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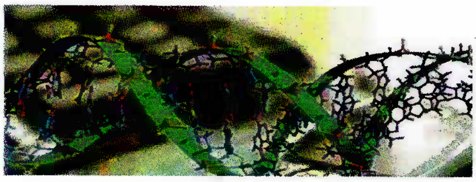

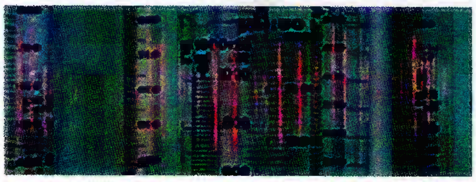

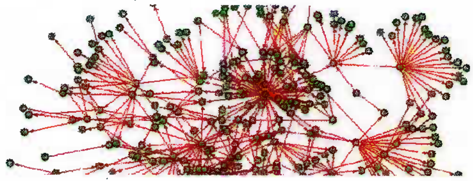

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Recombinant industrial *Saccharomyces cerevisiae* strains for bioconversion of cellobiose

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The fermentation of cellulose is essential for the bioconversion of lignocelluloses to fuels and chemicals. The hexoses are formed after hydrolysis of cellulose by fungal cellulases, which mainly generate cellobiose and soluble cellodextrins, which can be further hydrolyzed to glucose by β-glucosidases. Some cellobiose fermenting recombinant strains of *S. cerevisiae* have been reported. However, most of this work has been performed with laboratory *S. cerevisiae* strains.

In this study, a constructed vector provides targeted integration of *Neurospora crassa* cellodextrin transporter (*CDT1*) and intracellular *Thermoascus aurantiacus* β-glucosidase genes at *S. cerevisiae HO* locus. An integral vector containing the KanMX selectable marker gene was used. Four industrial strains of varied genetic background were engineered to ferment cellobiose. Chromosomal integration of genes into *HO* locus were confirmed by PCR. The recombinant strains have shown continuous expression of β-glucosidase and *CDT1* genes.

Recombinant *S. cerevisiae* expressing both genes became able to grow in synthetic medium containing cellobiose. Moreover, the recombinant strains produced approximately 44.8 g/l ethanol from 80 g/l cellobiose within 72 h. The ethanol yield from cellobiose was 0.4 g/g, which corresponds to 80.0% of the theoretical yield. Under aerobic conditions, the growth rate of the recombinant strain co-expressing two genes could achieve 0.196 h^{-1} (OD600).

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The bio-hydrogen production by *Proteus, Shigella* and *Enterobacter aerogenes* from wastewater which contained teal oil, camellia oil or flaxseed oil

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The bio-hydrogen production by fermentation of *Proteus, Shigella* and *Enterobacter aerogenes* from wastewater containing teal oil, camellia oil or flaxseed oil had been investigated in this article. As to the wastewater containing teal oil with *Proteus, Shigella* or *Enterobacter aerogenes*, the hydrogen production ratio was 4.53 mL/g h^{-1} (Proteus), 6.02 mL/g h^{-1} (Shigella) or 8.13 mL/g h^{-1} (*Enterobacter aerogenes*). As to the wastewater containing camellia oil with *Proteus*, the hydrogen production ratio was 3.22 mL/g h^{-1}. As to the wastewater containing camellia oil with *Shigella*, the hydrogen production ratio was 5.05 mL/g h^{-1}. As to the wastewater containing camellia oil with *Enterobacter aerogenes*, the hydrogen production ratio was 6.16 mL/g h^{-1}. As to the wastewater containing flaxseed oil with *Enterobacter aerogenes, Shigella* or *Proteus*, the hydrogen production ratio was 6.69 mL/g h^{-1} (*Enterobacter aerogenes*), 4.97 mL/g h^{-1} (*Shigella*) or 3.82 mL/g h^{-1} (*Proteus*). Therefore, compared with *Proteus* or *Shigella, Enterobacter aerogenes*, as our best aim, was the most potential bacteria for hydrogen production from wastewater containing olive oil, camellia oil or flaxseed oil.

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Energy and exergy analysis of biodiesel

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Biodiesel can be produced from different vegetable oils, such as soybean, rapeseed, sunflower oils etc. as well as a variety of less common oils. This study presents the thermodynamic analyses of a compression ignition engine fueled with diesel and tea seed (*Camellia sinensis*) oil biodiesel. Although there are various studies about biodiesel topics, thermodynamic analyses have not been investigated in detail for diesel engine fueled with tea seed biodiesel. Tea seed oil has lower pour point and lower viscosity value and it is one of the cheapest feedstocks. Energetic and exergetic characteristics of the engine for each fuel were determined and compared with each other. It is concluded that tea seed oil biodiesel has similar performance with diesel fuel in terms of the energy and exergy efficiencies. Energy efficiencies of the engine fueled with diesel and tea seed oil biodiesel were determined to be 35.21% and 34.83% while the corresponding exergy efficiencies were calculated to be 33.04% and 32.70%, respectively.

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A review on performance and emission characteristics of biodiesel produced from animal fat

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Animal fats have been more and more popular as an alternative to vegetable oils in the production of biodiesel. European Union with 210 million households has the potential of 525,000 tons of animal fat per year that can be transformed to 409,500 tons of biodiesel. They are low cost, cause less environmental damage and increase the fuel properties of the biodiesel. In this paper, recent studies on emissions and performance of biodiesel produced from animal fats reviewed briefly. In general, animal fat biodiesels (AFB) improve performance characteristics (power, torque and break specific fuel consumptions) slightly in comparing with vegetable oil based biodiesel (VOB). However, their engine performance is still lower than crude diesel fuel due to their low lower heating value. As for emission parameters; carbon monoxide, hydrocarbons and particle matter values of animal fat esters are lesser than both petroleum and vegetable oil diesel fuels. Also, previous studies