

Synthetic biology: applying engineering to biology: Rewiring of genetic network for advanced biofuels in engineered *E. coli*

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Recent development of microbial platforms for the production of bisabolene, a precursor of bisabolane, biosynthetic alternative to D2 diesel fuel, has been stimulated due to rising petroleum costs and environmental concerns. Microbial engineering based on Synthetic biology boots the efforts to produce 'Drop-In' biofuels from renewable feedstocks. In this presentation, I will present the IPTG-free bisabolene production system using engineered *E. coli*. Quorum-sensing (QS) mediated *E. coli* enables to induce neighboring cells as well as itself to initiate the carbon flux to the designated metabolic pathway without using expensive Isopropyl--D-1-thiogalactopyranoside (IPTG), a widely-used inducer, and showed the similar capability of genetic controls compared to the IPTG-induced system. Several genetic modules were constructed to link QS-system and biofuel pathway and direct QS-system depending on cell density led the comparable level of bisabolene productions in *E. coli* to the level of induced system. The QS-system for biofuels production could be a cost-effective and promising strategy to develop microbial platforms.