| parameter                          | symbol | value     | unit     |
|-----------------------------------|--------|-----------|----------|
| **discretization parameters**     |        |           |          |
| element size                      | $\Delta x$ | 2.5       | $\mu$m   |
| **basic cellular Potts model parameters** |        |           |          |
| intrinsic cell motility          | $T$    | 1         | -        |
| target volume                    | $A(s)$ | 50.264 *  | pixels   |
|                                  |        | 314.16    | $\mu$m$^2$ |
| strength of volume constraint     | $\lambda$ | 500       | -        |
| cell-medium contact cost          | $J_{cm}$ | 1.25      | pixelside$^{-1}$ |
| cell-cell contact cost            | $J_{cc}$ | 0.5       | $\mu$m$^{-1}$ |
| **finite element parameters**    |        |           |          |
| Young's modulus                   | $E$    | 0.5-32    | kPa      |
| Poisson's ratio                   | $\nu$  | 0.45      | -        |
| thickness for 2D analysis         | $t$    | 10        | $\mu$m   |
| accuracy level of solver          | $\psi$ | 0.00001   | -        |
| **cell traction model**           |        |           |          |
| traction per unit length          | $\mu$  | 0.01 **   | nN $\mu$m$^{-1}$ |
| **stretch guidance model**        |        |           |          |
| maximum guidance term             | $\lambda_{durotaxis}$ | 10    | -        |
| threshold for stiffness preference| $E_0$  | 15        | kPa      |
| steepness of stiffness preference | $\beta$ | 0.5       | kPa$^{-1}$ |
| strain stiffening parameter       | $\varepsilon_{st}$ | 0.1    | -        |

* based on a cell diameter of 20$\mu$m
** leads to total cell traction around 300nN (1)

Table S1. Parameter settings of the simulation model