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|  |  |  הטכניון - מכון טכנולוגי לישראל TECHNION - ISRAEL INSTITUTE OF TECHNOLOGY  |
| הפקולטה להנדסה כימיתע"ש וולפסון |  |  |
| The Wolfson Department of Chemical Engineering |  |  |

**Wolfson Department of Chemical Engineering Seminar**

**Zoom seminar /** <https://technion.zoom.us/j/91637548930>

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**Wednesday - January 27, 2021 at 13:30**

**“Synthesis of high-titer alka(e)nes in Yarrowia lipolytica**

**is enabled by a discovered mechanism”**

**Dr. Jingbo Li**

 Organism Engineer - Ginkgo Bioworks, Boston, USA

Alka(e)nes are ideal fuel components for aviation, long-distance transport, and shipping. They are typically derived from fossil fuels and accounting for 24% of difficult-to-eliminate greenhouse gas emissions. The synthesis of alka(e)nes in *Yarrowia lipolytica* from CO2-neutral feedstocks represents an attractive alternative. Here we report that the high-titer synthesis of alka(e)nes in *Yarrowia lipolytica* harboring a fatty acid photodecarboxylase (*Cv*FAP) is enabled by a discovered pathway. We find that acyl-CoAs, rather than free fatty acids (FFAs), are the preferred substrate for *Cv*FAP. This finding allows us to debottleneck the pathway and optimize fermentation conditions so that we are able to redirect 89% of acyl-CoAs from the synthesis of neutral lipids to alka(e)nes and reach titers of 1.47 g/L from glucose. Two other CO2-derived substrates, wheat straw and acetate, are also demonstrated to be effective in producing alka(e)nes. Overall, our technology could advance net-zero emissions by providing CO2-neutral and energy-dense liquid biofuels.