



**HAL**  
open science

## **A reference sequence of wheat chromosome 3B**

Frédéric Choulet, Adriana A. Alberti, Sébastien Theil, Natasha Marie Glover, Valérie Barbe, Josquin Daron, Lise Pingault, Pierre Sourdille, Arnaud Couloux, Etienne Paux, et al.

► **To cite this version:**

Frédéric Choulet, Adriana A. Alberti, Sébastien Theil, Natasha Marie Glover, Valérie Barbe, et al.. A reference sequence of wheat chromosome 3B. 22. Conference on Plant and Animal Genome, Jan 2014, San Diego, United States. hal-02742303

**HAL Id: hal-02742303**

**<https://hal.inrae.fr/hal-02742303>**

Submitted on 3 Jun 2020

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

**Title:** A Reference Sequence of Wheat Chromosome 3B

**Authors:** Frédéric Choulet<sup>1</sup>, Adriana Alberti<sup>2</sup>, Sébastien Theil<sup>1</sup>, Natasha Glover<sup>1</sup>, Valerie Barbe<sup>2</sup>, Josquin Daron<sup>1</sup>, Lise Pingault<sup>1</sup>, Pierre Sourdille<sup>1</sup>, Arnaud Couloux<sup>2</sup>, Etienne Paux<sup>1</sup>, Philippe Leroy<sup>1</sup>, Sophie Mangenot<sup>2</sup>, Nicolas Guilhot<sup>1</sup>, Jacques Le Gouis<sup>1</sup>, François Balfourier<sup>1</sup>, Michael Alaux<sup>3</sup>, Véronique Jamilloux<sup>3</sup>, Julie Poulain<sup>2</sup>, Céline Durand<sup>2</sup>, Arnaud Bellec<sup>4</sup>, Christine Gaspin<sup>5</sup>, Jan Safar<sup>6</sup>, Jaroslav Dolezel<sup>6</sup>, Jane Rogers<sup>7</sup>, Klaas Vandepoele<sup>8</sup>, Jean-Marc Aury<sup>2</sup>, Klaus Mayer<sup>9</sup>, Hélène Bergès<sup>4</sup>, Hadi Quesneville<sup>3</sup>, Patrick Wincker<sup>2</sup> and Catherine Feuillet<sup>1</sup>

**Affiliations:** (1)INRA GDEC, Clermont-Ferrand, France, (2)CEA - Genoscope, Evry, France, (3)INRA - URGI, Versailles, France, (4)INRA - CNRGV, Castanet Tolosan, France, (5)INRA UR875 Biométrie et Intelligence Artificielle, Castanet-Tolosan, France, (6)Institute of Experimental Botany, Olomouc, Czech Republic, (7)International Wheat Genome Sequencing Consortium, Cambridge, United Kingdom, (8)VIB Department of Plant Systems Biology, Ghent University, Gent, Belgium, (9)Institute of Bioinformatics & Systems Biology, MIPS, Neuherberg, Germany

**Abstract:** We produced a reference sequence of the hexaploid wheat chromosome 3B. We established a strategy that combined several technologies to sequence 8452 Bacterial Artificial Chromosomes pooled by 10 and were able to assemble a pseudomolecule of 774 Mb carrying 7264 protein-coding genes and 85% of transposable elements. Comparative genomics with model grasses revealed that wheat has recently undergone massive inter and intrachromosomal gene duplications. Distribution of both structural and functional features highlighted a striking compartmentalization. Chromosomal extremities, corresponding to regions where meiotic recombination takes place, are enriched in genes originating from recent duplication events, expressed in specific conditions, and with function related to adaptation, which contrasts with the features of the central region of the chromosome. Such reference sequence provides an important resource to support the identification of genes underlying important traits and novel insights into the organization, function and evolution of a complex polyploid genome.

Comment citer ce document :

Choulet, F., Alberti, A., Theil, S., Glover, N. M., Barbe, V., Daron, J., Pingault, L., Sourdille, P., Couloux, A., Paux, E., Leroy, P., Mangenot, S., Guilhot, N., Le Gouis, J., Balfourier, F., Alaux, M., Jamilloux, V., Poulain, J., Duran, C., Bellec, A., Gaspin, C., Safar, J., Dolezel, J., Roder, J., Vandepoele, K., Aury, J.-M., Mayer, K., Bergès, H., Quesneville, P., Wincker,