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Professor Lynne Macaskie

Professor Lynne Macaskie is an expert in bioremediation. Her recent work is using bacteria to recycle waste precious metals from industrial processes and scrap. These metals can be reprocessed by bacteria to make fuel cells; devices for making tomorrow's clean energy from hydrogen.

Fuel cells use platinum catalysts but there is not enough platinum left in mines to serve all our needs. One rich source is road dusts, due to small particles of platinum being shed from car catalytic converters. Tomorrow's cars will run on fuel cells, so by sweeping up and recycling road dusts we can make the clean cars of tomorrow.

Lynne also has a major strand of work looking at generating clean hydrogen from food wastes and the team has developed a sweet way of producing hydrogen. Fuel cells need clean hydrogen to run them. If you provide bacteria with a supply of waste produced from chocolate production, the bacteria can produce hydrogen. When finished here, they can then turn to metal recovery and, finally, when they die they become part of the fuel cell itself, making electricity using hydrogen produced by their offspring.

Creating clean hydrogen from waste gives us a fuel that is not only emission free but can also be generated sustainably. At the moment food manufacturers will pay to dispose of their waste but with our technique, they could convert it to clean electricity instead. Not just chocolate but all sorts of wastes like biscuits, bread, ands fruit and vegetables can be turned into electricity.

The bacteria have two more tricks. If they are not needed for fuel cells they can harvest uranium from minewater wastes, conserving a valuable resource for nuclear energy and helping to protect the environment. They can even be used to clean up nuclear wastes, helping to ensure a safe nuclear legacy.

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