

News Release

New method for successful bone tissue engineering wins Kaye Award for Hebrew University researcher

Jerusalem, June 22, 2008 – A new and better method for accelerating bone formation in cases of orthopedic injuries and conditions, such as osteoporosis, fractures and disc disorders, has been developed by Nadav Kimelman at the Hebrew University of Jerusalem's Faculty of Dental Medicine.

The method involves increasing oxygen availability in scaffolds in order to accelerate bone formation. The lack of such oxygen supply constitutes a serious impairment to successful tissue engineering.

For his work, Kimelman, who is a doctoral student under Prof. Dan Gazit, was chosen as one of the winners of a Kaye Innovation Award, which was presented on June 4 during the Hebrew University's 71st meeting of the Board of Governors.

The term 'tissue engineering' describes the development of biological replacements for damaged tissues or organs. Biological replacements could act as a solution for the shortage in organ donations and also serve as efficient substitutes for synthetic implants that usually fail in the long run.

For successful engineering of an organ or tissue, the appropriate cells, biological cues and a three-dimensional scaffold should be combined. This is also the case for bone tissue engineering in which cells, genes and scaffolds are combined to heal complex fractures that cannot be repaired otherwise.

One of the major hurdles in successful tissue engineering, however, is the lack of oxygen supply to the newly forming tissue – resulting in cell death and less efficient tissue formation.

Kimelman decided to overcome this fundamental hurdle by utilizing synthetic oxygen carriers as a way to increase oxygen availability in scaffolds. To validate their approach, they combined adult stem cells, programmed to generate bone tissue formation, with injectable scaffolds (hydrogels) containing synthetic oxygen carriers. They then tested the survival of the cells and the amount of bone that was generated.

The results demonstrated significant elevated bone formation and cell survival in the hydrogels supplemented with synthetic oxygen carriers compared to the control groups. They even found that the addition of oxygen carriers also led to more rapid bone formation than the controls.

His results show, for the first time, that synthetic oxygen carriers supplementation enhances and accelerates engineered bone formation, which he believes is achieved by elevating cell survival.

According to Kimelman, however, the results could pave the way for novel therapeutic strategies not only in orthopedics, but also in other medical applications such as cardiology and neurosurgery.

The Kaye Innovation Awards have been given annually since 1994. Isaac Kaye of England, a prominent industrialist in the pharmaceutical industry, established the awards to encourage faculty, staff and students of the Hebrew University to develop innovative methods and inventions with good commercial potential which would benefit the university and society.

For more information, or for press contact with students, faculty or spokespersons from HU, please speak in the first instance to Mikki Saperia, on +44 (0)20 7691 1479 or email mikki.saperia@bfhu.org.



About the Hebrew University

With 24,000 full-time students, the Hebrew University of Jerusalem is Israel's pre-eminent institute of higher education. Its faculty members pursue projects that are both essential to Israel's future and the benefit of humanity. It is a centre of international repute, with formal and informal ties extending to and from the worldwide scientific and academic community. Students come from all over Israel and across the Middle East to study in an atmosphere of academic and research excellence.

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Established in 1926, The British Friends of the Hebrew University is the oldest established Jewish charity in support of higher education. The charity works to promote and enhance the reputation of the Hebrew University, ensure that underprivileged students are given the opportunity to complete their studies, and help HU to maintain its standard of excellence and worldwide reputation for research.

BFHU acts as the UK's gateway to Hebrew University research, expertise and faculty, and provides financial and pastoral support for prospective and current students at HU, as well as supporting visiting and sabbatical Hebrew University lecturers during their time in the UK.