

# myTXTL<sup>®</sup> Featured Publications

## Cell-Free Expression Kits

Researchers from around the globe regularly publish data in peer-reviewed journals using products from Daicel Arbor Biosciences. Highlighted below are common applications and selected publications demonstrating the versatility and capabilities of the technology.

### SINGLE PROTEIN SYNTHESIS

*Elucidating strategies to produce soluble and membrane proteins in vitro from circular and linear DNA template formats.*

Blume, C. *et al.* (2021) **A novel ACE2 isoform is expressed in human respiratory epithelia and is upregulated in response to interferons and RNA respiratory virus infection.** *Nature Genetics.*

Tekel, S.J. *et al.* (2018) **Design, construction, and validation of histone-binding effectors *in vitro* and in cells.** *Biochemistry.*

Guo, S. *et al.* (2017) **Expressing biologically active membrane proteins in a cell-free transcription-translation platform.** *bioRxiv.*

Marshall, R. *et al.* (2017) **Short DNA containing  $\chi$  sites enhances DNA stability and gene expression in *E. coli* cell-free transcription-translation systems.** *Biotechnology and Bioengineering.*

### GENERATION OF BACTERIOPHAGES

*Demonstrating in vitro synthesis of coliphages from various genome formats like single- and double-stranded DNA and mRNA and a genome size of up to 170 kbp with about 300 genes, which has potential for novel biomedical applications such as phage therapy.*

Rustad, M. *et al.* (2018) **Cell-free TXTL synthesis of infectious bacteriophage T4 in a single test tube reaction.** *Synthetic Biology.*

Shin, J. *et al.* (2012) **Genome replication, synthesis, and assembly of the bacteriophage T7 in a single cell-free reaction.** *ACS Synthetic Biology.*

### CRISPR TECHNOLOGY

*Exemplifying the benefits of cell-free technology to study and validate the CRISPR-Cas system more rapidly for example by facilitating the measurement of quantitative dynamics of DNA cleavage and gene repression, and the screening for protospacer-adjacent motifs and Cas-inhibitor proteins.*

Galizi, R. *et al.* (2020) **Engineered RNA-interacting CRISPR guide RNAs for genetic sensing and diagnostics.** *The CRISPR Journal.*

Jacobsen, T. *et al.* (2020) **Characterization of Cas12a nucleases reveals diverse PAM profiles between closely-related orthologs.** *Nucleic Acids Research.*

Watters, K.E. *et al.* (2018) **Systematic discovery of natural CRISPR-Cas12a inhibitors.** *Science.*

## ASSAY DEVELOPMENT

*Highlighting the use of cell-free technology as a tool to generate reliable data in complex, high-throughput screening settings advancing research projects in many fields.*

Marshall, R. *et al.* (2020) **Rapid testing of CRISPR nucleases and guide RNAs in an *E. coli* cell-free transcription-translation system.** *STAR Protocols.*

Wandera, K.G. *et al.* (2019) **An enhanced assay to characterize anti-CRISPR proteins using a cell-free transcription-translation system.** *Methods.*

Yim, S.S. *et al.* (2019) **Multiplex transcriptional characterizations across diverse and hybrid bacterial cell-free expression systems.** *Molecular Systems Biology.*

## ARTIFICIAL CELLS

*Giving detailed insight into the bottom-up synthesis of cellular reactors constructed of molecular components and lipid membranes capable of recapitulating biological functions, and therefore key to understand living matter.*

Garenne, D. *et al.* (2020) **Membrane molecular crowding enhances MreB polymerization to shape synthetic cells from spheres to rods.** *Proceedings of the National Academy of Sciences.*

Garamella, J. *et al.* (2019) **An adaptive synthetic cell based on mechanosensing, biosensing, and inducible gene circuits.** *ACS Synthetic Biology.*

Izri, Z. *et al.* (2019) **Gene expression in on-chip membrane-bound artificial cells.** *ACS Synthetic Biology.*

## GENE CIRCUITS, RAPID PROTOTYPING AND MICROFLUIDICS

*Exploring the characteristics of gene circuits design and dynamics using various elementary circuit motifs and exemplifying synthetic prototyping within microdroplets.*

Adhikari, A. *et al.* (2020) **Effective biophysical modeling of cell free transcription and translation processes.** *Frontiers in Bioengineering and Biotechnology.*

Shojaeian, M. *et al.* (2019) **On-demand production of femtoliter drops in microchannels and their use as biological reaction compartments.** *Analytical Chemistry.*

Yelleswarapu, M. *et al.* (2018) **Sigma factor-mediated tuning of bacterial cell-free synthetic genetic oscillators.** *ACS Synthetic Biology.*

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