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Integrative Biology

Status	Current
Competition	III
Sector	Health
Genome Centre	Ontario Genomics Institute
Project Leader	Brenda Andrews

Project Description

The genomes of more than two hundred organisms have been sequenced, from microscopic earthworms to humans. The function of thousands of individual genes is attracting the attention of scientists. But integrative biology is revealing that genes work not individually but as physical or functional assemblies to perform their functions.

Dr. Brenda Andrews is Director of the Terrence Donnelly Centre for Cellular and Biomolecular Research at the University of Toronto and she is project leader of Integrative Biology.

According to Dr. Andrews, genes perform their functions not individually, but in assemblies or groups. In turn, these gene assemblies work with each other to allow the cell to function and respond to its environment. The value of integrative biology is underlined by the fact that some medications are highly specific, binding to one protein and one protein alone – but these medications can have unexpected and unpredictable effects when they impact on gene assemblies.

The project led by Dr. Andrews will develop an integrated view of *Saccharomyces cerevisiae* (baker's yeast) – a leading model organism, which has conserved many of the same genes and pathways as humans, and is amenable to experimentation. By investigating cells and functional sub-components in baker's yeast, the project is expected to yield valuable intellectual property. Examples of IP include new instrumentation, reagents (substances used in chemical analysis or synthesis), methodologies for human and veterinary therapeutics, and reagents for industrial processes and for basic and applied research.

Based at the newly opened Terrence Donnelly Centre for Cellular and Biomolecular Research, this project will help develop a world-leading platform for functional genomics and proteomics, drawing on multidisciplinary approaches and research strengths in Toronto and across Canada.