

BIOLOGY BUILT BETTER

Unlock the full potential of cell and gene therapies with GeneFab's synthetic biology services:

- Drug-regulated switches
- Custom promoters and UTRs
- Engineered cell lines for cell and gene therapy
- Cell state regulators for cell therapies
- Sense-and-respond circuits and logic gates

Engineering for success

With deep expertise in **AI/machine learning**, **synthetic biology**, and **cell engineering**, GeneFab's Synthetic Biology Taskforce has an established track record of delivering successful projects with various biotechs and large pharma partners.



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Using synthetic biology to tackle key challenges in cell and gene therapy



PRECISE DISEASE TARGETING

- Development of cell type and cell state selective promoters/UTRs
- High-throughput screening of CAR binders & architectures



ENHANCING CELL POTENCY

- Development of synthetic master regulators of cell state
- Protein engineering to control immune cell phenotype and/or cytokine secretion



IMPROVING CELLULAR CONTROL

- Improving proteins/small molecule binding domains through directed evolution
- Control of protein stability, mRNA transcription, and cellular apoptosis

*Interested to learn how GeneFab's SynBio platform can improve and optimize your cell and gene therapy performance and safety?
Tell us more about your project.*



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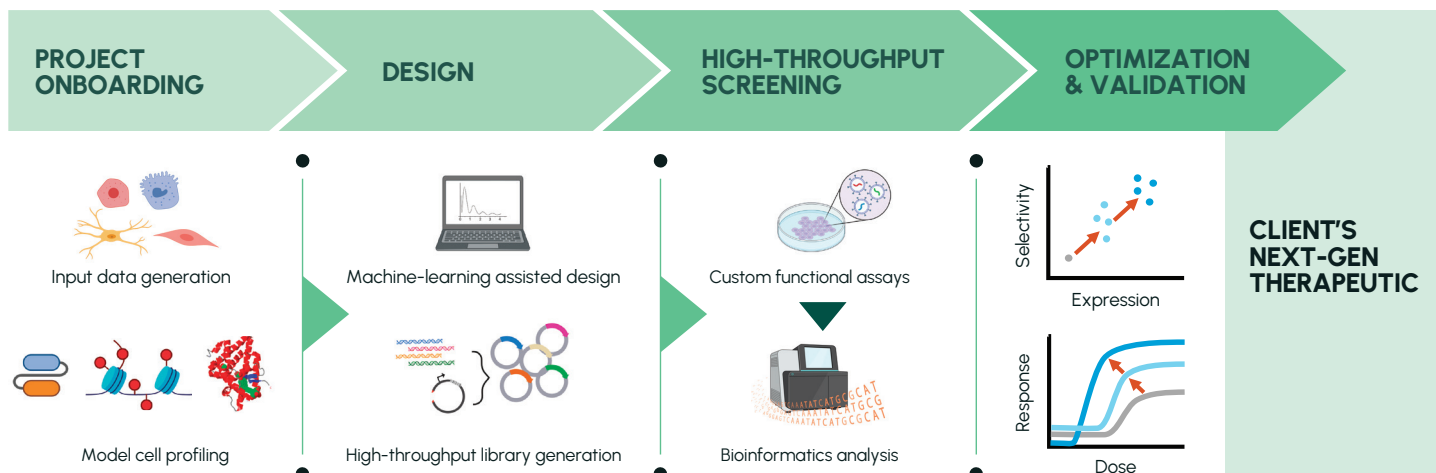
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Technology Development Workflow



Case Study 1 - Design of Potent, Compact, Cell-Specific Promoters

Synthetic promoter designs

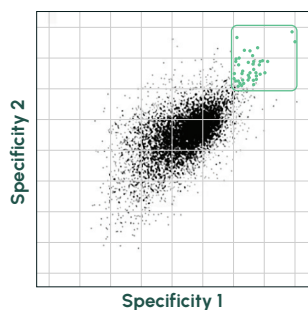
Bioinformatics-guided construction of promoter libraries

Synthetic Enhancer Library

Native Enhancer Library

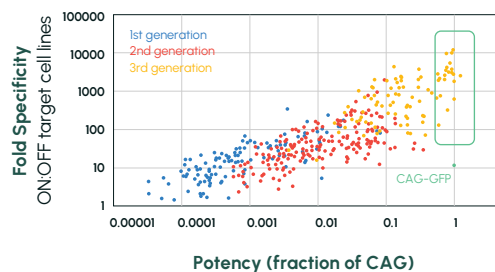
Massively parallel screening

50 hits identified from >10,000 synthetic promoters



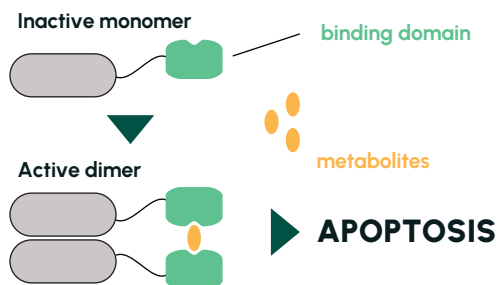
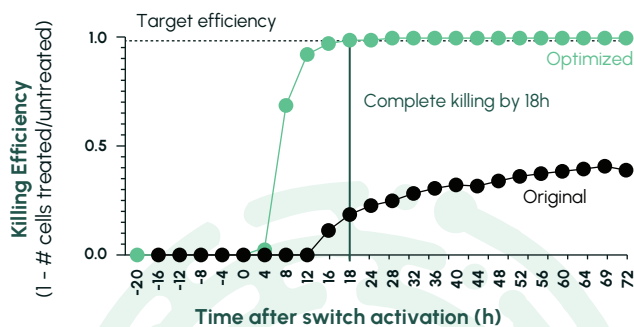
Iterative design and screening

Chimeric promoters achieved high potency and specificity



Case Study 2 - Drug-Regulated Safety Switch Optimization

Computational modeling and high throughput screening enabled development of an optimized kill switch that achieves **complete killing in <24 hrs** at FDA-approved molecule.



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