

Fabricated ear maintains structure and shape

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The ear with wire framework maintained its shape and could be elastically deformed. © Cervantes et al.

Researchers have fabricated a bioartificial ear that looks and mechanically behaves like a human one, as revealed in *Journal of the Royal Society Interface* today.

Lead author, Dr Thomas Cervantes explains, 'This is the first demonstration of a full-size human ear that maintains shape and flexibility after 3 months.'

The [new model](#), which incorporates an embedded titanium wire to maintain shape, has previously been demonstrated on a smaller scale, implanted on the back of a mouse, but this study demonstrates minimal

distortion of a full-size adult ear, when embedded on a rat.

The team at Massachusetts General Hospital combined [collagen](#) from cows with ear [cartilage cells](#) from sheep, which they moulded into ear structures using 3D printed scaffolds. After 3 months implanted on the backs of male nude rats, ears which contained a thin wire framework showed much less distortion of the initial ear shape, compared with ears without wire support.

Cervantes adds, 'Shape and flexibility are key; tissue engineered constructs tend to distort in shape during growth, which is obviously a problem for the ear, because we are aiming to recreate a very specific shape.'

All implants were well tolerated and no exposure or extrusions occurred during 12 weeks in vivo. However, when extracted, the implants containing wire resembled a human ear, whereas implants without wire were flattened and distorted. The implants containing the titanium framework also exhibited similar flexibility to a [human ear](#).

More information: Cervantes, T. et al. Design of composite scaffolds and 3D shape analysis for tissue engineered ear, *Journal of the Royal Society Interface*. [dx.doi.org/10.1098/rsif.2013.0413](https://doi.org/10.1098/rsif.2013.0413)

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