**S1 Table. List of dimensionless parameters.**

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| **Mechanical properties** |
| Cell Mobility |  |
| Adhesion force at BM |  |
| Adhesion force at AP |  |
| Diffuse interface thickness |  |

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| **Source terms** |
| Stem cell division rate |  |
| TDs death rate |  |

**For Figures 3, 4, and 5**

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| **Feedback control** |
| Minimum CP self-renewal rate |  |
| Maximum CP self-renewal rate |  |
| Positive feedback gain |  |
| Negative feedback gain |  |

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| **Feedback factors** |
| Production rate of F by CPs |  |
| Production rate of F by TDs |  |
| Natural decay rate of F |  |
| Diffusivity of F |  |
| Production rate of G by CPs |  |
| Production rate of G by TDs |  |
| Natural decay rate of G |  |
| Uptake rate of G by the stroma |  |
| Diffusivity of G |  |

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| **Exogenous sources** |
| Exogenous F source starts from |  |
| Exogenous F source ends at |  |
| Exogenous F production rate |  |
| Magnitude of exogenous F |  |
| Exogenous G source starts from |  |
| Exogenous G source ends at |  |
| Exogenous G production rate |  |
| Magnitude of exogenous G |  |

**For Figure 7 & 8**

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| **Source terms** |
| Stem cell division rate |  |
| TDs death rate |  |

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| **Feedback control** |

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|  |  |
| Maximum CP self-renewal rate |  |
| Positive feedback gain(Figure 7A-D) |  |
| Negative feedback gain(Figure 7A-D) |  |
| Positive feedback gain(Figure 7E-H) |  |
| Negative feedback gain(Figure 7E-H) |  |
| Positive feedback gain(Figure 8A – N, 8V, 8W) |  |
| Negative feedback gain( Figure 8A – N, 8V, 8W ) |  |
| Positive feedback gain(Figure 8O – U, 8V, 8W ) |  |
| Negative feedback gain(Figure 8O – U, 8V, 8W ) |  |

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| **Feedback factors** |
| Production rate of F by CPs |  |
| Production rate of F by TDs |  |
| Natural decay rate of F |  |
| Diffusivity of F |  |
| Production rate of G by CPs |  |
| Production rate of G by TDs |  |
| Natural decay rate of G |  |
| Uptake rate of G by the stroma |  |
| Diffusivity of G |  |

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| **Exogenous sources** |
| Exogenous F source starts from |  |
| Exogenous F source ends at(Figure 7F) |  |
| Exogenous F production rate |  |
| Magnitude of exogenous F |  |