



PHYSIKALISCHES KOLLOQUIUM

des Fachbereichs Physik
der Johann Wolfgang Goethe-Universität Frankfurt

Mittwoch, den 29.06.2016, 16 Uhr c.t.
Großer Hörsaal, Raum _0.111,
Max-von-Laue-Str. 1



Prof. Dr. Achilleas Frangakis

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"ZIP ME UP! Zooming into wound healing"

In order to prevent death by bleeding or infection, every wound (skin opening) must close at some point. The events leading to skin closure had been unclear for many years.

In my talk I will elaborate on our newest technical developments in light and electron microscopy, which lead to the understanding of the molecular mechanism of this process.

We used fruit fly embryos as a model system, which similarly to humans, at some point in their development have a large opening in the skin on their back that must fuse. This process is called zipping, because two sides of the skin are fastened in a way that resembles a zipper that joins two sides of a jacket. To visualize this orchestra of healing, a very high-resolution picture of the process is needed. For this purpose we have recorded an enormous amount of data that surpasses all previous studies of this kind. We can see how cells find their opposing partner by "sniffing" each other out. As a next step, they develop adherens junctions, which act like a molecular Velcro. This way they become strongly attached to their opposing partner cell. The biggest revelation of this study was that small tubes in the cell, called microtubules, attach to this molecular Velcro and then deploy a self-catastrophe, which results in the skin being pulled towards the opening, as if one pulls a blanket over. Unexpectedly, a somehow conserved mechanism in nature.