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Next-Gen heart valve created

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The researchers at Harvard University created a nanofiber fabrication technique to rapidly manufacture heart valves with regenerative and growth potential.



A team of researchers at Harvard's Wyss Institute and the University of Zurich has created a next-generation heart valve that accurately functions upon implantation and regenerates into long-lasting heart-like tissue.

The human heart beats approximately 35 million times every year, effectively pumping blood into the circulation via four different heart valves. Unfortunately, in over four million people each year, these delicate tissues malfunction due to a variety of reasons.

To address this issue, clinicians use either artificial prostheses or fixed animal and cadaver-sourced tissues to replace defective valves.

While these prostheses can restore the function of the heart for a while, they are associated with adverse comorbidity and wear down and need to be replaced during invasive and expensive surgeries.

Taking these limitations into consideration, the researchers at Harvard University created a nanofiber fabrication technique to rapidly manufacture heart valves with regenerative and growth potential. They fabricated a valve-shaped nanofiber network that mimics the mechanical and chemical properties of the native valve extracellular matrix (ECM).

They used a combination of synthetic polymers and ECM proteins to fabricate biocompatible JetValves that are hemodynamically competent upon implantation and support cell migration and re-population in vitro.