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Insights into mechanical and regulatory functions of epidermal keratins
Thursday, 6 February 2020
at 10.15 a.m.

Großer Seminarraum, Uniklinikum
Pauwelsstraße 30, 52074 Aachen

Host: Rudolf Leube
Institute of Molecular and Cellular Anatomy (MOCA)

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Abstract. Keratins form the major cytoskeleton and protect the epidermis against mechanical stress, dehydration and infections by forming a cytoskeletal network which is connected to cell adhesion and cell matrix structures. To fulfil these functions in highly specific ways, most mammals express only 2-6 keratins of a total of ~50 different genes in any given epithelial cell type. Missense mutations in keratins K5 and K14, highly expressed in the basal cell layer of the epidermis, cause the severe skin blistering disease epidermolysis bullosa simplex (EBS). EBS-associated mutations disrupt keratin networks and change keratinocyte mechanics by several mechanisms. Understanding underlying mechanisms is a prerequisite for the development of molecular therapies for EBS. Our group studies keratin functions using mouse and keratinocyte models.

In my presentation, I will address two major topics, following an introduction into the organization and interaction of keratins in epidermal keratinocytes. First, I will address the impact of keratin isotypes on desmosome composition and adhesion and on tight junctions. Second, I will discuss the role of keratins in traction force generation and discuss potential mechanisms by which keratins are involved in mechanotransduction.