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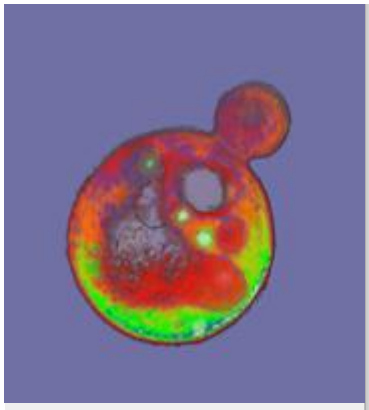
News

Bizarre models for human diseases

Plants shed light on disfigured faces, and yeast and blood vessels find common ground.

Janelle Weaver

The search for models of human diseases might just have become easier, thanks to a data-mining technique that screens genetic databases to find subtle links to organisms as distant from humans as plants.



Yeast could help model diseases affecting the growth of blood vessels in humans.

C. Larabell/ University of California/ San Francisco / Lawrence Berkeley National Laboratory

The new tool integrates information from existing databases that associate gene mutations with observable traits in a range of species, including humans, mice, yeast, worms and plants. And the method identifies genes in the non-human species that are more likely than by chance to contribute to human disease.

Mutations in the same gene can cause dramatically different effects in humans from those seen in other species. For instance, mutations in the *RB1* gene are associated with eye cancer in humans but cause worm genitalia to develop in the wrong place. Although such genes remain conserved across species, they evolve different functions, says Edward Marcotte, a systems biologist at the University of Texas, Austin.

On the basis of this principle, Marcotte and his colleagues set out to identify obscure gene candidates for human diseases. After screening a human database and identifying genes implicated in breast cancer, he searched for their function in the worm database and found that they were involved in producing male progeny. Moreover, he uncovered 13 genes in this worm network that might contribute to breast cancer in humans; nine of them had not previously been implicated in the disease. His findings are published today in *Proceedings of the National Academy of Sciences*.

Strange models

Marcotte found other unusual patterns. Genes responsible for sensing gravity in plants were linked to those associated with a developmental disorder in humans called Waardenburg syndrome, which causes abnormal pigmentation in the skin and hair, cleft palate and lip, and

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