Model Parameters

Table S1. Model parameters

Name	Value	Source
ROS_death_AEC2	1.00e-3	[1]
TGFb_ac_death_AEC2	1.65e-3	[1]
setInitialDamageAEC2	True/False	/
hitProbability	6.25e-2	[1] & Estimated
activationProbability_AEC2	0.25 [day-1]	[1]
measurement_cells_ops_freq_	1000	/
measurement_conc_ops_freq_	1000	/
nb_of_sim_steps_	>=864000 (1 day)	/
nb_of_subs_	10	/
sim_time_step	0.1 [s]	/
input_file_name	CellsData.root	/
sub_resolution	10	/
ECM_saturation	1e-2 [g cm-3]	[1]
$\lambda_{TGF\beta,IL13}$	1	[1]
$\lambda_{ECM,TGF\beta}$	3.65e+3	Est.
MMP_ECM_binding	2.59e+7 [cm3 g-1 day-1]	[1]
MMP_TIMP_binding	1.04e+9 [cm3 g-1 day-1]	[1]
TIMP_MMP_binding	4.98e+8 [cm3 g-1 day-1]	[1]
ECM_flat_conc	3.26e-3 [g cm-3]	[1]
FGF2_flat_conc	0.00 [g cm-3]	[2]
IL13_flat_conc	3.20e-8 [g cm-3]	[1]
MCP1_flat_conc	0.00 [g cm-3]	[1]
MMP_flat_conc	0.37e-7 [g cm-3]	[1]
PDGF_flat_conc	0.35e-8 [g cm-3]	[1]
TGFb_ac_flat_conc	2.51e-12 [g cm-3]	[1]
TGFb_in_flat_conc	2.51e-12 [g cm-3]	Estimated
TIMP_flat_conc	5.74e-10 [g cm-3]	[1]
TNFa_flat_conc	2.50e-8 [g cm-3]	[1]
flat_conc	0.0 [g cm-3]	/
ECM_D	0.0 [µm2 day-1]	[1]
FGF2_D	5.62e+6 [µm2 day-1]	[3]
IL13_D	1.08e+6 [µm2day-1]	[1]
MCP1_D	1.73e+7 [µm2 day-1]	[1]
MMP_D	4.32e+6 [µm2 day-1]	[1]
PDGF_D	8.64e+6 [µm2 day-1]	[1]
TGFb_ac_D	4.32e+6 [µm2 day-1]	[1]
TGFb_in_D	4.32e+6 [µm2 day-1]	Est
TIMP_D	4.32e+6 [µm2 day-1]	[1]
TNFa_D	1.29e+6 [µm2 day-1]	[1]
ECM_d	3.70e-1 [day-1]	[1]
FGF2_d	1.66 [day-1]	[4]
IL13_d	1.25e+1 [day-1]	[1]
MCP1_d	1.73 [day-1]	[1]
MMP_d	4.32 [day-1]	[1]
PDGF_d	3.84 [day-1]	[1]
TGFb_ac_d	3.33e+2 [day-1]	[1]

TGFb_in_d	1.10e+1 [day-1]	Estimated
TIMP_d	2.16e+1 [day-1]	[1]
TNFa_d	5.55e+1 [day-1]	[1]
k_FGF2	1.71e-9 [g cm-3]	[5]
k_IL13	2.00e-7 [g cm-3]	[1]
k_MCP1	5.00e-9 [g cm-3]	[1]
k_PDGF	1.50e-8 [g cm-3]	[1]
k_TGFb_ac	1.00e-10 [g cm-3]	[1]
k_TGFb_in	1.00e-10 [g cm-3]	Estimated
$\lambda_{FGF2,TGF\beta}$	3.00e-10 [g cm-3]	[6]
k_TNFa	5.00e-7 [g cm-3]	[1]
AEC2_proliferation	2.63e-2 [day-1]	Estimated
F_proliferation_IL13_TGFb	2.33e-1 [day-1]	Estimated
$\lambda_{F,AEC2}$	1.44e-2 [day-1]	Estimated
M0_basic_prob_production	8.46e-3 [day-1]	Estimated
AEC2_AEC1_differentiation	9.80e-3 [day-1]	Estimated
F_MF_PDGF_differentiation	1.17e-1 [day-1]	Estimated
F_MF_TGFb_ac_differentiation	1.17e-1 [day-1]	Estimated
M1_M2_differentiation	1.41e-2 [day-1]	Estimated
M2_M1_TNFa_differentiation	5.00e-3 [day-1]	[1]
AEC1_apoptosis	1.65e-2 [day-1]	Estimated
AEC2_apoptosis	1.65e-2 [day-1]	[1]
active_AEC2_apoptosis	1.65e-2 [day-1]	[1]
F_apoptosis	1.66e-2 [day-1]	[1]
M1_apoptosis	2.00e-2 [day-1]	[1]
M2_apoptosis	1.50e-2 [day-1]	[1]
MF_apoptosis	1.66e-2 [day-1]	[1]
AEC2_FGF2_secretion	1.44e-14 [g day-1]	Estimated
AEC2_MCP1_secretion	5.98e-14 [g day-1]	Estimated
AEC2_TNFa_secretion	1.50e-11 [g day-1]	Estimated
AEC2_TGFb_secretion	1.07e-12 [g day-1]	Estimated
F_TGFb_secretion	1.57e-14 [g day-1]	Estimated
F_ECM_secretion	1.14e-8 [g day-1]	Estimated
MF_ECM_secretion	2.28e-8 [g day-1]	Estimated
M1_TNFa_secretion	3.00e-14 [g day-1]	Estimated
M2_IL13_secretion	3.67e-11 [g day-1]	Estimated
M2_MMP_secretion	9.67e-11 [g day-1]	Estimated
M2_PDGF_secretion	9.67e-12 [g day-1]	Estimated
M2_TGFb_secretion	3.82e-13 [g day-1]	Estimated
M2_TIMP_secretion	1.75e-11 [g day-1]	Estimated

1. Hao W, Marsh C, Friedman A. A mathematical model of idiopathic pulmonary fibrosis. *PLoS One* (2015) **10**:1–19. doi:10.1371/journal.pone.0135097
2. Li CM, Khosla J, Pagan I, Hoyle P, Sannes PL. TGF-β1 and fibroblast growth factor-1 modify fibroblast growth factor-2 production in type II cells. *Am J Physiol - Lung Cell Mol Physiol* (2000) **279**:1038–1046. doi:10.1152/ajplung.2000.279.6.l1038
3. Kołodziej M, Sauer DG, Beck J, Marek WK, Hahn R, Jungbauer A, Dürauer A, Piątkowski W, Antos D. Scale up of a chromatographic capture step for a clarified bacterial homogenate – Influence of mass transport limitation and competitive adsorption of impurities. *J Chromatogr A* (2020) **1618**: doi:10.1016/j.chroma.2020.460856

4. Dvorak P, Bednar D, Vanacek P, Balek L, Eiselleova L, Stepankova V, Sebestova E, Kunova Bosakova M, Konecna Z, Mazurenko S, et al. Computer-assisted engineering of hyperstable fibroblast growth factor 2. *Biotechnol Bioeng* (2018) **115**:850–862. doi:10.1002/bit.26531
5. Grazul-Bilska AT, Luthra G, Reynolds LP, Bilski JJ, Johnson ML, Adbullah SA, Redmer DA, Abdullah KM. Effects of basic fibroblast growth factor (FGF-2) on proliferation of human skin fibroblasts in type II diabetes mellitus. *Exp Clin Endocrinol Diabetes* (2002) **110**:176–181. doi:10.1055/s-2002-32149
6. Xiao L. TGF-beta 1 induced fibroblast proliferation is mediated by the FGF-2/ERK pathway. *Front Biosci* (2012) **17**:2667. doi:10.2741/4077