GCAT Release Notes

Version 4.5

The version 4.5 release is about fixing the variable transformation issue. Apparently, the back-transformation is not consistently applied in version 4.4 so different elements of the output end up being on different scales. The result files will include updated plots files and updated output file.

Version 5.0

New feature: default OD transformation constant was changed from *1* to *0.1*. I (Yury) believe that *0.1* is a more appropriate setting for most experiments done at GLBRC, as ODs range mostly up to 1.5. If the old behavior is desired, click log(x+δ) in the OD Transform menu and enter *1* in the box.

Also, LOESS smoothing parameter values > 1 are now allowed. Greater smoothing parameter results in a more smooth curve. However, a highly smoothed curve may not fit the data as closely as a less smooth one.

The main purpose of version 5 is bug fixes, code clean-up and refactoring to prepare GCAT for further development and potential KBase integration.

Version 6.0

Changed default options to be more appropriate for most users:

- The user is expected to enter a blank OD value by default. It remains possible to use the first reading in the well as blank. It is also possible to set blank value to 0.
- The default OD Transform is now *log(x)*. It remains possible to select *log(x+0.1)* or *log(x+δ)*, with δ specified by the user.
- The default Inoculation time point index is now *1*, e.g. it is assumed that the first OD reading in the well is post-inoculation and not that of blank media. However, GCAT generates and error if Media background is set to the *first OD reading* while Inoculation time point remains *1*, as these two choices are inconsistent with each other.

Note: when the *log(x)* transform is used for OD, all data points where $OD < OD_{blank}$ are discarded.

Enable specification of value ranges for heat maps. Setting these ranges consistently in different GCAT runs will result in heat maps with identical color scales, facilitating comparisons between experiments.

Version 6.1

Implemented Area Under the Curve (AUC) calculation.

Version 6.2

- Enabled use of average OD of control wells as the blank value at each time point. This makes it

possible to account for potential changes in the OD of blank media during the course of an experiment, e.g. due to evaporation. This happens when a user checks *Average OD of blank wells at each time point* option under the *Media background* menu.

- It is now possible to define only one limit, e.g. upper or lower, for the heat map color scale ranges. The other limit is set automatically to the lowest or highest value of the corresponding growth curve parameter in the dataset. This happens when only one value is specified in the *Heat map ranges* menu, while the other is left blank.
- Improved error handling and reporting. R errors are now correctly passed to Rails. The users can display the R errors by pushing the *Full console message* button on the error page. They can also send the error and other debugging info to GCAT developers by email by pushing the *Send* button. When sending the error to the development team, a user can optionally identify self by providing an email address and a name.
- When media background is set to the first OD reading, GCAT automatically changes default inoculation timepoint to 2. This happens when a user checks the *Take the first OD reading of each well to be the blank* option in the *Media background* menu.
- Substantially refactored the Rails code and added unit tests.
- Back-end R package is now available in a ready-to-install archive form.