

## **Three-dimensional force microscopy**

December 7 2015

FAU researchers develop method of measuring forces of tumor cells as they migrate through connective tissue.

Julian Steinwachs and colleagues at the Biophysics Group investigated tumour cell migration in artificial <u>connective tissue</u> made of collagen, which mimics the natural matrix of organs in terms of its <u>chemical</u> <u>composition</u>, structure and other material properties. The idea behind their method is simple: the researchers first measured the deformation of the connective tissue around the migrating cells. If the elasticity of the connective tissue is known, it can then be used like a spring scale to calculate the cell forces from the tissue deformations.

A particular challenge for the researchers was that connective tissue is initially soft when forces are weak, but stiffens at the level of forces generated by <u>tumour cells</u>. Tumour cells also used part of their forces to elongate into a spindle-like shape, allowing them to migrate at a remarkable speed even through very small pores of the connective tissue. In their next project, the researchers will apply this method to investigate differences in the cell forces between differently aggressive tumours.

**More information:** Three-dimensional force microscopy of cells in biopolymer networks, <u>dx.doi.org/10.1038/nmeth.3685</u>

Provided by University of Erlangen-Nuremberg



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