

# **The International Wheat Genome Sequencing Consortium (IWGSC): Strategies & Resources**

**Isabelle Caugant**

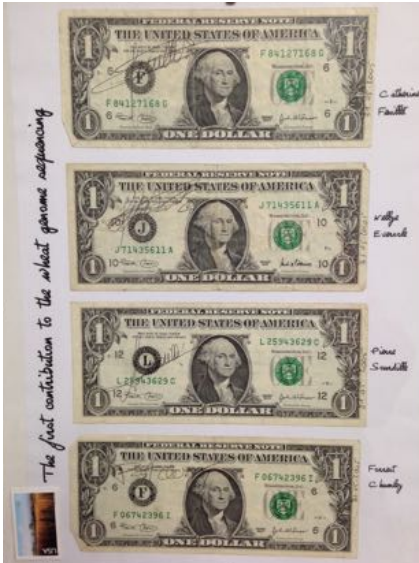
**IWGSC Communications Officer**

Institute of Experimental Botany  
Olomouc, Czech republic  
23 September 2015



# The International Wheat Genome Sequencing Consortium

2005



2 sponsors  
3 institutes

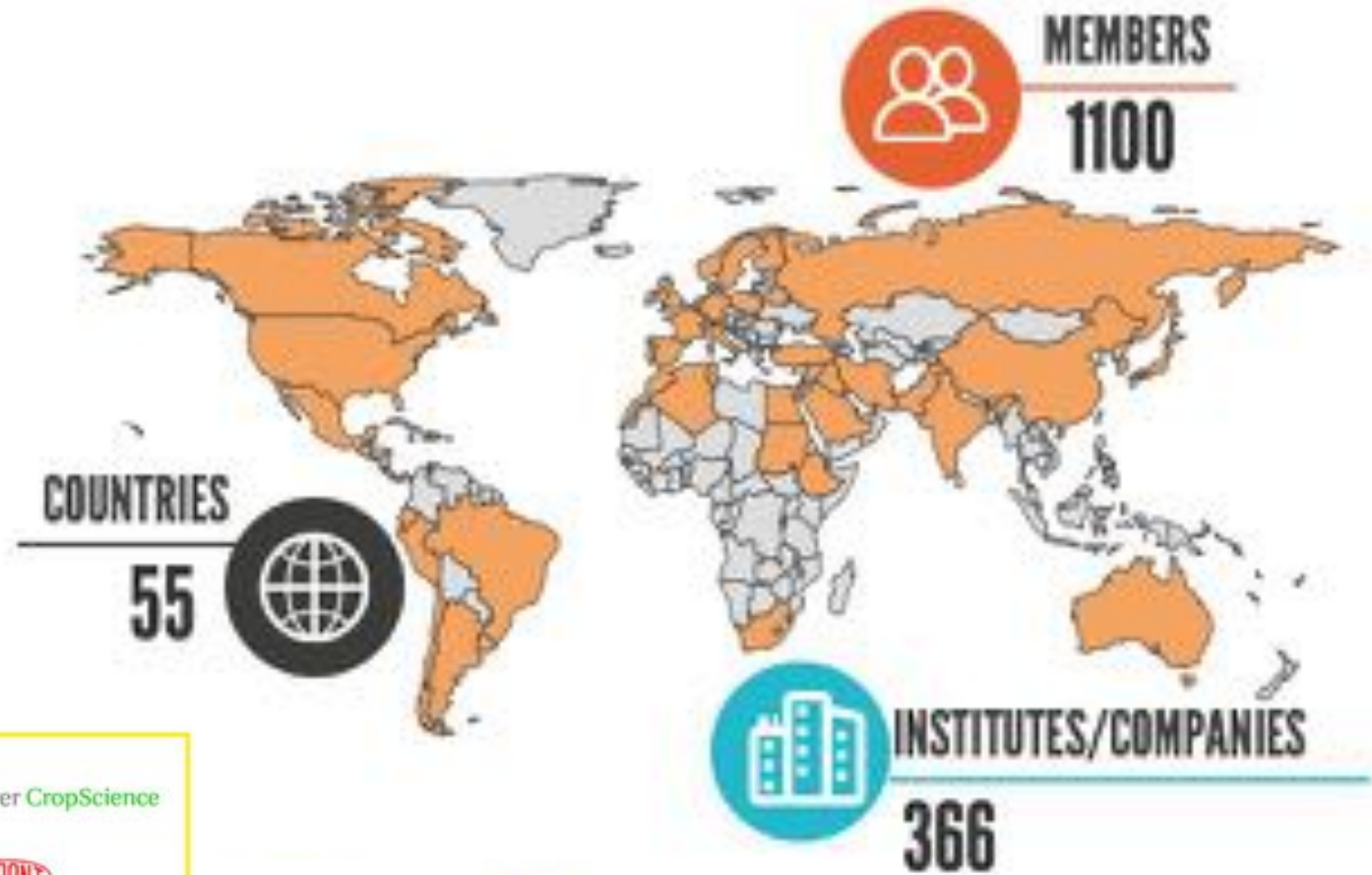
5 members  
3 countries



[www.wheatgenome.org](http://www.wheatgenome.org)

# The International Wheat Genome Sequencing Consortium

2015



# The IWGSC : A non-profit Corporation



# Vision

## Goal

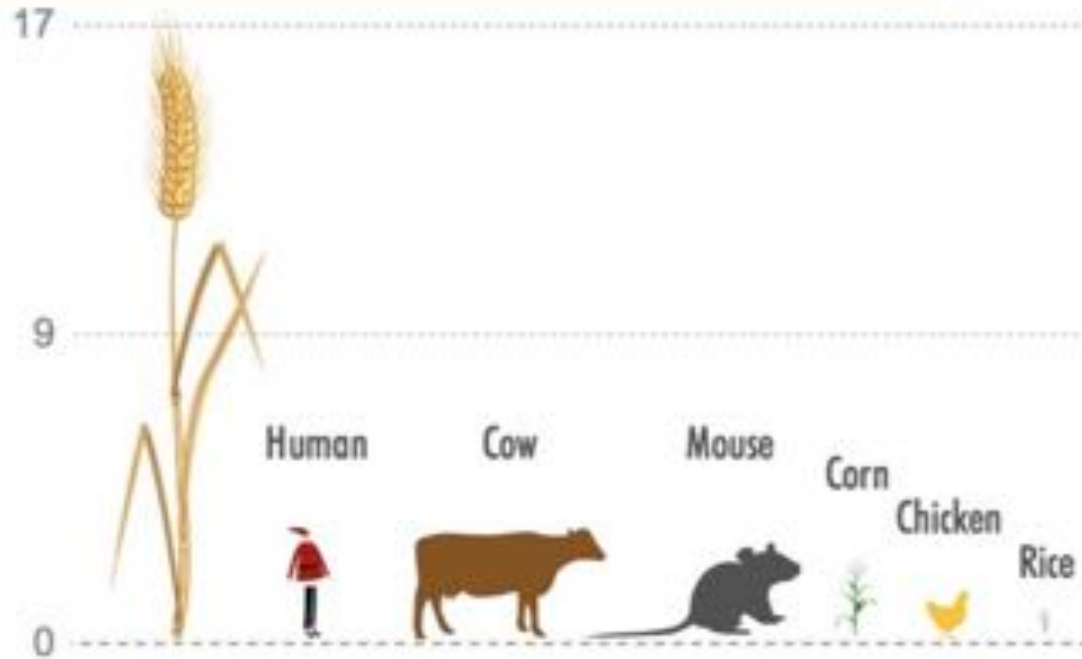
- Lay a foundation to accelerate wheat improvement
- Increase profitability throughout the industry

## Vision

- High quality annotated genome sequence, comparable to rice genome sequence
- Physical map-based, integrated and ordered sequence



# The wheat genome is complex



- **Large: 17 Gb**
- 5 times larger than the human genome
- 35 times larger than the rice genome

- **Allohexaploid: 3 sets of chromosomes**
- Highly **similar gene content**
- More than 80% of the genome is made of **repetitive elements**
- Genes represent only **2% of the genome**

# How to produce a useful sequence?

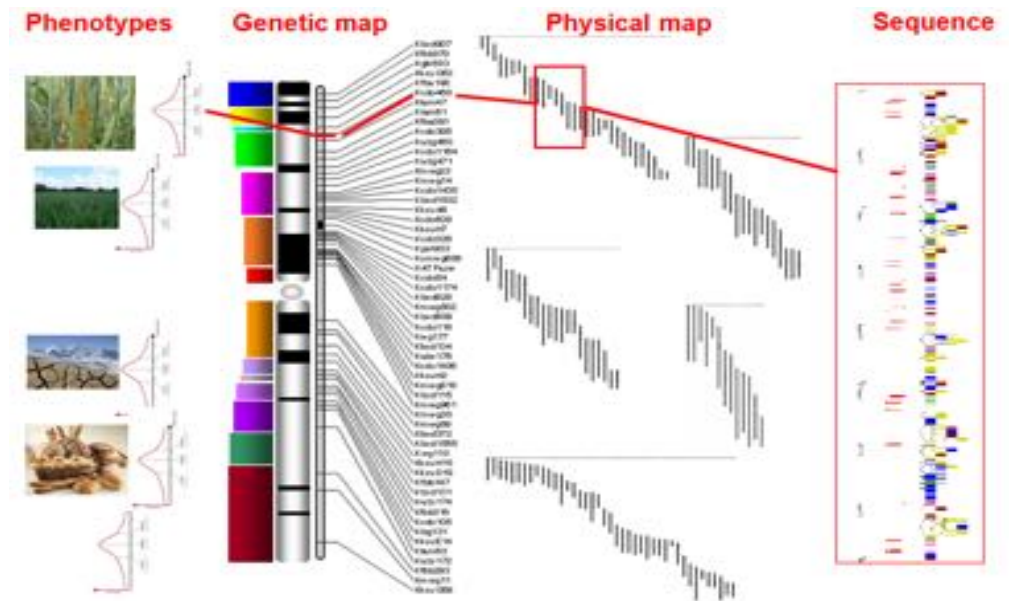
For whom and for what purposes?

- Comparative genomics
- Markers
- Gene cloning
- Development of new varieties
- Long-term breeding pipelines

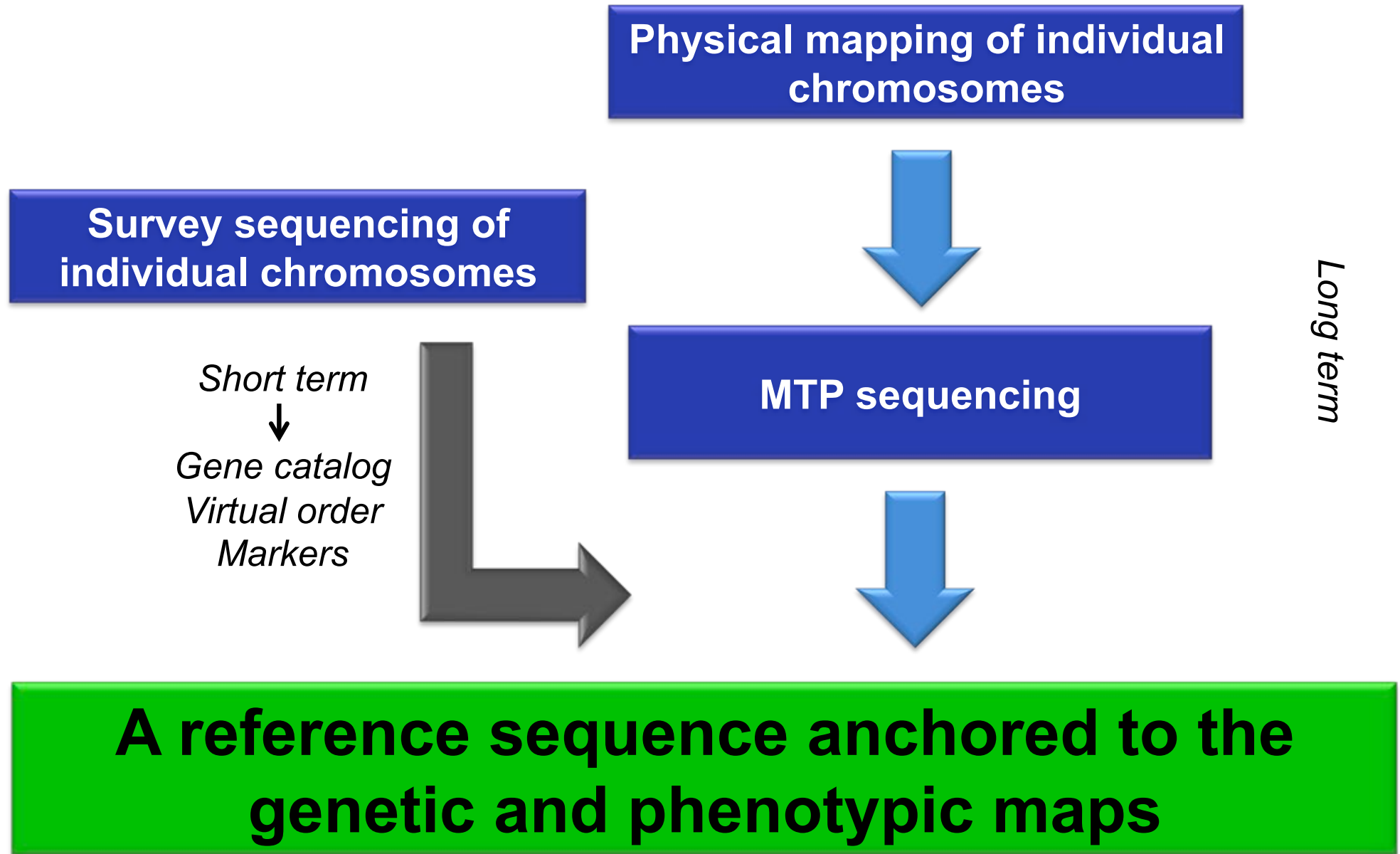
A sequence that grows in the field  
→ Bread Wheat, *Chinese spring*



A sequence linked to the genetic maps and phenotypes

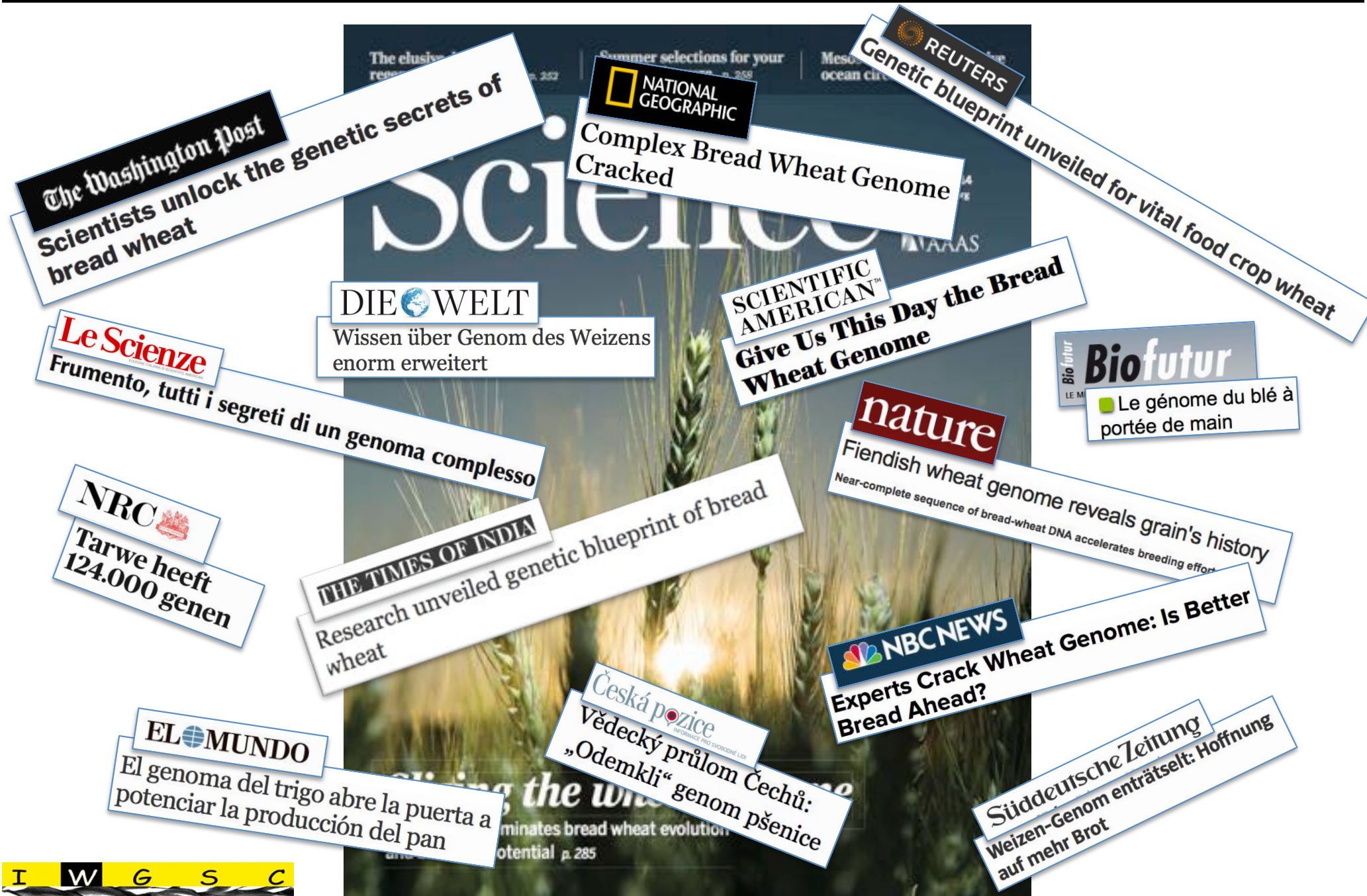


# Roadmap to the Wheat Genome Sequence

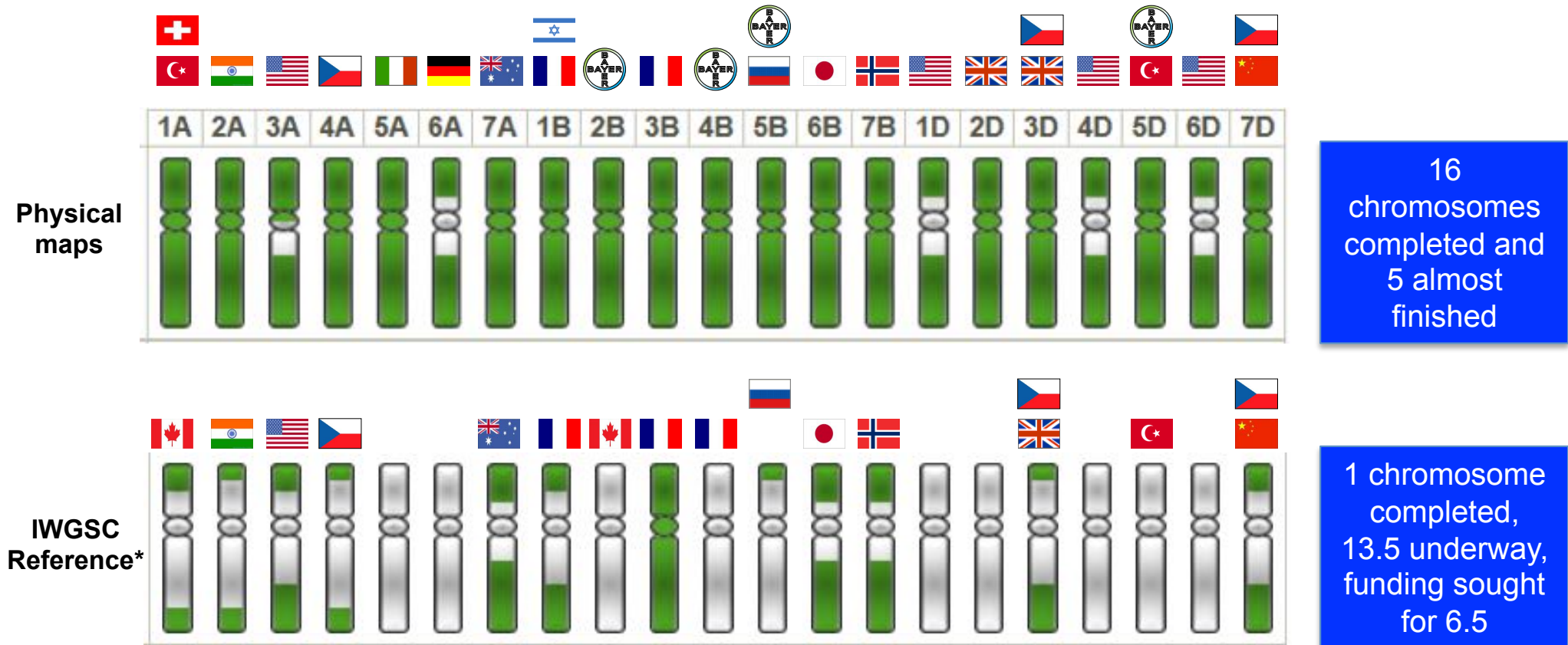




# IWGSC Results: *Science*, July 2014



# Progress towards completion of Bread Wheat Projects

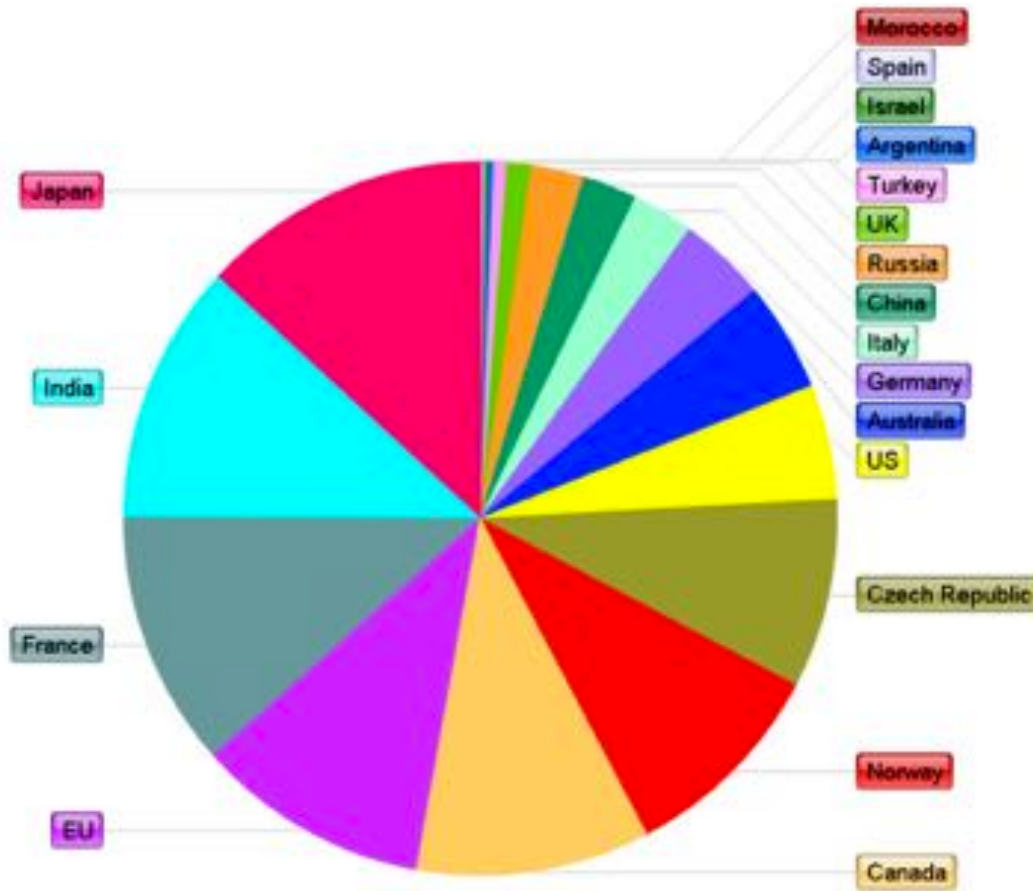


\*Flags represent countries where work is underway with funding, as of August 2015

Still needed : €11.5 million to complete the entire project



# Project Funding Sources



Funding provided so far for IWGSC projects to generate physical maps, survey sequences and BAC-based reference sequences for bread wheat

Total: €50 million

→ 98% public funding  
→ 2% private partners

Still needed : €11.5 million to complete the entire project





# IWGSC Resources

- All resources accessible at URGI, Versailles  
<http://wheat-urgi.versailles.inra.fr/Seq-Repository/>
- IWGSC CSS Raw sequence reads in the SRA
- IWGSC CSS assemblies available at URGI and EBI
- IWGSC CSS assemblies & gene models integrated into EnsemblPlants

[http://plants.ensembl.org/Triticum\\_aestivum](http://plants.ensembl.org/Triticum_aestivum)



# Latest news and more: the IWGSC website

[www.wheatgenome.org](http://www.wheatgenome.org)

- Project outlines & updates
- Tools & resources
- Next meetings & workshops
- Community news
- IWGSC Publications
- Key individuals
- Awards
- Presentations
- Press releases
- Fact sheets & Infographics

**International Wheat Genome Sequencing Consortium**  
Generating a high quality genome sequence of bread wheat

About News IWGSC Activities People Meetings and Workshops Projects Tools and Resources

### LEADER SPOTLIGHT

 Hikmet Budak is a Professor in the Molecular Biology, Genetics and Bioengineering Program at Sabanci University, Turkey, where he leads the Plant Genetics and Genomics team. He also serves as an adjunct Professor at the University of Nebraska-Lincoln, USA. His major research foci include biotic and abiotic stress responses in cereals, and the components of stress tolerance mechanisms, including post-transcriptional regulators, such as microRNAs.  
[Read his profile and interview](#)

### SCIENCE SPECIAL ISSUE

 On 15 July 2014, the IWGSC published in the international journal *Science* a draft sequence of the bread wheat genome. The chromosome-based draft provides new insight into the structure, organization, and evolution of the large, complex genome of the world's most widely grown cereal crop.

### IWGSC NEWS

- [Sequencing steps](#) Pictures of the different sequencing steps, courtesy of Helene Berges at INRA-CNRGV
- [The Bread Wheat Genome](#) The bread wheat genome is both extremely large and complex. It is more than five times larger than the human genome and comprises 21 chromosomes originating from three individual subgenomes with highly similar gene contents. To circumvent this co...
- [PAG 2016 First Announcement](#) The IWGSC will hold two workshops and a business meeting at the Plant and Animal Genome Conference XXIV, 9-13 January 2016, San Diego, CA, USA
- [6B physical map published](#) Publication of the 6B physical map by a team led by IWGSC Coordinating Committee member Hirokazu Handa (National Institute of Agrobiological Sciences, Japan)
- [Wheat Initiative publishes its Strategic Research Agenda](#) The Wheat Initiative presented today its Strategic Research Agenda (SRA) in occasion of the fourth Meeting of the G20 Agricultural Chief Scientists (MACS). The SRA contributes towards the global food security challenge by identifying

### FACT SHEETS

**THE BREAD WHEAT GENOME**



### PROJECTS PROGRESS OVERVIEW

	1A	2A	3A	4A	5A	6A	7A	1B	2B	3B	4B	5B	6B	7B	1D	2D	3D	4D	5D	6D	7D
Phys. Map	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Survey Seq.	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Ref. Seq.	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█

### PUBLICATIONS

**International Innovation magazine - July 2015**

 The July issue of International Innovation magazine features an interview with Kellye Eversole and an article on the IWGSC achievements.  
[Read the articles \(PDF\)](#)

### PRESS RELEASES





# News from the IWGSC

## Press releases

Three press release thumbnails are displayed. The top one is titled "Wheat genome sequencing on track" from Bethesda, Maryland, USA, dated January 6, 2015, featuring logos for the International Wheat Genome Sequencing Consortium and KeyGene. The middle one is titled "New momentum for wheat genome project Sequencing of wheat chromosome 4B to begin" from Bethesda, Maryland, USA, dated 16 June 2015, featuring the IWGSC logo and a "WHEAT" graphic. The bottom one is titled "SEQUENCING OF WHEAT CHROMOSOME 5D UNDERWAY IN TURKEY" from Bethesda, Maryland, USA, dated 30 June 2015, featuring the IWGSC logo and a "WHEAT INITIATIVE" graphic.

[Home / News / Press releases](#)

## Articles

Two article thumbnails are displayed. The left one is titled "WHEAT GENOM SEQUENCING CATCHING UP" with the subtext "More financing needed so the genome of bread wheat can be sequenced." The right one is titled "Reap the genome harvest" with the subtext "Katie Eversole provides an insight into her work at the helm of a large-scale, international consortium whose aim is to advance agricultural genomics by sequencing the bread wheat genome." Both articles feature images of wheat plants and the IWGSC logo.

[Home / IWGSC Activities / Publications](#)

## Presentations

Two presentation thumbnails are displayed. The top one is titled "A high quality chromosome-based reference sequence for hexaploid bread wheat" and is a "Wheat Initiative Associated Programme update" by Jane Rogers, Deputy Director, IWGSC. The bottom one is titled "Moving Wheat to the Cutting edge of Innovation IWGSC and BreedWheat" by Grégoire Y BERTHE, ISF Field Crop Section, dated 27 May 2015. Both presentations feature the IWGSC logo.

[Home / IWGSC Activities / Presentations](#)

## Newsletter

*Emailed to members  
Three times a year*

A thumbnail of the IWGSC Newsletter, N° 2/2015, dated May to August 2015. It features the IWGSC logo and the text: "Published three times a year, the IWGSC newsletter keeps you abreast of the latest news and activities of the IWGSC."



[www.wheatgenome.org](http://www.wheatgenome.org)

# Recognizing key individuals in wheat research

→ [www.wheatgenome.org/People](http://www.wheatgenome.org/People)

## Leader spotlight

[Home](#) / [People](#) / [Leader Spotlight](#)



Next Leader Spotlight: Hana Šimková

## Awards

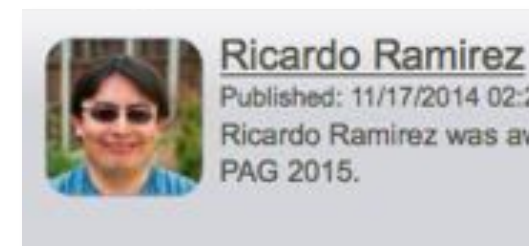
### → Leadership award

[Home](#) / [People](#) / [Leadership Award](#)



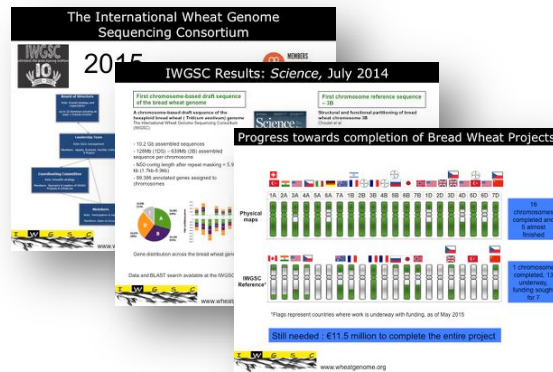
### → Early Career Award

[Home](#) / [People](#) / [Early Career Award](#)



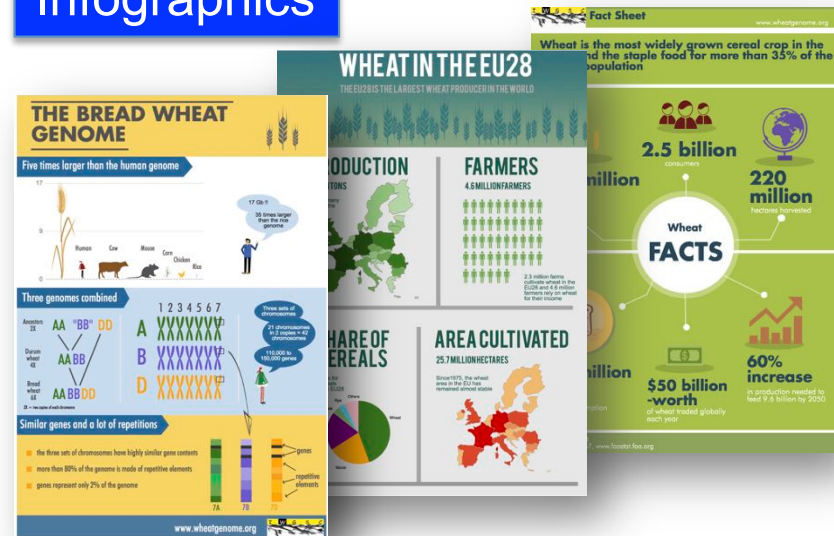
# Resources for members

Slides



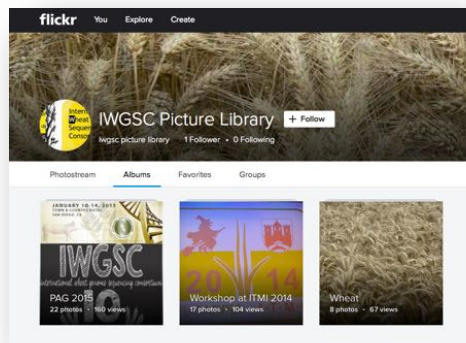
[Home / IWGSC Activities / Presentations / Resource for members: slides](#)

Infographics



[Home / News / Media resources / Fact Sheets & Infographics](#)

Image library



[Home / News / Media resources / Image library](#)

Workshops

Next Workshop

**PAG 2016 First Announcement**

Published: 09/09/2015 11:44 am

The IWGSC will hold two workshops and a business meeting at the [Plant and Animal Genome Conference XXIV](#), 9-13 January 2016, San Diego, CA, USA.

[Home / Meetings and Workshops / Next workshop](#)



[www.wheatgenome.org](http://www.wheatgenome.org)

# Next workshop: PAG 2016

→ [www.wheatgenome.org/Meetings-and-Workshops](http://www.wheatgenome.org/Meetings-and-Workshops)



- Scientific Workshop

- Saturday 9 January 2016, 8:00 am
- organized by Catherine Feuillet and Kellye Eversole
- abstracts are now being accepted
- nomination of early career awardee now open
- [deadline for submissions 25 September](#)

- Standard & Protocols Workshop

- Tuesday 13 January, 1:30 pm
- Organized by Jane Rogers and Frédéric Choulet



# IWGSC Sponsors







[www.wheatgenome.org](http://www.wheatgenome.org)



[twitter.com/wheatgenome](https://twitter.com/wheatgenome)



[www.facebook.com/wheat.genome](https://www.facebook.com/wheat.genome)

## Contacts

Kellye Eversole  
Executive Director  
[eversole@eversoleassociates.com](mailto:eversole@eversoleassociates.com)

Isabelle Caugant  
Communications Officer  
[communications@wheatgenome.org](mailto:communications@wheatgenome.org)