

Using our brains to save and improve the lives of workers

A close-up photograph of a clear glass petri dish containing a light-colored, semi-transparent agar medium. Several bright red, oval-shaped bacterial colonies are visible, scattered across the surface of the medium. The colonies vary in size and are clustered in some areas.

In Vitro
Toxicology

The Client

The client was a small company in the West Country, developing novel products for addressing occupational health issues in the construction industry.

The Problem

Contact dermatitis is a type of skin inflammation that can arise from contact with many different types of chemicals. In the construction industry, it can be caused by handling materials such as wet cement and paints. The client was developing a novel product that could be added to cement to reduce its potential to cause contact dermatitis. They wanted HSL to investigate the effects of cement, with and without their new product, on human skin using an in vitro model system. "Will our product reduce the potentially harmful effects of skin contact with cement?"



What we did

Human skin cells are normally grown in the laboratory in a clean, sterile environment. However, mortar mix is made up of sand and cement, both of which are granular and not sterile. HSL therefore developed a novel solution to the problem, consisting of a gel-like barrier for keeping the skin cells separate from the cement mix, but which allowed soluble chemicals from the cement to migrate into the medium on the cells. Therefore the effects of the chemicals in the cement could be tested without interference from the large granules/particles present.

HSL's In Vitro Toxicology team provided the customer with information on the potential toxicity of the mortar mixes both with and without the new additive. They also worked with our analytical scientists who analysed the customer's different cement mixes for Chromium VI, one of the components of cement most likely to cause contact dermatitis.

Outcome/Benefits

HSL provided the client with an inter-disciplinary, cost-effective solution to their problem, including:

- Analysis of the chemicals in the mortar mix.
- A novel approach for testing the potential effects of cement on human skin cells in vitro.
- A staged series of experiments, with detailed analysis and interpretation of the results, as each stage was completed, which informed future product development work by the client as part of its ongoing business