Scientific Publishing in the Future

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with

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Slides at
Lectures.GersteinLab.org
(See Last Slide for References & More Info.)
The Situation: a Changing Landscape between "Info. Resources" & Traditional Journals

- Explosion of Web Information Resources
- DBs & Journals
  - Ends of blurring spectrum
  - Reading articles from "queries" & "Mining" journal text
- Reading DB entries
- Biology as science of heterogeneous facts
  - What's vehicle for annotating each base of genome?

[Nat. Biotech. 21:979; Bioinformatics 15:429]
An Aspect of the Situation:
Hard to fit everything into conventional journal articles or biological DBs

• Many other aspects of a "citatable paper" than just narrative text
  – for computational biology: code downloads, annotation sets
  – for expt. biology: reagents, apparatus, &c....
  – associated lectures and easy-to-read summaries, videos (scivee)
• Readability of Narrative Decreasing
  – Data embedded into papers, making text hard to read
• Data aliquot for DBs
  – DB handle huge homogenous datasets
    but what of isolated facts

[BMC Bioinformatics 8:17 ; PLoS Comp. Bio. 4: e1000037]
Potential Directions Forward: Between Extremes

• Stay with Traditional Paper
  – "3 author" narrative on a conceptual advance
  – "Hard currency" of scientific discovery & advancement
• Move to Blogs, Websites, &c.
  – Posts, freeware distributions, DB depositions &c
  – Reference "Marker Papers", just shells
    • Hypothetical "1 Million Genomes" consortium "marker",
      associated with many pieces of software, datasets, &c
      which not fully explained in article
• Take Middle Way
  – Structured and multi-tiered scientific literature
    more compatible with the digital world
Structured, Multi-tiered Digital Paper Proposal

• "Broadened," Multi-tiered papers
  - Narrative text +
    easy-to-read lay version +
    structured, mach. readable vers.
  - Extended Suppl. material,
    containing data & code
  - associated lectures, videos

• "Structured" Tier
  - for automatic deposition into DBs & textmining
  - Cross-referencing with a specific part of the genome, proteome, &c
  - Written as annotation from start

• All tiers submitted in parallel
  - Refereed & edited normally

• Incentives
  - Capitalizes on peer review & incentives to publish
  - Authors (not currators) in control of process
  - But officiated by referees and editors

• A Path Forward
  - Abstract, Tables, Figures, Equations..... eventually all

[Cheung et al. MSB ('10, in press); FEBS Lett 582: 1170; Nature 447: 142]
Abstract

In the yeast *Saccharomyces cerevisiae* the Gβγ dimer of the heterotrimeric G protein transduces a pheromone signal from serpentine receptor to a MAP kinase cascade that activates the mating response pathway. Haploid cells lacking the Gβ subunits do not respond to sexual pheromone, leading to sterility. In this work we demonstrate that the β-subunit of *kluyveromyces lactis*, encoded by the *KISTE4* gene, is a component of the G protein, and that its disruption gives rise to sterile cells. However, unlike Ste4p in *S. cerevisiae*, its overexpression does not induce growth arrest or promote mating. It has been shown that in *K. lactis*, the Gα subunit has a positive role in the mating process, hence the resulting double GαΔ GβΔ mutant was viable and sterile. Here we show that the overproduction of Gβ subunit fails to rescue GαΔ mutant from sterility and that expression of a constitutive active allele of Gα enhances transcription of the *KISTE4* gene. The mating pathway triggered by the Gβ-subunit requires a functional KlSte12p transcription factor. Gβ has a 10-fold higher association rate with the Gα1 subunit involved in pheromone response than with Gα2, the protein involved in cAMP regulation in *K. lactis*. Additionally, the Gβ-subunit from *K. lactis* is able to interact with the Gα-subunit from *S. cerevisiae* but fails to restore the mating deficiency of *SceSte4A* mutant. The data presented indicate that the mating pathway of *K. lactis* is positively and cooperatively regulated by both the Gα and the Gβ subunits. Copyright © 2005 John Wiley & Sons, Ltd.

Keywords: Ste4; G protein; signal transduction; yeast; *K. lactis*
Structured Digital Table

- Canonical Table Types
- Using standardized journal tables as small "stubbs" for larger datasets

[Cheung et al., MSB ('10) in press]
Default Theme

- Default Outline Level 1
  - Level 2
More Information on this Talk

SUBJECT: Textmining

DESCRIPTION:
PLOS Workshop at ISMB 2010: Where & How to Get Published, 2010.07.13, 10:45-12:45; [I:ISMB10] (5' total)

NOTES:
This PPT should work on mac & PC.