

# 3D-printed bone for emergency medicine in space

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Credit: ESA-Remedia

This artificial bone sample is an early step towards making 3D bioprinting a practical tool for emergency medicine in space. An ESA R&D effort aims to develop bioprinting techniques capable of giving astronauts on an extended mission ready access to the "spare parts" needed for bone or skin grafts, and even complete internal organs.

3D bioprinting may soon be practical on Earth, and could help meet the challenging conditions of spaceflight. Astronauts in zero or low gravity lose [bone density](#), for example, so fractures may be more likely in orbit or on Mars.

Or, treating a burn often involves a graft of skin taken from a patient's body—manageable on Earth with full hospital care but more risky in space, as the secondary damage may not heal easily.

Skin or bone can be bioprinted using a nutrient-rich "bio-ink" of human blood plasma, available from the [astronauts](#) themselves. By working upside down—in "minus 1g" gravity—the team has shown they can probably do it in space.

This bone sample is part of the first selection of items on the 99 Objects of ESA ESTEC website, a set of intriguing, often surprising artifacts helping tell the story of more than half a century of activity at ESA's technical heart.

Provided by European Space Agency

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