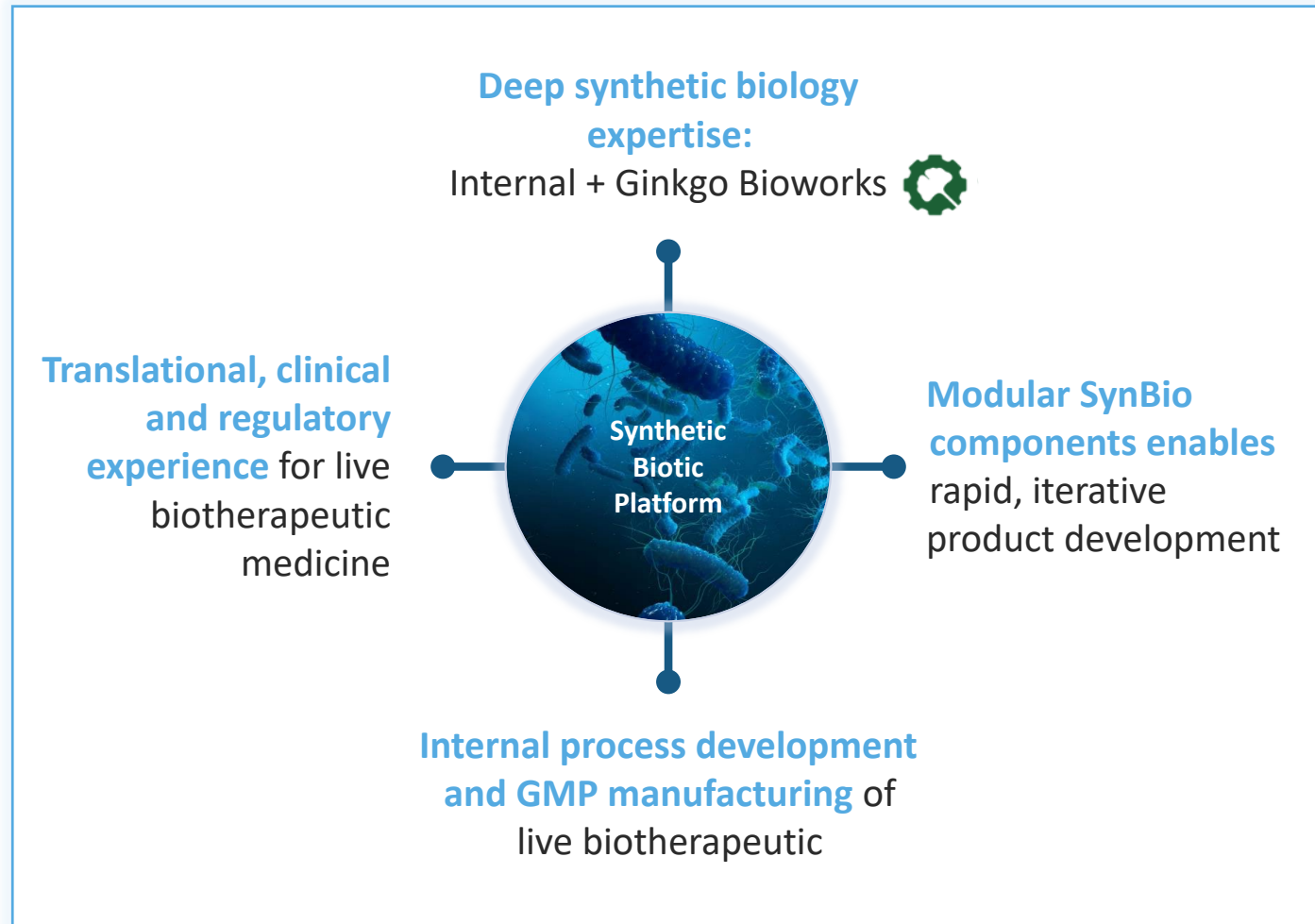
- Drug-like properties
- Does not colonize
- No *in vivo* reproduction or risk of genetic drift

Reusable parts enable rapid iteration of rationally designed prototypes

# Synthetic Biotic Platform accelerates pathway into the clinic



# Synthetic Biotic Platform is enabling engine for drug development



**>200 humans dosed** with Synthetic Biotic medicines

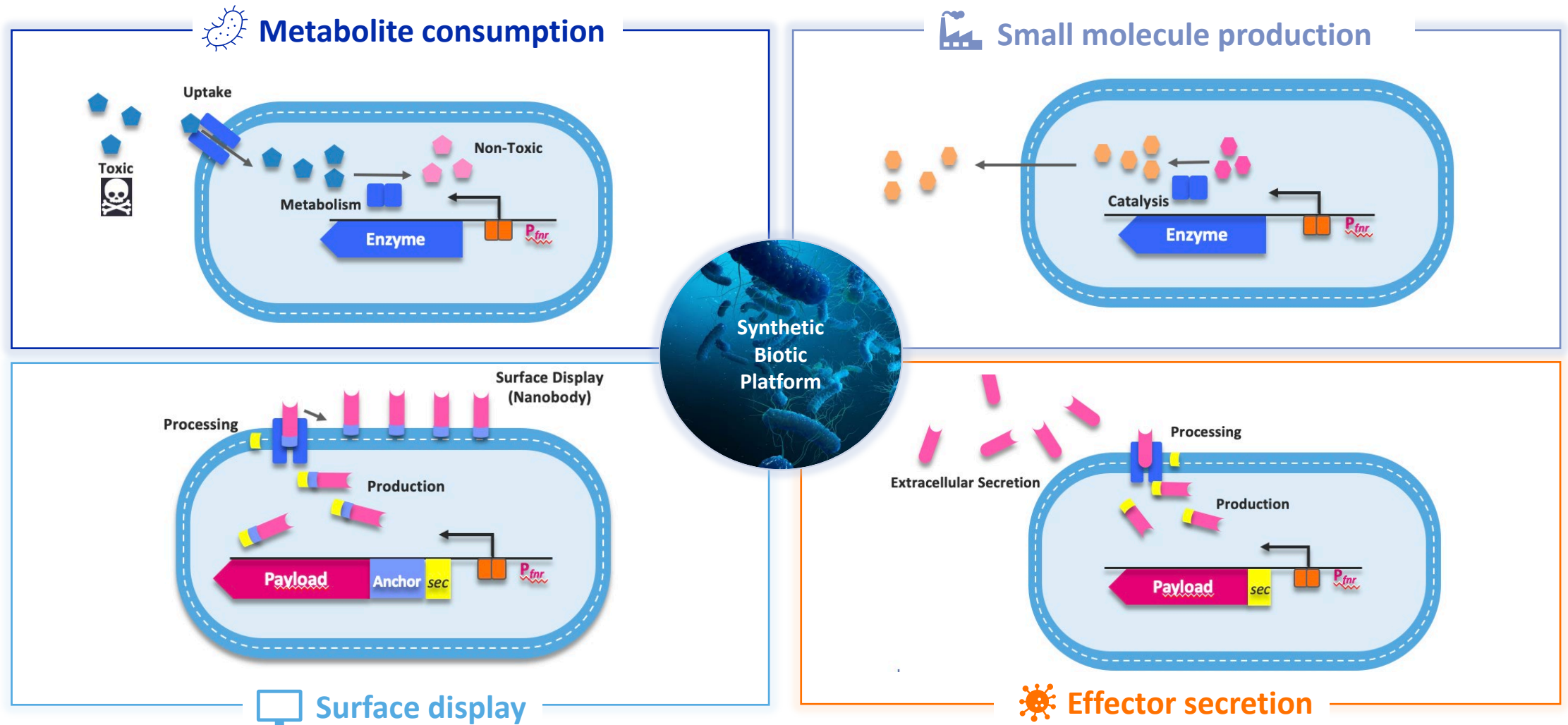
**4 INDs opened** with the U.S. FDA

**Supportive regulatory feedback** from global agencies

**Safe** chassis organism (>100 years of human experience)

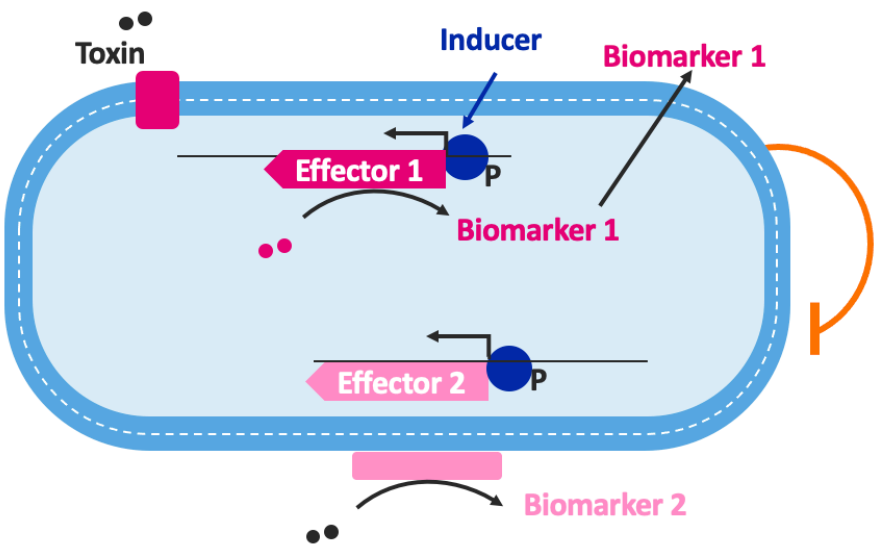
**Rapid pipeline expansion possible with reusable engineering**

# Versatile platform enables diverse therapeutic strategies for range of diseases



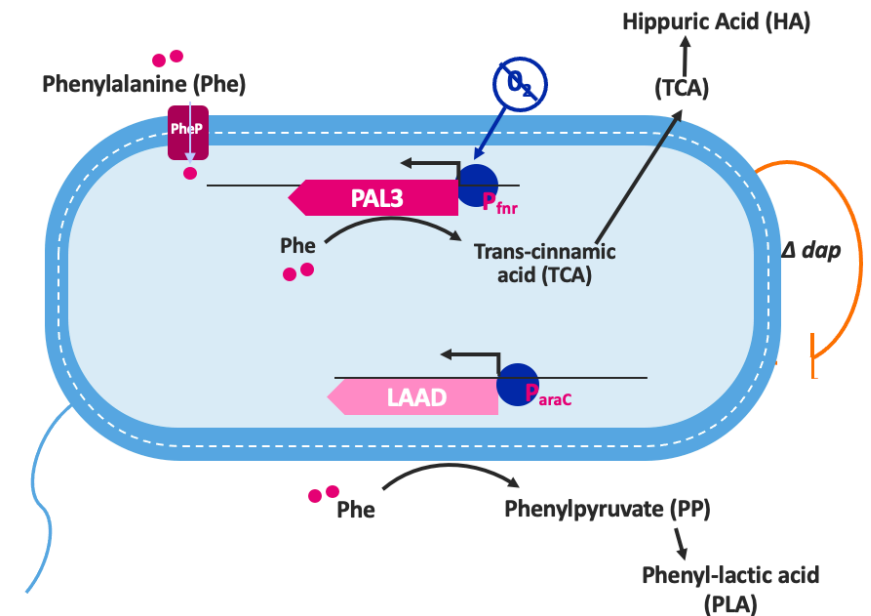
# Reusable parts enable rapid iteration of rationally designed prototypes

Component	Library of parts
Therapeutic strategy	Metabolite consumption, small molecule production, effector secretion or surface display
Bacterial Chassis	Probiotic: Decades of human use & safety data
Effector(s)	Proteins for activity: Can generate biomarkers
Pump	Transports metabolites or proteins across cell membrane
Switch	Inducer-promoter pair: Controls gene expression
Safety Features	Auxotrophies: Prevents growth within or external to the body



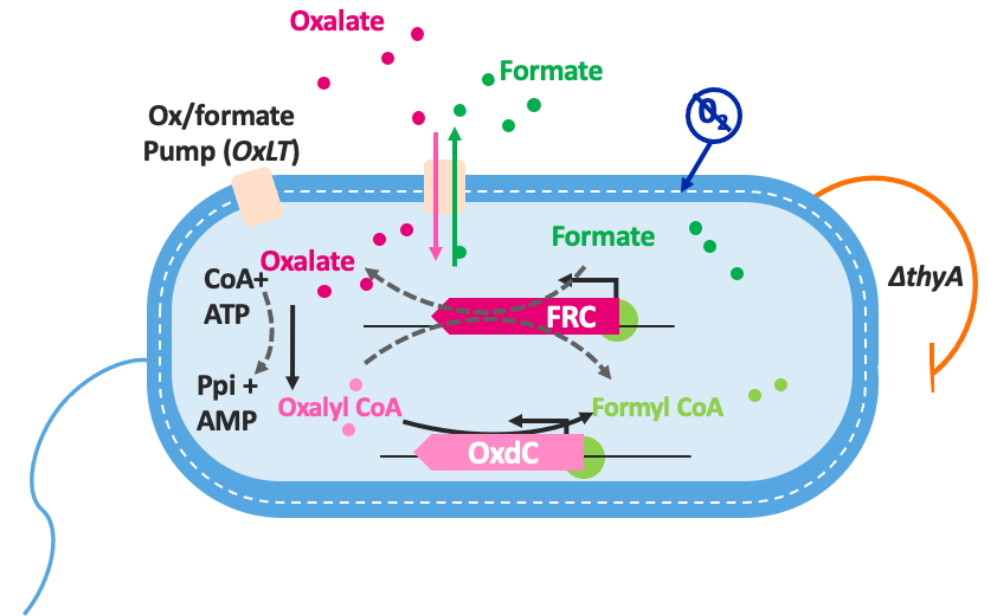
# SYNB1618 Design

Component	SYNB1618 Design
Therapeutic strategy	<b>Metabolite consumption:</b> Built from Synthetic Library Specifically to Consume Phe
Bacterial Chassis	<i>E. coli</i> Nissle
Effector(s)	<b>PAL3 Enzyme:</b> Degrades Phe to TCA (measurable biomarker of activity) <b>LAAD Enzyme:</b> Alt. Phe-consuming pathway
Pump	<b>PheP:</b> Pumps Phe into cell
Switch	<b>FNR &amp; AraC promoter:</b> Control expression during manufacturing and at site of action
Safety Features	<b><math>\Delta dap</math>:</b> Auxotrophy – requires diaminopimelic acid (DAP) to grow

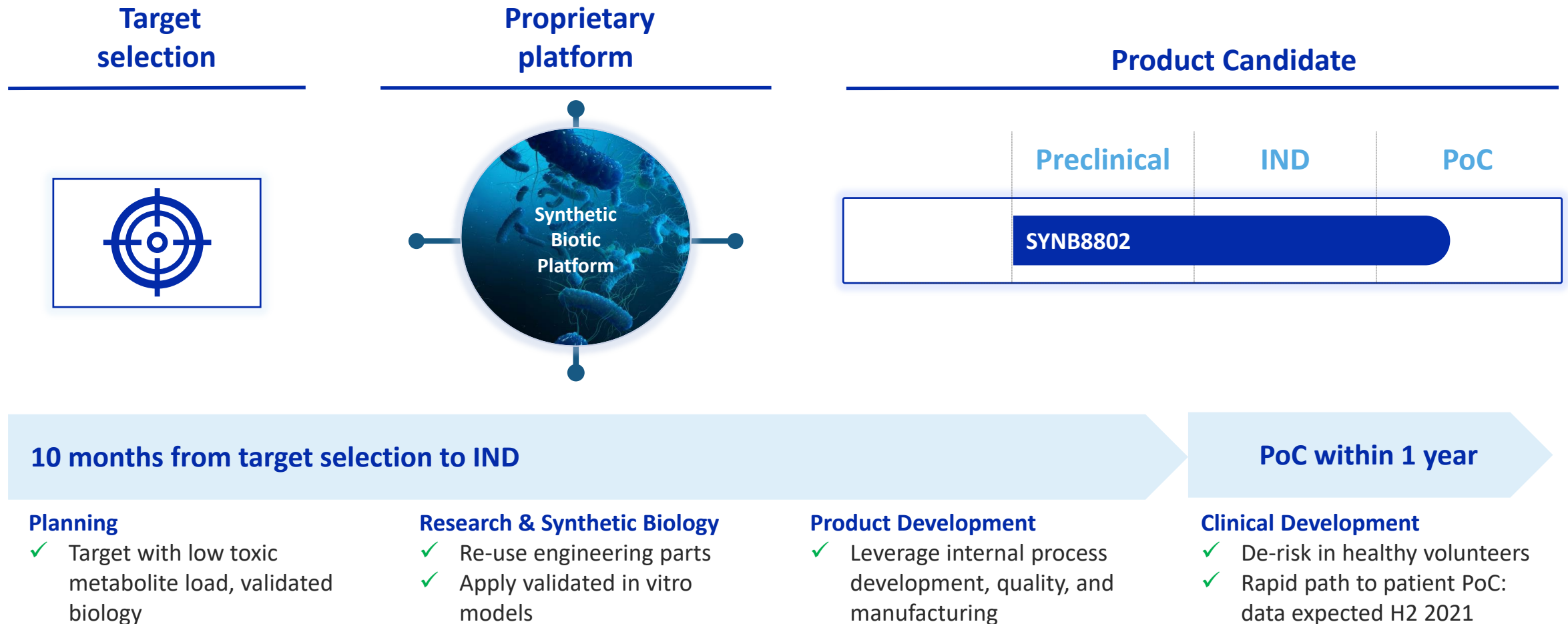


# SYNB8802 Design

Component	SYNB8802 Design
Therapeutic strategy	<b>Metabolite consumption:</b> Engineered to Convert Oxalate to Formate for the Treatment of Enteric Hyperoxaluria
Bacterial Chassis	<i>E. coli</i> Nissle
Effector(s)	<b><i>OxdC</i> and associated components:</b> Catalyzes conversion of oxalate to formate
Pump	<b><i>OxLT</i>:</b> Pumps oxalate in & formate out
Switch	<b>FNR promoter:</b> Inducer-promoter pair
Safety Features	<b><math>\Delta</math> <i>thyA</i>:</b> Controls growth



# Reusable parts enables rapid progress to proof of concept: SYNB8802 case study

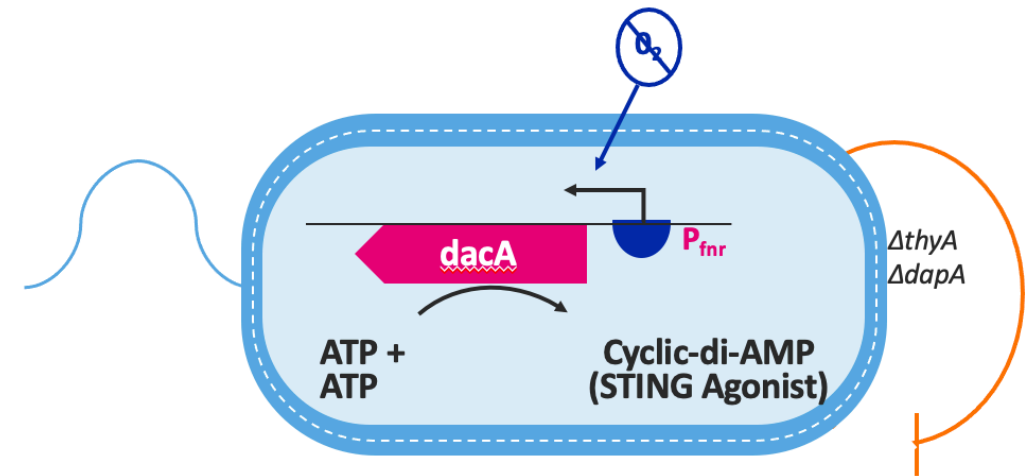


**Portfolio of metabolic opportunities available with similar engineering**



# SYNB1891 Design

Component	SYNB1891 Design
Therapeutic strategy	<b>Small molecule production:</b> Leveraging the ability of bacteria to interact with the immune system to turn a cold tumor hot
Bacterial Chassis	<b><i>E. coli</i> Nissle:</b> Targeting to antigen presenting cells in the tumor microenvironment. Innate immune activation
Effector(s)	<b>STING Agonist:</b> Innate immune activator compounds with chassis effect
Pump	Not necessary
Switch	STING-agonist production restricted to hypoxic TME for sustained payload delivery
Safety Features	Dual auxotrophies inhibit bacterial proliferation outside of tumor





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