

## **AN ADAPTIVE LABORATORY EVOLUTION PLATFORM FOR STRAIN CONSTRUCTION AND ENGINEERING PARTS**

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Adaptive Laboratory Evolution (ALE) can be used to obtain useful strains for biotechnology applications. A complete platform containing automation, bioinformatics, and biological selection systems can be used to replace the design and build steps in the rational strain engineering process. In this talk, I will describe the different parts of this platform and current use cases applying the platform to strain construction goals. Examples of advanced biological selection systems which have been developed will be highlighted to show how ALE can be used to obtain production strains for a wider set of products and for focusing selective pressures on targeted enzymatic steps. An additional specific focus will be to highlight what a quality-controlled mutation identification pipeline, a mutation database, and higher order interpretations of mutations using biological network analyses provides for such engineering goals. Finally, I will review what is learned with increasing scale from gathering mutation and strain data from ALE experimentation and what it means for synthetic biology.