SEMINAR
ALL ARE WELCOME

TEMASEK LIFESCIENCES LABORATORY

01 December 2017 (Friday), 11am
The Auditorium (Level 1)
Hosted by: Dr Jedd Gregory Jeremiah

Systems biology approaches to deciphering fungal deconstruction of plant cell walls

Professor Glass Louise
University of California-Berkeley, United States



N. Louise Glass is a professor in the Plant and Microbial Biology Department at the University of California-Berkeley and is also director of the Environmental Genomics and Systems Biology Division of the Lawrence Berkeley National Laboratory. The Glass laboratory focuses on delineating microbial interactions using the filamentous fungus *Neurospora crassa* as a model system and deciphering its ability deconstruct plant cell walls.

Rational engineering of filamentous fungi for improved plant cell wall deconstruction for 2nd generation biofuels production is hampered by incomplete knowledge of transcriptional and signalling regulatory networks. The model fungus *Neurospora crassa* colonizes burned plant material and shows robust growth on lignocellulosic material. We use systems biology approaches to decipher the mechanism of plant cell wall deconstruction by defining regulatory networks associated with production of hydrolytic enzymes using transcriptomics, proteomics, phosphoproteomics and a full genome deletion strain set. Systems biology approaches will enable the construction of high-resolution metabolic models that allow predictive power for function of new proteins involved in plant biomass deconstruction and rational engineering of filamentous fungi for industrial purposes. The development a genetic blueprint will enable directed engineering of regulatable hyper-secretion strains in cellulolytic filamentous fungal species to efficiently secrete plant cell wall degrading enzymes, enabling lower cost production of biofuels from lignocellulosic material.

Recent Publications:

1. Huberman LB, Coradetti ST, **Glass NL**, 2017. Network of nutrient-sensing pathways and a conserved kinase cascade integrate osmolarity and carbon sensing in *Neurospora crassa.* Proc Natl Acad Sci U S A. 2017 Sep 25. pii: 201707713. doi: 10.1073/pnas.1707713114.
2. Wu, VW, Dana CM, Iavarone AT, Clark DS, **Glass NL**, 2017. Identification of glutaminyl cyclase genes involved in pyroglutamate modification of fungal lignocellulolytic enzymes. mBio 8(1). pii: e02231-16. doi: 10.1128/mBio.02231-16
3. Qin L, Wu VW, **Glass NL**, 2017. Deciphering the regulatory network between the SREBP pathway and protein secretion in *Neurospora crassa.* mBio 8(2). pii:e00233-17. doi: 10.1128/mBio.00233-17.