

Researchers recreate rat heart

by Bend_Weekly_News_Sources

Researchers report that they have artificially created a beating rat heart, with help from nature. Through a process called whole organ decellularization, University of Minnesota scientists said they grew the organs by taking dead animal hearts and re-seeding them with live cells. The results are described in the January 13 online issue of the research journal *Nature Medicine*. Although recreating human hearts may be years away, the work seems to be a promising start, said the principal investigator, Doris Taylor of the university. "The idea would be to develop transplantable blood vessels or whole organs that are made from your own cells." An estimated 550,000 heart failure cases are diagnosed yearly in the United States, and some 50,000 U.S. patients die annually waiting for a donor heart. A solution may be "decellularization," using nature's platform to create a heart, Taylor said. Decellularization is the process of removing all of the cells from an organ—in this case a dead animal's heart—leaving intact the so-called extracellular matrix, the framework between cells. After removing all cells from rat and pig hearts by bathing them in detergents, researchers injected the remaining scaffold with a mixture of progenitor cells from newborn rat hearts. The scientists then placed the structure in a sterile setting to grow. Within eight days, the researchers said, the hearts were pumping, though only at two percent strength compared to adult hearts. "The cells have many of the markers we associate with the heart and seem to know how to behave like heart tissue," Taylor said. "We just took nature's own building blocks to build a new organ," said Harald C. Ott, co-investigator of the study, who now works at Massachusetts General Hospital. "When we saw the first contractions we were speechless." Researchers said they're optimistic the discovery could help increase the donor organ pool. The supply of donor organs is limited. And once a heart is transplanted, patients may have to take life-long immunosuppressing drugs, often trading heart failure for high blood pressure, diabetes, and kidney failure, Taylor said. Scientists hope decellularization could be used to make new donor organs. Because a new heart could be filled with the recipient's cells, researchers hypothesize it's much less likely to be rejected by the body, and would be nourished, regulated, and regenerated in a natural way.

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