

Synthetic Biology



Synthetic Biology takes an engineering approach to genetically augment living systems for useful purposes.

An Engineering Approach to Life Sciences

Synthetic Biology is more than genome editing, although it employs some of the same tools and techniques. Taking an analogy to digital devices, Synthetic Biologists write 'apps' in DNA that they 'load' into organisms to enable them to carry out new functions.

The field of synthetic biology leverages computational biology software and multiscale models to reduce the genetic design space to a tractable number for experimentation, and to extract meaningful knowledge from high-dimensional datasets. Engineered microbes that produce proteins or small molecules not found in nature, living sensors for environmental conditions, and even live therapeutics for the treatment of certain disorders have been created, and several have been deployed at scale.

MITRE has expertise in the core set of tools used in Synthetic Biology: *in silico* genetic design, biophysical, metabolic, kinetic, and economic modeling, as well as capabilities, laboratories, and equipment for molecular biology, microbiology, biochemistry, analytical chemistry, and laboratory automation. MITRE is also leveraging its knowledge of synthetic biology workflows and diverse stakeholder connections to create a *BioNet*, a systems-engineered network to facilitate Synthetic Biology project collaboration and disaggregation.

For information about MITRE's Synthetic Biology expertise and capabilities, e-mail bio@mitre.org.

MITRE's experts in synthetic biology write 'apps' in DNA that they 'load' into organisms to enable them to carry out new functions.

MITRE's mission-driven teams are dedicated to solving problems for a safer world. Through our public-private partnerships and federally funded R&D centers, we work across government and in partnership with industry to tackle challenges to the safety, stability, and well-being of our nation.