

# The actin cortex act as a mechanical memory of shape in confined migrating cells

Yohalie Kalukula<sup>1\*</sup>, Marine Luciano<sup>1</sup>, Guillaume Charras<sup>3</sup>, David B. Brückner<sup>2</sup> and Sylvain Gabriele<sup>1\*</sup>

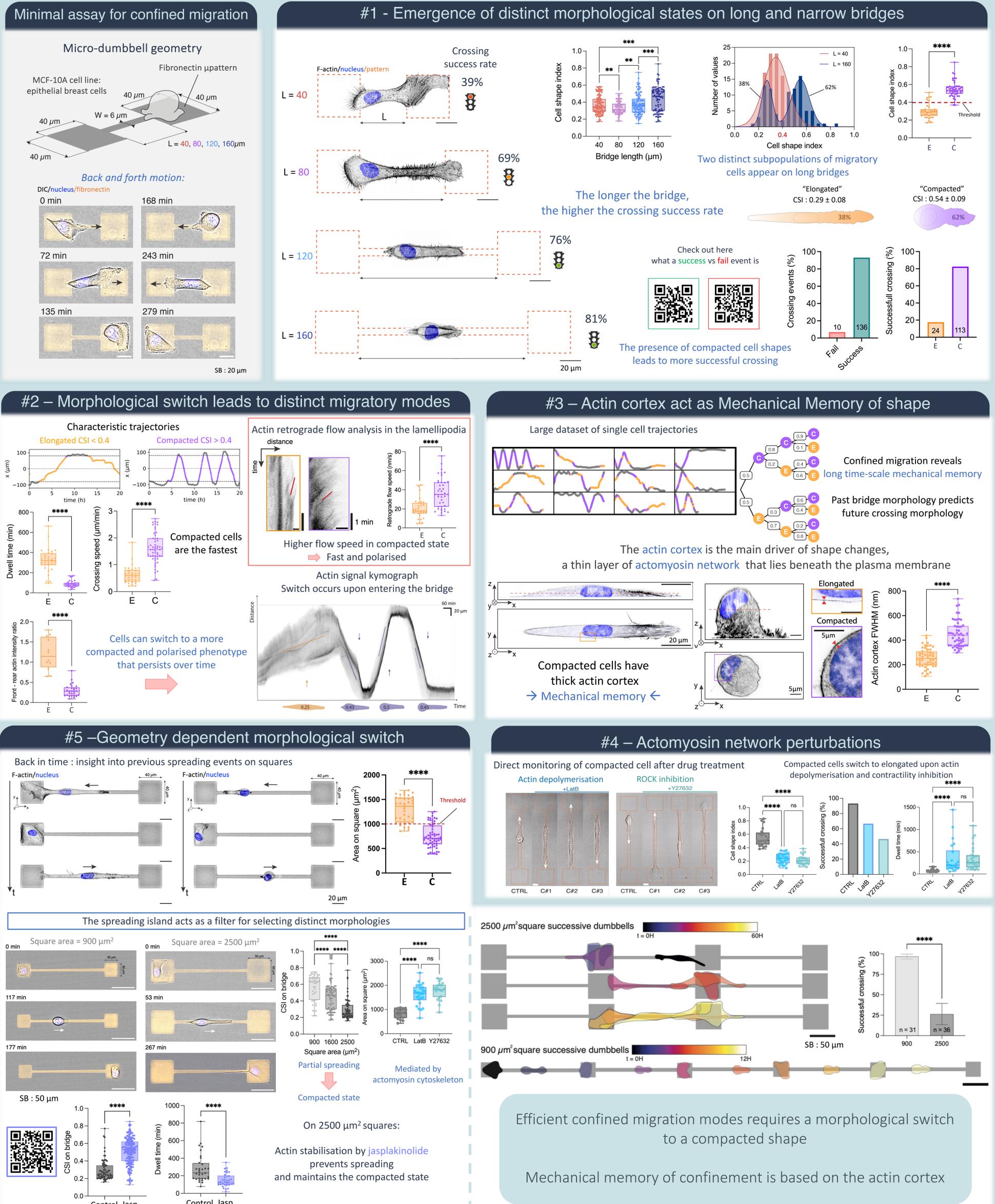
<sup>1</sup> Mechanobiology & Biomaterials Group, Research Institute for Biosciences, CIRMAR, University of Mons, Belgium

<sup>3</sup> London Centre for Nanotechnology, University College London, London, WC1H 0AH, UK

<sup>2</sup> Institute for Science and Technology Austria, Klosterneuburg, Austria

\*Contacts: yohalie.kalukula@umons.ac.be and sylvain.gabriele@umons.ac.be

The migration of epithelial cells through narrow environments is crucial in tissue development, homeostasis, and cancer. We investigated this process using adhesive dumbbell-shaped micropatterns to observe repeated migrations through confined spaces, showing that crossing rates and migration dynamics are controlled by a morphological switch triggered by the bridge's aspect ratio. Cytoskeletal perturbation experiments revealed that the morphological switch relies on actin remodeling. By tuning the area of the adhesive zones connected to the bridge, we can tune the mechanical memory of confined migrating cells.



Y.K and S.G. acknowledge FNRS, FRIA and FRMH for financial support.