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Invitation to Seminar Talk

Directional persistence of migrating cells requires Kif1C-mediated stabilisation of trailing adhesions

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Host: Daria Siekhaus

Directional cell migration requires the establishment and maintenance of differences in structure and function between the front and back of a cell. In particular, the organization of the actin cytoskeleton and substrate attachments mediated through focal adhesions need to change between the front and the rear of the cell to produce cell polarity and coordinate protrusion at the front and retraction at the rear.

We find that the microtubule motor Kif1C accumulates at the tips of extended cell rears of randomly migrating human fibroblasts. Kif1C is required for the maintenance of these cell tails, as depletion of Kif1C leads to a drastically shortened tail lifetime and rapid tail retractions. Tail retraction is often followed by changes in migration direction, so that loss of Kif1C also leads to a loss of persistent cell migration. Kif1C stabilizes cell rears through participating in the trafficking of a5b1-integrins, which supports focal adhesion maturation and sliding in cell tails. Inhibition of myosin II activity stabilizes cell tails and suppresses the Kif1C depletion phenotype which results in higher directional stability of migrating cells. We propose a rear drag mechanism for directional persistence of migration whereby the counterforce originating from a well-anchored tail serves to maintain directionality of the force-generating leading edge of the cell.

Friday, February 8, 2013, 11:00am

Seminar Room Mondi 3, Central building, 1st floor

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