Supplementary Information

Investigating the nature of active forces in tissues reveals how contractile cells can form extensile monolayers

Lakshmi Balasubramaniam[1]* Amin Doostmohammadi,[2,3]* Thuan Beng Saw,[4,5] Gautham Hari Narayana Sankara Narayana,[1] Romain Mueller,[3] Tien Dang,[1] Minnah Thomas,[4] Shafali Gupta,[6] Surabhi Sonam,[1,7] Alpha S. Yap,[6] Yusuke Toyama,[4] René-Marc Mège,[1] Julia Yeomans,[3] Benoît Ladoux[1]

1 Institut Jacques Monod (IJM), CNRS UMR 7592 et Université de Paris, 75013 Paris, France,

2Niels Bohr Institute, University of Copenhagen, Blegdamsvej 17, 2100 Copenhagen, Denmark

3 The Rudolf Peierls Centre for Theoretical Physics, University of Oxford, Parks Road, Oxford OX1 3PU, UK

4 Mechanobiology Institute (MBI), National University of Singapore, Singapore, 117411

5 National University of Singapore, Department of Biomedical Engineering, 4 Engineering Drive 3, Engineering Block 4, # 04-08, Singapore, 117583

6 Division of Cell and Developmental Biology, Institute for Molecular Bioscience, The University of Queensland, St. Lucia, Brisbane, QLD 4072, Australia

7 Present address: D Y Patil International University, Akurdi, Pune, India

∗**These authors contributed equally to this work**

Supplementary Table 1

Drug	Pathway affected	MDCK WT	MDCK E-cadherin KO
No drug	--	Extensile	Contractile
Blebbistatin (5 μM)	Non-muscle Myosin II	--	Contractile
Blebbistatin (20 μM)	Non-muscle Myosin II	Extensile	Extensile
Y27632 (25 μM)	ROCK 1 and 2	Extensile	Extensile

Supplementary Video legends

Video 1:| Phase contrast images overlaid with orientation vectors obtained from MDCK WT monolayers. Blue arrow shows the location of a +1/2 (comet) shaped defect and the direction in which they move. Scale bar: 50μm

Video 2:| Phase contrast images overlaid with orientation vectors obtained from MDCK E-cadherin KO monolayers. Blue arrow shows the location of a +1/2 (comet) shaped defect and the direction in which they move. Scale bar: 50μm

Video 3:| Time lapse demixing of extensile (magenta) and contractile (green) particles obtained from simulations.

Video 4:| Time lapse demixing of MDCK WT (extensile-magenta) and MDCK Ecadherin KO (contractile-green) cells observed from experiments. Scale bar: 100μm

Video 5:| Time lapse demixing of MDCK WT (extensile-magenta) and MDCK Ecadherin KO (contractile-green) cells before and after the addition of 20μM blebbistatin. Scale bar: 100μm