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The nonconventional yeast[1] JAIME GARCIA, St. Marys University, ADITHYA RAMESH, IAN WHEELDON, University of California-Riverside — The nonconventional yeast, Yarrowia lipolytica has garnered much interest in the field of biotechnology primarily for its ability to synthesize, modify, and store intracellular lipids at a high capacity. A number of established gene-editing tools have been applied for both gene disruption and regulation. However, for rapid strain development, a practice common in large-scale industrial manufacturing, we require an efficient genome-wide tool that can simultaneously disrupt and regulate gene expression. We investigate the use of a novel CRISPR-Cpf1 system that meets both functions. It can mature its own crRNA array and doesn't require a transactivating CRISPR RNA (tracrRNA), making it highly desirable for multiplexed genome editing. It was previously shown that by reducing the length of the sgRNA, catalytically active Cas9 could bind to the genomic target without effecting a double-stranded break and gene regulation was achieved when fused to a transcriptional regulator. By applying this in tandem with a previous genome-wide mutational screen in Y. lipolytica we can regulate gene expression. Thus, enabling investigation of the relationships between genetic architecture and phenotype to identify industrially relevant phenotypes in a more accurate and feasible manner.

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