**Collective migration in tissues**

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The Minisymposium on “Cell Migration in Tissues” focused on analysis of dynamic collective cell migration in several model systems and was cochaired by Alissa M. Weaver (Vanderbilt University Medical Center) and Celeste M. Nelson (Princeton University). The program highlighted both the physical forces exerted during migration and the signaling pathways involved in the process.

Celeste Nelson (Princeton University) presented results suggesting that cells migrate collectively through fibrous extracellular matrix (ECM) by exerting tensile forces at the leading edge of the cohort. Three-dimensional traction force microscopy was used to quantify the physical forces exerted by normal and malignant mammary epithelial cells undergoing collective migration through collagen gels (Gjorevski et al., 2015). The forces and displacements were surprisingly dynamic, with the cohort periodically relaxing as it migrated forward.

Jessica Konen (Marcus laboratory, Emory University) described a new technique called spatiotemporal genomic analysis, which was used to select rare populations of leader cells from three-dimensional (3D) lung cancer spheroids and compare their gene expression patterns to that of follower cells. Leader cells were found to express higher levels of genes related to cell adhesion and vascular sprouting. These gene expression changes persisted in purified cultures.

Eliah Shamir (Ewald laboratory, Johns Hopkins University) showed that in 3D culture of mammary epithelial organoids, the myoepithelial layer was required to prevent invasion and dissemination of Twist1-expressing luminal epithelial cells. Surprisingly, Twist1-induced invasion required the expression of E-cadherin, and knocking down expression of this cell–cell adhesion protein prevented dissemination downstream of Twist1 (Shamir et al., 2014).

Joshua Bloomekatz (Yelon laboratory, University of California, San Diego) showed a critical role for “ghost fibers,” ECM remnants of damaged muscle fibers, in organizing skeletal muscle progenitor migration, division, and fusion during regeneration in mice (Webster et al., 2016). Cells that lack nhr-67 are proliferative and noninvasive, failing to express matrix or form invadopodia.

The Minisymposium concluded with three lightning talks. Micah Webster (Fan laboratory, Carnegie Institution for Science) showed a role for “ghost fibers,” ECM remnants of damaged muscle fibers, in organizing skeletal muscle progenitor migration, division, and fusion during regeneration in mice (Webster et al., 2016). Rebecca Green (Oegema laboratory, University of California, San Diego) developed a four-dimensional high-content imaging approach to screen for developmentally important genes within C. elegans embryos. Yutaka Matsubayashi (Stramer laboratory, King’s College London) showed that formation of the basement membrane in the Drosophila embryo requires rapid anterior–posterior dispersal of macrophages (hemocytes), which first appear in the head of the embryo.

**REFERENCE**


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