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Interview with Qiang Hu (Codirector of the Laboratory for Algae Research and Biotechnology)

"Biofuels derived from algae and other land plants sources have been tested that are comparable, if not better, to petroleum-derived fuels"

Sevilla, 18/7/2012. Dr. Hu received a Bachelors of Science in Biology from Hubei University and a Masters of Science in Hydrobiology from the Chinese Academy of Sciences in China, and a Ph.D. degree in Microalgal Biotechnology and has spent his entire research activity around biofuels. Currently is enjo-ying a stay in the cicCartuja, specifically at the Institute of Plant Biochemistry and Fotosóntesis (IBVF). We interviewed him days after his lecture entitled "Microalgal biofuels: Advances, Challenges and Opportunities," delivered in the meeting room of cicCatuja.

How did you get involved in algal research?

I began my algae research when I was a Masters student at Chinese Academy of Sciences some twenty seven years ago. My research project then was to conduct screening and selection of desirable algae strains for mass cultivation for animal feed. After that, I went to Israel to pursue my Ph.D. study under Professor Amos Richmond at Ben-Gurion University of the Negev, Israel and my research focus was photobioreactor design and development of high density algal mass culture. After Israel, I had my first postdoctoral period at Marine Biotechnology Institute in Japan developing an algae-based technology to capture and utilize carbon dioxide from industrial flue gases, and then spent my second postdoctoral period at Arizona State University in the US to continue exploring the potential of algae as a sustainable solution for bioremediation of wastewater and carbon dioxide-rich flue gases.

Which is the relationship between the fuel/combustible and algae?

Algae, like woody biomass, can be burned to release energy as heat, which can also be converted to electricity. The main attraction of algae is that many algae strains can produce large amounts of oils which can be readily extracted and converted to liquid fuels, such as biodiesel, green diesel, and bio-jet fuel. It is expected that algae can be a promising alternative source of oil feedstock for liquid fuels, particularly for transportation.

Microalgal researcher, Qiang Hu.

Scientific profile

Professor at Arizona State University, working in the field of microalgae while teaching various biological subjects for undergraduate and graduate students. Their research interests are microalgal photosynthesis, biosynthesis of lipids and carotenoids, photobioreactor system design, and mass culture of microalgae for biofuels and biomaterials. Together with students have conducted applied research on biology and biotechnology of microalgae, aiming at developing an advanced biotechnology for cost-effective and energy-efficient production of microalgal biomass feedstock for various commercial applications, in particular biofuels production from microalgae.

What impact do you think will have into the energy sector?

If successfully, algae can be part of solution for future sustainable liquid fuel sup-plies. The use of biofuels will also reduce greenhouse gas emissions and thus reduce unwanted global climate changes. The potential benefit of the use of algae will go beyond biofuels, as the production of algae will reduce foreign oil import, stimulate domestic and rural economic development and create more high-paid jobs.

Until today, is biofuel socially accepted?

Biofuels derived from algae and other land plants sources have been extensively tested with aircrafts, ships, and vehicles and been demonstrated that biofuels are comparable, if not better, to petroleum-derived fuels. In Europe as well as in the US, biofuels are being used as a blend with petroleum-based fuels in many public transportation systems, including school buses. The acceptance of the use of biofuels by the society is generally high.

What research are you currently working on?

Currently my research team at Arizona State University is addressing some critical technical questions or hurdles along the algae biofuels value chain. Our research topics cover strain improvement, large-scale photobioreactor system design and algae mass culture, and downstream processes including algae harvesting, dewatering and drying, as well as oil extraction and conversion.

What is your larger goal in all of your research?

Our goal is to develop a next generation platform technology to enable large-scale production of algae feedstock and biofuels economically viable ⬣

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