

Vimentin intermediate filament rings deform the cell nucleus during the first hours of adhesion

Emmanuel Terriac¹, Doriane Vesperini¹, Susanne Schütz² and Franziska Lautenschläger^{1,2}

¹Leibniz Institute for New Materials, Saarbrücken, Germany and ²NT Faculty, University of Saarland, Germany

Cells are forced to change their adhesion state during events such as epithelial to mesenchymal (or the reverse mesenchymal to epithelial) transitions or during *in vitro* experiments. Many changes, such as mechanical properties [1] or pathways regulations [2], may occur during such transitions.

We investigated the effect of adhesion on the vimentin intermediate filament, a component of the cytoskeleton, together with microtubules and actin microfilaments. We observed that during the first 6 to 12 hours of adhesion, vimentin formed juxtannuclear knot-like structures which were on many occasions accompanied by rings that deformed the nucleus [3].

Those vimentin structures may also appear after mitosis, when cell spread back on the surface. We further measured dynamic properties of vimentin using Fluorescent Recovery After Photobleaching, and observed differences depending on the vimentin location (lamellipodium, knots or rings).

[1] Maloney et al., Biophysical Journal 99, 2479 (2010).

[2] Bhadriraju et al., Experimental Cell Research 313, 3616 (2007).

[3] Terriac et al., Frontiers in Cell and Developmental Biology, 7 (2019).