

## **Description of Additional Supplementary Files**

### **File Name: Supplementary Movie 1**

**Description:** Tissue dynamics with the cell orientation field  $n$  shown as black lines on top of a colour map distinguishing contractile (red) and extensile (blue) regions. Topological defects in the cell orientation are indicated by yellow (+1/2) and green (-1/2) symbols.

### **File Name: Supplementary Movie 2**

**Description:** Dynamics in the simulations, with the cell orientation field  $n$  shown as black lines on top of a colour map distinguishing contractile (red) and extensile (blue) regions. Topological defects in the cell orientation are indicated by yellow (+1/2) and green (-1/2) symbols.