r0 = [0.12; 0.1]; % population reproduction rates, per hour

K1 = 1e6; % K\_C1S2, Michaelis-Menten coefficient for uptake, fmole/ml

K2 = 1e6; % K\_S2C1, Michaelis-Menten coefficient for influence, fmole/ml

ExtTh = 0.1; % population extinction threshold

tau0 = 0;

tauf = 250; % in hours

dtau = 0.01; % in hours, cell growth update and uptake timescale

at = 0.01; % avg. consumption values (fmole per cell); alpha\_ij: population i, resource j

bt = 0.1; % avg. production rates (fmole per cell per hour); beta\_ij: population i, resource j

Ng = 100; % number of generations for preconditioning (before fitting)

rint = [0; 0.1]; % Nc\*Nm matrix of interaction coefficients

[Nc Nm] = size(rint);

KU = K1\*[1 1]; % Michaelis-Menten coefficients for uptake, fmole/ml

KI = K2\*[1 1]; % Michaelis-Menten coefficients for influence, fmole/ml

rp0 = 1/Nc\*ones(1,Nc);

%% Connectivity, Nm\*Nc

R = [0 1]; % release

P = [1 0]; % consumption

% interaction matrix

alpha = at\*[0 1]; % consumption rates

beta = bt\*[1 0]; % mediator release rates

A = (R.\*alpha)';

B = (P.\*beta)';

%% Case 1 – Low Density

CSD = 2e5; % total initial cells

DilTh = 2e6; % coculture dilution threshold

%% Case 2 – High Density

CSD = 2e8; % total initial cells

DilTh = 2e9; % coculture dilution threshold