**S1 Code. MATLAB sample code to calculate growth dynamics**

**Software information:**

MATLAB R2016b

**Installation:**

* Obtain a MATLAB license from <https://www.mathworks.com/>
* Install the appropriate version of MATLAB for your operating system and activate your license.
* Download the S1 Code zip folder into your MATLAB folder or another known location and unzip it.

**Scripts:**

* S1\_Code\_Implementation.m – Run this script to calculate and plot the growth dynamics of the 20 carbon sources supporting growth of all five lineages (plots each biological replicate separately). To avoid plotting all 300 growth curves, comment out line 23.
* calcGrowthDynamics.m – Function called by S1\_Code\_Implementation.m. This script contains the algorithm for calculating the growth rate and time to mid-exponential for each growth curve.

**Data files:**

* S1\_RawData.mat – This is a .mat file containing the data needed from S1\_RawData.csv needed to calculate growth dynamics.
* S1\_RawData.csv – All raw growth data for three replicates of five lineages on the 20 carbon sources in Fig 5. Note that the data in the main text are all averaged across the three replicates.

**Instructions:**

* Open MATLAB and change your path to the S1 Code folder (or folder where you have the above scripts and data files stored).
* Run S1\_Code\_Implementation.m to calculate growth dynamics from the manuscript. (Keep in mind that the values reported in Fig 5 and S3 Data are the averages of what this script generates)
* To calculate growth dynamics of your own growth curve data, you can write your own script that uses the provided function calcGrowthDynamics.