

## Organ-on-a-chip: breakthrough in drug development

**Organ-on-a-chip is a new technology that uses stem cells to grow tiny pieces of organ on a plastic chip. These fragments of blood vessel, heart or nerves pave the way for all sorts of new research, such as into dementia for instance.**

### **Better models for drug research**

You cannot simply test a new drug on humans. Scientists therefore often use mice to study the effect of new drugs. However, numerous potential drugs appeared to be successful in mice but proved not to work in humans, and you cannot study some diseases in mice at all, for instance because they do not occur in mice. There is therefore a great need for better drug research models. Organs-on-a-chip are a new solution. The technology was developed by the [Leiden Academic Centre for Drug Research](#).

### **Mini organs**

Organ-on-a-chip is a technology that involves growing organ cells and connecting them on a plastic chip. The chip has channels running along it through which fluids flow to and from the cells. Scientists then use the latest equipment to measure such things as how the organ cells contract (in the example of a piece of heart tissue), where inflammatory reactions occur or what the effect is of any medication that is introduced.

To grow such a piece of organ you first need cells from a patient or a healthy test subject, skin or blood cells, for example. By adding four genes you turn these cells into stem cells or induced pluripotent stem cells (iPS), as they are also known. The cells can then grow into almost any type of cell.