

## Intellectual property

## Innovation tested by market approach

Patrick Walter

An international group of researchers has come up with a market-based approach to innovation and invention that eschews the traditional patent system. The researchers hope it could find use in areas poorly served by the current patent system, such as computer software.

The two systems were tested using the 'knapsack problem'. Participants had to pack a knapsack to maximise the number of valuable objects in it, as not all the items would fit. In the patent-style simulation, the person who came up with the best solution won a prize. In the market-led approach participants were given shares in each item and then traded them electronically to buy up those that they thought would be required for the optimal solution. When the solution was revealed participants received money for shares in the correct items, so many people received some reward for their efforts (*Science* 2009, **323**, 1336).

Author Peter Bossaerts, from

Caltech, US, says that part of the problem with the patent system is its 'winner takes all approach'. Most people are not suitably convinced of their own brilliance that they think they can get to a solution to a specific problem before anyone else. '[The market-led approach] is relying on what psychologists call over-confidence... if you ask people on the street "are you a good driver?" then you'll find 70-80% of the people will tell you they are better than the median. If you ask them "are you the best driver?" then most of them will say no.'

Bossaerts illustrates his idea with the example of a fuel cell that depends on a platinum catalyst. If the inventor thinks this fuel cell will be a runaway success, s/he can buy up futures in platinum on the expectation that their value will increase. He does, however, add that this system is dependent on well organised markets that do not yet exist.

However, Markus Reitzig, assistant professor of strategic management at London Business School, UK, is

sceptical that this approach could work in the real world.

'It is actually not easy to get money from anybody on the simple promise that you have come across some kind of technology using superior information.' Trust is also a big problem. Why would any inventor place his idea in the hands of venture capitalists without the protection a patent provides?, Reitzig asks. 'With R&D somebody has to sit down and do the tedious work and bear all the risks, and in the end, hopefully, be compensated. If you take away that compensation from the person, why would anyone engage in it?'

Another unrealistic assumption is the free access to complementary assets, a crucial assumption in the market-based approach. 'In order for this system to work, market participants need to be able to act on their insights,' Reitzig argues. 'In other words, you need to be able to buy the shares that increase in value because of the invention. Markets for technology, however, often don't work like this.'

## Water treatment

## Balls to bacterial blockages

Andrew Turley

Carbon nanoparticles known as buckyballs could stop bacteria and other organisms accumulating on membranes used in water treatment.

Researchers from Duke University, NC, US, found that fewer *E coli* colonies formed on 200nm pore aluminium oxide membranes dip-coated with the nanoparticles than on conventional equivalents (*J Membr Sci* 2009, doi:10.1016/j.memsci.2008.12.023). In separate tests, they added buckyballs to *E coli* in water, and found, using chemical stains, that this reduced their ability to respire, leading to death, although the researchers do not yet know the precise mechanism.

Just as our arteries can become clogged with plaques, membranes used in water treatment can become clogged with films of bacteria that restrict the flow of water. Dealing

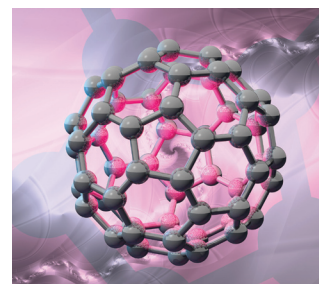
with 'biofouling' is one of the biggest costs associated with water treatment, says co-author Claudia Gunsch, a civil engineering professor at Duke.

The group is planning to investigate a range of biofouling bacteria and the coating's long-term resistance to wearing. Research to determine the effects of carbon nanoparticles, such as buckyballs, on people and the environment is also needed, says Gunsch.

The market for water treatment membranes has grown consistently by about 10-15%/year for ten years, says Tom Arnot, a membrane engineer from the University of Bath, UK. But biofouling increases the pressure – and therefore the energy – needed to force water through membranes, and this increases costs. 'Anything that can reduce the fouling on the surface

is a bonus,' he says.

Davide Mattia, a nanotechnology engineer also at Bath, says that the surface of the buckyballs could be functionalised for additional helpful effects. But he notes that the buckyballs are not chemically bonded to the membrane surface, which could make loss through wearing more likely.



Buckyballs: stop biofouling

## News in brief

**The narcolepsy drug *Modafinil*, which is increasingly being abused to improve concentration, could be habit forming. A study of the effects of the drug on dopamine levels in 10 healthy men found that *Modafinil* dramatically increased dopamine and blocked dopamine transporters in the brain (*JAMA* 2009, **301**, 1148). The authors note that drugs that increase the levels of dopamine in the brain, such as the stimulants methylphenidate and amphetamine, can be addictive. A recent online survey of 1400 academics, conducted by *Nature*, found that one in five had used cognitive enhancers, (*C&I* 2008, **8**, 5).**

**The National Institute for health and Clinical Excellence (NICE) has refused to approve GlaxoSmithKline's (GSK) cancer drug *Tyverb* (lapatinib) for advanced breast cancer, despite the drug giant's promise to pay for as much as the first 12 weeks of treatment. NICE stated that *Tyverb*, a drug used to treat tumours that overexpress the HER2 gene, which increases a cancer's aggressiveness, was not cost-effective in comparison with the generic vinorelbine and Roche's *Xeloda*.**

**The EU has put in place anti-dumping and anti-subsidy tariffs on US biodiesel to try to protect home grown biodiesel. The anti-subsidy tariff will be around €237/t and the anti-dumping tariff as much as €208/t. The measures will be put in place for four months while the investigation continues, after which the EU will decide whether to extend this for as long as five years. US imports have grown rapidly over the past year and now control 17% of the European market.**