

# Mast cell expansion from blood

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Mast cells are critically involved in immunity and immune disorders. However, they are rarely cultured *ex vivo* for experimental manipulation because of the difficulty in isolating useful numbers and limitations

related to 2-D culture. A new study reports the successful development of authenticated mast cells by culturing hematopoietic stem cells in an engineered 3-D connective tissue matrix. The work is published in *Tissue Engineering*.

Heather Gappa-Fahlenkamp, Ph.D., School of Chemical Engineering, Oklahoma State University, OK, with other colleagues from OSU present their work in an article titled "Human Mast Cell Development from Hematopoietic Stem Cells in a Connective Tissue-Equivalent Model." In an attempt to recapitulate the native environment, the authors isolated mast cell progenitors and co-cultured them with human primary fibroblasts in a 3-D collagen matrix; the matrix was then coated with type IV collagen and fibronectin, and [endothelial cells](#) were seeded to stimulate further mast cell development. Several characteristics of cell morphology and phenotypic marker expression were assessed to validate typical mast cell immune-related behavior, demonstrating the success of this technique.

"The authors present a successful complex tissue model for studying mast cell progenitors and mast cell development," says *Tissue Engineering* Co-Editor-in-Chief Antonios G. Mikos, Ph.D., Louis Calder Professor at Rice University, Houston, TX. "Not only will this model prove useful in understanding mast cell biology, but it may also be a rich testing ground for future therapies and drug discovery involving [mast cells](#), inflammatory disorders, and allergic diseases."

**More information:** Tahereh Derakhshan et al, Human Mast Cell Development from Hematopoietic Stem Cells in a Connective Tissue-Equivalent Model, *Tissue Engineering Part A* (2019). [DOI: 10.1089/ten.tea.2018.0347](#)

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