Natural Functional Diversity of the Yeast Galactose Network
Florent Chuffart, Eddy Caron, Gael Yvert

To cite this version:
Florent Chuffart, Eddy Caron, Gael Yvert. Natural Functional Diversity of the Yeast Galactose Network. EMBL-EBI-Wellcome Trust Course: In silico Systems Biology, Apr 2012, London, United Kingdom. hal-01427716

HAL Id: hal-01427716
https://inria.hal.science/hal-01427716
Submitted on 5 Jan 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives| 4.0 International License
Natural Functional Diversity of the Yeast Galactose Network
Florent Chuffart, Eddy Caron and Gael Yvert

The aim of our research is to study the natural intra-species variability of the yeast galactose regulatory network. Our approach consists in studying more than 100 natural strains of yeast (S. cerevisiae).


We use a Green Fluorescent Protein (GFP) reporter under the control of the Gal1 Promoter and make single-cell acquisitions by flow cytometry. We will put in perspective in vivo experiments with in silico modelling, based on the models of [M. Acar et al., Nature, vol 435, 12 may 2005], [S. A. Ramsey et al., nature genetics, WIREs SysBio, vol 38, num 9, sept 2006], [V. R. Pannala, Vol 2, Jan/Feb 2010] [Hsu C. et al., Nature 435, 12 may 2005], [S. A. Ramsey et al., nature genetics, WIREs SysBio, vol 38, num 9, sept 2006], [V. R. Pannala, Vol 2, Jan/Feb 2010] [Hsu C. et al., Nat Commun. 2012 Feb 21;3:682] we will build a simulator and perform dynamic simulations of the galactose response using SPADES. SPADES is high performance computing platform targeting different supercomputer. Parameters of the model will be fit to relevant observations and predictions from simulations will supervise further experiments. Our aim is to run simulations efficiently and to describe which network parameters vary across the species and which ones are stable.

Our expectation is to describe and quantify the variability in terms of response distribution, kinetics and dose response.