

International Conference on Heterosis in Plants

University of Hohenheim, Stuttgart, Germany

September 7 - 9, 2009

07.09.09 Euroforum, Kirchnerstr. 3; Conference office opens at 7:30

Opening

9:00 **Liebig, Hans-Peter**; Rector of the University of Hohenheim, Stuttgart, Germany
Melchinger, Albrecht E.; Conference Chair; University of Hohenheim, Stuttgart, Germany
Weber, Gerd; Research priority program on 'Biotechnology and Plant Breeding'; University of Hohenheim, Stuttgart, Germany

Session 1: *Exploring genetic hypotheses of heterosis; chair: Alain Charcosset*

9:20 **Zamir, Dani**; Hebrew University of Jerusalem, Rehovot, Israel:
Genes that drive heterosis

9:50 **Birchler, James**; University of Missouri, Columbia, USA:
Studies on heterosis in maize

10:20 – 10:50 Coffee Break

10:50 **Rafalski, Antoni**; DuPont, Willmington, USA:
Copy number variation in the maize genome and heterosis

11:20 **Abel, Stefan**; Limagrain GmbH, Rosenthal, Germany:
The effect of fixed heterosis in allopolyploid plants and implications for rape seed hybrid breeding

11:40 **Becker, Heiko C.**; University of Göttingen, Göttingen, Germany:
Analysing fixed heterosis by comparative mapping of QTL for early biomass in *Brassica napus*, *B. rapa* and *B. oleracea*

12:00 **Geiger, Hartwig H.**, University of Hohenheim, Stuttgart, Germany:
Does "marginal overdominance" contribute to heterosis in maize? First inferences based on transcript abundancy and enzyme activity studies

12:20 – 14:00 Lunch break and poster viewing

Session 2: *Quantitative genetic analysis of heterosis in maize; chair: Qifa Zhang*

14:00 **Melchinger, Albrecht E.**; University of Hohenheim, Stuttgart, Germany:
Quantitative genetic models and experimental designs for heterosis research

14:30 **Jiansheng, Li**; China Agricultural University, Beijing, China:
Dissection of the genetic basis of heterosis in an elite maize hybrid by analyzing an immortalized F₂ population with molecular markers

14:50 **Schön, Chris-Carolin**; TU München, Freising, Germany:
High congruency of QTL positions for heterosis of grain yield in three crosses of maize

15:20 **Frascaroli, Elisabetta**; University of Bologna, Bologna, Italy:
Heterosis in maize: from QTL analysis to development and evaluation of near isogenic lines for heterotic QTL

15:40 – 16:10 Coffee break

Session 3:	<i>Quantitative genetic analysis of heterosis in other species; chair: Mei Guo</i>
16:10	Zeng, Zhao-Bang; North Carolina State University, Raleigh, USA: QTL mapping and genetic basis of heterosis in maize and rice
16:40	Zhang, Qifa; Huazhong Agricultural University, Wuhan, China: Genetic and molecular bases of heterosis in rice
17:10	Sun, Qixin; China Agricultural University, Beijing, China: Genetic and molecular bases of heterosis in wheat (<i>Triticum aestivum</i> L.)
17:40	Ecke, Wolfgang; University of Göttingen, Göttingen, Germany: Mapping of QTL for heterosis in rapeseed (<i>B. napus</i> L.)
18:15	Reception at the castle of Hohenheim Welcome address by Albrecht E. Melchinger, University of Hohenheim, Stuttgart, and Patricia Schmitz-Möller, DFG, Bonn, Germany
19:00	Group photo
19:30	Dinner at Mensa

08.09.09 Euroforum

Session 4:	<i>New tools in heterosis research; chair: Thomas Altmann</i>
9:00	Schnable, Patrick S.; Iowa State University, Ames, USA: Heterosis in maize: new tools, complexities and insights
9:30	Guo, Mei; Pioneer Hi-Bred, Johnston, USA: The maize cell number regulator genes: implications for plant and organ size control, crop yield enhancement and heterosis
10:00	Mette, Michael Florian; IPK Gatersleben, Gatersleben, Germany: Relationship between intraspecies hybridisation and DNA/histone modifications in <i>Arabidopsis thaliana</i> L.
10:20	van Eeuwijk, Fred; Wageningen UR, Wageningen, The Netherlands: Detection of dominance at the QTL level in hybrid breeding programs
10:40 – 11:10	Coffee break
Session 5:	<i>Plant physiology and heterosis; chair: Günter Strittmatter</i>
11:10	Altmann, Thomas; IPK Gatersleben, Gatersleben, Germany: Molecular and genetic analysis of biomass-heterosis in <i>Arabidopsis thaliana</i>
11:40	Hochholdinger, Frank; University of Tübingen, Tübingen, Germany: Molecular dissection of heterosis manifestation in maize roots
12:00	Scholten, Stefan; University of Hamburg, Hamburg, Germany: Heterosis and associated gene expression patterns in early embryo and endosperm development
12:20	Weber, Hans; IPK Gatersleben, Gatersleben, Germany: Molecular physiology and genetics of seed heterosis in the model "<i>Vicia faba</i> L."
12:40 – 14:20	Lunch break and poster viewing

Session 6:	<i>From structure to function; chair: Roberto Tuberosa</i>
14:20	Springer, Nathan; University of Minnesota, St. Paul, USA: Potential implications for genome and transcriptome content variation on heterosis in maize
14:50	Piepho, Hans-Peter; University of Hohenheim, Stuttgart, Germany: The use of geostatistical methods in the analysis of cDNA microarrays for heterosis research
15:10	Snowdon, Rod; University of Gießen, Gießen, Germany: Comparative mapping of QTL and eQTL related to seedling and yield heterosis in oilseed rape
15:30 -16:00	Coffee break
16:00	Willmitzer, Lothar; MPI Golm, Potsdam, Germany: Metabolomics in heterosis research
16:30	Gierl, Alfons; TU München, Freising, Germany: Metabolic phenotype of heterosis in maize
16:50	Andorf, Sandra; FBN Dummerstorf, Dummerstorf, Germany: Molecular network structures in heterozygotes: A systems-biology approach to heterosis
17:10	de Vienne, Dominique; INRA, Gif-sur-Yvette, France: Systemic properties of metabolic networks lead to an epistasis-based model for heterosis
18:00	Departure from Hohenheim to Bad Cannstatt
19:00	Kurhaus Bad Cannstatt: Conference Dinner
22:15	Departure back to Hohenheim

09.09.09 Euroforum

Session 7:	<i>Prediction of heterosis and hybrid performance; chair: Albrecht E. Melchinger</i>
9:00	Maenhout, Steven; University College Ghent, Gent, Belgium: Hybrid prediction through machine learning on commercial maize breeding data
9:30	Schrag, Tobias; University of Hohenheim, Stuttgart, Germany: Prediction of heterosis and hybrid performance in maize by marker-based approaches
9:50	Frisch, Matthias; University of Gießen, Gießen, Germany: Transcriptome-based prediction of heterosis in experimental hybrids of maize
10:10	Gärtner, Tanja; University of Potsdam, Potsdam, Germany: Improved heterosis prediction in Arabidopsis by combining information on DNA-markers and metabolites
10:30 – 11:00	Coffee break

Session 8:	<i>Establishing and broadening the genetic basis of heterotic groups; chair: Chris-Carolin Schön</i>
11:00	Graham, Geoff; Pioneer, Johnston, USA: Exploitation of heterosis for 80 years in a commercial hybrid breeding program of maize
11:30	Meng, Jinling; Huazhong Agricultural University, Wuhan, China: Broadening the avenue of intersubgenomic heterosis for oilseed Brassica
12:00	Reif, Jochen C.; University of Hohenheim, Stuttgart, Germany: Broadening the Central European heterotic groups in rye
12:20	Knapp, Steven; University of Georgia, Athens, USA: Mining allelic diversity for heterotic traits in desert-adapted native American landraces and wild species in sunflower
12:50	Closing remarks
13:00	Lunch
14:30 – 17:00	Post congress tours: 1: Gardens of the University of Hohenheim 2: German Museum of Agriculture 3: Experimental Research Station of Plant Breeding, University of Hohenheim, (Maize and Sunflower) Conference venue: EUROFORUM, Kirchnerstr. 3, University of Hohenheim, 70599 Stuttgart- Hohenheim Conference telefon: +49 711 459-23388 (connected from Monday 07.09.2009, 07:00 to Wednesday 09.09.09 15:00) Conference dinner on September, 8 in Bad Cannstatt Kurpark: Kleiner Kursaal, Königsplatz 1, 70372 Stuttgart Tel: 0711 – 559 52 52 www.kursaal-stuttgart.de