



BaSysBio is a collaborative research programme (Integrated Project) funded by the European Commission under the 6th Framework Programme in the Life Sciences, Genomics and Biotechnology for Health

The Glucose to Malate Shift: Intracellular metabolite concentrations

Uwe Sauer – ETH, Switzerland

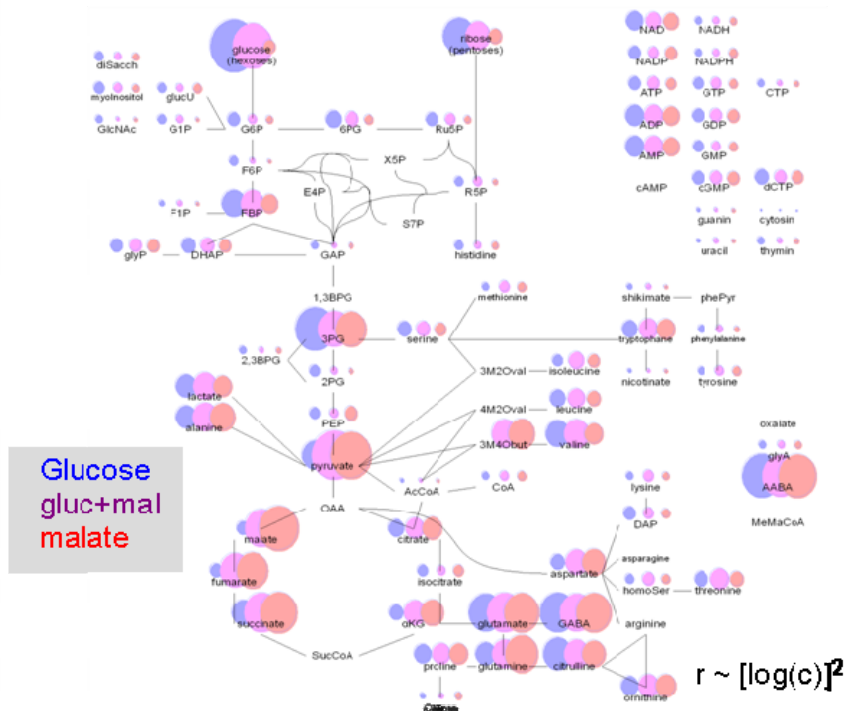
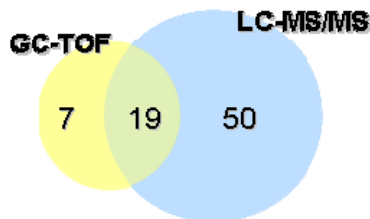
A major problem in interdisciplinary collaborations between experimental biologists and computational groups are the different time-lines of the work flows. In our particular case, first data were necessary for model construction and for preliminary parameter estimations that provide guidance on the required measurement accuracy and resolution. Within the consortium it became quickly clear that metabolite concentration data would be required at a much earlier phase than anticipated.

Partner ETHZ has therefore established a quantitative method and a first work flow for metabolomics with high priority. The initial method was used to generate the first metabolome dataset for the consortium. The conditions were chosen such that the data are from key steady state conditions of the first dynamic regulation phenomenon investigated, the shift from glucose to malate (Figure). This is one of the first comprehensive metabolomics datasets for *B. subtilis*, and the only one from these conditions. Briefly, malate (a gluconeogenic carbon source) resulted in low metabolite concentrations in the upper central carbon metabolism (pentose-phosphate pathway and glycolysis) and high concentrations in the lower central carbon metabolism (TCA-cycle). The opposite trend was observed for growth on glucose (a glycolytic carbon source) while growth on a mixture of malate/glucose produced metabolite concentrations in-between those of the two single carbon source experiments.

Focus on quantification of 100 ubiquitous, central intermediates

Absolute [c] in *B. subtilis* under 3 environmental conditions

Platforms



The first comprehensive metabolomics dataset for *B. subtilis* has been generated for the consortium. Steady state metabolite concentrations for approximately 70 metabolites of central carbon metabolism were measured during growth on glucose, malate and a mixture of glucose/malate. The data have been made available to the modelling groups. This represents major progress as the corresponding milestone was planned for M24 of the project.

From Work-Package 2.2 : RNA and metabolite dynamics

January 2008

contact: sauer@ethz.ch

The contents of this newsletter are subject to copyright law. The copyright in the text, images in this newsletter is the property of BaSysBio Consortium partners. No use of images is permitted without written permission and appropriate citation. Please email such requests and enquiries to sauer@ethz.ch
EC contract reference LSHG-CT-2006-037469

