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DESIGNED FOR LIFE

Corporate Presentation

Forward Looking Statements

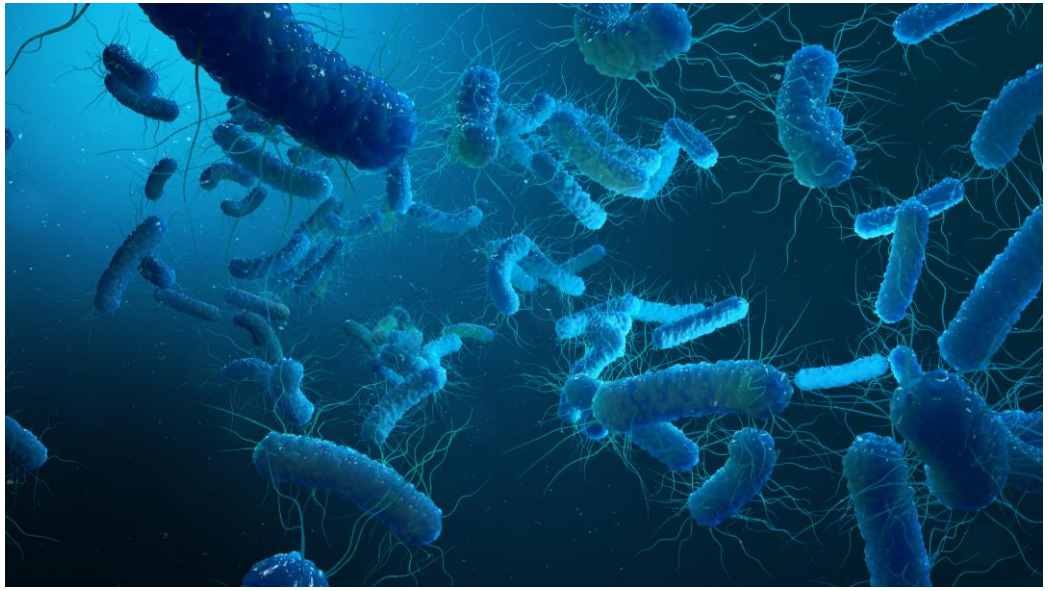
This presentation contains “forward-looking statements” that involve substantial risks and uncertainties for purposes of the safe harbor provided by the Private Securities Litigation Reform Act of 1995. All statements, other than statements of historical facts, included in this presentation regarding 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: metabolic disease, 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-K filed with the SEC on March 12, 2020, 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

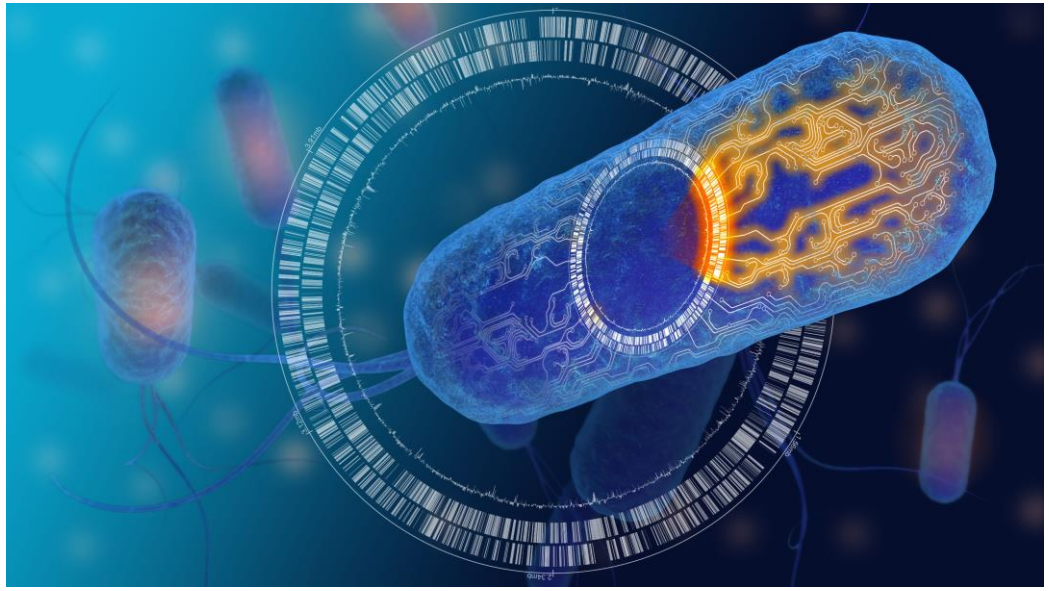
Synlogic's mission is to
address patients' dynamic therapeutic needs
by developing living medicines
that sense and respond to disease

Synthetic Biotic Medicines: A New Class of Potent Living Medicines

Trillions of bacteria live in and on us



What if we could program them to execute biological functions to treat disease in new ways?



Therapeutics with potent and programmable clinical effects

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Why Synthetic Biotic Medicines?

A Living Medicine Provides Advantages Over Conventional Treatments for Many Diseases

Conventional Medicines	Synthetic Biotic 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

Engineered Strain Development Approach

Deliver Candidate Quality Strains in a Timely and Resource Efficient Manner

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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

Building a Diverse Portfolio of Synthetic Biotic Medicines

Portfolio Growth Built on Foundational Platform Capabilities

Biological Targets

Where a Synthetic Biotic medicine is uniquely positioned to impact patients

Enabling Engine Core Differentiating Capabilities

- **Synthetic Biology** (internal + Ginkgo)
- **Manufacturing of live biotherapeutics** (Solid and liquid forms)
- **Regulatory, Translational & Clinical Dev.**

Internal Pipeline Focus

Rare metabolic diseases based on consumption of toxic metabolites from the GI tract

External / Pipeline Expansion

Immunology and oncology leveraging the ability of bacteria to interact with the immune system

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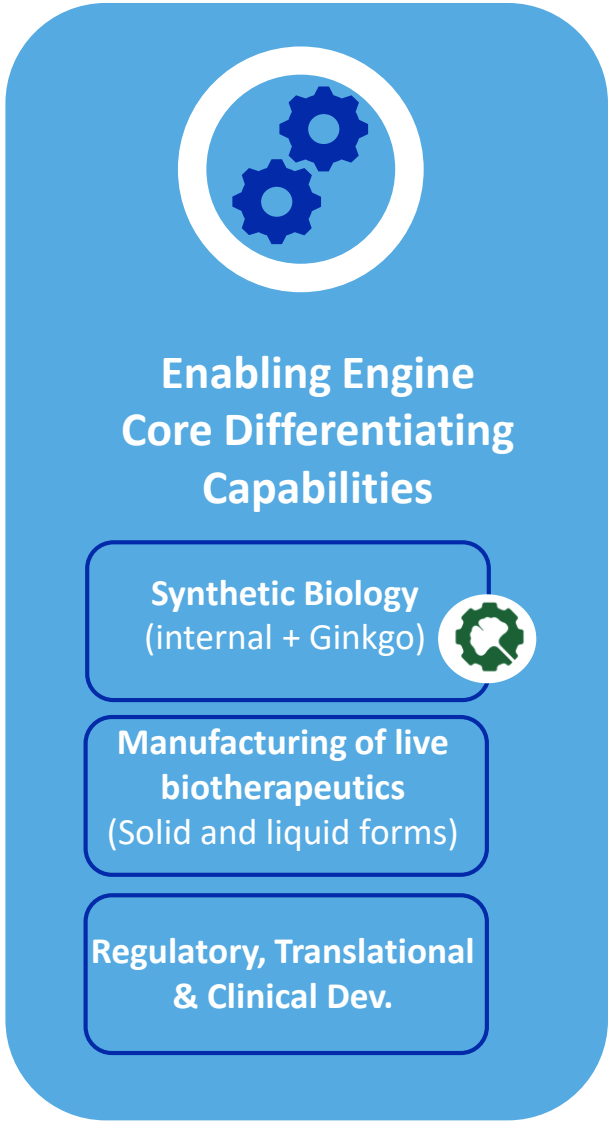
Building the Engine to Develop Synthetic Biotic Medicines

Foundational Platform Capabilities are Key to Successful Development of Therapeutics



- **200 humans dosed** with Synthetic Biotic medicines
- **3 INDs opened** with the U.S. FDA
- **Supportive regulatory feedback** on approach from global regulatory agencies
- **Internal process development and GMP manufacturing** capabilities established to support production of material for mid-stage trials
- **Collaborations and agreements** with large pharma partners (AbbVie and Roche)
- **Expanded synthetic biology expertise** with Ginkgo Bioworks collaboration

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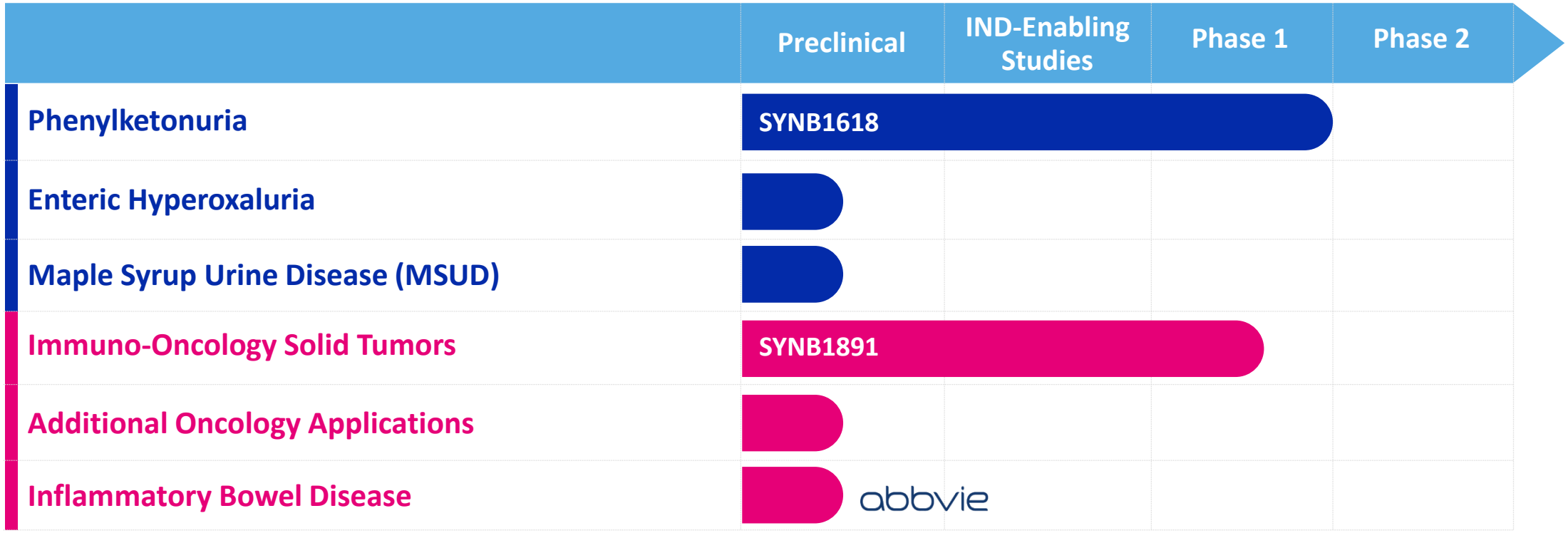
Investing in Development of a Robust Pipeline for a Range of Diseases



Rare Metabolic Diseases

Immunomodulation

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Internal Pipeline: Metabolic Disease

Rare metabolic diseases based on consumption of toxic metabolites from the GI tract

Why Metabolic Diseases For Synthetic Biotic Medicines?

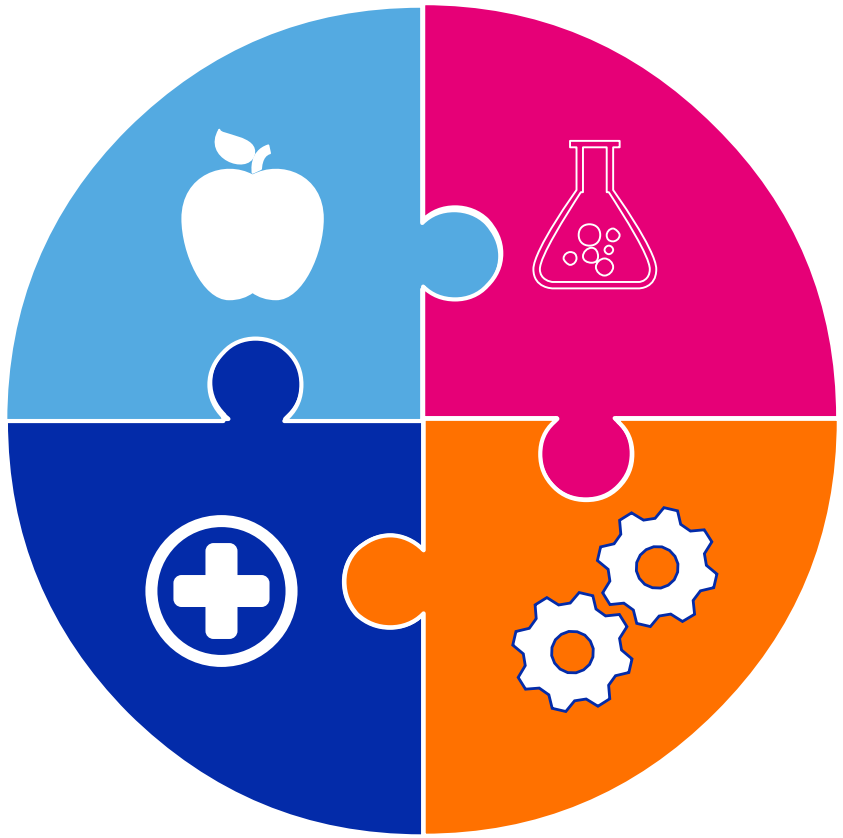
Consumption of Toxic Metabolites In GI Tract

Validated Biology

Diseases with known pathophysiology. Dietary intervention provides support for GI-based approach

Unmet Medical Need

Across both inherited and acquired metabolic diseases



Platform Proof of Mechanism

PKU program has demonstrated that we can consume a toxic metabolite in the GI tract. Subsequent programs build on that experience.

Unique Advantage of SYNB

Bacteria act catalytically, can contain multiple enzyme pathways and are protected from digestion within the GI tract.

Phenylketonuria (PKU)

Rare Inherited Disease Requires Strict Dietary Control

Julia, living with PKU

Why PKU?

Biology well-understood: Inability to break down phenylalanine (Phe) results in toxic levels in the brain leading to cognitive impairment, convulsions and behavioral problems

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

High unmet need particularly for pediatric patients

~ 34,000 patients US + EU

Status

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

Identified MTD of solid formulation for Phase 2 study in PKU patients

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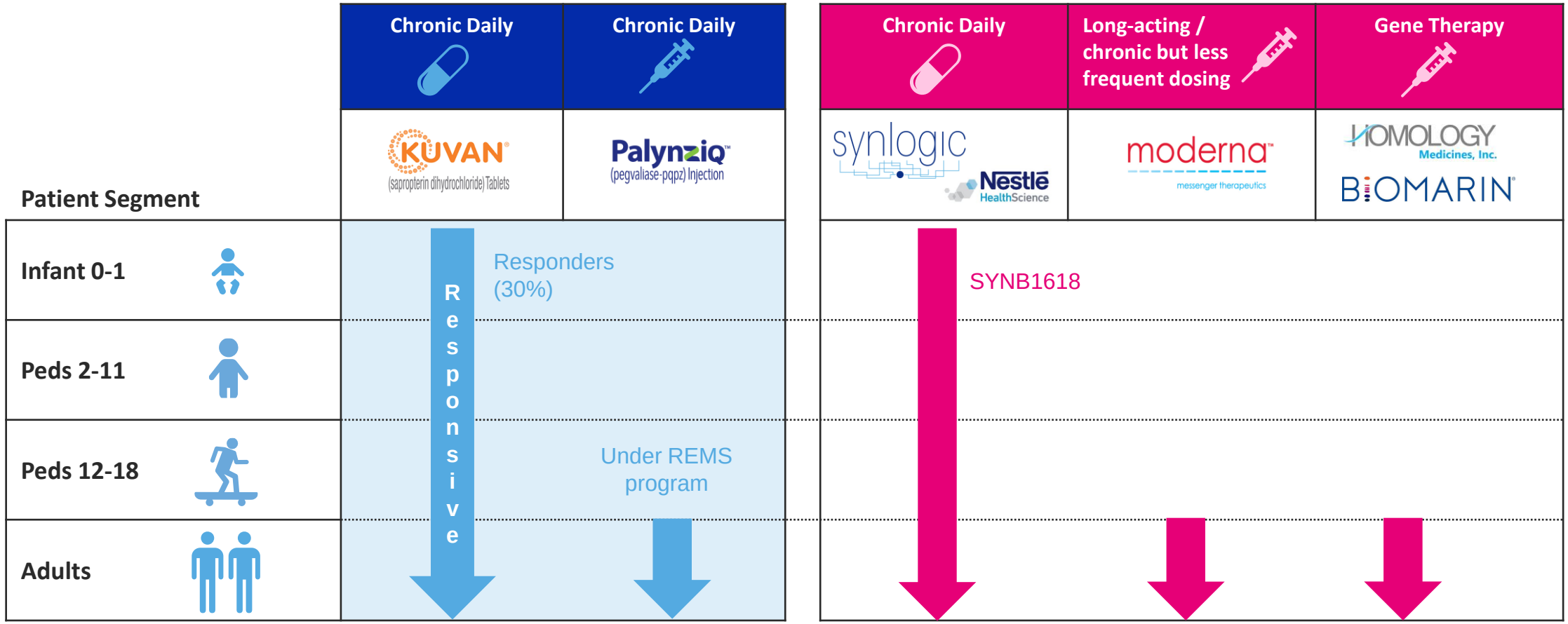
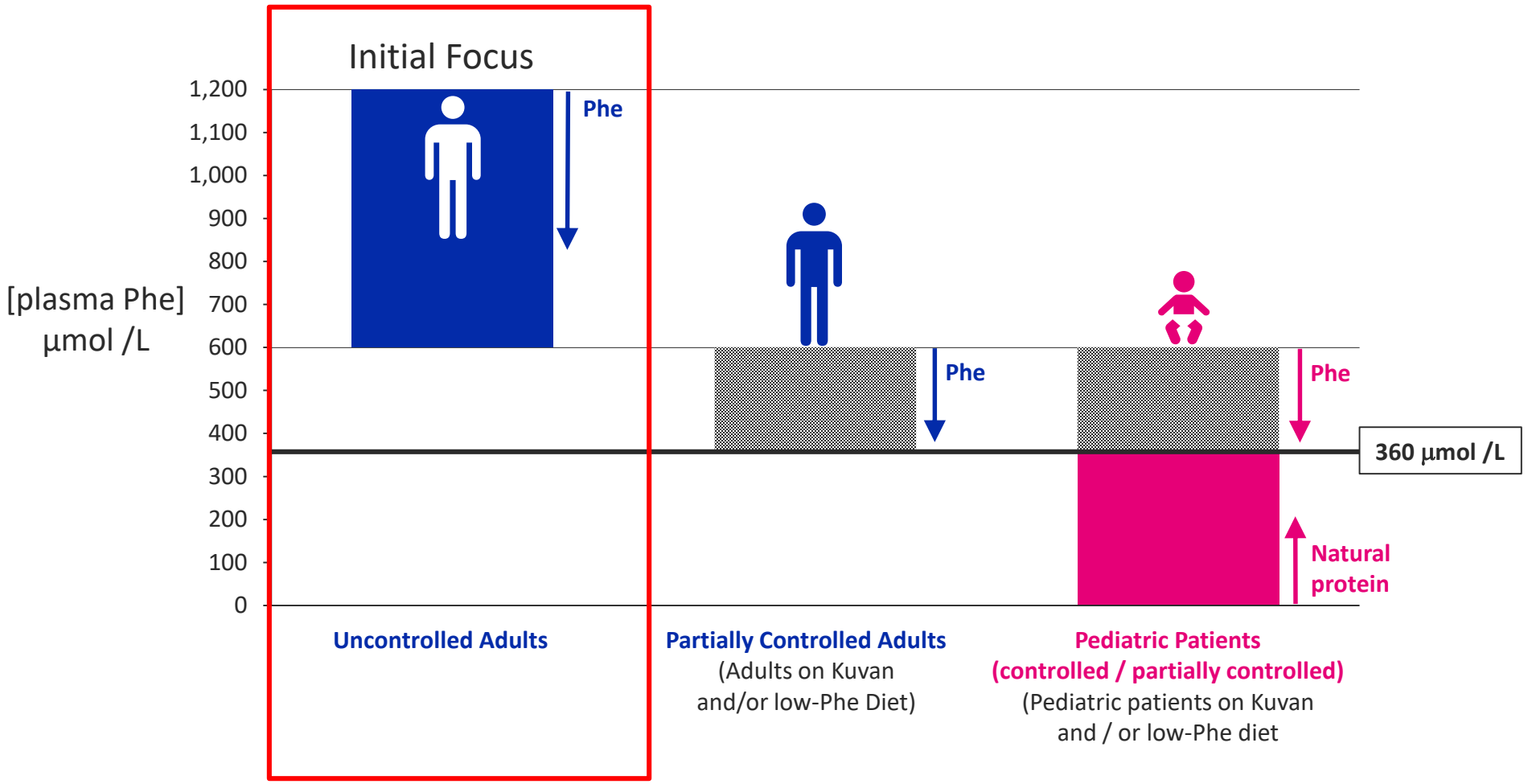
SYNB1618 Differentiation

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

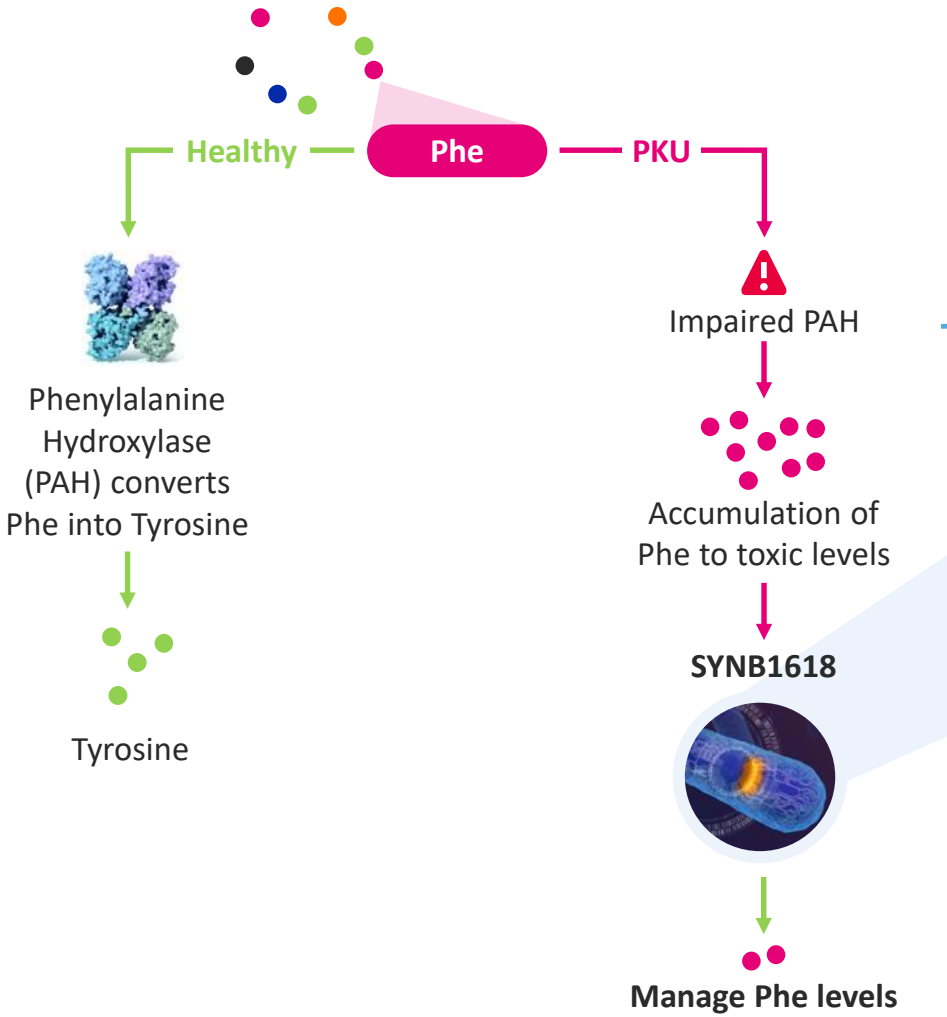


SYNB1618 Potential to Address Unmet Need Across Patient Groups

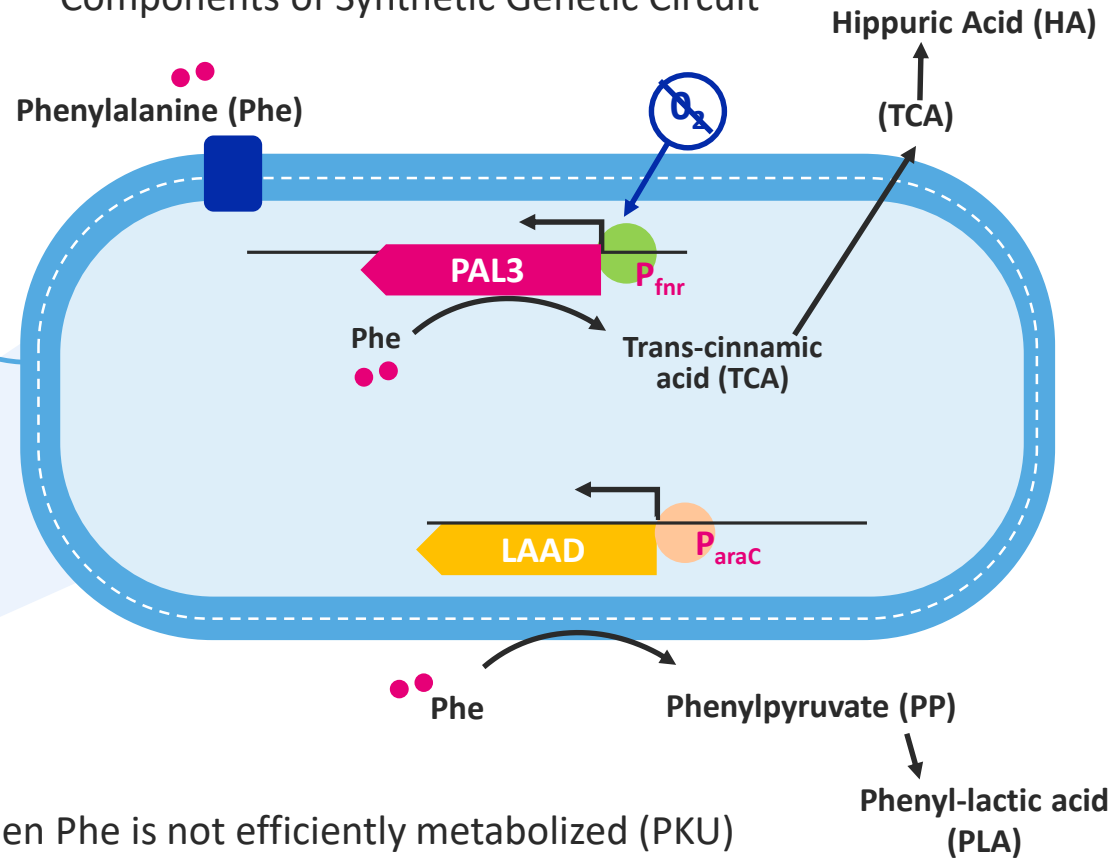


SYNB1618 Mechanism of Action

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) which can be metabolized to phenyl-lactic acid (PLA)

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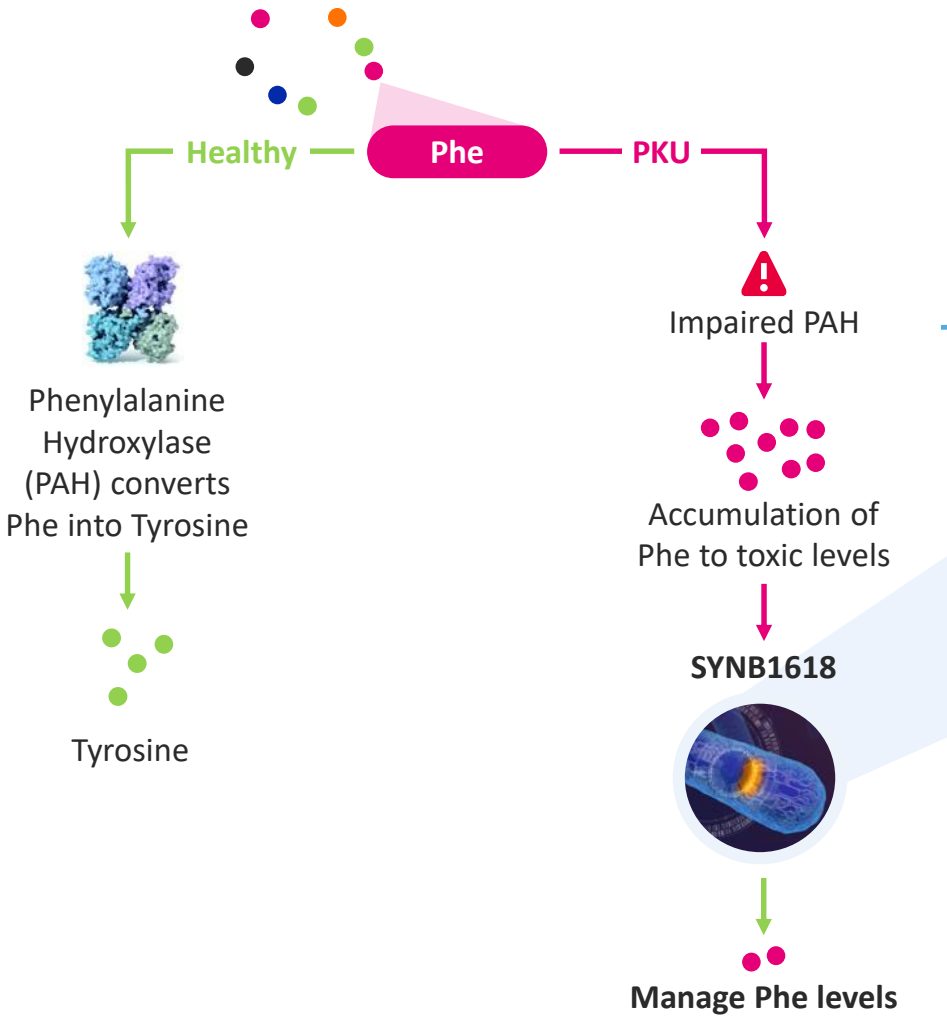

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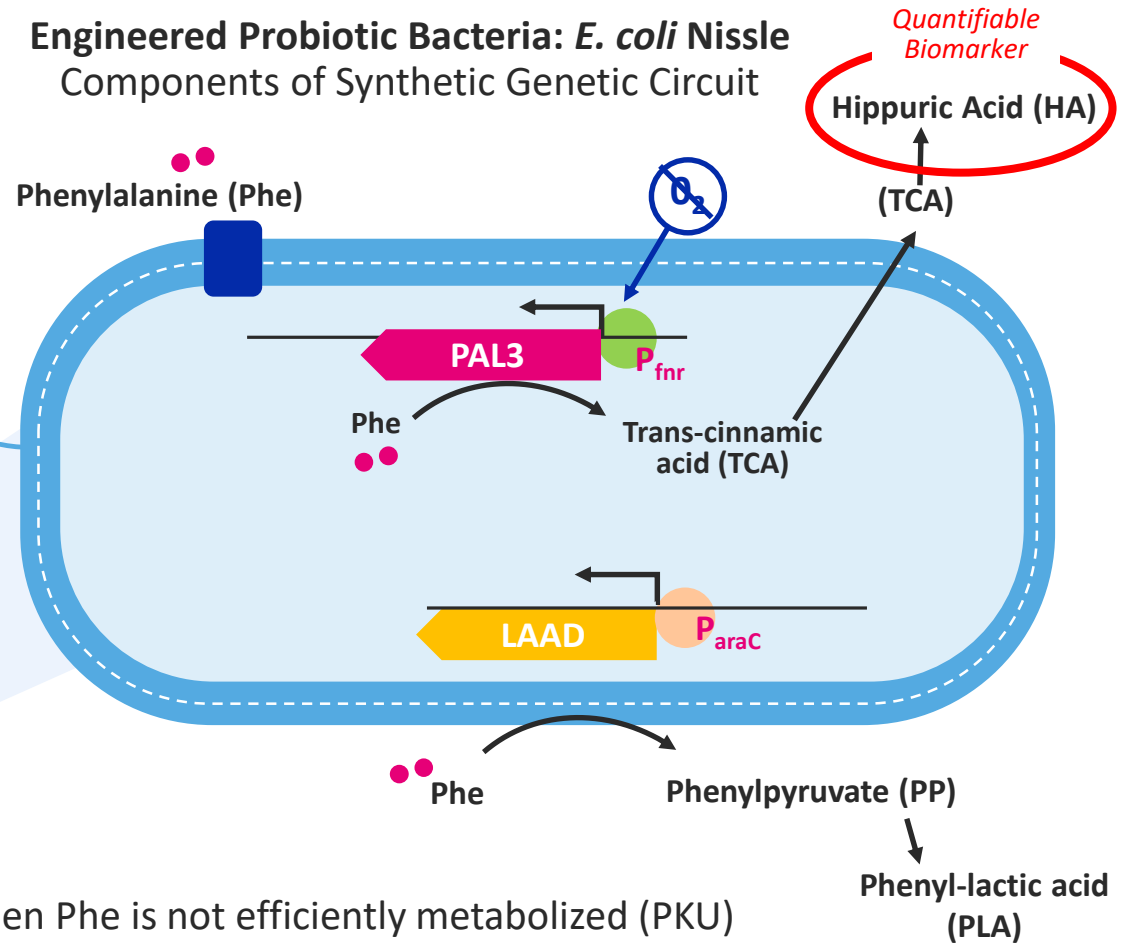

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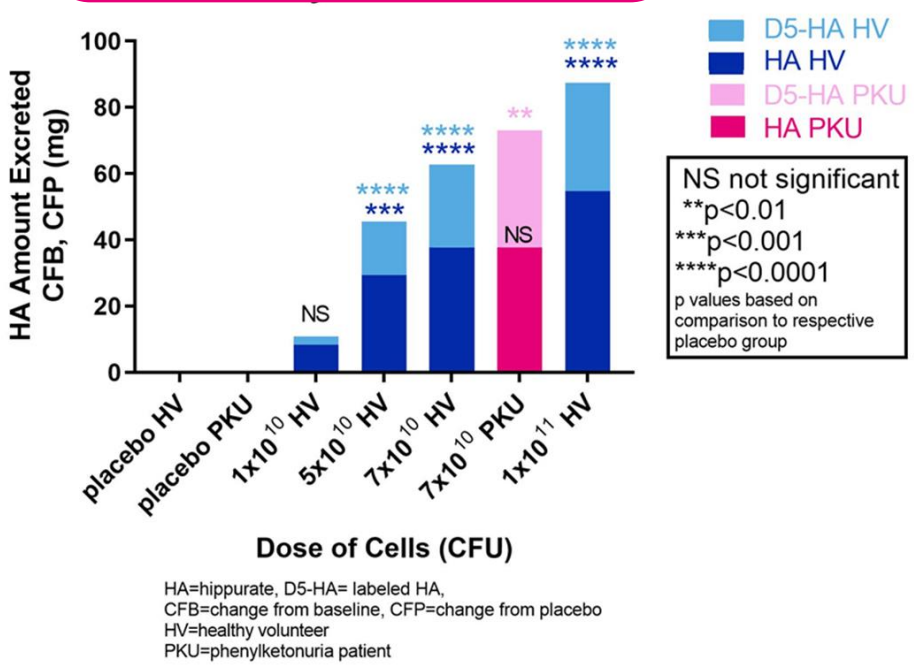
SYNB1618 in the Clinic: Activity

SYNB1618 can consume Phe in the GI tract of Healthy Volunteers and PKU patients

56 healthy volunteers,
14 PKU patients

Liquid Formulation

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

CONCLUSIONS

No SAEs, no systemic toxicity or infections

AEs mild or moderate in severity, and reversible. Most GI-related

All subjects cleared SYNB1618

Statistically Significant and Equivalent Activity of Liquid Formulation in Healthy Volunteers (HV) and Patients

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Development of Solid Oral Formulation of SYNB1618

Better Fit for Patients and Commercial Distribution

Improved tolerability

Bridging study: SYNB1618 solid formulation – v- original liquid formulation

- Identified MTD for Phase 2 study in PKU patients that will evaluate:
  - Safety and tolerability
  - Potential to lower blood Phe
  - Validity of pharmacodynamic and in vitro modeling

Improved stability at 4-8^{o}C and room temperature

Expanded range of solid patient-friendly presentations

- Free powder in sachets
- Enteric coated capsules
- Pressed tablets
- Straws

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New Metabolic Disease Programs

Enteric Hyperoxaluria (HOX)

No Approved Treatment

Why HOX?

Biology is well-understood: excess absorption of oxalate in the GI tract results in accumulation in kidneys - recurrent kidney stones and kidney failure

⬇Oxalate in GI tract = ⬇Urinary oxalate = clinical benefit for patient

High unmet need: no available therapies

>80K severe patients US: recurrent stones, risk for kidney failure

Status

Prototype demonstrates oxalate lowering in preclinical studies, additional work ongoing, benchmark to competition

Declare clinical candidate in 2H2020

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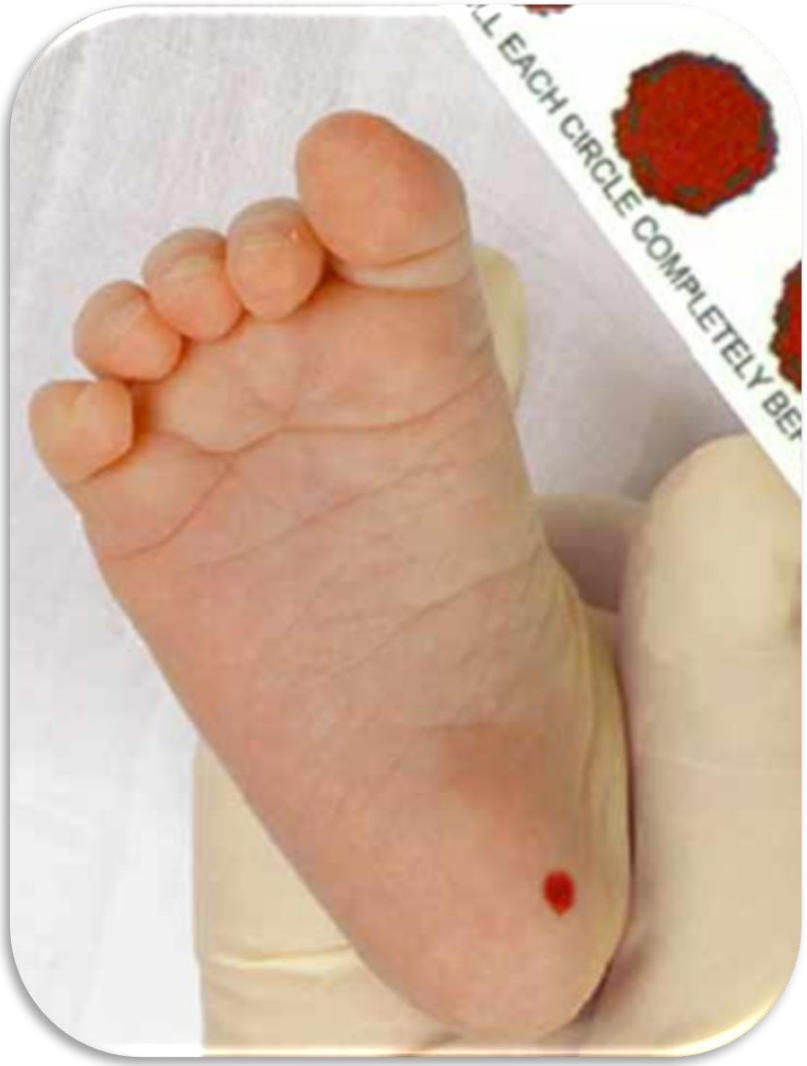
Maple Syrup Urine Disease (MSUD)

Rare Inherited Disease Requires Strict Dietary Control



Why MSUD?

Biology is well-understood: Inability to break down branched chain amino acids leucine (Leu), isoleucine and valine leads to progressive neurodegeneration in untreated infants. Risk of acute crises with neurocognitive damage and death

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

High unmet need treatment dietary control and liver transplant

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

Status

Ginkgo optimized strain (SYN5941) blunts peptone-induced increase in blood [Leu] in NHPs - further optimization and preclinical work ongoing

Declare clinical candidate in 2H2020

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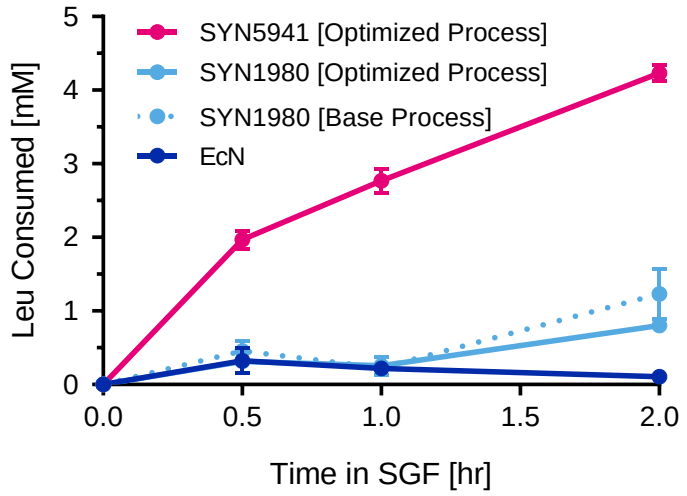
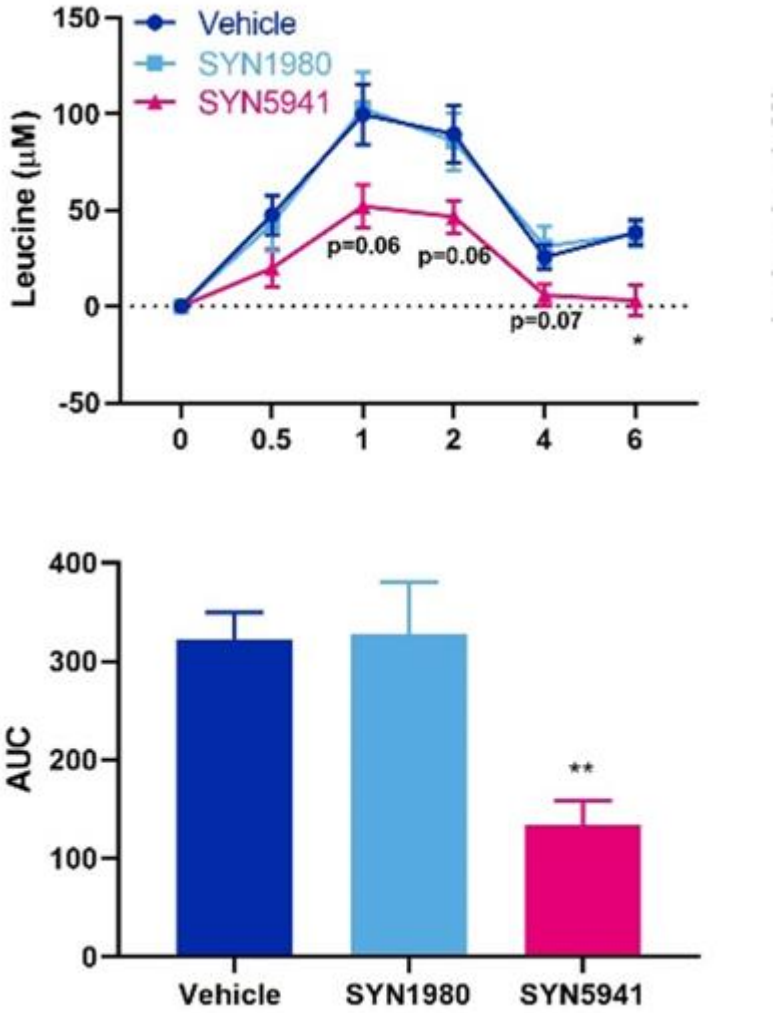
Leucine Consumption is Improved with Optimized Strain

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

In Vitro Simulated Gut system (IVS)



Non-Human Primates



Pipeline Expansion: Immunology and Oncology

Leveraging the ability of bacteria to interact with the immune system

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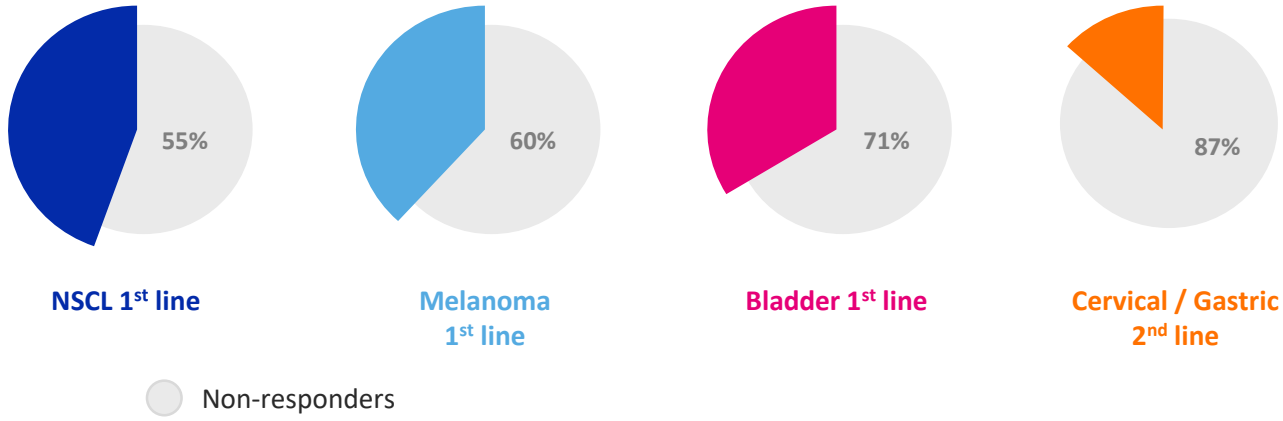
Synlogic Vision for Immuno-Oncology

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

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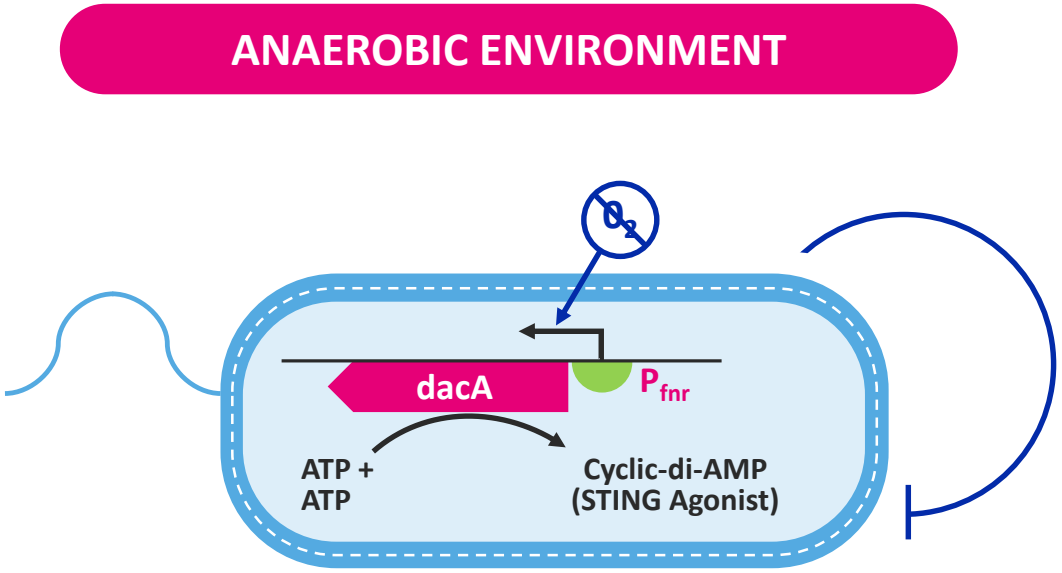
Synthetic Biotic Medicine Producing STING Agonist (SYNB1891)

Dual Innate Immune Activator

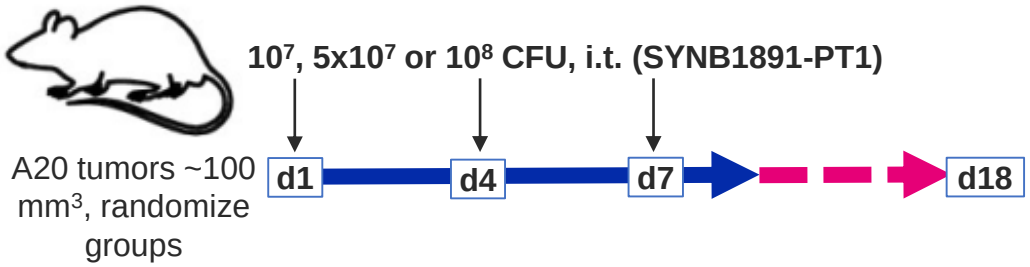
- Synthetic biology applied to confer activities for efficacy and control for safety
- Designed as a dual innate immune activator: combined benefit of bacterial chassis and STING agonist
- The dacA gene is integrated into genome under the control of inducible promoter (P_{fnr}) to produce c-di-AMP (CDA)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

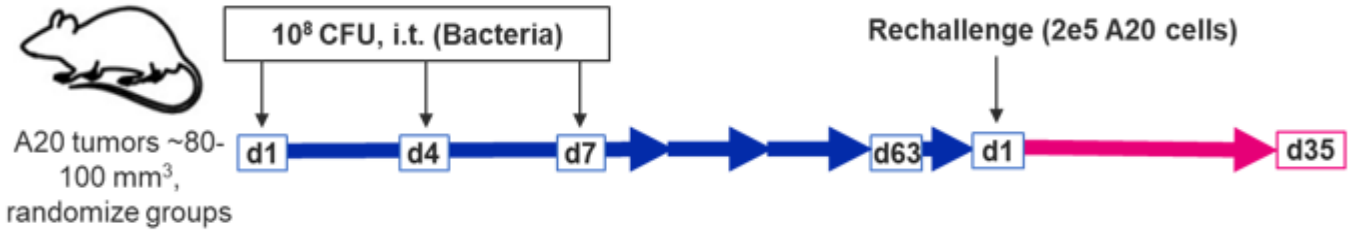


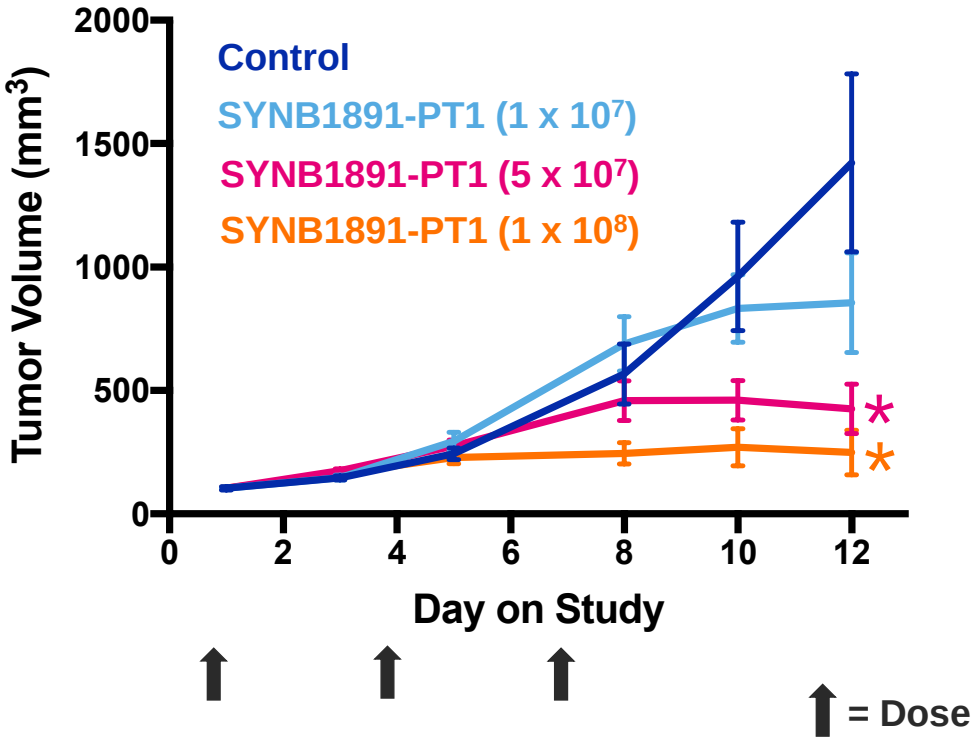
Auxotrophies

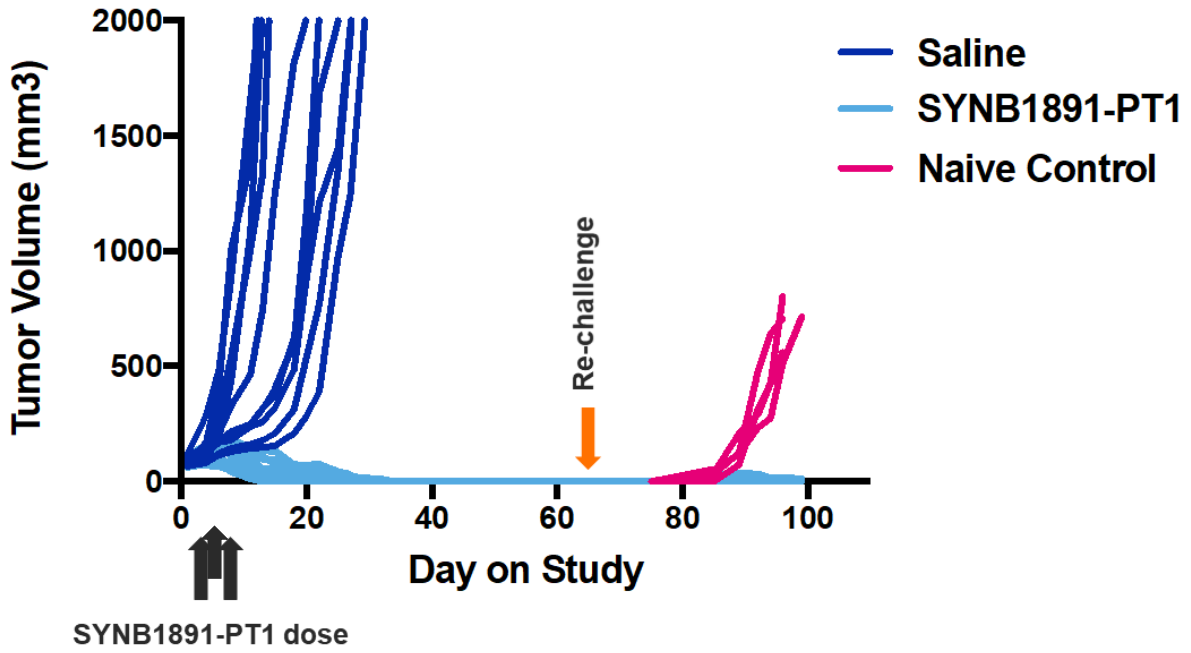
- Diaminopimelic acid (DAP)
- Thymidine

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

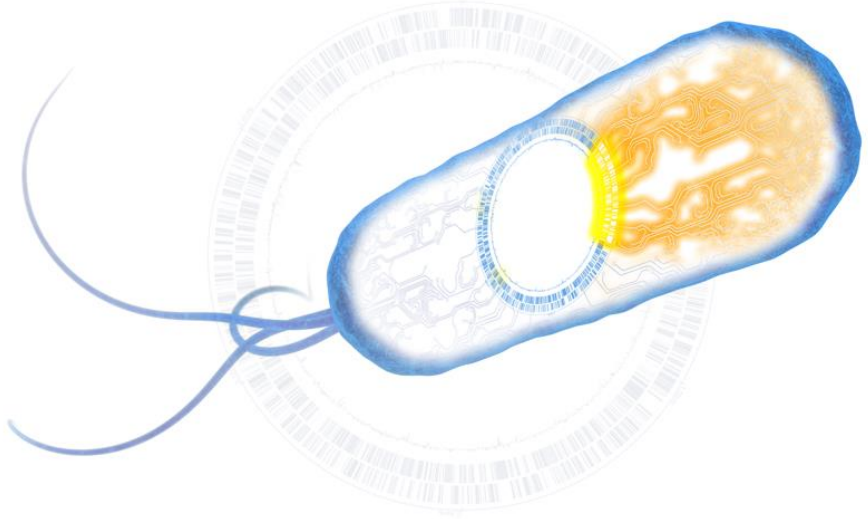
- STING agonism in target cells that drive efficacy (APCs)
- Sparing cells where STING agonism is detrimental
- Low systemic risk - tumor colonization without leakage

Dual activity

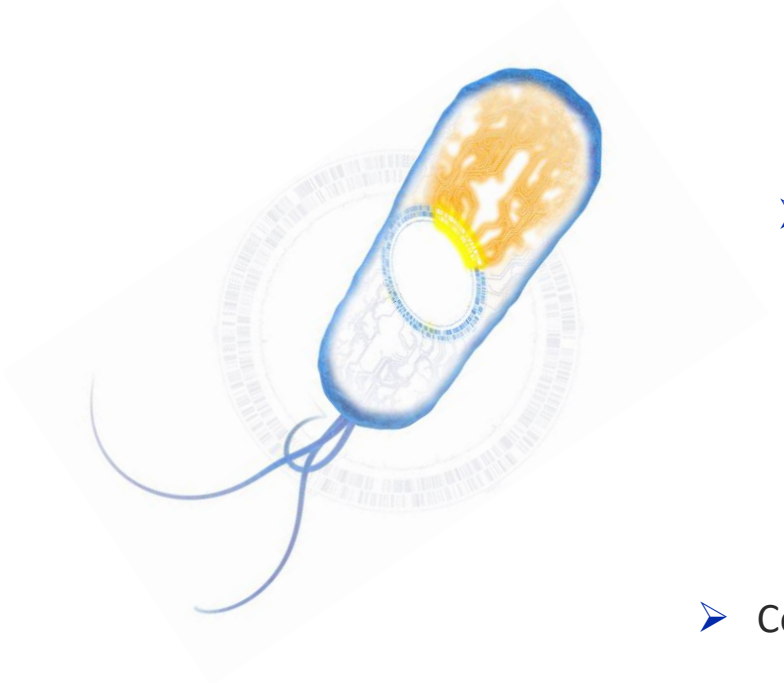
- Intracellular activation of STING and bacterial-induced immune pathways provides dose-dependent anti-tumor activity
- Activation of multiple innate immune pathways
- Induction of immunological memory
- Enhanced activity vs. naked STING agonist

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



2020 Milestones



SYNB1618 in PKU

- Initiate study of solid formulation in PKU patients

SYNB1891 in Immuno-Oncology

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

New Programs

- Advance enteric 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

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

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301 BINNEY ST., #402, CAMBRIDGE, MA 02142
TEL: 617-401-9975
WEB: WWW.SYNLOGICTX.COM
EMAIL: INFO@SYNLOGICTX.COM

