Microbes fuel energy debate

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Microbes may well be the answer to our global energy crisis. By fermenting biomass to produce biofuels, they offer a possible climate-friendly solution to the anticipated shortfall in fossil fuel supply. A review by Professor Arnold Demain from Drew University in New Jersey, USA, on how microbes could be used to salvage the energy crisis has just been published online Springer's *Journal of Industrial Microbiology & Biotechnology*.

According to Professor Demain, the petroleum-based economy in the US is getting close to the end of its lifecycle. Global oil reserves and new petroleum discoveries will not be enough to meet the annual demand worldwide. It is therefore essential to anticipate and avoid any shortfall in future supply and to provide access to new bioenergy alternatives for the marketplace.

In the context of a strong global political and economical debate on the gradual substitution of petroleum by renewable alternatives such as biofuels, Demain reviews how microbes can help solve the energy problem, and focuses on the organisms that ferment lignocellulosic biomass to produce bioethanol, biobutanol, biodiesel and biohydrocarbons in particular. His review also highlights how the use of these biofuels would help to reduce greenhouse gas emissions. The plants that produce the biomass remove carbon dioxide from the atmosphere as part of their growth and normal metabolism.

Demain also highlights a number of important commercial developments, including the establishment of biotechnology companies

in the biofuel sector since 2006, either alone or with companies of the petroleum and chemical industries. In addition, there have been a number of U.S. Government initiatives pushing for and backing the development of biofuels.

Demain concludes that: "What remains is a major effort and challenge to biochemical engineering at the many new plants being built for biofuel production. The new processes have to be scaled up and carried out in a cost-effective way. The future of biofuels looks very bright…the best is yet to come."

Source: Springer