

Korea develops highly productive bioprocessing system

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A genetic circuit to guide microorganisms to stop fighting and work together in a cell factory



Bioprocesses, meant for increasing the number of living cells or other biologic systems/components such as bacteria, viruses, enzymes, proteins, or nucleic acids in a commercial bioreactor for biopharmaceutical manufacturing, are often limited to pure cultures of a single strain.

Although multiple strains can be grown together for diverse processes, these strains will inevitably compete, just as humans do, for limited resources, lowering the overall productivity.

A joint research team at South Korea-based Pohang University of Science and Technology (POSTECH) in collaboration with Chung-Ang University has developed a new bioprocess by introducing a genetic circuit, named “population guider,” into a co-culturing consortium, which induces cooperation among microorganisms to improve productivity.

“Our findings are the first to suggest an artificial genetic circuit in multiple microbial strains to prevent their competition from lowering productivity in chemical production. This new technology is acclaimed as an innovation that can secure both higher productivity and flexibility in microbial bioprocesses.”