

Scientists create a functional model of the extracellular matrix

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Scientists at the National Physical Laboratory (NPL) have created a functional model of the native extracellular matrix that provides structural support to cells to aid growth and proliferation. The model 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.

Max Ryadnov, the lead researcher at NPL, said: "The extracellular matrix is a cellular "scaffolding", which provides necessary signalling environment for cell growth and development into tissues and can help to heal wounds and other damaged tissues. Therefore, extracellular mimetics such as one developed by NPL could be useful for the progress of regenerative medicine."

More information: The full research was published recently in *Angewandte Chemie*. It is available here: [onlinelibrary.wiley.com/doi/10... e.201104647/abstract](https://onlinelibrary.wiley.com/doi/10.1002/anie.201104647/abstract)

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