UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 8-K

CURRENT REPORT

Pursuant to Section 13 or 15(d) of the
Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): **March 20, 2019**

SYNLOGIC, INC.

(Exact name of registrant as specified in its charter)

Delaware	**001-37566**	**26-1824804**
(State or other jurisdiction of incorporation)	(Commission File Number)	(IRS Employer Identification No.)

301 Binney St., Suite 402 **Cambridge, MA** (Address of principal executive offices)	**02142** (Zip Code)

Registrant's telephone number, including area code: **(617) 401-9975**

Not applicable
(Former Name or Former Address, if Changed Since Last Report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (see General Instruction A.2. below):

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (17 CFR §230.405) or Rule 12b-2 of the Securities Exchange Act of 1934 (17 CFR §240.12b-2).
Emerging Growth Company ☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☒

Item 7.01. Regulation FD Disclosure.

Synlogic, Inc. ("Synlogic") has prepared an investor presentation to be used in connection with general corporate presentations. A copy of the presentation is furnished with this Current Report on Form 8-K as Exhibit 99.1.

The information in Item 7.01 of this Current Report on Form 8-K and Exhibit 99.1 attached hereto is intended to be furnished and shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934 (the "Exchange Act") or otherwise subject to the liabilities of that section, nor shall it be deemed incorporated by reference in any filing under the Securities Act of 1933 or the Exchange Act, except as expressly set forth by specific reference in such filing.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

99.1 Investor presentation provided by Synlogic dated March 20, 2019

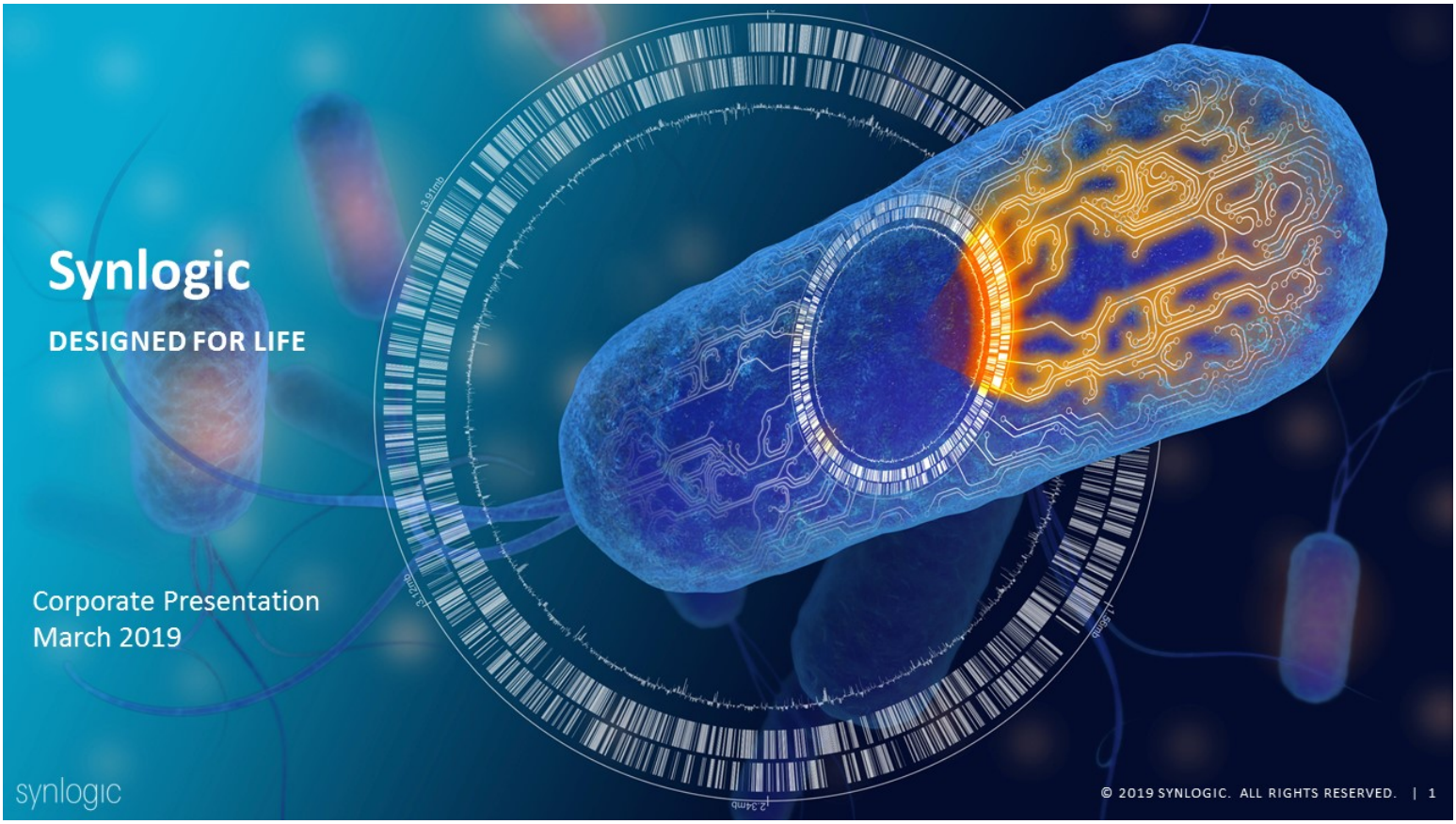
SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

Date: March 20, 2019

SYNLOGIC, INC.

By: /s/ Todd Shegog
Name: Todd Shegog
Title: Chief Financial Officer


Synlogic
DESIGNED FOR LIFE
Corporate Presentation
March 2019
synlogic
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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, liver disease, inflammatory and immune disorders, and cancer; the future clinical development of Synthetic Biotic medicines; the potential of our technology to treat hyperammonemia and phenylketonuria; the expected timing of our anticipated clinical trial initiations; 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 12, 2019. 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
Designing for LIFE
Patient Need
There remain many indications for which conventional medicines do not provide effective solutions for all patients
Conventional Approaches Limited
Single mechanism agents do not address complex biology, often lead to systemic exposure without control
An Engineered Living Medicine Solution
Synlogic is harnessing nature and technology to create LIVING medicines designed to significantly improve patients' LIVES
synlogic
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Synthetic Biotic™ Medicines
A Novel Class of Engineered Living Medicines

SYNTHETIC

- Designed genetic circuits to execute biological functions
- Degradation of disease-causing metabolites
- Production of therapeutic molecules

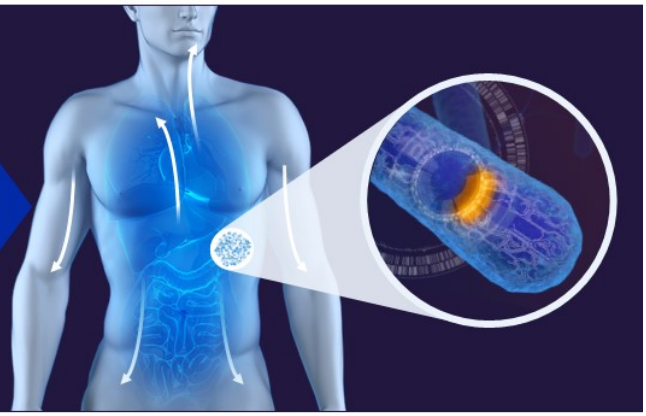
BIOTIC

- Bacterial chassis
- Non-pathogenic
- Amenable to genetic manipulation

PATHWAYS, COMBINATIONS, BIOMARKERS

PROGRAMMABLE POTENCY AND CONTROL

LOCAL ACTIVITY, REDUCED SYSTEMIC TOXICITY



Synthetic Biotic Portfolio: Breadth and Potential

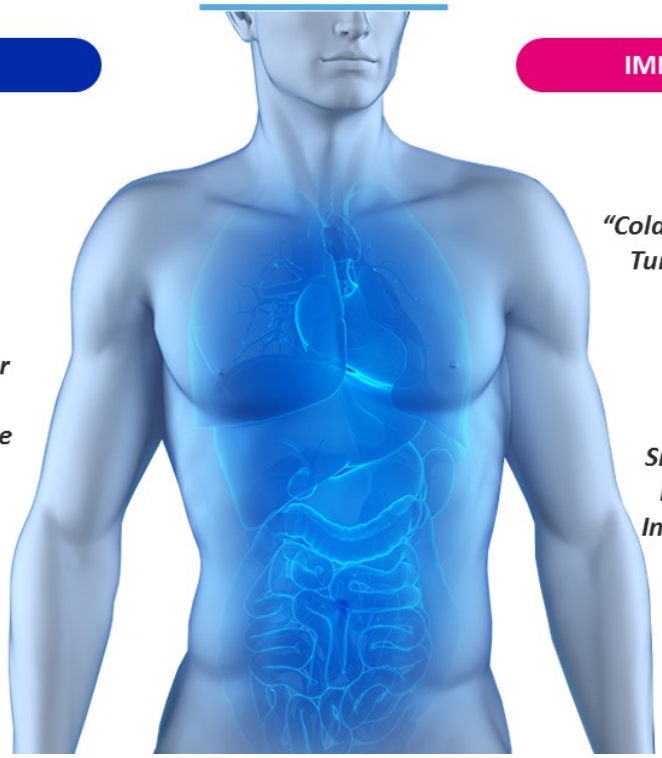
Initial Applications Designed to Target Different Sites of Action in Metabolic and Immunomodulatory Diseases

METABOLIC DISEASES

Rare Metabolic Disease

Broad Metabolic Disease

Small or Large Intestine



IMMUNOMODULATION

"Cold" Solid Tumors

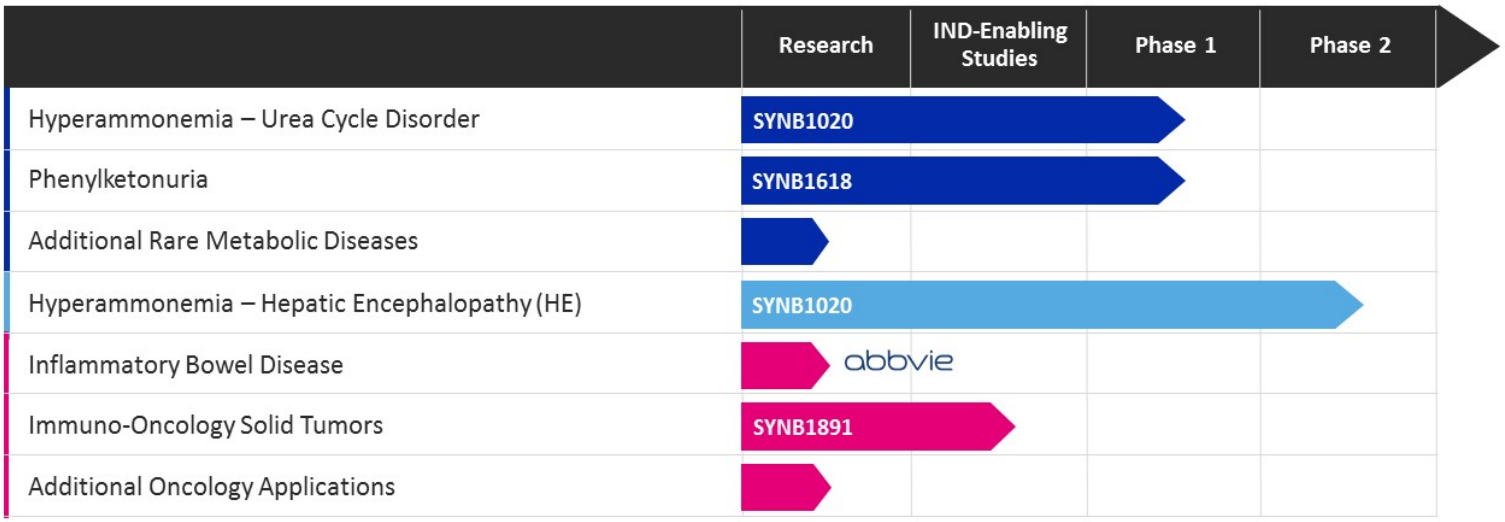
Immuno-Oncology

Small or Large Intestine

Inflammatory and Autoimmune

synlogic

Synthetic Biotic Portfolio



Rare Metabolic Diseases
Broad Metabolic Disease
Immunomodulation

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SYNB1020 for Hyperammonemia Indications

Characterized by Systemic Ammonia Accumulation

HEPATIC ENCEPHALOPATHY (HE)

Neuropsychiatric complication in patients with end-stage liver disease (cirrhosis)

- Liver dysfunction leads to ammonia accumulation
- Toxic to brain, leading to HE crisis & hospitalization

Patients:

- 165,000 diagnosed overt patients in US
- Up to 70% of patients with cirrhosis characterized as covert (subclinical)

Treatment:

- Lactulose: laxative with significant side effects
- Rifaximin: reduction in overt HE recurrence

Target Profile to Address Unmet Need:

- Reduce episodes of hospitalization
- Improve cognitive outcomes, Quality of Life

UREA CYCLE DISORDERS (UCD)

Genetic defects in Urea Cycle

- Deficiency in one of the six enzymes
- Nitrogen accumulates as toxic ammonia leading to metabolic crisis

Patients:

- ~2,000 diagnosed in US; similar in EU

Treatment:

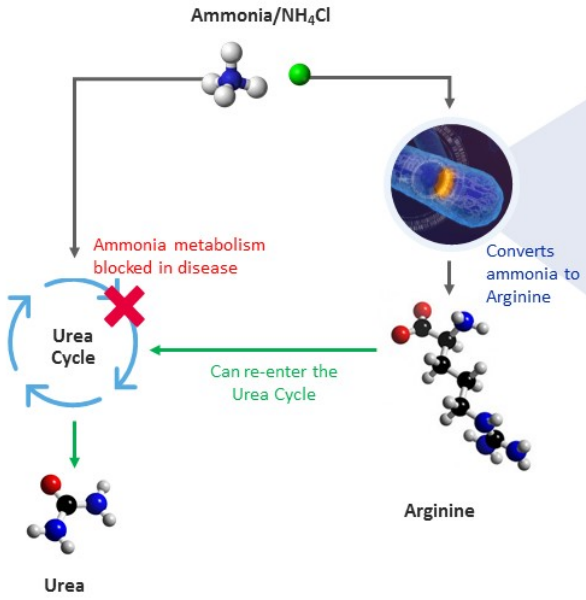
- Ammonia scavengers: Buphenyl® (sodium phenylbutyrate), Ravicti® (glycerol phenylbuterate)
- Low protein diet with amino acid supplements

Target Profile to Address Unmet Need:

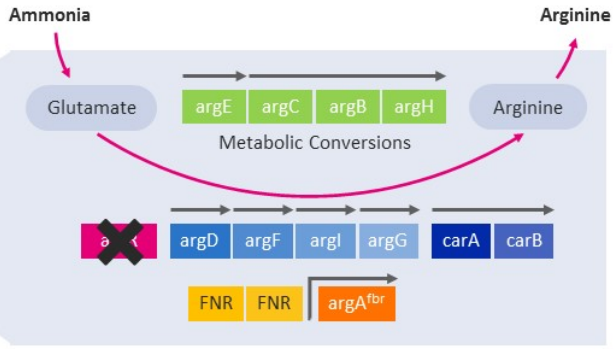
- Maintain blood ammonia in normal range, avoid crisis
- Protein liberalization: 50-100% more per day
- Oral administration

SYNB1020 Mechanism of Action:

Conversion of Toxic Ammonia into Beneficial Arginine for the Treatment of UCD and HE



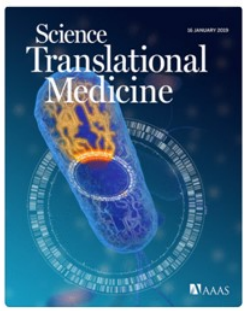
Engineered Probiotic Bacteria: *E. coli* Nissle
Components of Synthetic Genetic Circuit



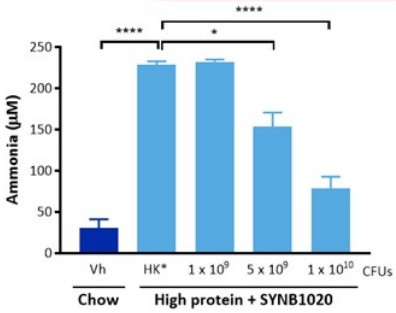
- Under normal conditions, the **urea cycle metabolizes ammonia into urea**
- In UCD and HE, ammonia is not efficiently metabolized via urea cycle. **SYNB1020 provides an alternative mechanism**

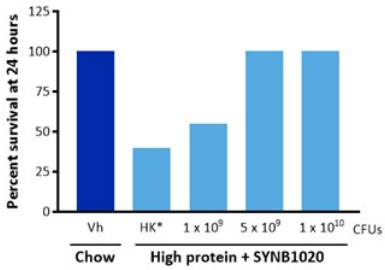
SYNB1020 data recently published in *Science Translational Medicine*

In vivo data in mouse models and healthy volunteers demonstrate mechanism of action

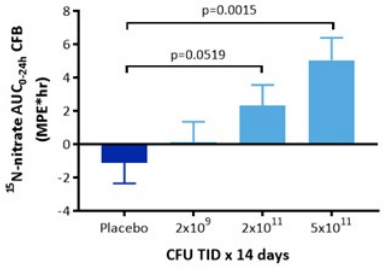


MOUSE MODEL

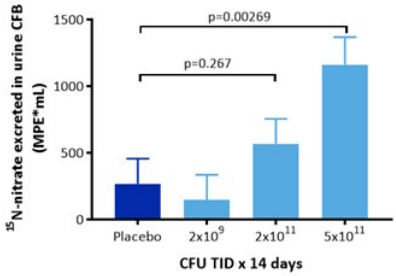




PLASMA NITRATE



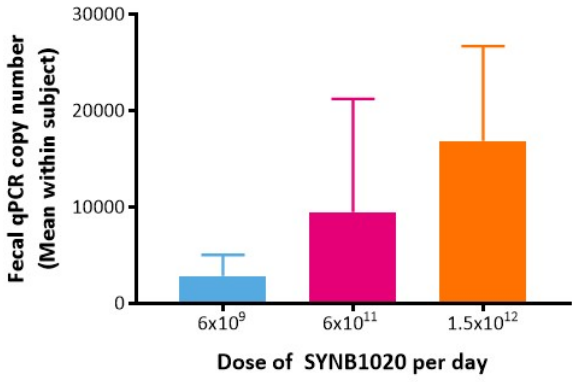
URINARY NITRATE



SYNB1020 Clinical Data in Healthy Volunteers

Dose-dependent Increase in SYNB1020 in Feces, Clearance on Cessation of Dosing

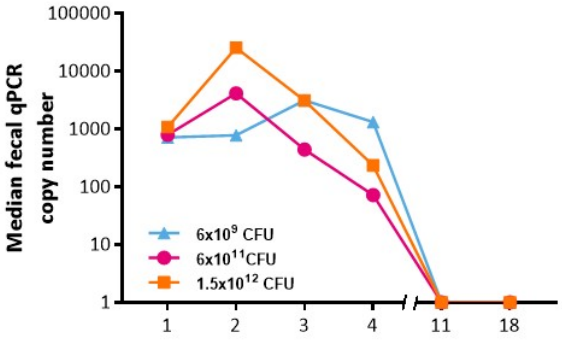
DOSE-DEPENDENT INCREASE IN FECES



Dose of SYNB1020 per day

Dosing period = 14 days
Samples collected daily

CLEARANCE



Days since last dose

Dosing period = 14 days

SYNB1020 Clinical Development

Hepatic Encephalopathy Phase 1b/2a in Patients with Cirrhosis and Elevated Ammonia

PROGRAM	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4
Hepatic Encephalopathy		Phase 1b / 2a						

Hepatic Encephalopathy Clinical Trial

- Randomized, double-blind placebo-controlled study ongoing at multiple sites in the US
- Primary outcome: establish safety/tolerability in patients with cirrhosis and elevated ammonia
- Secondary outcome: reduction of ammonia

Urea Cycle Disorders
(Plans to continue development in UCD dependent on data from Ph 1b/2a HE study)

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[1] *MELD score: scoring system model for end-stage liver disease*

SYNB1618 for Phenylketonuria (PKU)

Goal: Managing Plasma Phe Levels

PKU is a rare inherited amino acid metabolism disorder

- Causes build up of amino acid phenylalanine (Phe) in the body
- Today, less than half of adults are at or below target Phe levels of 120-360 µmol / L
- If left untreated, symptoms include cognitive impairment, convulsions, behavioral problems, skin rash

Patients:

- 16,500 diagnosed in US, similar in EU5

Treatment:

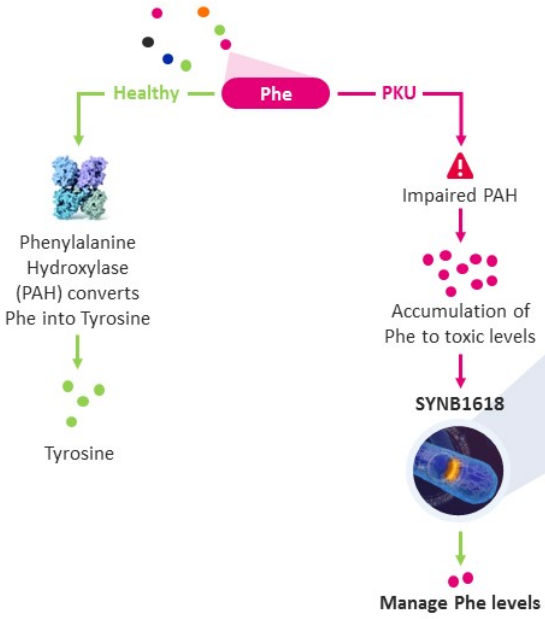
- Phenylalanine is found in all proteins therefore low protein diet is followed (no meat, dairy, nuts, eggs)
- KUVAN® (sapropterin dihydrochloride): PAH cofactor. 20-40% of patients are responders
- Palynziq™ (pegvaliase-pqpz): injectable, pegylated, bacterial enzyme (phenylalanine ammonia-lyase or PAL) for treatment of adult patients

Target Profile to Address Unmet Need:

- Manage Phe below target levels to prevent irreversible cognitive damage
- Increase natural protein intake: classic PKU patients' natural protein intake is typically less than 10g
- Oral dosing without systemic toxicity

SYNB1618 Mechanism of Action

Amino acids from dietary proteins
(absorption and recirculation)



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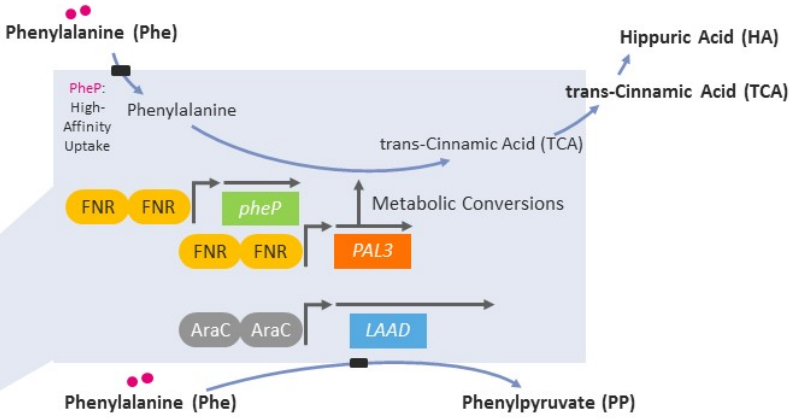


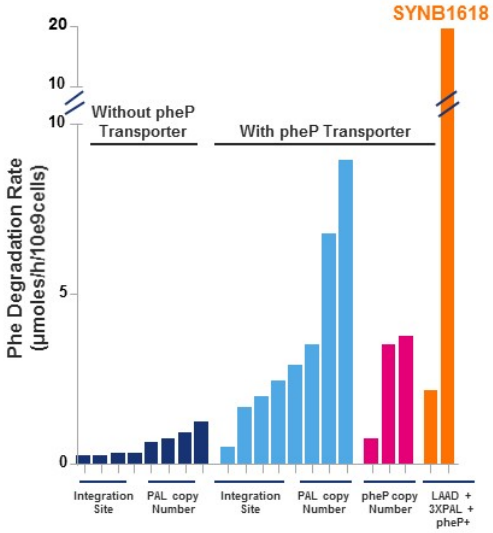
When Phe is not efficiently metabolized (PKU) **SYNB1618** provides an alternative mechanism

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

Iteration Potential

Advantage of Synthetic Biotic Design Build Test Cycle

LEAD OPTIMIZATION *IN VITRO*



COLLABORATION

GINKGO BIOWORKS
THE ORGANISM COMPANY

enEvolv

SYNB1618 Preclinical Characterization

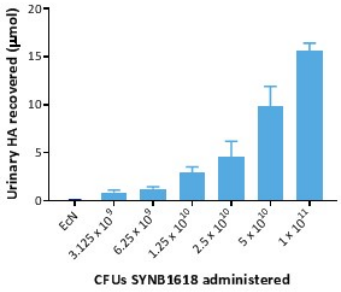
Biomarkers Demonstrate Activity of SYNB1618 in Mouse Model of PKU and Healthy NHPs

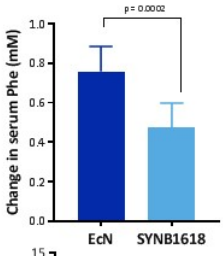
nature biotechnology

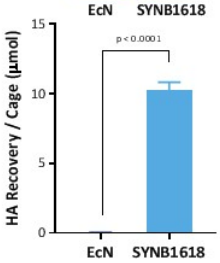
Development of synthetic live bacterial therapeutic for the human metabolic disease phenylketonuria

Vincent M Isabella et al, Synlogic, Inc.

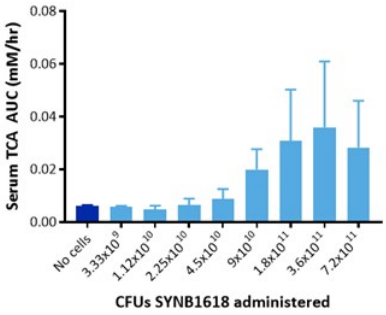
IN VIVO EFFICACY IN (PKU) PAH$^{enu2/enu2}$ MOUSE

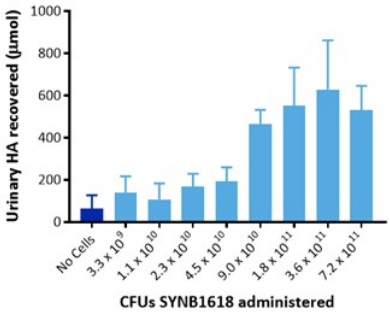






DOSE RESPONSE IN HEALTHY NHP's





Nat. Biotechnol. 2018 Oct;36(9):857-864

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SYNB1618 in the Clinic: Safety

Interim Analysis of Phase 1/2a SAD/MAD Study Demonstrates Safety and Clearance in Healthy Volunteers

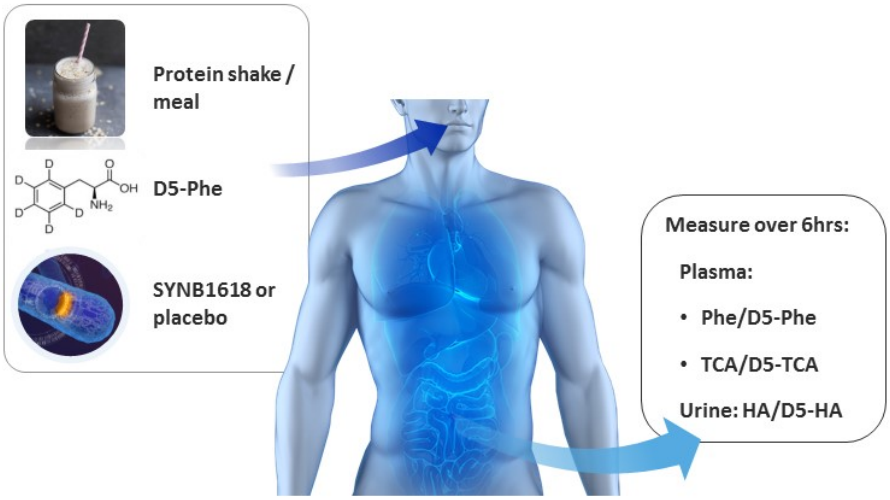
56 healthy volunteers	Received at least one dose of SYNB1618 or placebo	Adults Age range: 18-62 yrs old

- ✓ There were no treatment-related serious adverse events, no systemic toxicity or infections
- ✓ Treatment-emergent adverse events were either mild or moderate in severity, and reversible. Most adverse events were GI-related
- ✓ Single dose MTD was defined as $2x10^{11}$ CFU. Doses above this level were associated with dose-limiting GI adverse events
- ✓ All subjects cleared the bacteria. There was no evidence of colonization, and no subject required antibiotics

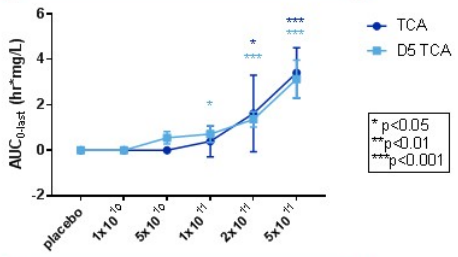
Based on pharmacodynamic data and tolerability profile, a dose of $7x10^{10}$ CFU was identified for the second part of the study in PKU patients

SYNB1618 in the Clinic: Activity

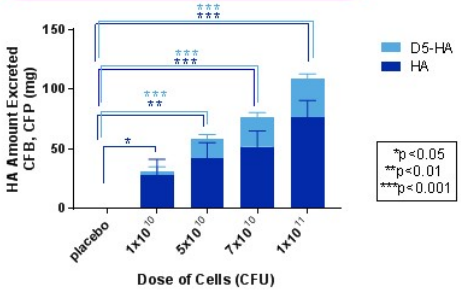
Statistically Significant Dose-dependent Activity of SYNB1618 in Healthy Volunteers



TCA AUC SINGLE DOSE RESPONSE



MAD URINARY HA AND D5-HA

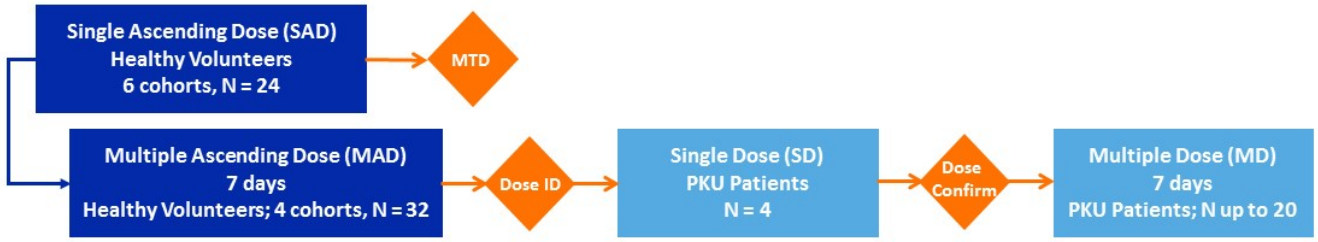


Key: HA: Hippurate, D5-HA: labeled HA, CFB: change from baseline, CFP: change from placebo

SYNB1618 Clinical Development

Phase 1/2a in Healthy Volunteers with Patient Cohort

PROGRAM	2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4
SAD / MAD Healthy Volunteers		Phase 1 / 2a						
SD / MD PKU Patients					Phase 1 / 2a			



PKU Clinical Trial Design

- Randomized, double-blind placebo-controlled study ongoing at multiple sites in the US
- Primary outcome: establish safety/tolerability following single and multiple doses in HV and PKU patients
- Secondary outcome: SYNB1618 kinetics in feces
- Exploratory: change from baseline in plasma and urinary biomarkers

Immuno-Oncology

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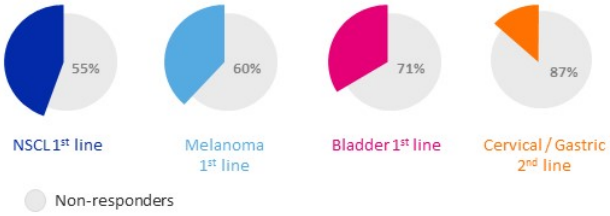
Synlogic Vision for Immuno-Oncology

Expand the Benefits of Immunotherapy Broadly Across Tumor Types

CHECKPOINT INHIBITORS HAVE TREATMENT FAILURES

For indications where immune checkpoint inhibitors are indicated, 55-87% of patients fail to respond

Failure Rates for Select FDA Approved CPI Monotherapy



Other tumors, where CPIs are not indicated, show little-to-no response to checkpoint inhibitors

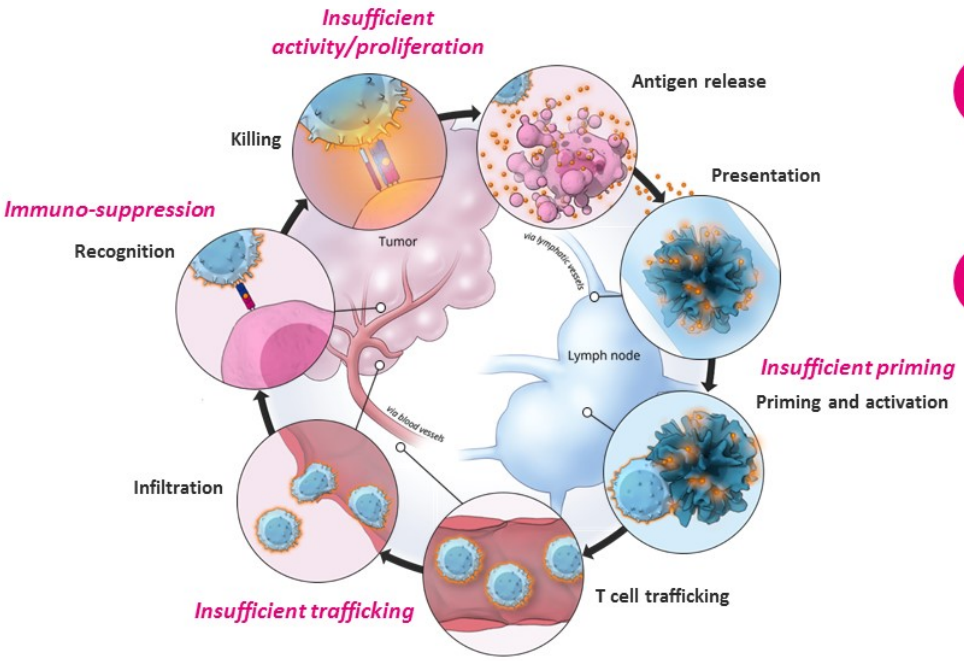
Bacteria Recognized as Earliest Immunotherapy

"Nature often gives us hints to her profoundest secrets, and it is possible that she has given us a hint in which, if we will but follow, may lead us on to the solution of this difficult problem."

DR. WILLIAM B. COLEY
IMMUNO-ONCOLOGY PIONEER

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

A Tumor Can Evade Multiple Critical Aspects of the Cancer-Immunity Cycle



MONOTHERAPIES OFTEN FAIL TO OVERCOME TUMOR EVASION MECHANISMS

Recognized Need to Combine Mechanisms to Broaden the Benefit of Immunotherapy

ENGINEER LIVING SOLUTIONS: SYNTHETIC BIOTIC MEDICINES

Rationally Designed for Combinatorial Effect

Locally Inflame the tumor microenvironment (TME)

Systemically Drive Tumor-Antigen Specific Immunity

In Situ Vaccination: Neo-antigen Priming and Sustained Immune Response

synlogic Adapted from Chen, Melman; Immunity 2013

Intra-tumoral Injection of Synthetic Biotic Chassis: Tumor Colonization Without Leakage; Local Innate Immunity

CHASSIS DISTRIBUTION

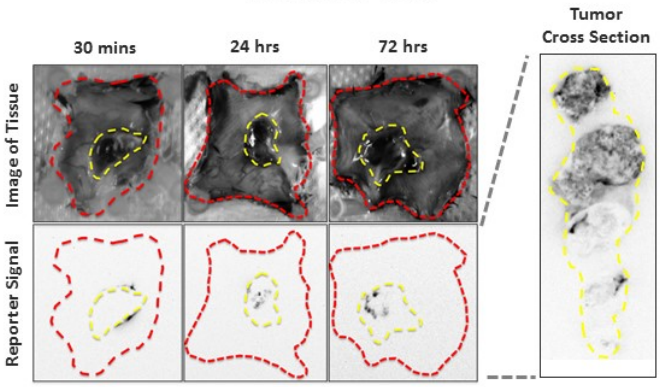
Robust proliferation in tumor.
No significant leakage

Survival/proliferation in tumors 10-15 days post-single dose. Potential for limited injections

Elicits **innate responses** (IL-6 and TNFα) **in the tumor.** Not in circulation

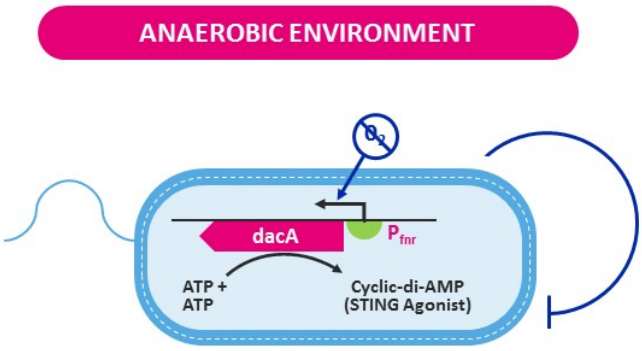
BEHAVIOR WITHIN TUMOR

in B16.F10 Mice



Dual Innate Immune Activator: Synthetic Biotic Medicine Producing STING Agonist (SYNB1891)

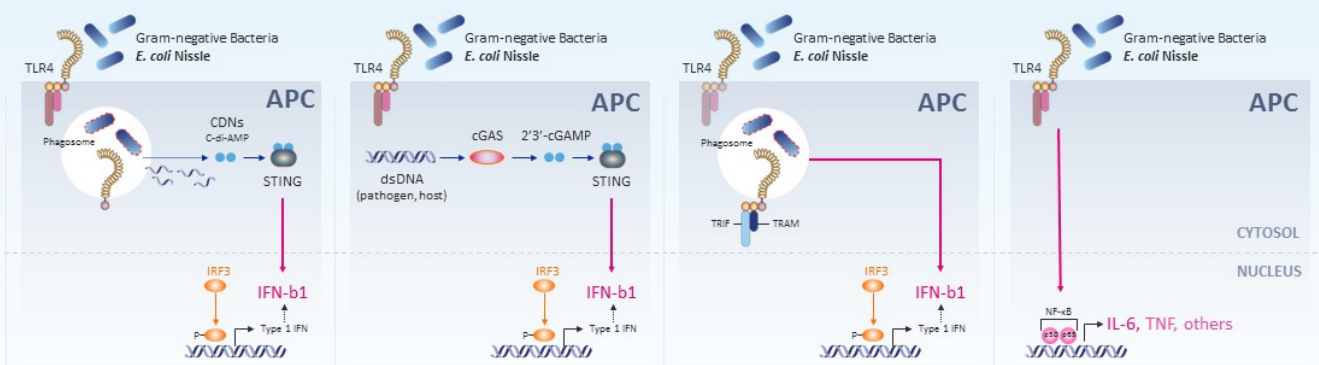
- Synthetic biology applied to confer activities for efficacy and control for safety
- Designed as a dual innate immune activator: combined benefit of bacterial chassis and STING agonist
- The dacA gene is integrated into genome under the control of inducible promoter (P_{fnr}) to produce c-di-AMP (CDA)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



Auxotrophies
- Diaminopimelic acid (DAP)
- Thymidine

Innate Immune Activation through Multiple Pathways

Uniquely Signals Through CDN-STING and Bacterial Chassis in Target Cells to Drive Efficacy



	CDN-STING Activation	**BACTERIAL** cGAS-STING Activation	**BACTERIAL** Intracellular TLR4 Signaling	**BACTERIAL** TLR/MyD88 Signaling
SYN-STING	✓	✓	✓	✓
Naked STING Agonist	✓	✓ ⊗	⊗	⊗

Promotes Trafficking, Immune Activation/Proliferation, Priming

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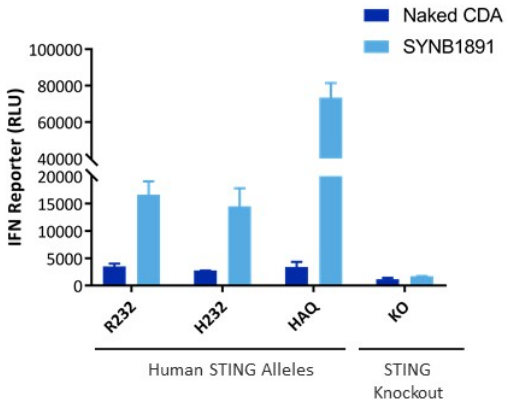
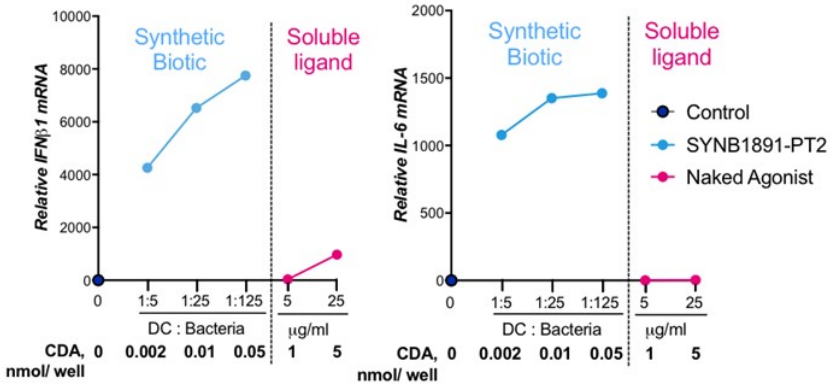
SYNB1891 *In Vitro* Characterization

Interferon Production Across Multiple Human STING Alleles Greater than Naked STING Agonist
Additional Proinflammatory Pathways Engaged

REPORTER HUMAN MONOCYTIC LINE

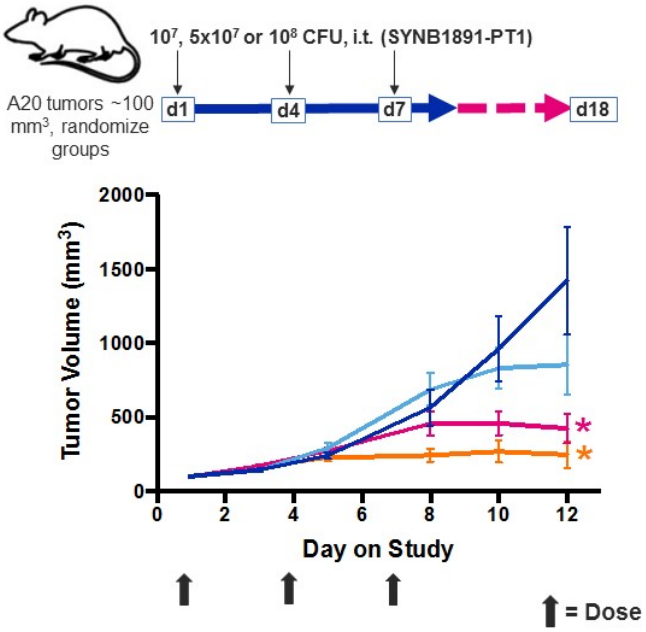


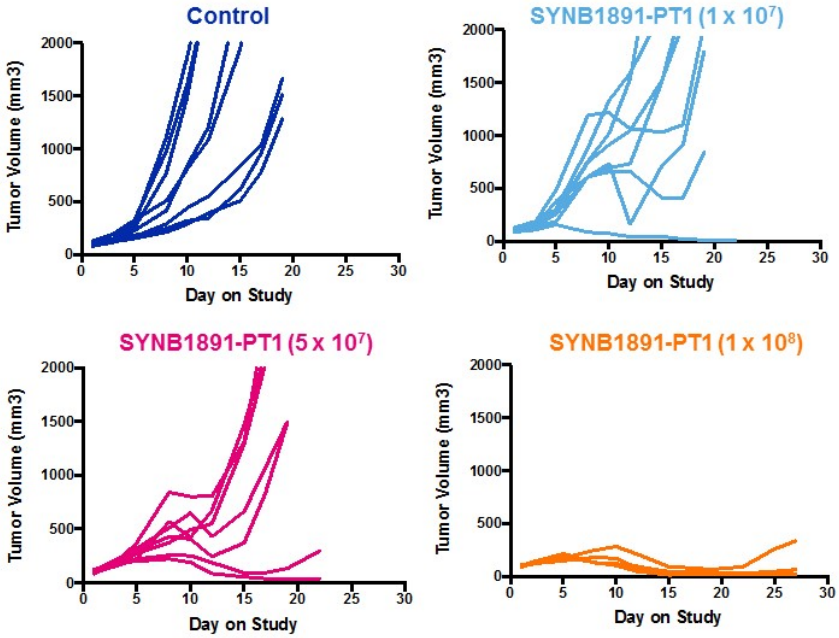
HUMAN PRIMARY DENDRITIC CELLS



SYNB1891 *In Vivo* Characterization

Dose-dependent Anti-tumor Activity of SYNB1891 Prototype Strain (PT1) as a Single Agent





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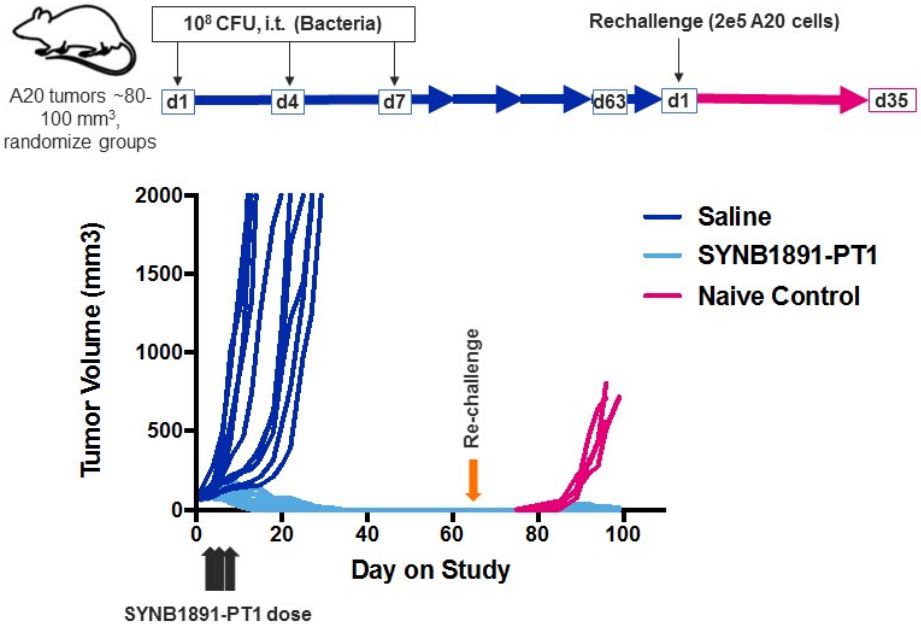
SYNB1891 *In Vivo* Characterization

SYNB1891 Prototype Strain (PT1) Leads to Systemic Anti-tumor Immunity



Dual Innate Immune Activator SYNB1891

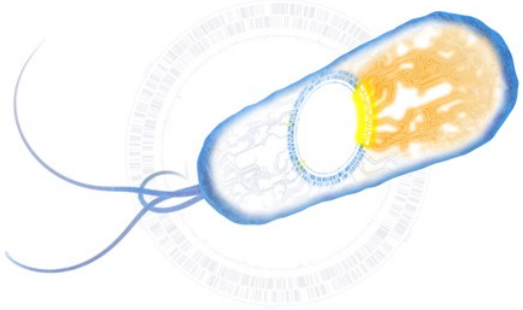
A STING Agonist-producing Synthetic Biotic Designed to Locally Inflame the TME and Systemically Drive Tumor Antigen-Specific Immunity

PROGRESS TOWARDS THE CLINIC

- Tumor Colonization without Leakage
- Enhanced Activity vs. Naked STING Agonist
- Intracellular Activation of STING and Bacterial-Induced Immune Pathways Within APCs
- Dose-dependent Anti-tumor Activity
- Immunological Memory
- IND Submission 2H19

PROMISE OVER OTHER APPROACHES

- STING Agonism in Target Cells that Drive Efficacy
- Sparing Cells Where STING Agonism is Detrimental
- Activation of Multiple Innate Immune Pathways
- Low Systemic Risk



Additional Synthetic Biotic Effectors

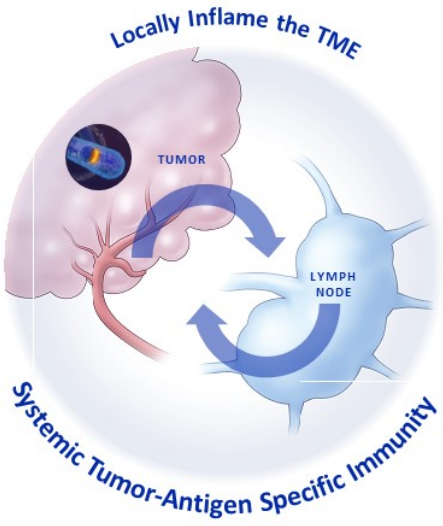
VISION: Rational Design to Locally Inflame the TME
AND Systemically ~~Drive Tumor-Antigen~~ Specific Immunity

RELIEVE IMMUNOSUPRESSION

- Kyn Consumption
- Ade Consumption
- αPD-1 scFv

PROMOTE TRAFFICKING

- Chassis effect
- CXCL10
- Hyaluronidase



PROMOTE AND SUSTAIN IMMUNE ACTIVATION

- IL-15; IL-12
- Arg Production
- 4-1BBL
- OX40L

PRIME FOR TUMOR-ANTIGEN-SPECIFIC VACCINATION

- Chassis effect
- 5FC→5FU
- STING
- αCD40 scFv/CD40L
- TNFα
- IFNγ
- αCD47 ScFv / Sirpα
- GM-CSF

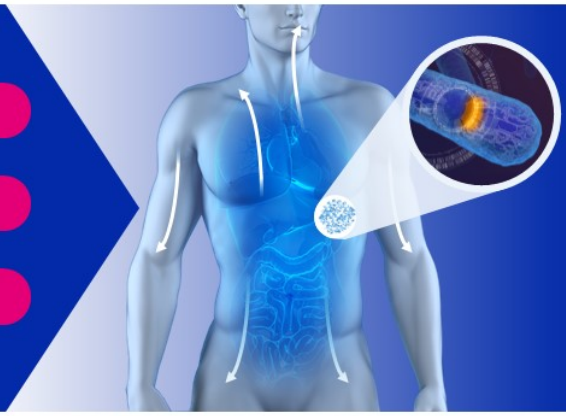
Broad Ambitions in Immuno-Oncology

Vision: Expand and Exceed the Effect of Cancer Immunotherapies

SYNB1891

DISCOVERY PORTFOLIO

INTRATUMORAL



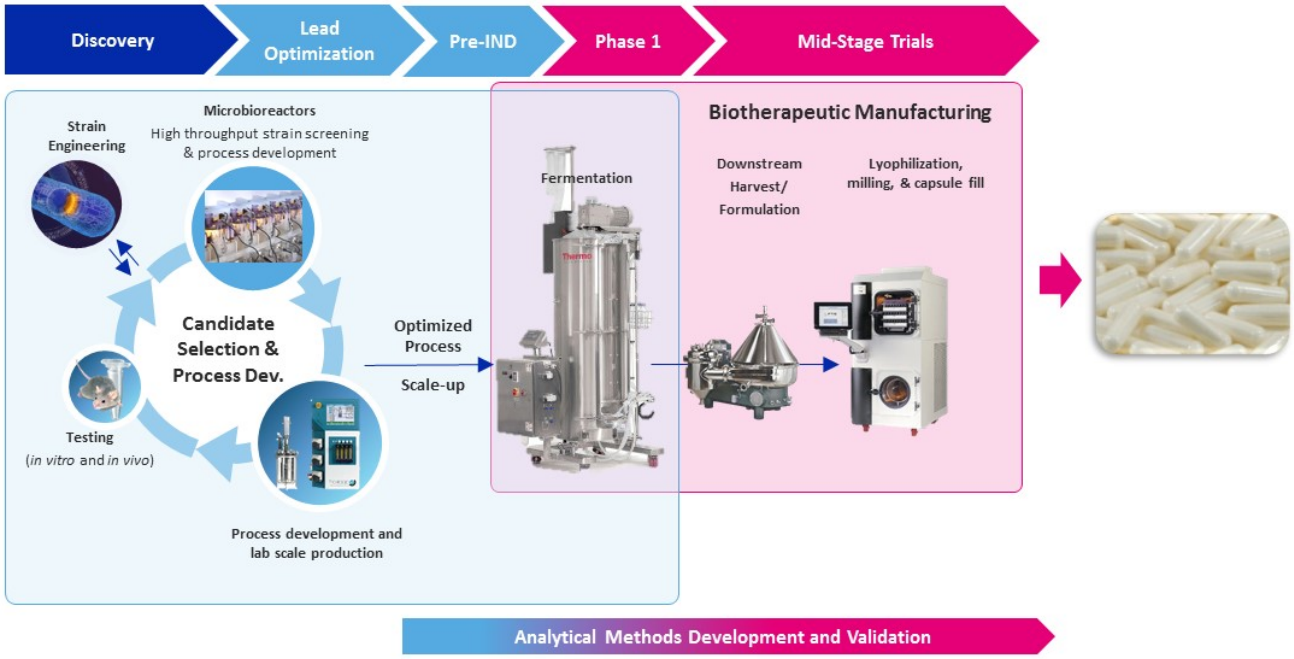
COMBINATIONS

HARNESS THE MICROBIOME

ORAL

Synlogic Internal GMP Manufacturing Capabilities

In-house Process Development and Clinical Manufacturing for Early & Mid-Stage Trials



Progress and 2019 Milestones

2018 Accomplishments

SYNB1618 in PKU

- ✓ Preclinical data published in *Nature Biotechnology*
- ✓ Safe, well-tolerated, proof of mechanism in HVs
- ✓ FDA Fast Track Designation

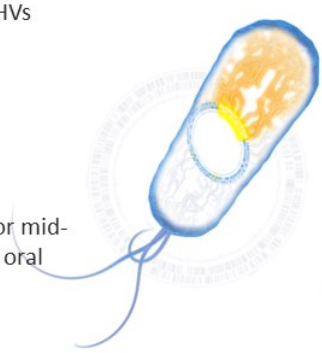
SYNB1618 and SYNB1020

- ✓ Initiated studies in patients

- ✓ Established in-house manufacturing capability for mid-stage clinical studies. Developed path to solid oral formulation

- ✓ **IO Lead Candidate, SYNB1891**, selected
- ✓ Initiated IND enabling studies

- ✓ Advanced **AbbVie collaboration**



2019 Milestones

SYNB1618 in PKU

- ➢ Complete ongoing study in patients
- ➢ Data expected mid-2019 (safety, tolerability and biomarkers)

SYNB1020 in Hyperammonemia

- ✓ Preclin. and HV clin. data published in *Sci. Transl. Med.*
- ➢ Complete ongoing study in patients with cirrhosis
- ➢ Data expected mid-2019 (safety, tolerability and ammonia-lowering)
- ➢ With ammonia-lowering data define development plan

SYNB1891 in Immuno-Oncology

- ➢ IND submission 2H2019

- ✓ Advance **AbbVie collaboration**
- ➢ Advance **preclinical pipeline**

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