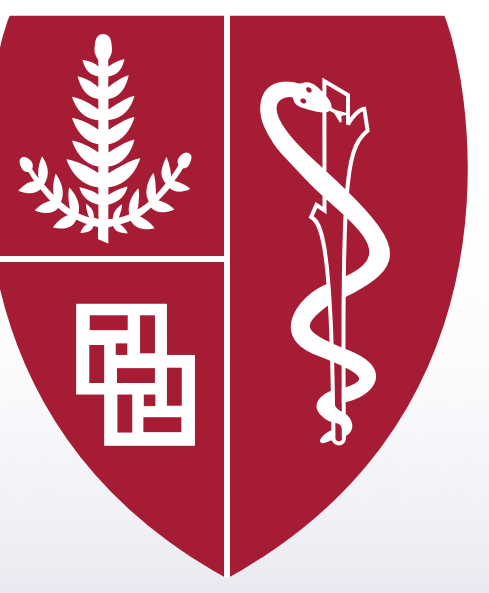# YeastPathways at *Saccharomyces* Genome Database: Transitioning to Noctua

S. Aleksander[1], D. Ebert[2], S.R. Engel[1], E.D. Wong[1], P.D. Thomas[2], J.M. Cherry[1] and the SGD Project[2]

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[2] University of Southern California, Department of Population and Public Health Sciences, Los Angeles, CA

The *Saccharomyces* Genome Database (SGD, http://www.yeastgenome.org) is the leading knowledgebase for *Saccharomyces cerevisiae*. SGD collects, organizes and presents biological information about the genes and proteins of the budding yeast, including information concerning metabolism and associated biochemical pathways. YeastPathways have now been available at SGD for over 20 years, with the last major content update in 2019. Now, YeastPathways are being moved from a curation system reliant on Pathway Tools software to one that uses the Gene Ontology (GO) curation platform Noctua, which is the interface SGD already uses to curate GO annotations. The GO-Causal Activity Model (GO-CAM) structured framework allows multiple GO annotations to be linked in Noctua, which is ideal for a metabolic pathway. Using this interface for biochemical pathways and eliminating the need for external software will streamline curation at SGD. This work is funded by the US National Institutes of Health: National Human Genome Research Institute (NHGRI [U41HG001315]) and National Institute of General Medical Sciences (NHGRI NIGMS [U41HG12212]).
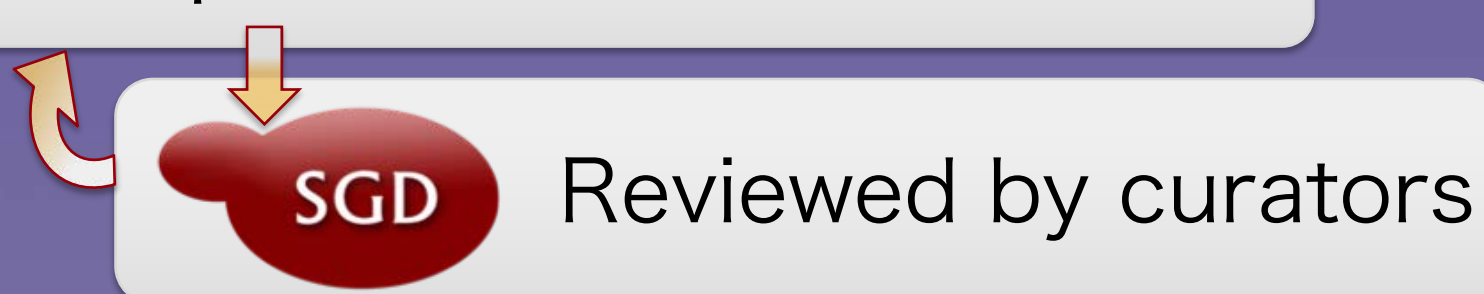
YeastPathways with Pathway Tools
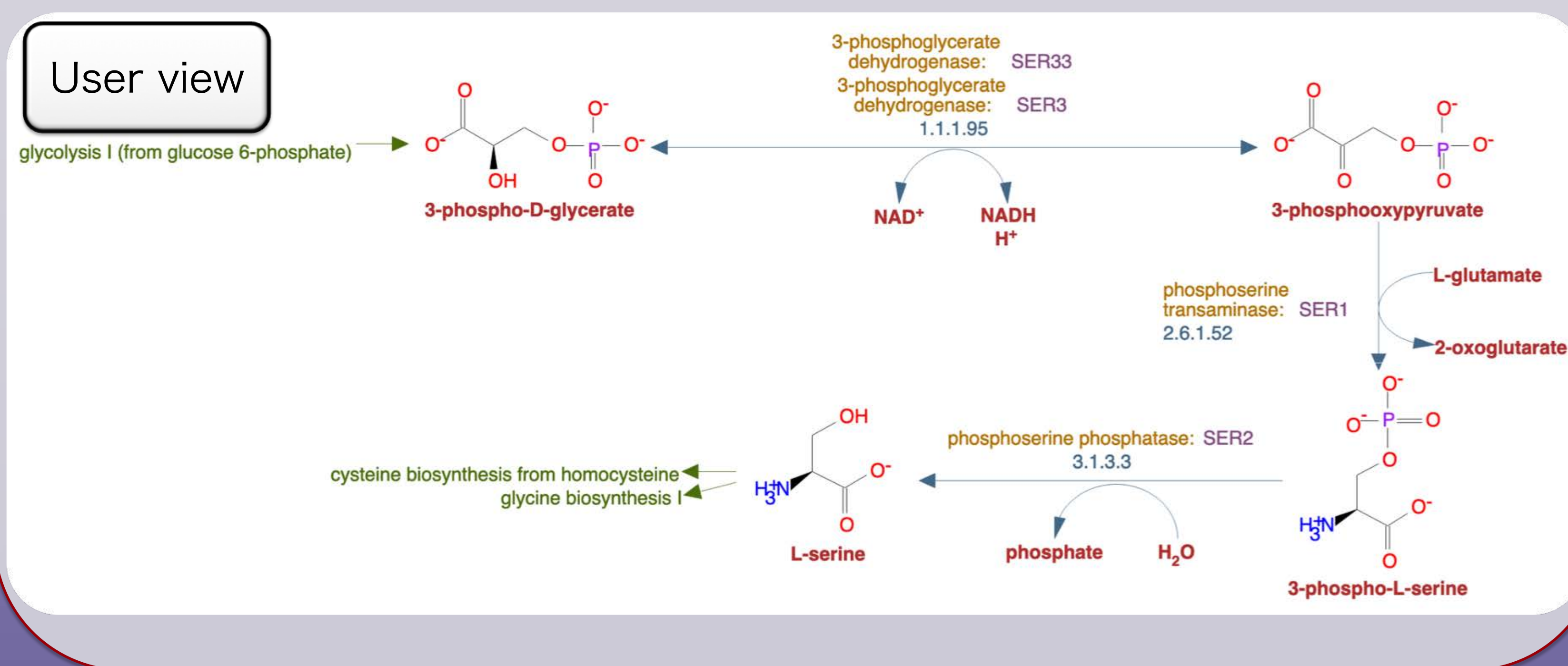
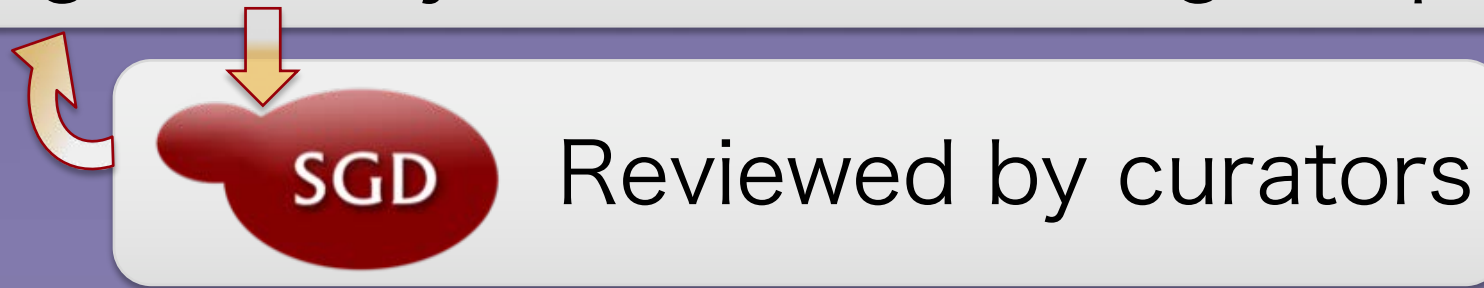## YeastPathways in Noctua: FAIR data

The transfer to Noctua helps make YeastPathways FAIR (**F**indable, **A**ccessible, **I**nteroperable and **R**eusable) [DOI: 10.1038/sdata.2016.18]:

[F]: Unique & persistent `gomodel:` identifiers

[F, A I R]: Metadata accessible on GitHub; uses numerous external ontologies and identifiers

[A]: GO-CAMs available in SPARQL (Blazegraph) & REST (Swagger) endpoints

[I, R]: Stored as Turtle (.ttl); output available as OWL and GPAD

[R]: Noctua records each edit with curator ORCiD

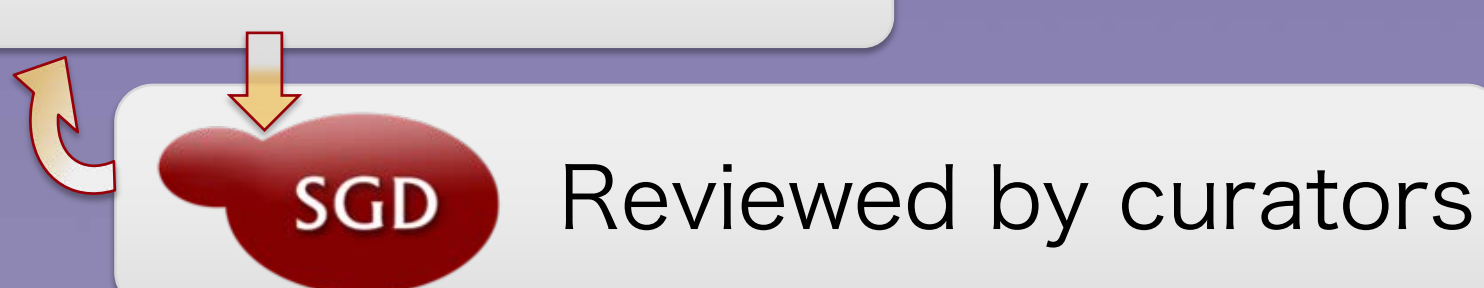[R]: GO has two 5 star ratings (ontology and annotations) with the (Re)usable Data Project

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220 Pathways exported as BioPax Level 3

SGD Reviewed by curators

Pathways conversion code uses mappings provided by SGD & GO e.g. MetaCyc IDs to GO:biological_process

SGD Reviewed by curators

Pathways available as GO-CAMs

SGD Reviewed by curators

GO-Causal Activity Model (GO-CAM)

SGD Curator view

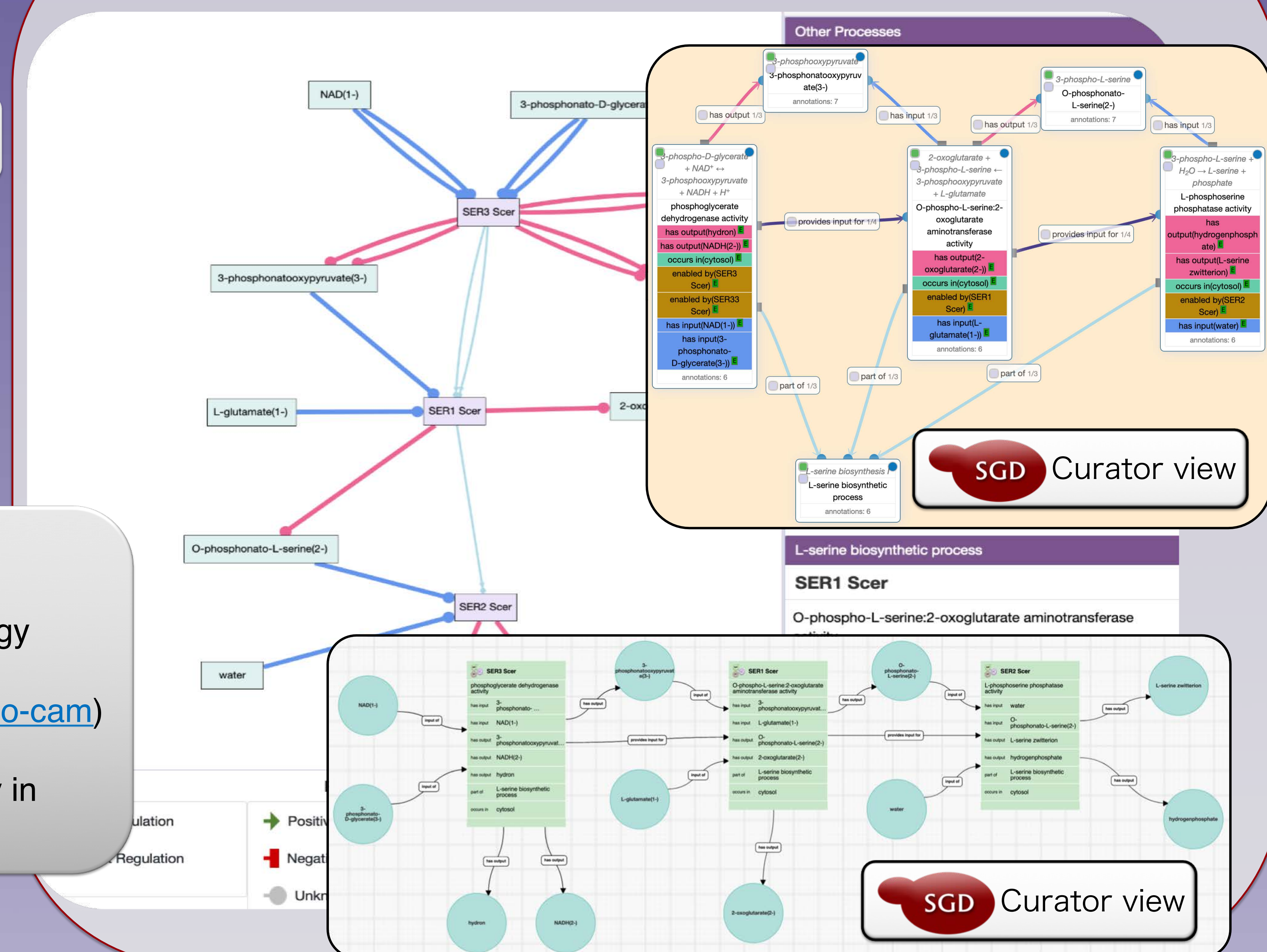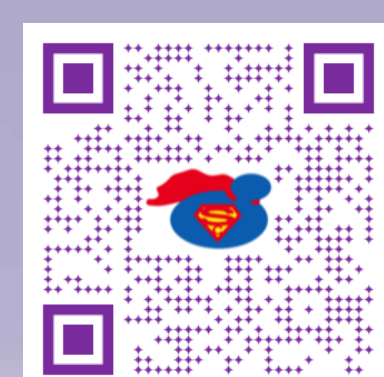SGD Curator view

YeastPathways in Noctua

- Noctua is the web-based curation platform from the Gene Ontology
- YeastPathways will be available to users as GO-CAMs where supported, including GO's GO-CAM browser (geneontology.org/go-cam) & Alliance of Genome Resources (alliancegenome.org)
- GO annotations from YeastPathways can be extracted for display in other formats, use in enrichment studies, etc.

SGD Poster Archive:

www.yeastgenome.org

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