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## Comparative and Functional Genomics of the Human Pathogen *Cryptococcus Neoformans*

<b>Status</b>	Past
<b>Competition</b>	Competition II
<b>Sector</b>	Health
<b>Genome Centre</b>	Genome British Columbia
<b>Project Leaders</b>	James Kronstad

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### Project Description

Two potentially separate species of the genus *Cryptococcus*, *C. neoformans* and *C. bacillisporus* (now called *C. gattii*), are important fungal pathogens of humans. These fungi have emerged as serious threats to human health in recent years because of their ability to cause life-threatening infections in immunocompromised people and because fungal infections are difficult to completely cure with existing drugs.

To establish new therapeutic approaches, a pressing need exists to develop a thorough understanding of the *Cryptococcus* species that are human pathogens. An understanding of the ability of these fungi to cause disease could also contribute to more general strategies to control serious diseases caused by other fungi.

The sequence produced by our project – WM276 – provides a critical resource to the scientific community working to control fungal diseases. We anticipate that this sequence will provide important comparative insights and greatly enhance the overall quality of all genome projects for this pathogen. In addition, as serotypes A and D are more commonly studied, our choice of serotype B has catapulted Canada into a leadership position in the studies of this fungal pathogen. Our collaborator, the Broad Institute, has partially sequenced another serotype B strain, R265.

Together, WM276 and R265 represent the types of serotype B strains that are causing the world's largest outbreak of cryptococcosis on Vancouver Island in British Columbia. The associated genome sequences represent a critical resource for the development of diagnostic tools for identifying vaccine targets and for identifying and testing antifungal drug targets. These areas of development will be important for industry (e.g., companies interested in antifungal drugs), clinicians treating patients with cryptococcosis, and veterinarians treating animal cases of cryptococcosis.

## **Fast Facts**

### ***Highlighted outcome:***

sequence provides a critical resource to the scientific community that is working to control fungal diseases sequence provides a critical resource to the scientific community that is working to control fungal diseases

### ***Number of research personnel employed by the project:***

5

### ***Patents:***

1 provisional patent for a PCR-based diagnostic test for the outbreak strains from Vancouver Island has been transferred to the BC Centre for Disease Control for further development