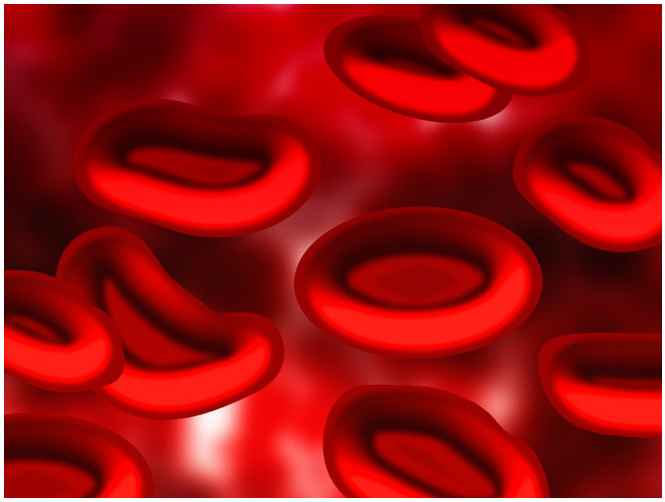
Mast cell expansion from blood

19 September 2019



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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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