myTXTL®

Featured Publications

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

SOLUBLE AND MEMBRANE PROTEIN PRODUCTION

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

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 χ sites enhances DNA stability and gene expression in *E. coli* cell-free transcription-translation systems.** *Biotechnology and Bioengineering.*

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.

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

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.*

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.

Marshall, R. *et al.* (2018) **Rapid and scalable characterization of CRISPR technologies using an *E. coli* cell-free transcription-translation system.** *Molecular Cell.*

Maxwell, C.S. *et al.* (2018) **A detailed cell-free transcription-translation-based assay to decipher CRISPR protospacer-adjacent motifs.** *Methods.*

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

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ARTIFICIAL AND MINIMAL 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.

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.*

Majumder, S. *et al.* (2017) **Cell-Sized Mechanosensitive and Biosensing Compartment Programmed with DNA.** *Chemical Communication.*

GENERATION OF BACTERIOPHAGES

Demonstrating* in vitro *production 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.

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.*

GENE CIRCUITS, RAPID PROTOTYPING AND TOOLBOX 2.0

Explaining concepts of gene circuits design using various elementary circuit motifs and tuning of RNA turnover as well gives an overview of the capabilities of the myTXTL® Toolbox 2.0 Plasmid Collection.

Marshall, R. & Noireaux, V. (2019) **Quantitative modeling of transcription and translation of an all-*E. coli* cell-free system.** *Scientific Reports.*

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

Garamella, J. *et al.* (2016) **The all *E. coli* TX-TL toolbox 2.0: a platform for cell-free synthetic biology.** *ACS Synthetic Biology.*

For a complete list of publications, please visit: arborbiosci.com/resources/publications.