Bacteria from the Black Sea

There may be a medical application for new sulphur-eating bacteria.

The vast majority of bacteria have not yet been described. Daan van Vliet studied the sulphur cycle in the Black Sea and found bacteria that play an important role in the anaerobic breakdown of substances containing sulphur. He graduated with a PhD for his study this week. Van Vliet made cultures with different polysaccharides as a nutritional base. One of the substrates he used was fucoidan, a polysaccharide that is extracted from seaweed and that contains sulphate groups. Fucoidan provides a model for a large group of sulphated polysaccharides that are found in the marine environment in large numbers. The cultures produced a new genus which Van Vliet named Pontiella. Genetic research showed that the new bacteria had 'unheard-of numbers' of genes – around 500 – for making sulfatases (sulphate-splitting enzymes). To process fucoidan, Pontiella activates about one fifth of those sulfatases.

'Our bodies make similar substances for our cartilage'

Cartilage

The full range of fucoidan-processing genes could be of interest for applications in biotechnology, says Van Vliet. Also of potential interest is the production of exo-polymers by the Pontiellas. 'A study done with Delft University showed that the substances in question resemble substances our bodies make for our cartilage.'

This could mean the Pontiellas have potential for medical purposes, thinks Van Vliet. 'Biotechnologists are working with strains of *E-coli* to modify them so that they manufacture these kinds of substances. But it's not working very well with *E-coli*, whereas Pontiellas make them of their own accord, albeit in small quantities.' RK