

New momentum for wheat genome project

Sequencing of wheat chromosome 4B to begin

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The International Wheat Genome Sequencing Consortium (IWGSC) and the Wheat Initiative announced today that reference sequencing of wheat chromosome 4B would commence shortly in France. This complements the reference sequencing projects already underway on 11 other wheat chromosomes and adds momentum to the goal of achieving a high quality reference sequence of the bread wheat genome to speed up gene discovery and breeding of new wheat varieties.

So far, only the largest of the 21 wheat chromosomes, 3B, has been sequenced to high quality. The reference sequence was published last year in the international journal *Science* and established the benchmark for sequencing the remaining chromosomes.

Chromosome 4B is the third chromosome to be sequenced in France, following the pioneering work on 3B and the ongoing sequencing of 1B. The 4B sequencing project is co-funded by France Génomique as well as by the French National Institute for Agricultural Research (INRA) as part of its commitment to the Wheat Initiative to provide financial support of €1 million to sequence the wheat genome, one of the top priorities for the wheat research community identified by the Wheat Initiative in its Strategic Research Agenda.

The 4B sequencing project will be carried out in the next two years by a team led by Etienne Paux at the INRA Genetics, Diversity and Ecophysiology of Cereals (INRA-GDEC) research unit in Clermont-Ferrand, France. Sequencing and assembly will be done at the French national sequencing centre, Genoscope, which has already carried out the sequencing for 3B and 1B. The pseudomolecule will be completed at INRA-GDEC.

“Sequencing the wheat genome is not only a scientific and technical challenge, says Etienne Paux, but also a socio-economic priority to assist wheat breeding and ensure that we will be able to keep pace with increasing food demand. France is aware of what is at stake, as clearly demonstrated by the financial support granted to wheat research over the past years.”

The starting material for sequencing chromosome 4B is a physical map that was produced as part of a €1 million project funded by Bayer CropScience aimed at completing all remaining physical maps in wheat. The company has agreed to an early release of the 4B physical map data to allow the research teams in France to start sequencing. “Bayer is committed to wheat improvement and we are convinced that a finished, high quality reference genome will be critical for accelerating and guiding fundamental and applied wheat research to achieve long-term goals of sustainable food security. We believe in public-private partnering and are convinced that our support to the wheat

sequencing project will be beneficial to all stakeholders,” said John Jacobs, Expert Scientist at Bayer CropScience.

The IWGCS, together with Wheat Initiative members, is still working on securing funding for reference sequencing of the remaining chromosomes. It estimates that €11.5 million is still needed to produce, assemble, and make available high quality reference sequences for all chromosomes. Provided that funding is secured soon, the IWGSC anticipates that a high quality genome sequence for bread wheat could be publicly available by 2018.

Wheat is the most widely grown cereal crop in the world and the staple food for more than 35% of the global human population. Each year, wheat worth nearly US \$50 billion is traded globally. With the world's population estimated to reach 9.6 billion by 2050, the World Bank has estimated that global wheat production will need to increase by 60 % by this date. To meet this rising demand, plant breeders will need new tools such as a high quality reference genome sequence to accelerate breeding programs for new wheat varieties with higher yields and improved sustainability.

About the IWGSC

The IWGSC, with more than 1,100 members in 55 countries, is an international, collaborative consortium, established in 2005 by a group of wheat growers, plant scientists, and public and private breeders. The goal of the IWGSC is to make a high quality genome sequence of bread wheat publicly available, in order to lay a foundation for basic research that will enable breeders to develop improved varieties. The IWGSC is an Associated Program of the Wheat Initiative.

www.wheatgenome.org

About the Wheat Initiative

Created in 2011 following endorsement from the G20 Agriculture Ministries, the Wheat Initiative provides a framework to establish strategic research and organization priorities for wheat research at the international level in both developed and developing countries. The Wheat Initiative fosters communication between the research community, funders and global policy makers, and aims at securing efficient and long-term investments to meet wheat research and development goals.

www.wheatinitiative.org

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