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Chemogenomics-Driven Drug Discovery in the Human Fungal Pathogen, *Candida albicans*

Status	Current
Competition	Applied Genomics and Proteomics Research in Human Health
Sector	Health
Genome Centre	Genome Quebec
Project Leaders	Deming Xu & Terry Roemer

Project Description

New therapeutic treatments for life-threatening fungal infections

Candida albicans is a fungal pathogen that causes life-threatening infections in people with compromised immune systems from conditions like cancer, AIDS, and organ transplants. Despite the prevalence of fungal infections, however, relatively few efficacious antifungal drugs currently exist. In addition, the emergence of drug-resistant fungi and serious problems of toxicity limit the usefulness of these drugs. As a result, there is an urgent need for a new generation of antifungal drugs with superior safety and efficacy against a broad fungal spectrum.

The Chemogenomics-Driven Drug Discovery in the Human Fungal Pathogen, *Candida albicans* project will provide new therapeutic treatments for life-threatening fungal infections. Elitra Canada Ltd., an awardee of Genome Canada/Genome Québec Competition II*, has successfully used genomic strategies to identify genome-wide drug targets in *C. albicans*.

In this assay, researchers will test each gene of the pathogen for its relationship with a given active compound. Using bioinformatics, they will connect these compounds and their targets.

The genome-wide *C. albicans* Fitness Test will provide a global approach to exploring the antifungal activities of novel chemical compounds directly within the principal human fungal pathogen. This research will give Canada the lead in a new drug discovery paradigm that focuses on mechanisms of action. Furthermore, the technologies developed in this project will offer new tools to Canadian and international academic researchers to facilitate basic scientific research. Within the next three years, Elitra will contribute proprietary resources to take the new drug compounds through clinical trials and ultimately to market.

*Genome-wide essential gene identification in *Candida albicans* and application to antifungal drug discovery