

BIOINFORMATICS PhD Studentship

The International Maize and Wheat Improvement Center (CIMMYT) and Washington State University, is seeking an innovative, self-motivated, scientifically outstanding candidate for a PhD studentship to participate in a project to characterize genetic variation for breeding durable resistance to rusts in wheat.

Leaf rust and stripe rust are globally important foliar fungal diseases of wheat, while stem rust is again becoming a global threat after half of a century of durable resistance (Global Rust Initiative, <http://www.globalrust.org/>). Enhanced durable resistance to these fungal pathogens is a high priority in the adaptation of high yielding improved wheat cultivars for different agroclimatic regions. Breeding resistance to both leaf and stem rust in wheat cultivars has traditionally focused on the pyramiding of race-specific resistance genes. However, this approach is short lived, with new virulent races of the pathogen evolving that overcome the resistance. Rapidly and efficiently identifying and deploying new and diverse sources of resistance will require an aggressive, holistic approach that combines traditional techniques with novel approaches for breeding strategies that hinder pathogen evolution to create sustainable global solutions to rusts. Modern bioinformatics will be at the heart of this approach, critically integrating, bridging and iterating between disciplines that have hitherto failed to work together effectively.

The project will utilize data from gene expression studies to discover genes involved in durable resistance to rusts:

- Analyze differential gene expression data in different types of interactions between wheat and wheat rusts, including susceptible, partially resistant and resistant interactions.
- Utilize wheat expression arrays to examine the genes and mechanisms involved in the ultimate durable resistance, non-host resistance by studying differential gene expression in wheat cultivars challenged with host and non-host pathogens.

From these candidate genes the student will use a number of bioinformatics techniques to determine level of confidence that a gene is involved in the resistance mechanism.

The student will be registered at the Department of Plant Pathology, Pullman Campus, Washington State University and will be based part-time at WSU and part time in the Crop Research Informatics Laboratory at CIMMYT's Main Campus located 45 km northeast of Mexico City, Mexico.

We are seeking candidates with the following qualifications:

- ✓ Degree in plant genomics, bioinformatics or a related field.
- ✓ Background in bioinformatics and genetics
- ✓ Experience with biometrics and statistics
- ✓ Interest in international agricultural research and development
- ✓ Ability to work well as part of multidisciplinary decentralized teams
- ✓ Proficiency in spoken and written English language

Experience in any of the following areas would be considered an asset:

- ✓ Statistical analysis using R
- ✓ Software development in Java
- ✓ Relational database design and administration
- ✓ Knowledge of molecular plant-microbe interactions
- ✓ Proficiency in Spanish

CIMMYT (www.cimmyt.cgiar.org) is an internationally funded, non-profit research and training organization affiliated with the Consultative Group on International Agricultural Research (CGIAR, www.cgiar.org) and has an annual budget of over US\$40 million. CIMMYT's mission is to help the poor in the developing world by increasing the productivity, profitability, and sustainability of maize- and wheat-based cropping systems while protecting natural resources. The Center is a global leader in scientific research and training related to maize and wheat improvement, and in biotechnology, economics, and natural resource management research. These activities are conducted in partnership with national agricultural research systems, non-governmental organizations, and advanced research institutions, both public and private, in globally- and regionally-focused programs. CIMMYT employs a staff of over 600 and operates in a decentralized, partnership mode, having staff in 14 countries in Africa, Asia and Latin America, plus projects and partnership networks in many more.

Please send via e-mail your letter of application, CV/Resume (including full contact information), and names and contact information of three references to:

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We will accept applications until October 1, 2006.

For further information contact

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