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Pilot Project Proposal
(Not to exceed two pages)

Name of Project: Synthetic Regulatory Genomics

Proposer and Contact Information:

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Background:

An expansive atlas of the regulatory DNA landscape is now available. Some variants have assay-defined functions (promoters, enhancers, silencers, etc.), but most have complex activities that are still being sorted out. Mapping human disease- and trait-associated variation by genome-wide association studies (GWAS) has demonstrated that the majority of variants (95%) lie in non-coding regions. Thus, there is a need to study regulatory variation in context.

Technical Idea:

This pilot project proposes the use of a synthetic approach to study regulatory genomics.

Utility and “Fit” For GP-write:

The key advantages of a synthetic approach include multi-edited “synthetic haplotypes”, cross-species function, gene fusions, chromosomal rearrangements, position effect variegation, and gene therapy. A synthetic approach also allows flexible incorporation of alternate functional modules.