
Yeast Glycolytic Oscillations

Catherine Lloyd

Table of Contents

Model Structure	1
Download This Model	2

Model Structure

Under certain well-defined conditions, a population of yeast cells exhibits glycolytic oscillations that synchronise through intercellular acetaldehyde. This implies that the dynamic phenomenon of the oscillation propagates within and between cells. Several theories to explain the mechanisms underlying these oscillations have been suggested, including the idea that the frequency of the oscillations is dependent on several molecular processes, especially glucose transport across the plasma membrane. Due to the highly integrated nature of metabolism it is difficult to study metabolites or even metabolic pathways in isolation. They are part of a much larger metabolic network.

In 2000, Jana Wolf, Jutta Passarge, Oscar J.G. Somsen, Jacky L. Snoep, Reinhart Heinrich and Hans V. Westerhoff published a kinetic model describing the transduction of intracellular and intercellular dynamics in yeast glycolytic oscillations (see Figure 1 below).

The complete original paper reference is cited below:

Transduction of Intracellular and Intercellular Dynamics in Yeast Glycolytic Oscillations [<http://www.biophysj.org/cgi/content/abstract/78/3/1145>], Jana Wolf, Jutta Passarge, Oscar J.G. Somsen, Jacky L. Snoep, Reinhart Heinrich and Hans V. Westerhoff, 2000, *Biophysical Journal* [<http://www.biophysj.org/>], 78, 1145-1153. (The PDF [<http://www.biophysj.org/cgi/reprint/78/3/1145.pdf>] and full text [<http://www.biophysj.org/cgi/content/full/78/3/1145>] versions of the article are available on the Biophysical Journal website.) PubMed ID: 10692304 [http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10692304&dopt=Abstract]

The raw CellML description of the model can be downloaded in various formats as described in the section "Download This Model".

- [wolf_model_2000.html](#) [../models/wolf_model_2000.html] — an HTML version for browsing online.
- [wolf_model_2000.pdf](#) [../models/wolf_model_2000.pdf] — a PDF version suitable for printing.
- [cellml_wolf_model_2000.tar.gz](#) [../downloads/cellml_wolf_model_2000.tar.gz] — a gzipped tarball with the XML and this documentation.

- [wolf_model_2000_maths.pdf](#) [../maths_pdf/wolf_model_2000_maths.pdf] — a PDF of the equations described in the model generated directly from the CellML description using the MathML Renderer [../public/tools/index.html].