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ACCELERATING MICROORGANISM STRAIN SELECTION FOR ENHANCED PRODUCTIVITY: A REVIEW OF MICRODROPLET TECHNOLOGY SOLUTIONS FOR SCREENING MUTANT AND GMO STRAINS

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Abstract – This article reviews state-of-the-art microdroplet technological solutions for screening microorganisms mutant and GMO strains. Microorganisms used in the production of various products – single-cell protein, single-cell oil, enzymes, pigments and other bioactive compounds – can always be improved and their properties enhanced to increase the production of products of interest, to simplify microbial cultivation process, improve efficiency or adapted strains to use cheaper raw materials such as agroindustrial by-products. Microorganisms can be improved using either classical mutagenesis techniques or genetic engineering methods. Regardless of the selected method for mutant or GMO creation, during the process most promising microorganism strains must be selected, which is usually a slow and labour-intensive process. The use of microdroplets is a promising technological solution to speed up strain selection. This review looks at the latest developments in microdroplet technology, compares their variations, and identifies future prospects.

Keywords – *Biotechnology; genetic engineering; GMO strains; industrial microbiology; microdroplet technology; microorganisms; mutant strains; screening; strain selection*