

Creating a modern Frankenstein

Two hundred years after Mary Shelley's *Frankenstein* was published, developments in medical science from transplants and artificial limbs to 3-D printing and bionics, are bringing fiction closer to reality

TRANSPLANTS

Kidney is most commonly transplanted organ, followed by liver, heart, lung and pancreas. Skin, bone, cornea, cartilage, tendon and nerve transplants also successful

More than 40 face transplants performed since 2005. Surgeons looking at head transplant but still distant prospect

MECHANICAL ORGANS

Include pacemaker and cochlear implant. Artificial heart and kidney dialysis machine support patient until donor available

Artificial heart

Fully artificial heart, lungs and pancreas could eventually outperform natural organs

LAB-GROWN ORGANS

Patient's own cells can be grown on biodegradable scaffold. Best suited for flat or tubular organ like skin, blood vessel, bladder, windpipe or vagina

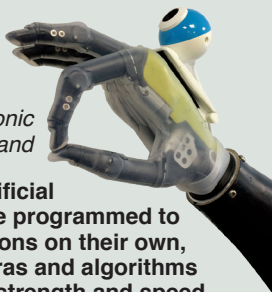


3D printed ear scaffolds

Groundbreaking 3D bioprinting techniques could create more complex organs – such as heart, liver or womb

BIONICS

Robotic exoskeletons enable paraplegics to walk. Prosthetics replace missing limbs – advanced versions can read brain commands through electrodes on skull



Bionic hand

Bionic suit

Artificial limbs can be programmed to make decisions on their own, using cameras and algorithms to increase strength and speed