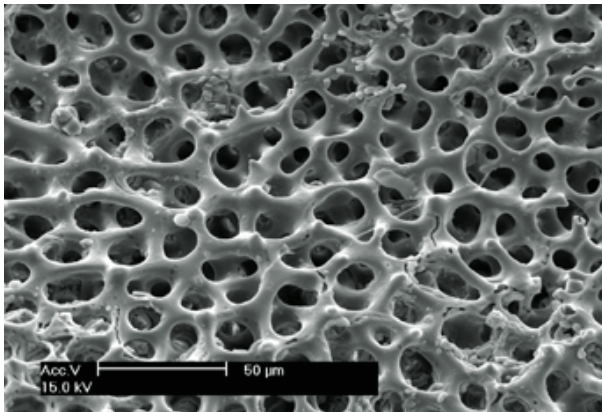


‘Sponge’ from starfish biomimetic key to no-carb biofuel?

The nanoscale engineering found in sea creatures such as starfish may hold the key to a renewable energy source that does not produce carbon dioxide.



Credit: University of Sydney

Dr Andrew Harris and his team from the University of Sydney have been researching techniques to capture the carbon dioxide normally released while extracting hydrogen from biomass (agricultural wastes). The hydrogen generated would be used as a sustainable ‘energy carrier’ for fuel cells, with water as the only by-product.

The team aims to make a sorbent or sponge that will capture the released carbon dioxide, an innovation that will also change the reaction chemically, increasing the amount of hydrogen produced.

‘We found that calcium oxide-based sorbents were the most effective and that Echinodermata – sea creatures including starfish and sea cucumbers – already provided the perfect templates for the structure we sought,’ Dr Harris said.

‘Hydrogen is the cleanest energy carrier available, but there are serious barriers to its widespread use. Most of the hydrogen produced at the moment – around 95 per cent – is derived from fossil fuels, so it releases the same amount of carbon dioxide as burning fossil fuels.

‘But making hydrogen from biomass and capturing the carbon dioxide means negative net greenhouse gas emissions, and this is a significant step on the road to a future hydrogen economy.’

The project will use renewable sources such as wood and agricultural wastes, rather than food crops, for producing hydrogen.

The researchers have received a \$1 million grant from major European energy investor E.ON – which funds applications of nanotechnology in the energy industry – to develop the materials. Dr Harris is the first Australian recipient of an E.ON grant.

From **ECOS** online <http://www.ecosmagazine.com/?paper=EC149p8a>