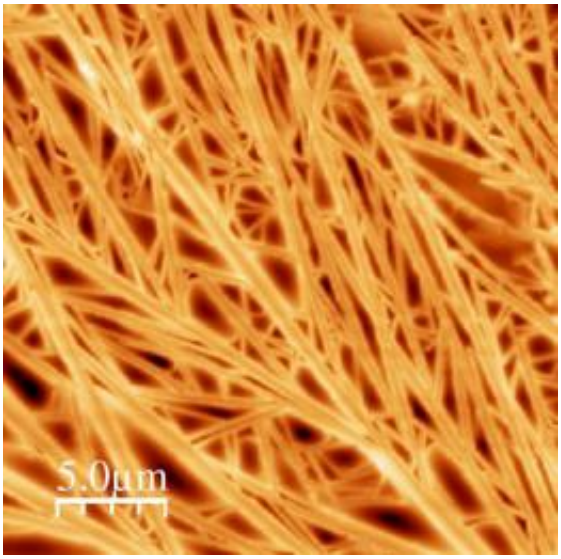
The extracellular matrix

December 12 2011



Atomic Force Microscopy (AFM) image of the designed extracellular matrix

NPL scientists have created a functional model of the native extracellular matrix which provides structural support to cells to aid growth and proliferation and could lead to advances in regenerative medicine.

The extracellular matrix (ECM) provides the physical and chemical conditions that enable the development of all biological tissues. It is a complex nano-to-microscale structure made up of protein fibres and serves as a dynamic substrate that supports tissue repair and regeneration.

Man-made structures designed to mimic and replace the native matrix in damaged or diseased tissues are highly sought after to advance our understanding of tissue organisation and to make regenerative medicine a reality.

Self-assembling peptide fibres that have similar properties to those of the native matrices are of particular interest. However, these near-crystalline nanostructures fail to arrange themselves into interconnected meshes at the microscopic scale, which is critical for bringing cells together and supporting tissue development.

To solve this problem, a research team at NPL designed a small protein consisting of two complementary domains (structural units) that promote the formation of highly branched networks of fibres that span microscopic dimensions. The team showed that the created matrix is very efficient in supporting cell attachment, growth and proliferation.

Provided by National Physical Laboratory

Citation: The extracellular matrix (2011, December 12) retrieved 28 April 2024 from https://phys.org/news/2011-12-extracellular-matrix.html