Carboxylic acids based biofuels and biochemicals production

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Recent advances in green catalysts and system biology provide new tools for researchers and engineers to direct their strategies and construct optimal chemical and bio-based catalysts for the sustainable production of biofuels and biochemicals. To get the qualified vehicle fuels from the biological ways, the carbon number of the fuels should be increased. However there is an antinomy that increasing carbon number in the biofuels provides better fuel characteristics but is more toxic to the fuel-producing microorganisms during fermentation. It is the fatal drawback of butanol or higher carbon-chained alcohols as the competitive biofuel with ethanol as the economical value aspect. To overcome the fatal drawback, carboxylic acids as the precursors of higher carbon-chained alcohols could be produced up to the similar concentration level with ethanol from the fermentation and could be converted to the higher carbon-chained alcohols by the chemical catalytic reaction, such as hydrogenation, etherification, esterification, etc. This is our novel idea to produce the biofuels containing higher carbon numbers using the integrated biological process with the chemical catalytic reaction.