

Artificial micro-humans may replace animals in lab tests

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SCIENTISTS are creating artificial humans for use in laboratory testing, potentially doing away with the need for experiments that claim the lives of up to 90m animals each year.

Animal laboratories will begin to be replaced by "farms", made up of hundreds of artificial human machines, within three years, experts forecast.

These will simulate the response of humans to substances inhaled, absorbed in the gut or circulated through the bloodstream. Early versions comprising an artificial lung, liver, kidney, heart and gut are already being used to test cosmetics, chemicals and drugs.

"If our system is approved by the regulators, then it will close down most of the animal-testing laboratories worldwide," said Uwe Marx, a tissue engineer from Technische Universität Berlin and founder of TissUse, a firm developing the technology.

Marx said the machines, which are the size of a microchip, will replace most types of animal tests, from routine repeat dosage trials conducted on millions of rodents to complex tests such as experiments on diabetes induced in monkeys.

Speaking at the World Congress on Alternatives and Animal Use in the Life

Sciences in Prague last week, Marx said he would create "human farms made up of hundreds of the machines".

Scientists at Harvard University are developing a similar system and are already using a five-organ version, including artificial lungs, to conduct tests on conditions such as asthma.

"We are replacing animal

testing right now," said Geraldine Hamilton, senior staff scientist at the university's Wyss Institute. "These systems allow a much greater understanding of the mechanisms of the human body and give us insights that are not possible with animal studies."

Over recent years scientists have used individual artificial organs such as hearts and

livers to test products, but these cannot be used on their own and a second set of tests have to be conducted later on animals to prove that the substances are safe when put into a living body where organs interact.

Substances often behave differently in animals, however, and almost half of drugs that pass the animal tests later cause unforeseen side effects during human trials.

The new farms will eliminate such unsafe human drug trials, speed up the development of life-saving treatments and could one day be used to tailor medicine to individual patients.

Despite the likely use of the "organ farms", about 20% of animal testing will continue on conditions that affect the brain, such as Alzheimer's disease or hip-replacement technology, which requires tests on animals greater than 88lb.

Animal testing has already been banned for products such as lipstick, perfume and skin lotion in Europe and north America.

This has helped to drive the development of human-testing machines, with cosmetics companies playing a leading role in investing in the new technology.

More than 4m animals were used in laboratory experiments in Britain last year and the worldwide figure is estimated at 115m.

