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## Israeli advance in stem cell tech

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28/03/2010

Hadassah breakthrough to produce large number of human embryonic stem cells.

A new technology developed at Hadassah University Medical Center has made it possible to produce large amounts of human embryonic stem cells for industry and research by growing them in suspension.

Until now, hESCs – which have the potential of ripening into any other type of body cells for repair of tissues and organs – have been created in small numbers.

Called a “breakthrough” in hESC technology, the research was just published in the prestigious science journal *Nature Biotechnology*. The article, titled “Derivation, propagation and controlled differentiation of human embryonic stem cells in suspension,” was written by Dr. Debora Steiner as part of her post-doctoral work under the direction of Prof. Benjamin Reubinoff, both of Hadassah’s Human Embryonic Stem Cell Research Center, with participation by other Hadassah colleagues.

HESC research has been stymied by the fact that it has, until now, been difficult to make large amounts of them. Conventionally, they have been cultured as colonies consisting of one cell layer attached to a flat “bed” of chemicals or nutrients. The involved a great deal of work, and the number of hESCs produced was limited.

It was thought that propagation of hESCs in a suspension (a mixture in which fine particles are suspended in a fluid where they are supported by buoyancy) was impossible because under these conditions, the cells would stop multiplying and instead undergo uncontrolled ripening into various types of cells.

But the Hadassah researchers developed unique conditions that made it possible for the cells to multiply significantly in suspension without differentiating into specific cell types. By changing the conditions of the culture, they showed that they could control the ripening of hESC clusters in suspension into neural spheres. Thus instead of being grown on beds in one layer, the stem cells could be cultivated in large vats with precise, computerized monitoring of growth conditions.



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