$$\partial_t S_T(r,z,a,t) + \partial_a S_T(r,z,a,t) =$$
$$-\underbrace{\mu_{ST}\frac{F}{\lambda_F+F}\frac{M}{\lambda_M+M}S_T(r,z,a,t)}_{S_T \xrightarrow{\text{PIC, DAMPs}} D_A} - \underbrace{\kappa_2\cdot\gamma(a-\tau_1)\frac{F}{\lambda_F+F}S_T(r,z,a,t)}_{S_T \xrightarrow{\text{PIC}} S_A}$$
$$-\underbrace{\Gamma(\epsilon,r,z,U)S_T(r,z,a,t)}_{S_T \xrightarrow{\text{chronic strain}} D_N}, \quad (6a)$$

$$\partial_t S_A(r,z,t) =$$
$$\underbrace{\int_0^\infty \kappa_2\cdot\gamma(a-\tau_1)\frac{F}{\lambda_F+F}H(P_c-P)S_T(r,z,a,t)da}_{S_T \xrightarrow{\tau_1\text{ delay}} S_A} - \underbrace{\alpha_1 S_A\frac{P}{\lambda_P+P}}_{S_A \xrightarrow{\text{EPO}} C_U}$$
$$-\underbrace{\mu_{S_A}\frac{F}{\lambda_F+F}H(P_c-P)S_A}_{S_A \xrightarrow{\text{PIC}} D_A} - \underbrace{\Gamma(\epsilon,r,z,U)S_A}_{S_A \xrightarrow{\text{chronic strain}} D_N}, \quad (6b)$$

with initial and boundary conditions

$$S_T(r,z,0,t) =$$
$$\int_0^\infty (\underbrace{\beta_{11}\frac{M}{\lambda_M+M}H(P_c-P)}_{C_T \xrightarrow{\text{DAMPs}} S_T} + \underbrace{\beta_{12}\frac{F}{\lambda_F+F}H(P_c-P)}_{C_T \xrightarrow{\text{PIC}} S_T})C_T(r,z,a,t)da, \quad (6c)$$

$$S_T(r,z,a,0) = S_A(r,z,0) = 0. \quad (6d)$$