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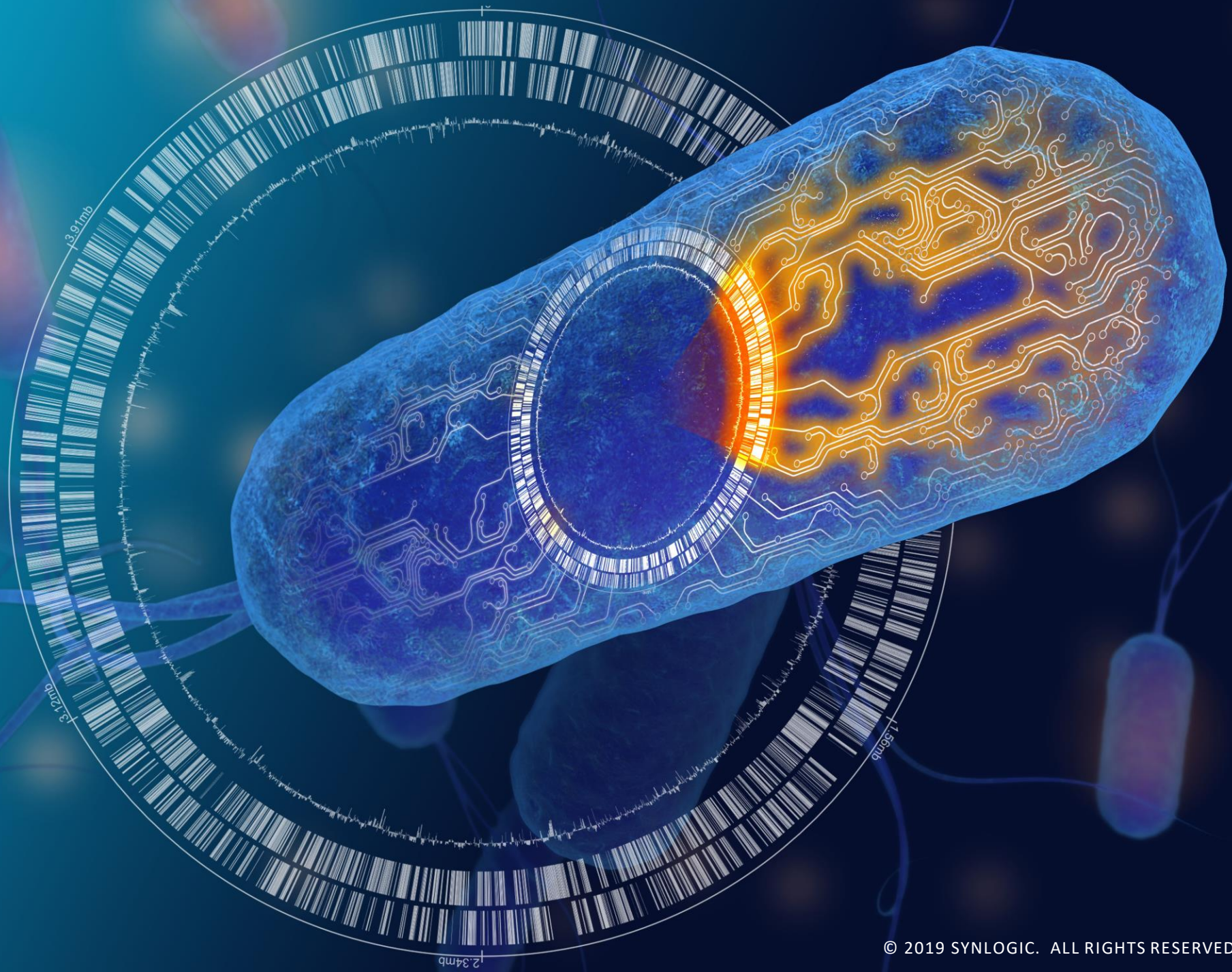
DESIGNED FOR LIFE



1Q2019 Teleconference

May 9, 2019

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Forward Looking Statements

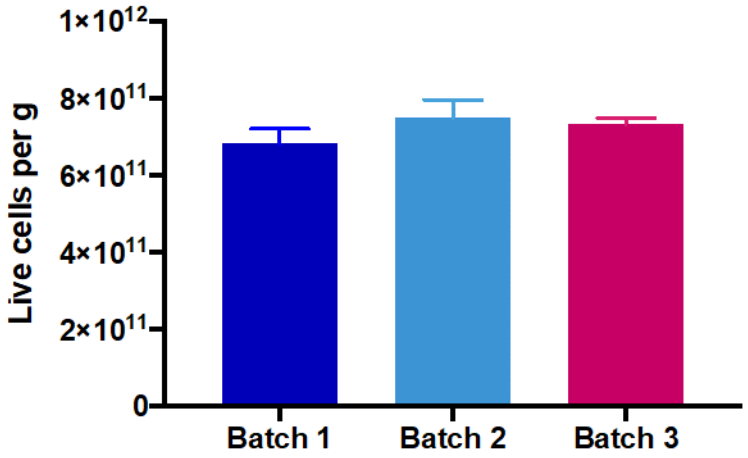
This presentation contains “forward-looking statements” that involve substantial risks and uncertainties for purposes of the safe harbor provided by the Private Securities Litigation Reform Act of 1995. All statements, other than statements of historical facts, included in this presentation regarding 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 most recent Quarterly Report on Form 10-Q filed with the SEC on May 9, 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.

Demonstrated Progress in Development of Lyophilized SYNB1618

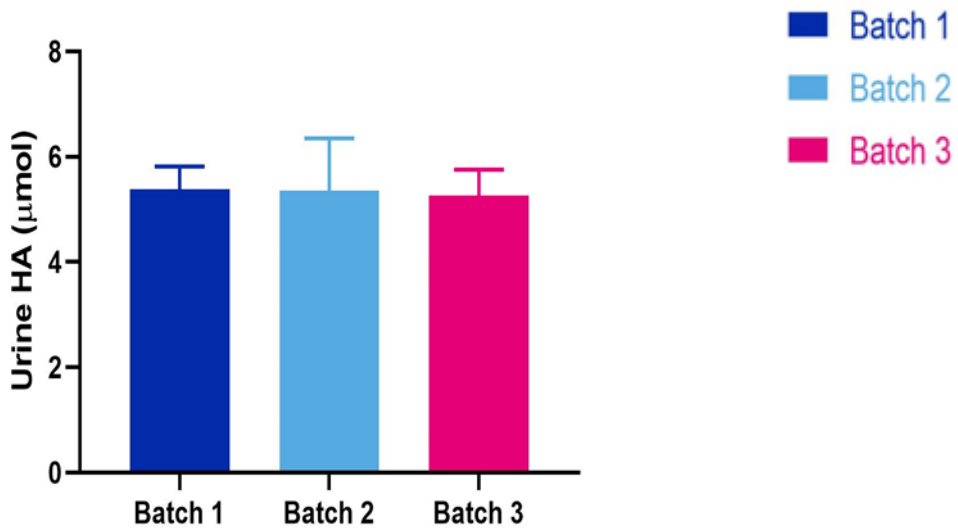
- Improved fermentation process enables production of a solid formulation of SYNB1618 with minimal impact on cell viability or activity
- Lyophilized SYNB1618 is similarly active to frozen liquid in terms of consumption of Phe or production of TCA/HA i*n vitro* and *in vivo*
- New solid process material is expected to have improved quality attributes including less free protein and reduced viscosity
- Process is robust and reproducible at 30 L production scale
- Lyophilized SYNB1618 is stable for >90 days at 2-8 °C and >30 days at room temperature
- Suite build-out complete and ready to manufacture cGMP lyophilized SYNB1618

Batch to Batch Consistency of SYNB1618 Solid Formulation

Viability



Activity in WT mice



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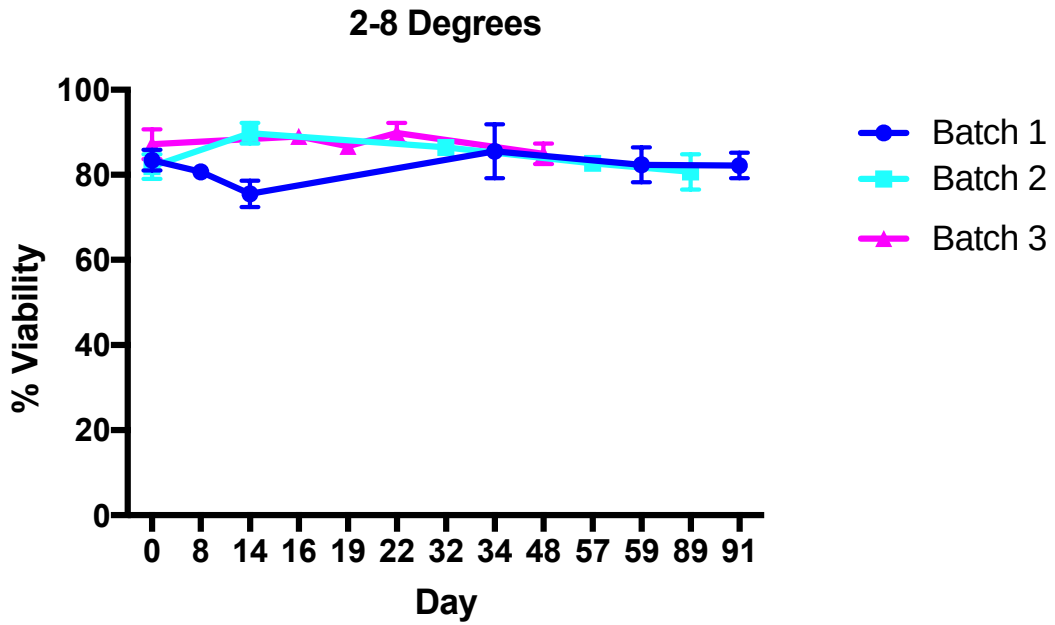
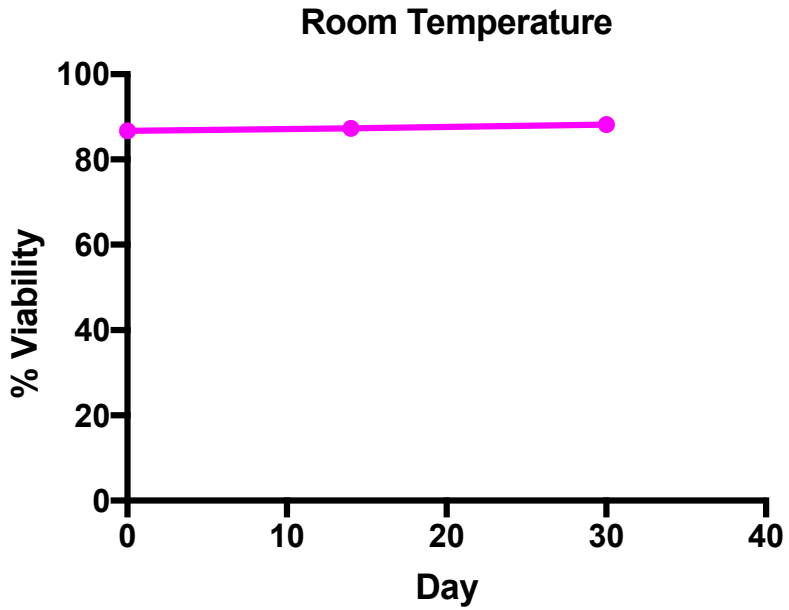
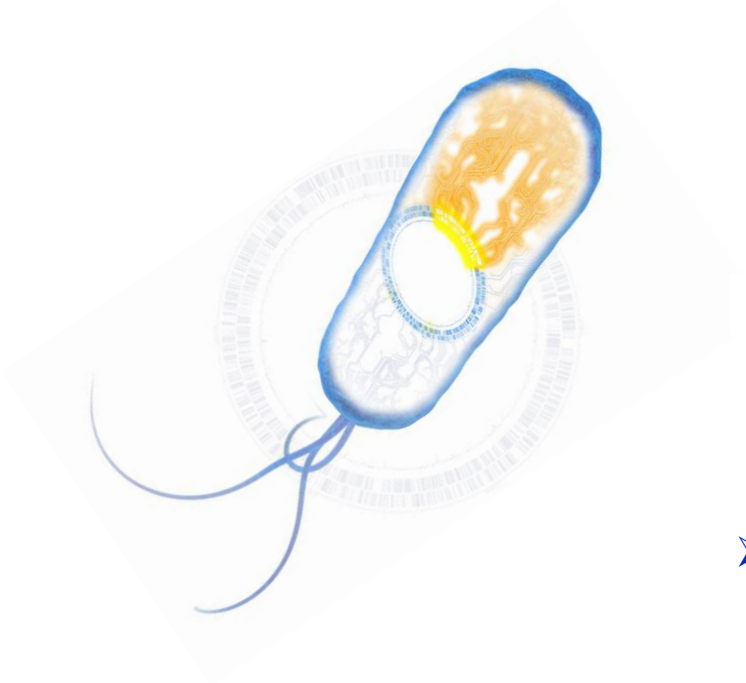
Stability of SYNB1618 Solid Formulation





2019 Progress and Milestones



SYNB1618 in PKU

- ➢ Complete ongoing study in patients
- ➢ Data expected 3Q2019 (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 3Q2019 (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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