

Microscopic solutions to world's biggest problems

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World class scientist professor Willy Verstraete will explain on Monday how he and his team are using bacteria to produce energy, degrade waste, clean water and kill viruses. Today we are faced with seemingly insurmountable challenges: from climate change to the need for renewable energy sources, the threat of new pandemics and a general demise in environmental quality. The role of microbes in each of these challenges is not well-known but is crucially important.

Many countries now acknowledge the need to obtain their energy supply from renewable sources such as biomass. Prof. Verstraete will explain how his team have developed a new anaerobic digestion reactor which can generate as much electricity as 25 [wind turbines](#). These reactors use a consortium of methanogenic (methane-producing) [bacteria](#) to degrade waste and energy crops to produce biogas (a mixture of methane and carbon) which is then converted to electricity using a turbine.

We were reminded of the threat of pandemic infectious disease with the [swine flu](#) (Influenza A H1N1) [pandemic](#) of last year. Prof. Verstraete and his team have produced nanosilver particles from silver ions using the 'good bacteria' *Lactobacillus*. These particles can kill the highly infectious norovirus and could potentially be used as therapy against other viruses such as influenza.

Microbes have long been used for [decontamination](#) and bioremediation. Prof. Verstraete and his team, through funding by the EU's "LIFE" project, have isolated *Desulphitobacterium dichloroeliminans* – a

bacterium which can be injected into ground water sites to decontaminate them from chlorinated waste such as chlorinated alkanes - the most frequently encountered contaminants in soil and groundwater.

These are just a few of the ways in which microbes can help.

"To fully understand how microbes play a part in solving our environmental problems, we must better explore our microbial resources as they currently exist - in culture collections or at 'evolved' environmental sites. We need to develop key strategies to deal with microbial communities, instead of thinking of them in terms of haphazard assemblages of bacterial species. By 'upgrading' the services of microbial communities through implementing Microbial Resource Management (MRM) and combining these communities with new technology, these environmental challenges can be addressed." said Professor Verstraete.

A pragmatic approach to solving environmental problems will be proposed at this lecture, making use of current developments in molecular methods and potential biotech solutions which are appropriate to the current market economy.

On 11 October 2010, Professor Willy Verstraete will present the third Environmental Microbiology Lecture: "Microbial Resource Management (MRM): the way forward for environmental biotechnology"

Provided by Wiley

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