

Scientists print out human skin

SCIENTISTS have created human skin from a 3D printer.

It is hoped the skin could be used to treat burns patients, as well as for testing cosmetics and medicines in place of animals.

It was created by a Spanish team using "bio inks" made with biological components and human cells. Now it is hoped the techniques could ultimately be used to print more complex organs such as hearts and livers.

Lead researcher José Luis Jorcano, professor of bioengineering at University Carlos III of Madrid, where the work was carried out, said: "We are very excited. The idea of using the 3D printing technique is innovative. It changes our way of thinking about how to produce human tissues.

"It has several applications - to produce human skin to be transplanted for burns patients but also testing of industrial products, new drugs, cosmetics and chemicals."

EXCLUSIVE

By **Lucy Johnston** HEALTH EDITOR

Using the techniques to print more complex organs, however, will be challenging as these parts of the body involve more cell types.

"My hope is that bioprinting will be the method of choice for replacing organs on any occasion," said Prof Jorcano.

The work, which has taken 15 years, was based on cells isolated from a biopsy from one patient. These were multiplied using growth factors, nutrients and chemicals and loaded on to a 3D printer with special proteins.

Computer software was then programmed to transport the mixture through sterile tubes to the nozzle of the bioprinter, which in turn deposited the mixture as skin.

This bio ink-based "skin" replicates the structure of actual human skin - complete with the same layer

of epidermis to act as protection against the environment, with a thicker, deeper dermis that produces the collagen to give the skin its elasticity and strength.

The skin has so far been successfully transplanted to mice and it is hoped could be mass produced and used for chemical or cosmetic testing within the next year.

Prof Jorcano said: "The data you gather from animals cannot always be extrapolated to humans. What is needed is something as close to human tissue as possible."

Longer-term, it is hoped the skin could also be used to create transplants for burn patients or those individuals who suffer with severe skin problems.

Skin used for transplant purposes would need to be specifically designed to match each patient and would also need approval from regulatory agencies, which is currently being sought.