

Conversion of Ionic Liquid Pretreated Poplar into Jet Fuel

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Project Goals: Establish the scientific knowledge and new technologies to transform the maximum amount of carbon available in bioenergy crops into biofuels and bioproducts.

Microbial production of energy-dense terpene biofuels from ionic liquid (IL) pretreated lignocellulosic biomass is a promising route to sustainable fuels. One-pot IL pretreatment and saccharification effectively releases biomass sugars while streamlining the deconstruction process and conserving water. This work describes a one-pot process with sugar-to-fuel conversion using the versatile basidiomycete, *Rhodospiridium toruloides*. This organism is an attractive lignocellulosic conversion host due to its ability to utilize a wide range of carbon sources, tolerate various ILs, and accumulate acetyl-CoA-derived bioproducts such as fatty acids and terpenes. Researchers at JBEI have previously demonstrated the potential of *R. toruloides* for conversion of IL-treated biomass into terpene bioproducts by engineering a strain to produce bisabolene, a potential alternative biodiesel. Here, we have selected two tricyclic sesquiterpenes that may have applications as jet fuels, epi-isozizaene and prespatane, and demonstrated their production from IL-pretreated poplar using *R. toruloides*.

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