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DESIGNED FOR LIFE

January 2020
Corporate Presentation

Forward Looking Statements

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: inborn errors of metabolism, inflammatory and immune disorders, and cancer; the future clinical development of Synthetic Biotic medicines; the potential of our technology to treat phenylketonuria and cancer; 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 quarterly report on Form 10-Q filed with the SEC on November 12, 2019, 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.

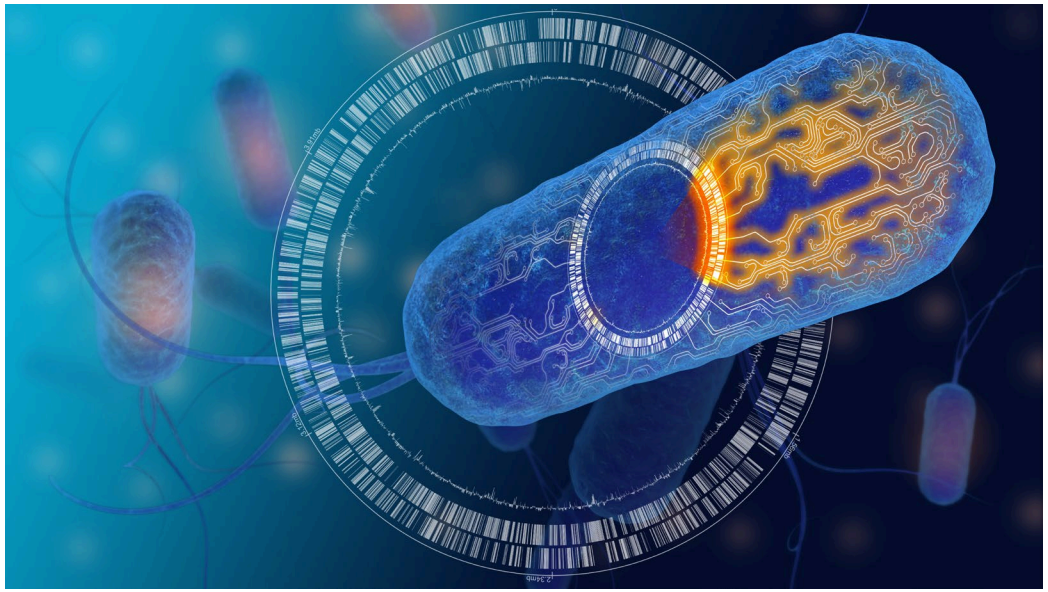
Synthetic Biotic™ Medicines Designed For Life

Synlogic's mission is to
address patients' dynamic therapeutic needs
by developing living medicines
that sense and respond to disease

Synthetic Biotic Medicines: A New Class of Potent Living Medicines

Non-pathogenic bacterial chassis

Rationally designed genetic circuitry programmed to execute biological functions



Therapeutics with potent and programmable clinical effects

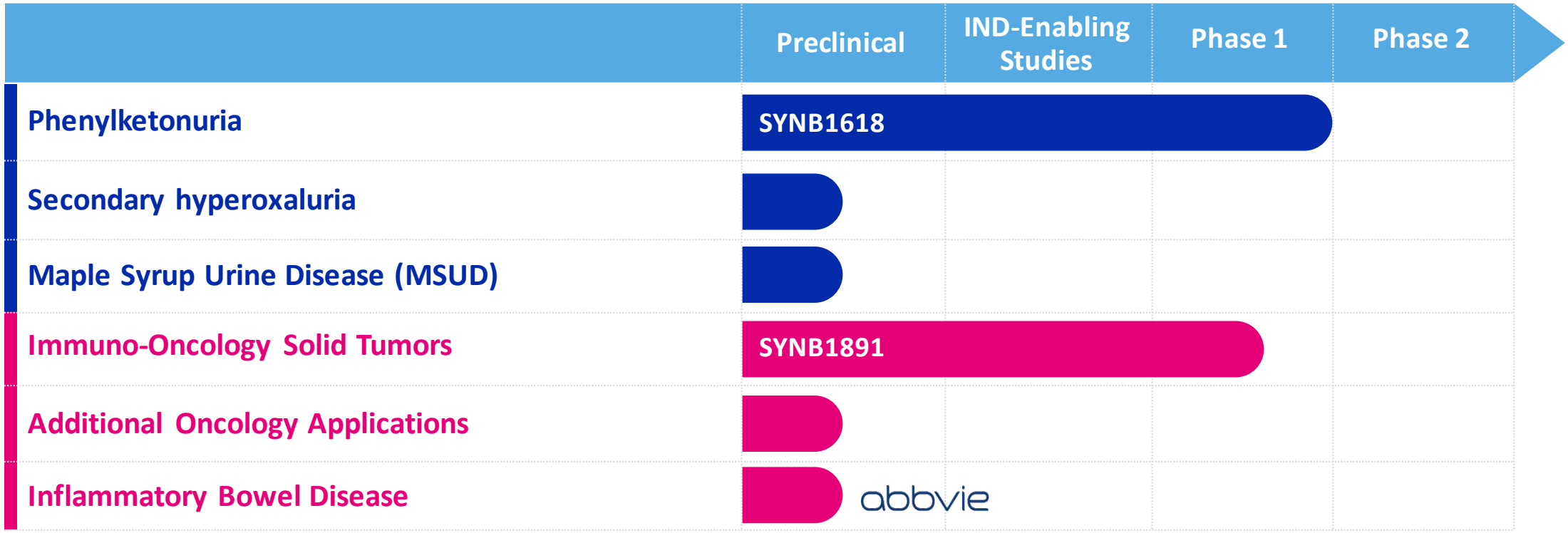
Why Synthetic Biotic medicines?

A Living Medicine Provides Advantages Over Conventional Treatments for Many Diseases

 **Conventional Medicines**	 **Living Medicines**
Cannot provide a dynamically variable response to disease symptoms	Can sense and respond to disease symptoms
Designed to affect one molecular dysfunction	Can be engineered to compensate for entire processes or pathways
Designed to affect one target or function	Can be engineered to perform multiple therapeutic functions
Risk of systemic toxicity	Can be designed to act locally and lower risk of systemic toxicity

Synlogic is leading the field in using synthetic biology to engineer and develop **Synthetic Biotic medicines - living medicines** based on non-pathogenic microbes

Investing in Development of a Robust Pipeline for a Range of Diseases



Rare Metabolic Diseases

Immunomodulation

Engineered Strain Development Approach

Deliver Candidate Quality Strains in a Timely and Resource Efficient Manner

Therapeutic Idea

Prototype Generation

Rational Pathway Design
Prototype Strain Construction
Potency Benchmarking

Strain Optimization

High Throughput Enzyme Screening
Expression Optimization
Potency Troubleshooting ('Omics)

Lead Selection

Potency Testing
Quantitative Modeling
Manufacturability Assessment

Candidate Selection

Animal Disease Models
Process Scale-up
IND Enabling Studies

Iterative Optimization

Process Development
Pathway Optimization
Chassis Optimization

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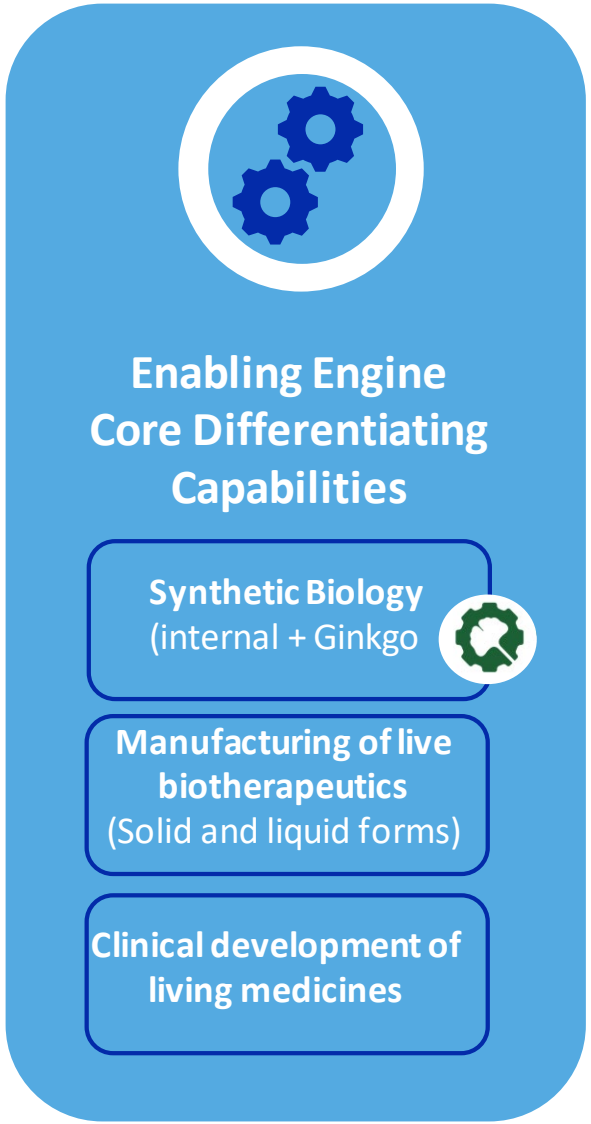
Building a Diverse Portfolio of Synthetic Biotic Medicines

Portfolio Growth Built on Foundational Platform Capabilities



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Building a Diverse Portfolio of Synthetic Biotic Medicines

Portfolio Growth Built on Foundational Platform Capabilities

Validated Biological Targets

Where a living medicine is uniquely positioned to impact patients

Enabling Engine Core Differentiating Capabilities

- **Synthetic Biology** (internal + Ginkgo
- **Manufacturing of live biotherapeutics** (Solid and liquid forms)
- **Clinical development of living medicines**

Internal Pipeline Focus

Consumption of toxic metabolites from the GI tract (rare metabolic diseases currently managed by dietary control e.g. PKU)

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Internal Pipeline: Metabolic Disease

Synlogic's initial internal programs are focused on metabolic diseases for which dietary intervention demonstrates clinical benefit

Phenylketonuria (PKU)

Rare Inherited Disease Requires Strict Dietary Control

Julia, living with PKU

Inability to break down phenylalanine (Phe) results in toxic levels of Phe in the brain leading to cognitive impairment, convulsions and behavioral problems

~34,000 patients in US and EU

Part of newborn screening panel

Limited treatment options beyond restrictive diet

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SYNB1618 for the Treatment of Phenylketonuria (PKU)

Advancing Solid Formulation to Phase 2 Study in Patients with PKU

Why PKU?

High unmet need, particularly for pediatric patients

Biology is well understood:

↓ Phe in GI tract = ↓ blood Phe = clinical benefit for patient

Status

Demonstrated equivalent Phe-consuming activity of SYNB1618 in patients and healthy volunteers

Identified MTD of solid formulation for next study in PKU patients

Program Milestones

1H2020: Initiation of Phase 2 trial of SYNB1618 solid formulation in PKU patients

- Evaluate potential for Phe-lowering; validate clinical pharmacology and preclinical modeling

Develop Phase 3/commercial-ready formulation

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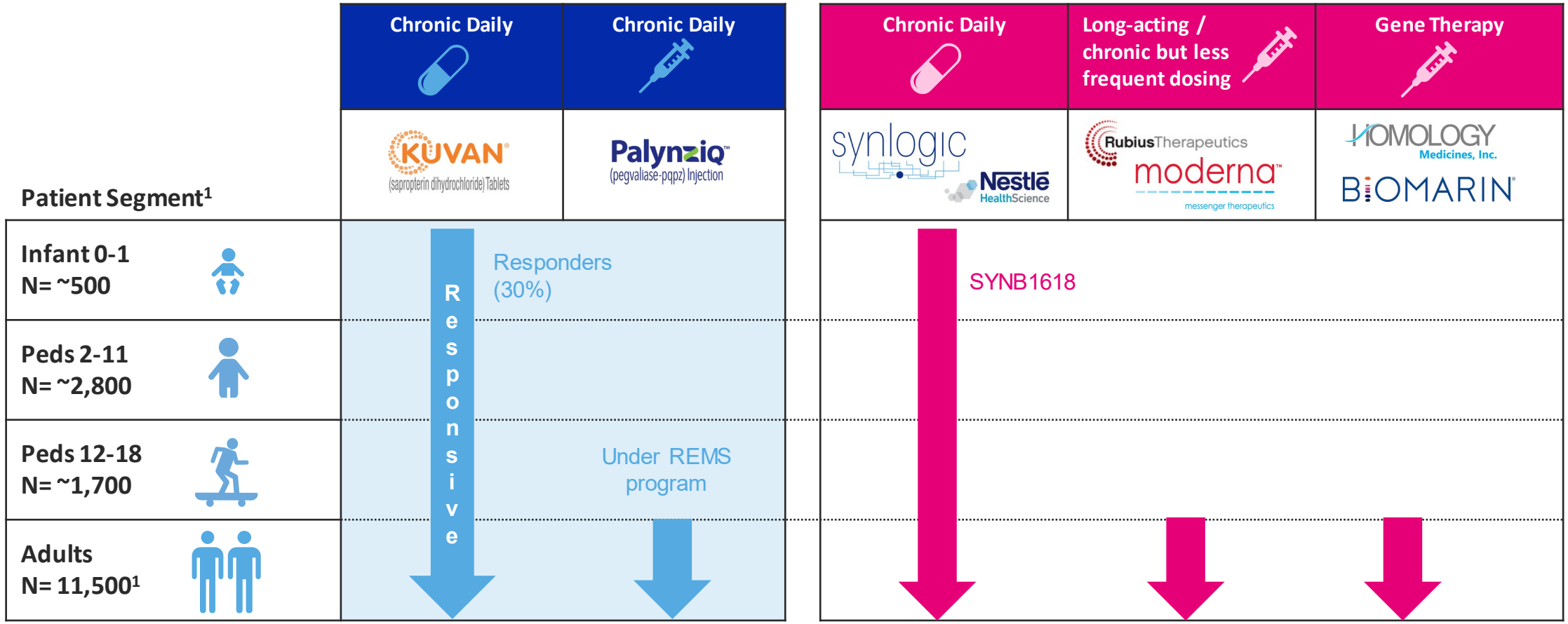
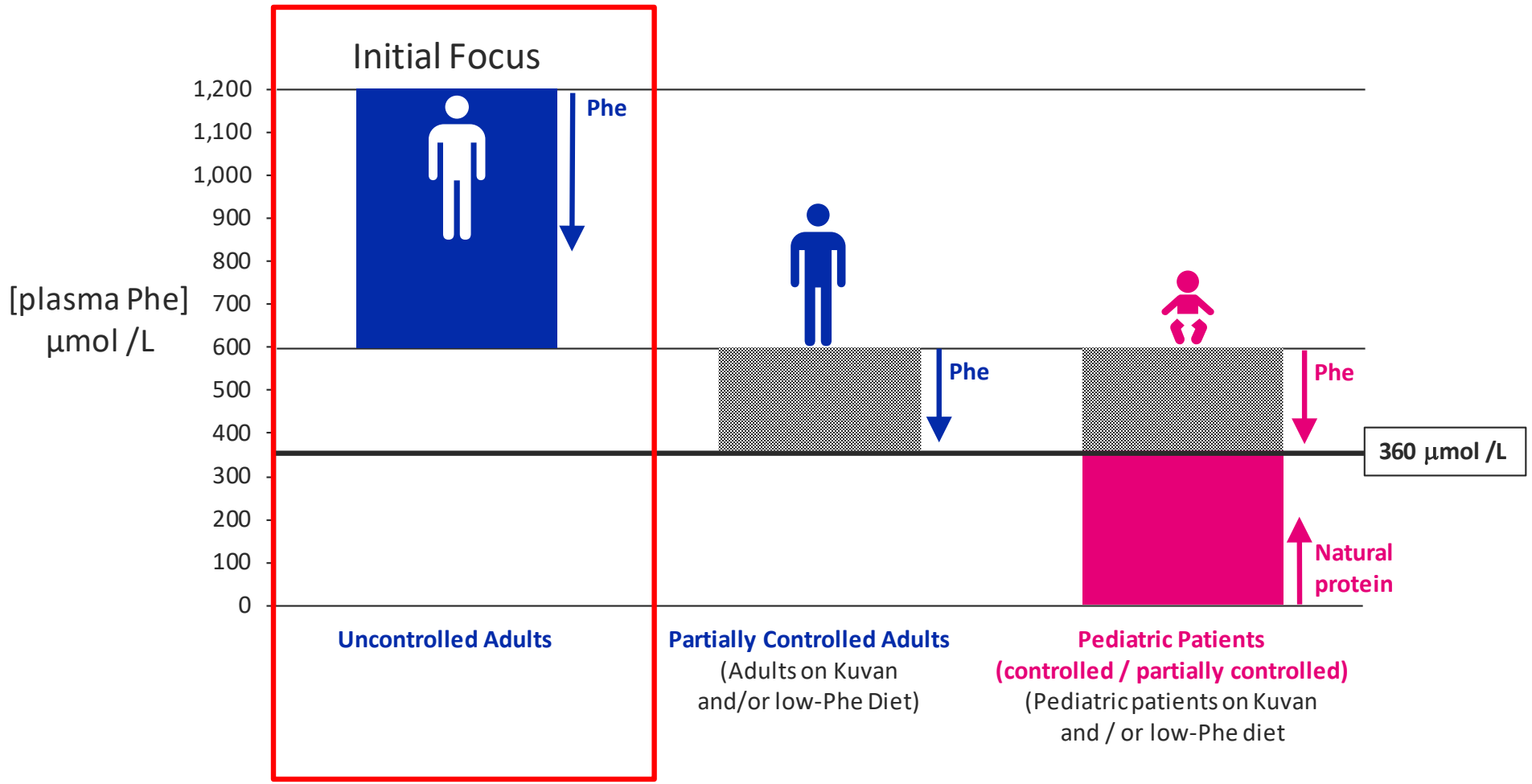
SYNB1618 Differentiation

With Demonstrated Safety, SYNB1618 Is Well-Positioned to Address the Needs of All PKU Patients



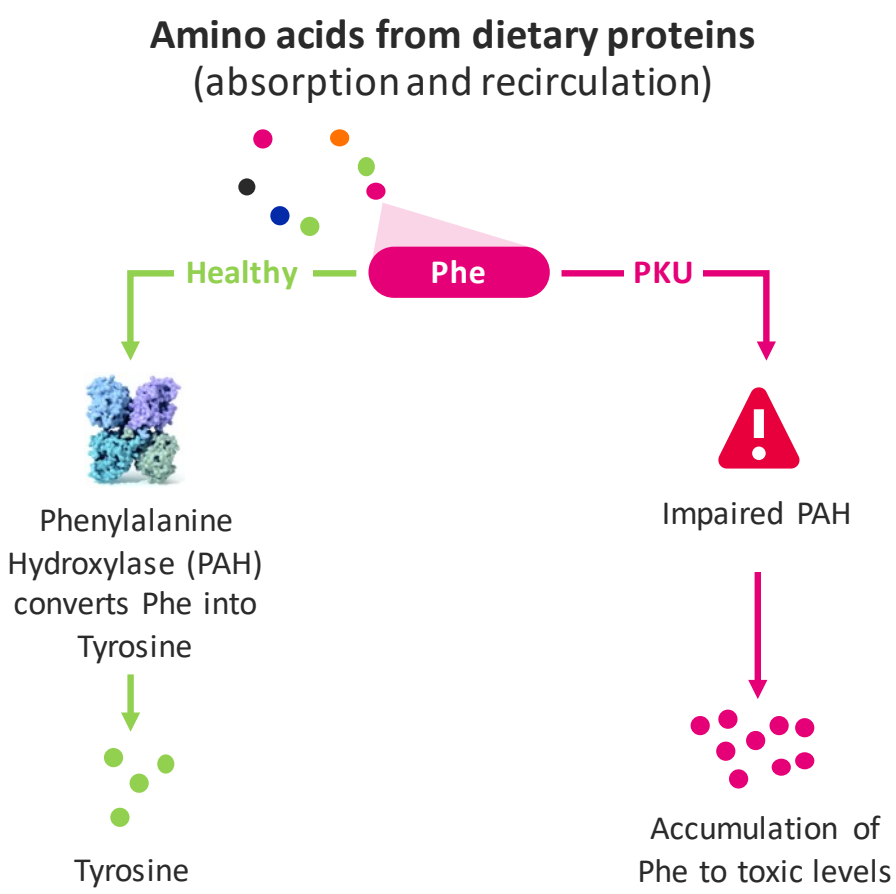
1. *Includes 7,500 "lost to follow up" adult patients*

SYNB1618 Potential to Address Unmet Need Across Patient Groups



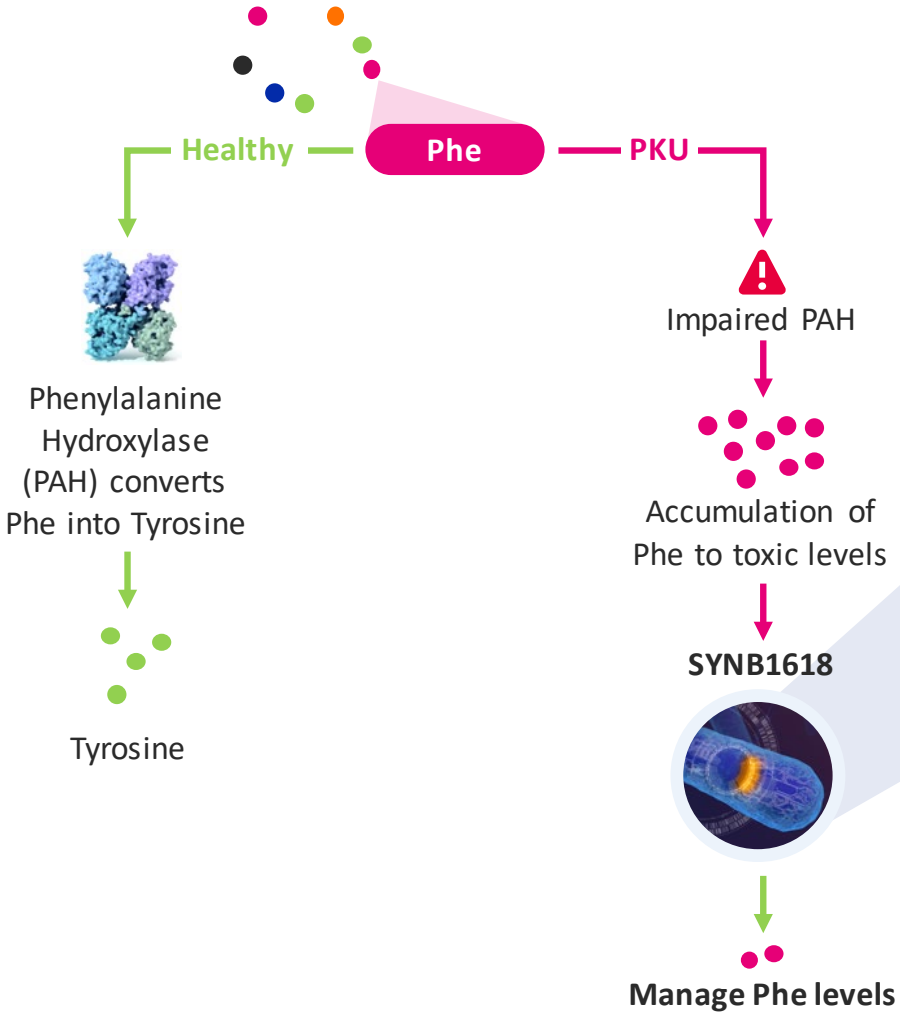
Phe Metabolism is Impaired in PKU Patients

Due to Impaired or Absent PAH Enzyme Activity

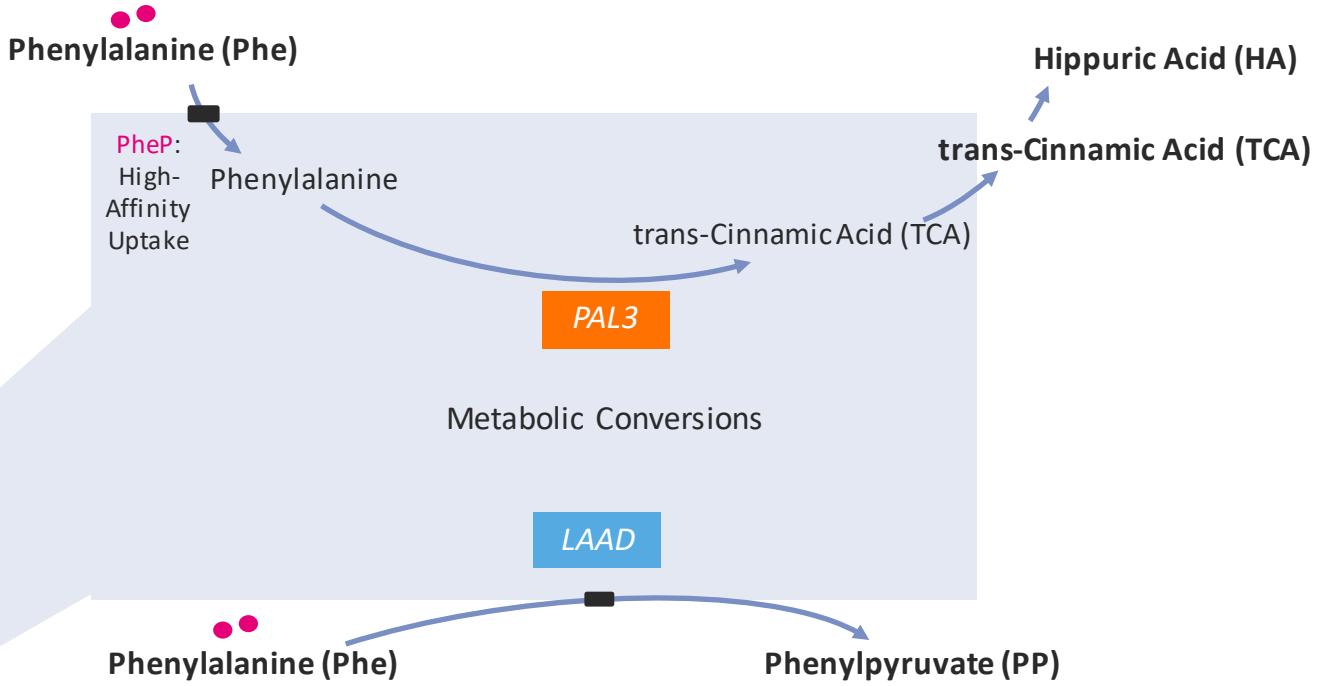


SYNB1618 Mechanism of Action

Amino acids from dietary proteins
(absorption and recirculation)



Engineered Probiotic Bacteria: *E. coli* Nissle
Components of Synthetic Genetic Circuit



When Phe is not efficiently metabolized (PKU) **SYNB1618** provides an alternative mechanism

- **PAL3**: produces TCA which is converted to HA in the liver and is excreted in urine
- **LAAD**: produces phenylpyruvate (PP)

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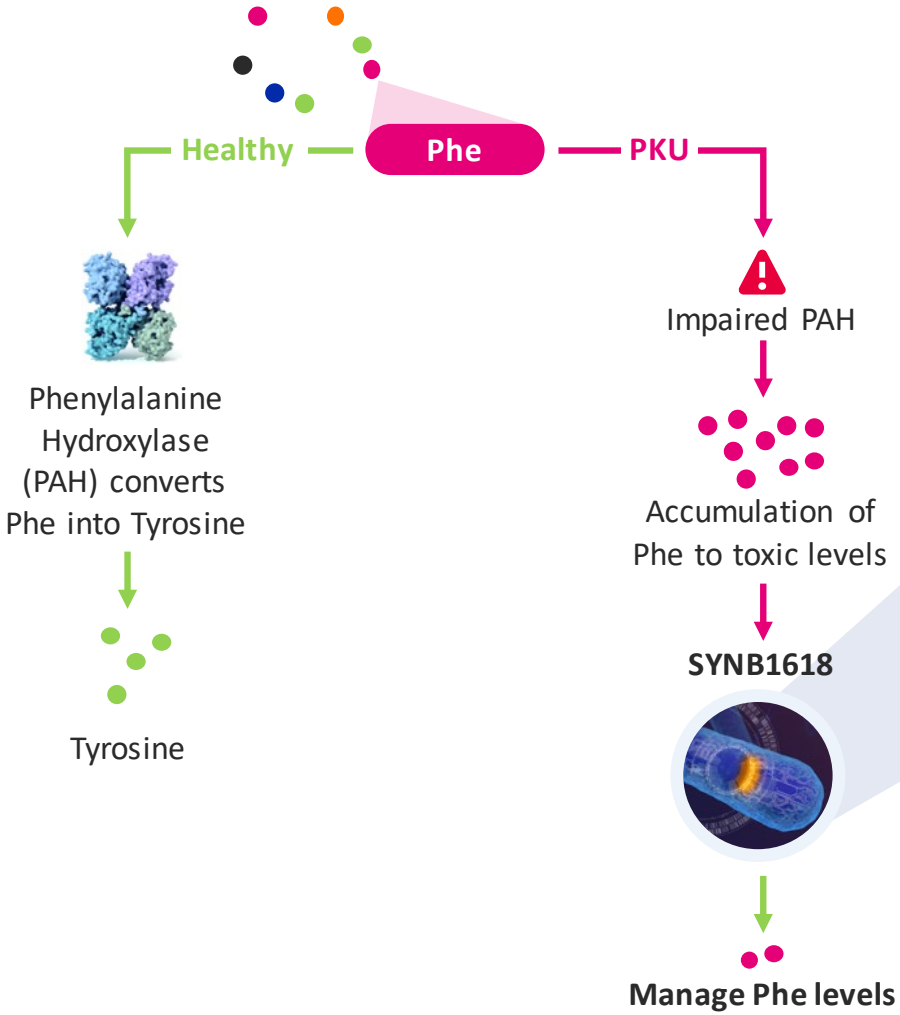

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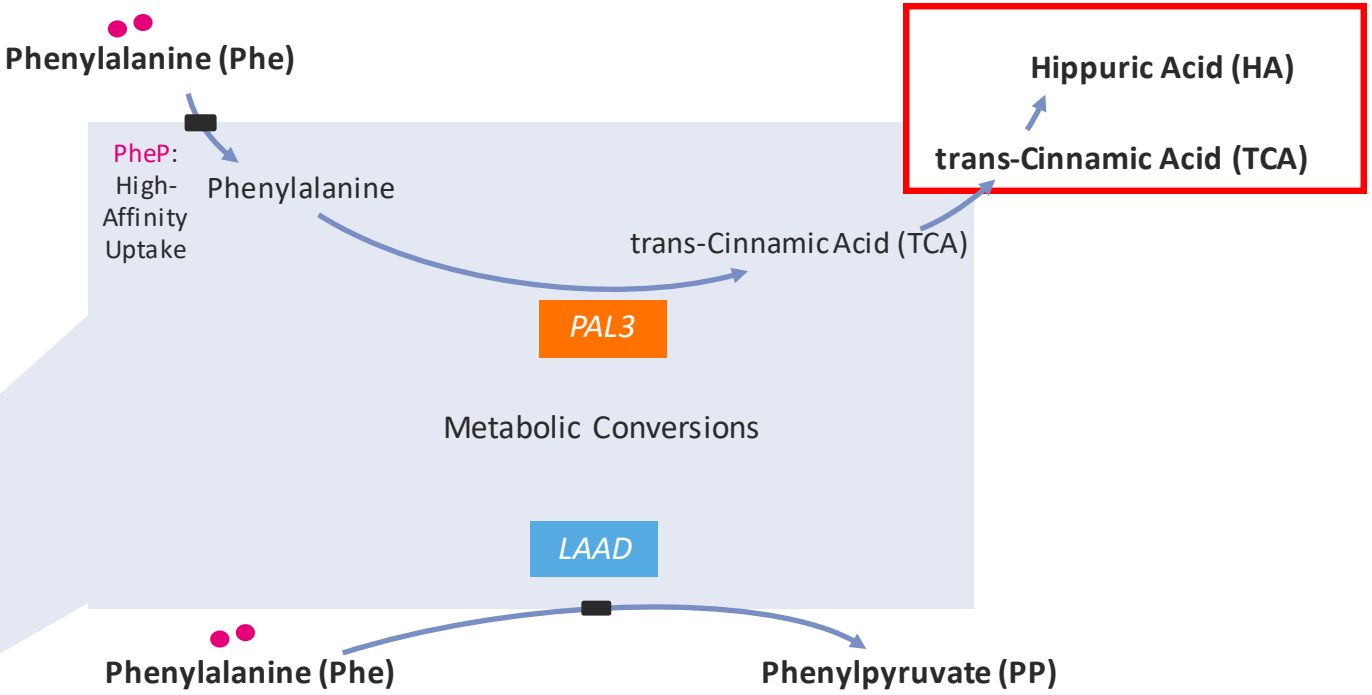

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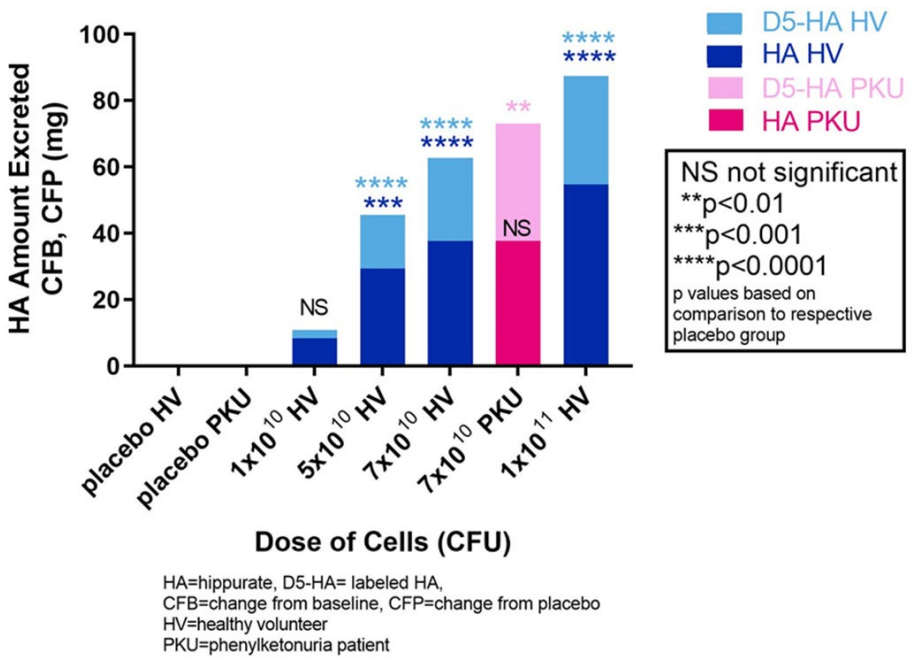
SYNB1618 in the Clinic: Activity

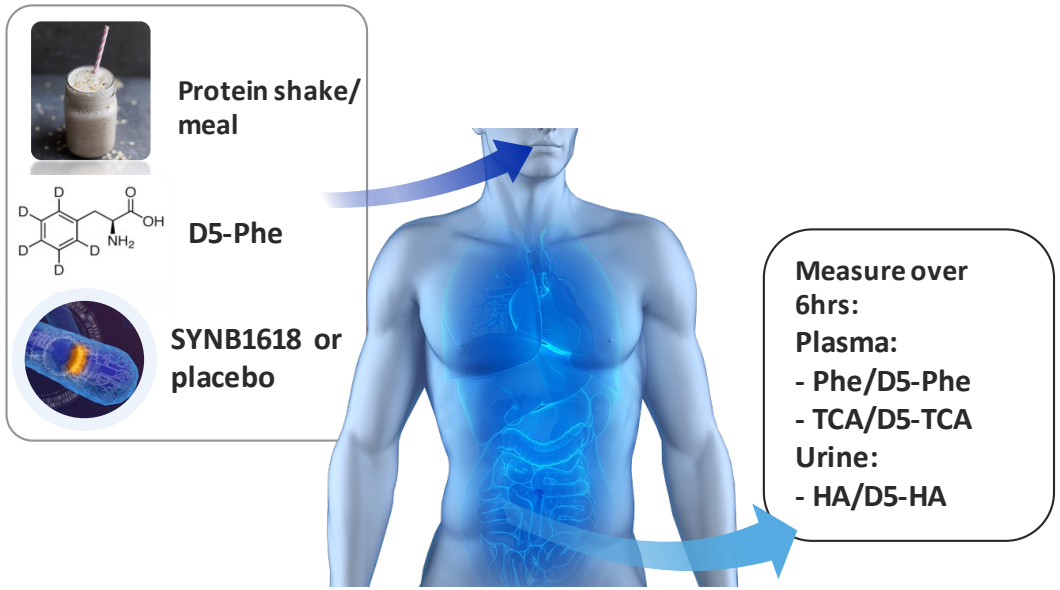
Statistically Significant and Equivalent Activity of liquid formulation in Healthy Volunteers (HV) and Patients

56 healthy volunteers, 14 PKU patients	Received at least one dose of SYNB1618 or placebo	Adults Age range: 18-62 yrs old

MD URINARY HA AND D5-HA



HA=hippurate, D5-HA= labeled HA,
CFB=change from baseline, CFP=change from placebo
HV=healthy volunteer
PKU=phenylketonuria patient



Key: HA: Hippurate, D5-HA: labeled HA, CFB: change from baseline, CFP: change from placebo

SYNB1618 in the Clinic: Safety and Tolerability

Clinical Studies Have Demonstrated Safety and Clearance in HV and PKU Patients

- No SAEs, no systemic toxicity or infections
- AEs mild or moderate in severity, and reversible. Most GI-related
- All subjects cleared SYNB1618, no evidence of colonization, antibiotics required
- New solid formulation demonstrates improved tolerability over original liquid formulation in healthy volunteers
- Bridging study of solid formulation defined MTD for Phase 2 study in patients with PKU – initiation expected in 1H2020

New Metabolic Disease Programs

Maple Syrup Urine Disease (MSUD)

Rare Inherited Disease Requires Strict Dietary Control

Inability to break down branched chain amino acids (BCAA): leucine (Leu), isoleucine and valine

Leads to encephalopathy/progressive neurodegeneration in untreated infants. Patients are prone to acute crises with risk of neuropsychiatric / neurocognitive damage and death

~1,000 - 4,500 patients in US and EU

Limited treatment options: strict dietary control and liver transplant

Maple Syrup Urine Disease (MSUD)

Advancing from Discovery into Lead Optimization

Why MSUD?

High unmet need without treatment options

Biology is well understood:

↓ Leu in GI tract = ↓ blood Leu = clinical benefit for patient

Status

Ginkgo optimized strain (SYN5941) blunts peptone-induced increase in blood [Leu] in NHPs

Further optimization and preclinical work ongoing

Program Milestones

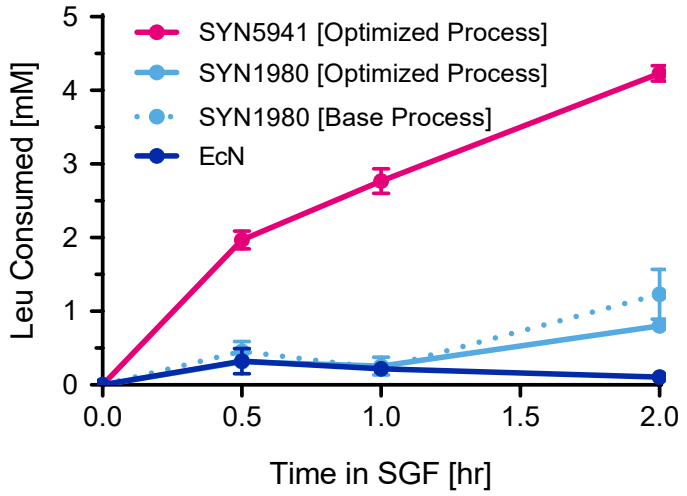
Complete optimization and preclinical efficacy studies in 2020

Declare clinical candidate by end of 2020

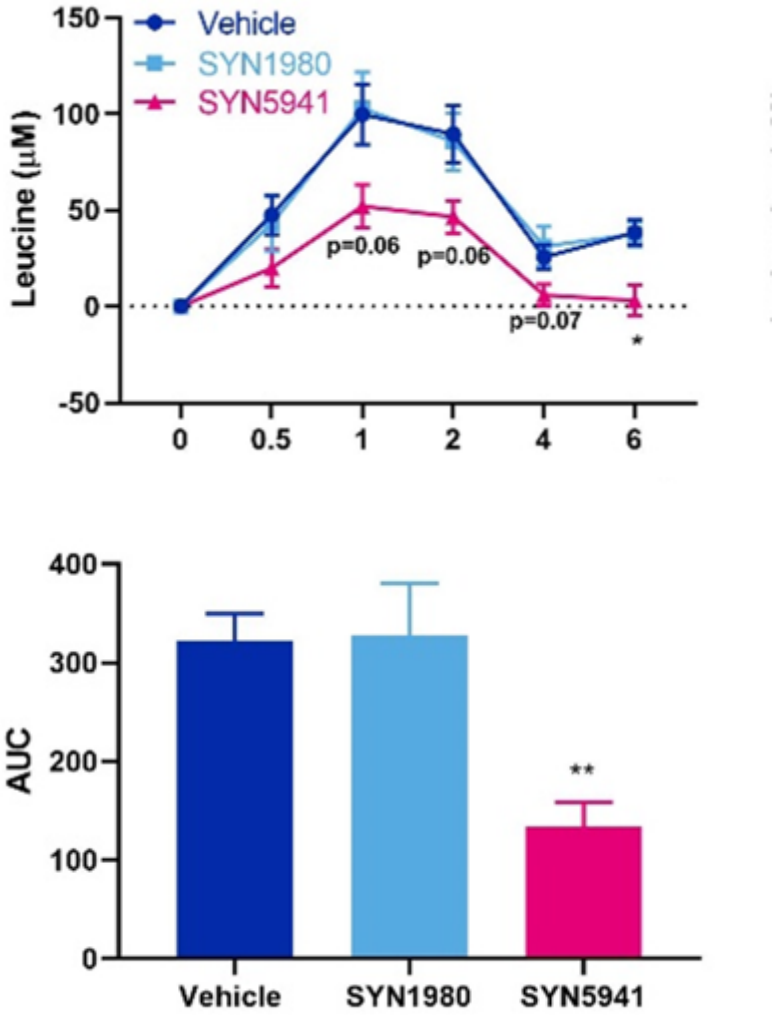
Leucine Consumption is Improved with Optimized Strain

In Both *In Vitro* Simulated Gut System and Non-Human Primates

In Vitro Simulated Gut system (IVS)



Non-Human Primates



Secondary Hyperoxaluria (HOX)

No Approved Treatment - Requires Strict Dietary Control

Results in excess absorption of oxalate in the GI tract. Oxalate accumulation in kidneys leads to kidney failure

~250,000 patients in US (100,000 severe)

In development (Ph 3): recombinant oxalate-degrading enzyme
(demonstrated 20% urinary oxalate reduction, dosed 5 times a day, Allena)

SYNB1618 for the Treatment of Secondary Hyperoxaluria (HOX)

Advancing from Discovery into Lead Optimization

Why HOX?

High unmet need, dietary treatment only (low oxalate diet)

Biology is well understood: ⬇ Oxalate in GI tract = clinical benefit for patient

Status

Strain optimization ongoing (Ginkgo)

Prototype demonstrates oxalate lowering in preclinical studies, additional work ongoing

Program Milestones

Optimized oxalate-consuming strains transferred from Ginkgo

Complete preclinical efficacy studies in animal models; benchmark to competition

Declare clinical candidate in 2H2020

Building a Diverse Portfolio of Synthetic Biotic Medicines

Portfolio Growth Built on Foundational Platform Capabilities

Validated Biological Targets

Where a living medicine is uniquely positioned to impact patients

Enabling Engine Core Differentiating Capabilities

- **Synthetic Biology** (internal + Ginkgo
- **Manufacturing of live biotherapeutics** (Solid and liquid forms)
- **Clinical development of living medicines**

Internal Pipeline Focus

Consumption of toxic metabolites from the GI tract (rare metabolic diseases currently managed by dietary control e.g. PKU)

External / Pipeline Expansion

- Larger metabolic indications
- Inflammation (AbbVie)
- Oncology
- Alternate routes of administration

Transfer of platform learnings

Funds, informs & builds

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Immuno-Oncology Pipeline

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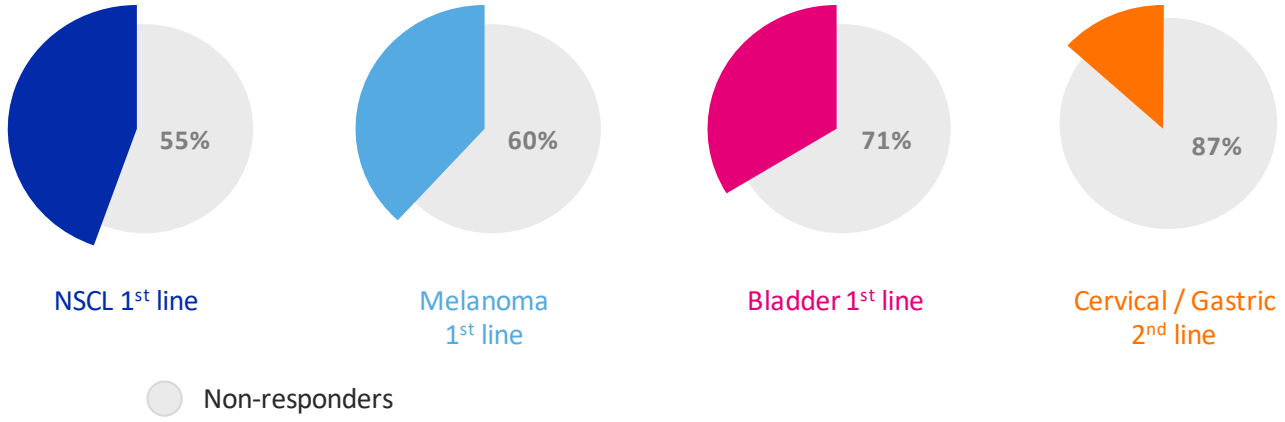
Synlogic Vision for Immuno-Oncology

Expand the Benefits of Immunotherapy Broadly Across Tumor Types

CHECKPOINT INHIBITORS HAVE TREATMENT FAILURES

55-87% of patients fail to respond in CPI-indicated cancers

Failure Rates for Select FDA Approved CPI Monotherapy

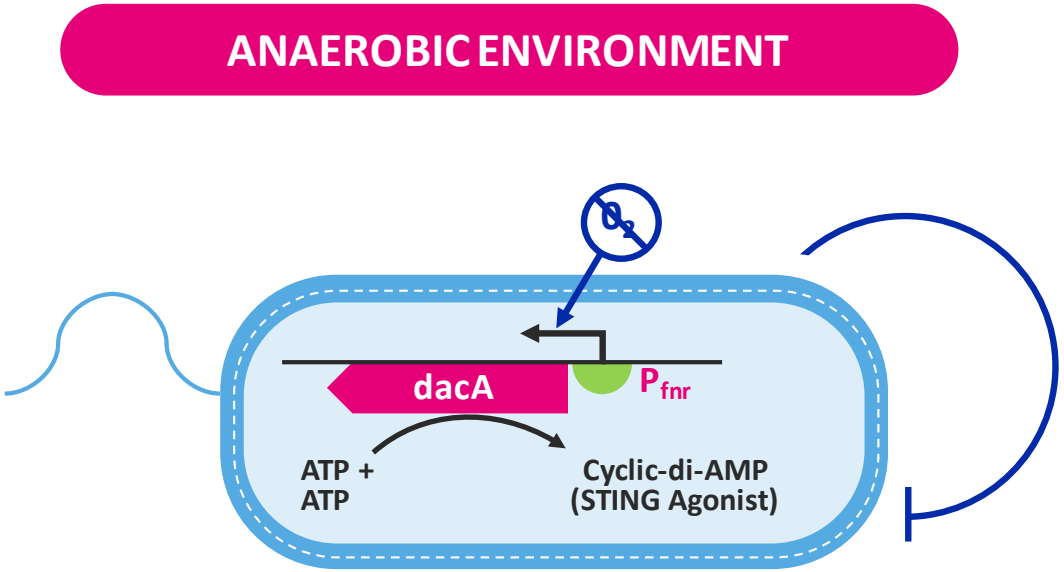


Enable broad response and remission through engagement of multiple immunomodulatory pathways to enhance tumor inflammation and promote robust T cell responses

Synthetic Biotic Medicine Producing STING Agonist (SYNB1891)

Dual Innate Immune Activator

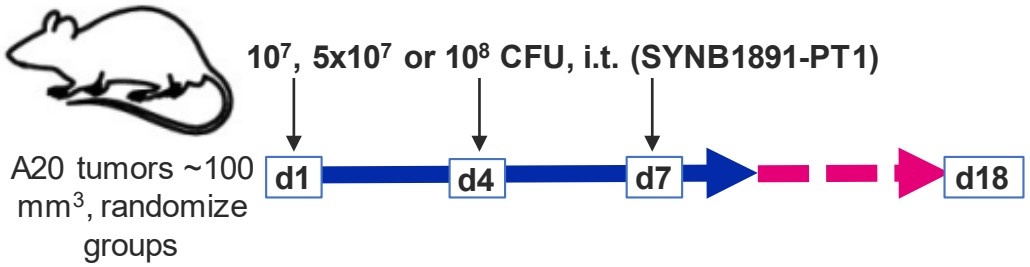
- Synthetic biology applied to confer activities for efficacy and control for safety
- Designed as a dual innate immune activator: combined benefit of bacterial chassis and STING agonist
- The dacA gene is integrated into genome under the control of inducible promoter (P_{fnr}) to produce c-di-AMP (CDA)
- Dual biosafety feature via auxotrophies – no proliferation in tumor, systemic circulation or environment
- Learnings inform future combinations

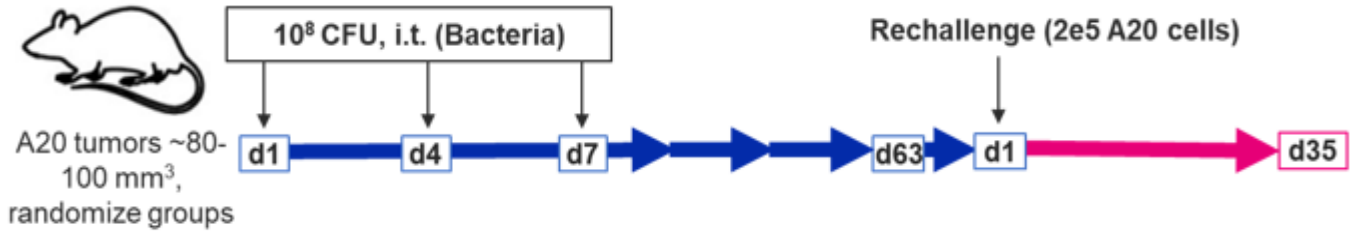


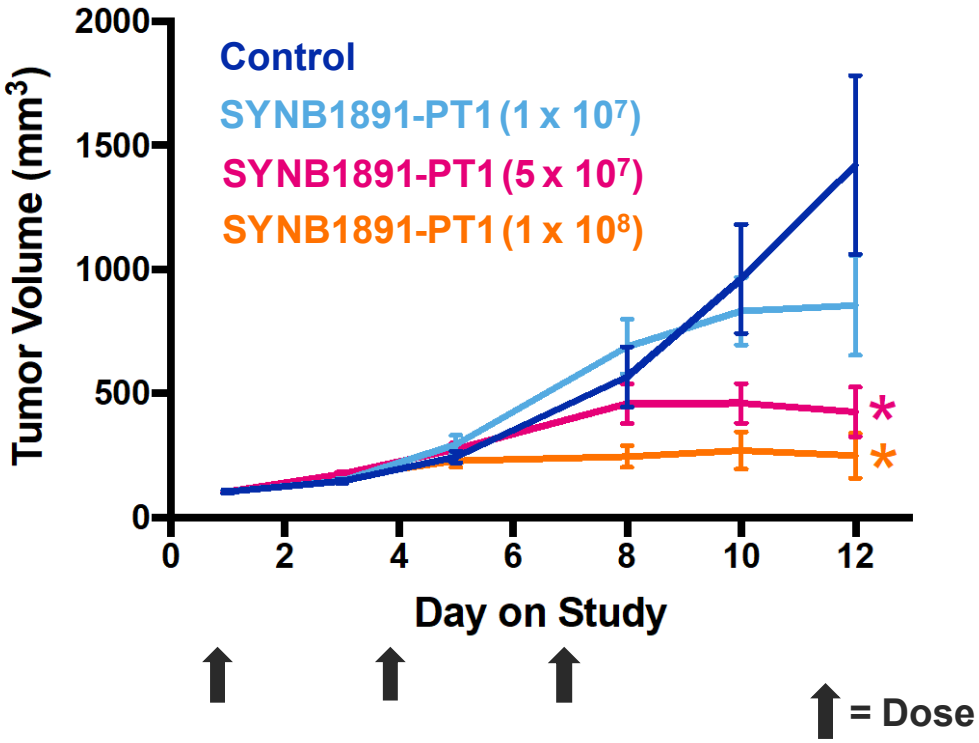
Auxotrophies

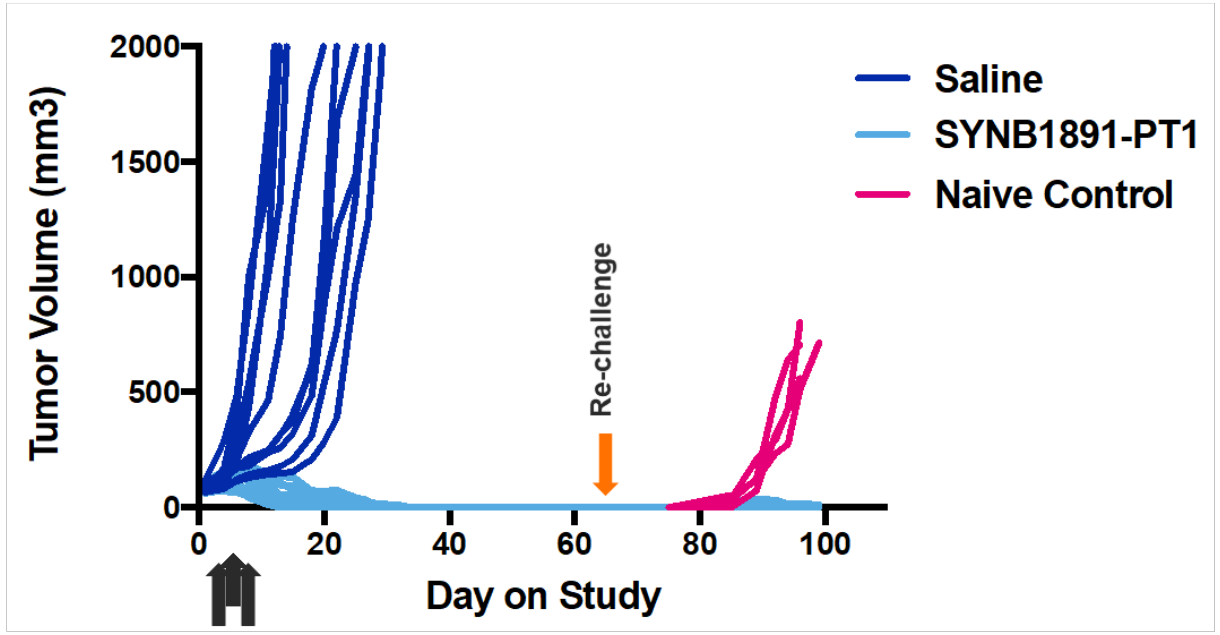
- Diaminopimelic acid (DAP)
- Thymidine

SYNB1891: Dose Dependent Antitumor Effect and Systemic Immunity









Dual Innate Immune Activator SYNB1891

Designed to Locally Inflame the TME and Systemically Drive Tumor Antigen-Specific Immunity

DIFFERENTIATION

Targeted

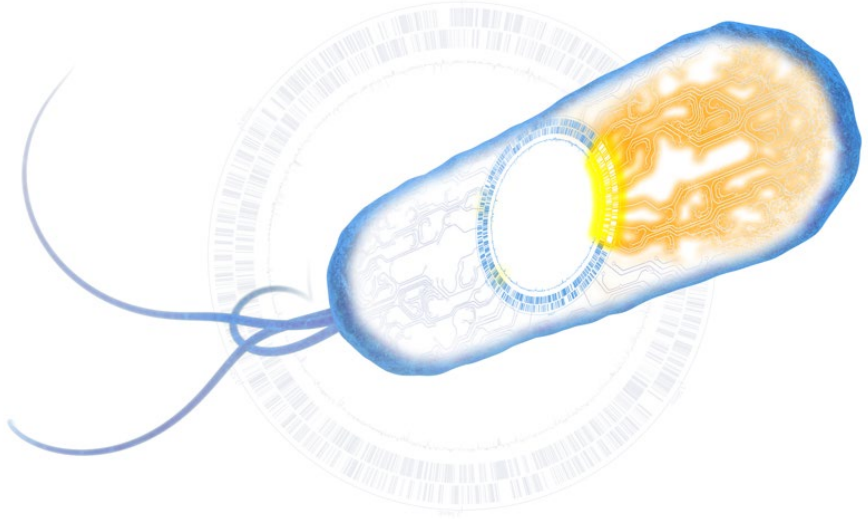
- STING agonism in target cells that drive efficacy (APCs)
- Sparing cells where STING agonism is detrimental
- Low systemic risk - tumor colonization without leakage

Dual activity

- Intracellular activation of STING and bacterial-induced immune pathways provides dose-dependent anti-tumor activity
- Activation of multiple innate immune pathways
- Induction of immunological memory
- Enhanced activity vs. naked STING agonist

PROGRESS

- First subject treated in Phase 1 clinical trial
- Arm 1 monotherapy, Arm 2 combo with CPI (Atezolizumab supply agreement in place)
- Phase 1 monotherapy data expected in 2020



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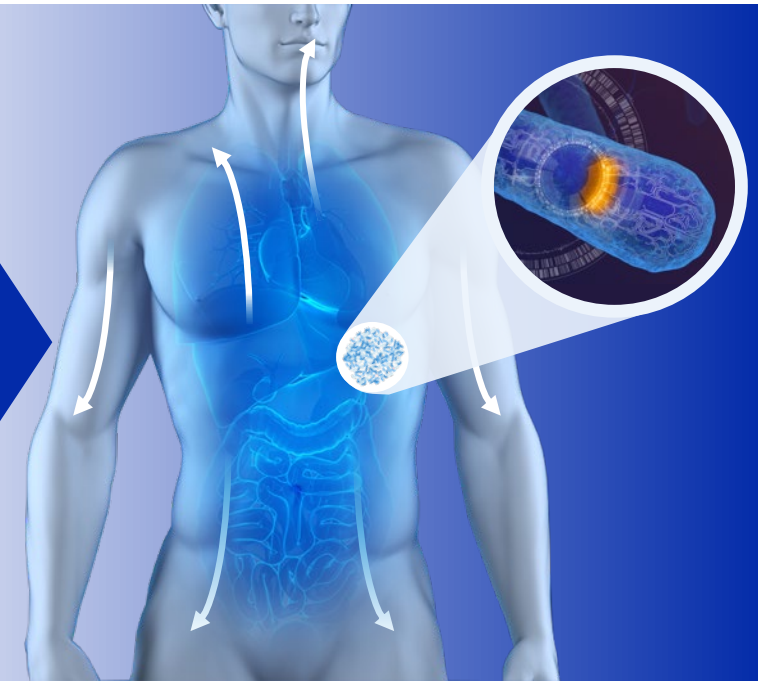
Broad Potential in Immuno-Oncology

Vision: Expand and Exceed the Effect of Cancer Immunotherapies

SYNB1891

INTRATUMORAL

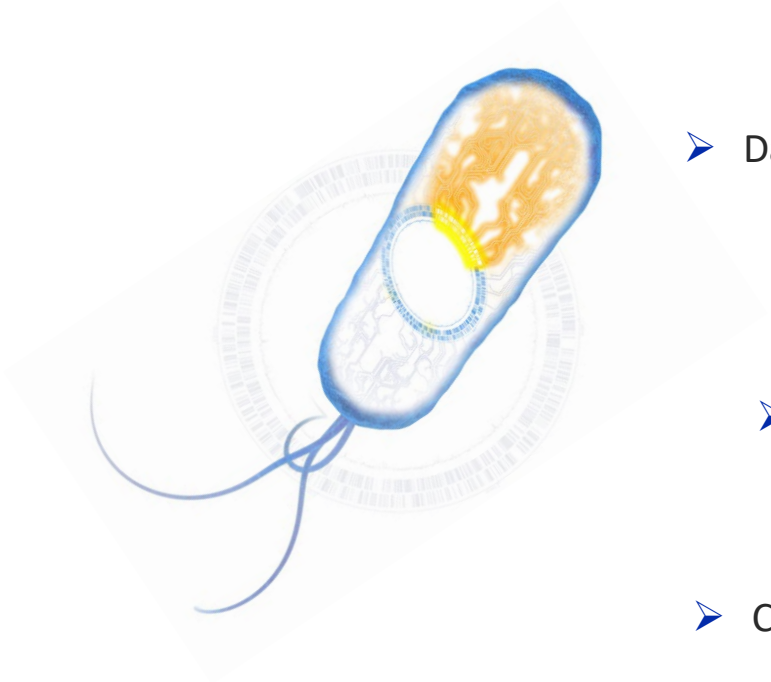


ALTERNATE ROA

COMBINATIONS

HARNESS THE MICROBIOME

2020 Milestones



SYNB1618 in PKU

- Initiate study of solid formulation in PKU patients in 1H2020

SYNB1891 in Immuno-Oncology

- Data from monotherapy arm of Phase 1 study expected in 2020
- Prepare to initiate combination arm of Phase 1 study

New Programs

- Advance secondary hyperoxaluria and MSUD programs

Platform and Pipeline Development

- Continue to advance additional early stage GI-based programs
- Publish and present data
- Seek strategic collaborators and partners to expand breadth of pipeline

Synthetic Biotic™ Medicines Designed For Life

Synlogic's mission is to
address patients' dynamic therapeutic needs
by developing living medicines
that sense and respond to disease

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