

UBI seminar

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Elastic contractile stress in the basement membrane generates basal tension in epithelia

Data: Oct. 29 (Tue) 15:00-

Place: Room 16-107 (Building 16, Komaba I campus) and zoom

The shaping of epithelial tissues into functional organs often depends on dynamic changes of mechanical tension at the apical and basal side of cells. While on the apical side, tension is known to be regulated by the apical actomyosin meshwork, basal tension regulation remains elusive due to the presence of a basal sheet of specialized extracellular matrix, the basement membrane. Here, we use atomic force microscopy to provide direct measurements of mechanical tension in the basal surface of the wing disc epithelium of *Drosophila* in control and perturbed conditions.

We find that next to actomyosin, the basement membrane is a key structure for the generation of basal tension. Further, we show that the basement membrane is a solid-like sheet subject to an expansile stretch in epithelial homeostasis. Performing osmotic shocks and optogenetic actomyosin activation, we find evidence that basal stretch and tension can be generated by intracellular hydrostatic pressure and actomyosin tension in lateral cell faces of the epithelium. In conclusion, we propose that elastic contractile stress corresponding to the actomyosin-induced expansile stretch of the basement membrane generates a major contribution to basal tension. We thereby disclose fundamental differences in the mechanical regulation of apical and basal epithelial tension.

zoom: <https://x.gd/AXOQz>

(meeting ID: 875 5263 4969 passcode : 830646)

