COST Action CA18111 "Genome Editing in Plants"

Book of Abstracts

3rd PlantEd conference

5 – 7 September 2022
Düsseldorf, Germany

Sponsoring:

Logistics note

LOCAL ORGANIZERS

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Conference Program

3rd PlantEd conference

Dusseldorf, Germany – September 5-7, 2022

Monday September 5, 2022

Session Chair – Dennis Eriksson – Lecture Hall 6L

	09:00-09:15	Welcome **Local Organizer Götz Hensel**; HHU Dusseldorf/Germany
		Welcome **Dean Faculty of Mathematics and Natural Sciences Peter Kleinebudde**; HHU Dusseldorf/Germany
		Welcome **COST Action Chair Dennis Eriksson**
	09:15-09:40	**Keynote Andreas PM Weber**; HHU Dusseldorf/Germany *Tackling grand challenges with plant sciences*
What do we know? – Technological advances	09:40-10:20	**Keynote Jens Boch**; Hannover/Germany *TALEs, TALEN and TALE-base editors - tools, techniques and applications*
	10:20-10:50	**Coffee break – Botanical Garden**
	10:50-11:10	**Ian Godwin**; QAAFI Centre for Crop Science/Australia *Editing the way to resilient high-value cereals*
	11:10-11:30	**Uriel Urquiza-Garcia**, HHU Dusseldorf/Germany *Biodesign automation for optimal assembly of polycistronic sgRNAs and crRNAs*
	11:30-11:50	**Sruthy Maria Augustine**; Department of Plant Breeding, Giessen/Germany *Genome editing for crop improvement*
	11:50-12:10	**Sadiye Hayta**; John Innes Centre, Norwich/UK *Genotype Independent Wheat Transformation with GRF–GIF Protein Fusion*
	12:10-12:30	**José Hernandes-Lopes**; Universidade Estadual de Campinas/Brazil *Unlocking the genome editing potential for maize breeding in the tropics*
	12:30-13:30	**Lunch – Botanical Garden**
	13:30-13:50	**Jan Schaart**; Wageningen University and Research, Wageningen/The Netherlands *Which Cas-enzymes work best for induction of targeted mutations?*
	13:50-14:10	**Virginia Zahn**; Thünen Institute of Forest Genetics, Grosshansdorf/Germany *Combining bacterial and viral elements for efficient gene targeting in poplar*
	14:10-14:30	**Mark Smedley**; John Innes Centre, Norwich/UK *Deploying CRISPR-Cas tools to design targeted mutagenesis in wheat*
	14:30-14:50	**Evelien Waegneer**; Institute of Agriculture, Fisheries and Food Research, Melle/Belgium *CRISPR and natural variation: complementary approaches for Cichorium haploid induction*
	14:50-15:10	***Jillis Grubben***; Wageningen University and Research, Wageningen/The Netherlands *Inducing kilobase to mega base-sized inversions in tomato using CRISPR/Cas9: The larger, the rarer?*
	15:10-15:30	**Teodoro Cardi**; National Research Council, Institute of Biosciences and Bioresources, Portici/Italy *Modification of potato mitochondrial DNA through mito-TALEN and targeted base editing*
	15:30-16:00	**Coffee break – Botanical Garden**
	16:00-18:00	PlantEd Working Group meetings (WG1-WG5)
	18:30-22:00	**Social dinner – Botanical Garden**

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Tuesday September 6, 2022

Session Chair – Katrijn Van Laere – Lecture Hall 6L

What can we do? Applications of Genome Editing

09:00-09:40	**Keynote Rene Smulders**; Wageningen University & Research, Plant Breeding, Wageningen/The Netherlands *Applications of new genomic techniques in plant breeding*
09:40-10:20	**Keynote Matin Qaim**; Center for Development Research (ZEF), Bonn/Germany *Possible socioeconomic implications of plant genome editing*
10:20-10:50	**Coffee break – Botanical Garden**
10:50-11:10	**Cintia Marchetti**; Czech Advanced Technology and Research Institute (CATRIN), Palacký University, Olomouc, Czechia *Using CRISPR-Cas9 to study and modify root system architecture in barley (Hordeum vulgare L.)*
11:10-11:30	**Angelo Santino**; Institute of Sciences of Food Production, Lecce/Italy *CRISPR/Cas9 mediated genome editing to develop Vitamin D-biofortified tomatoes*
11:30-11:50	**Per Hofvander**; Swedish University of Agricultural Sciences, Plant Breeding, Alnarp/Sweden *Trait development for unique starch quality in potato by multiallelic, multigene CRISPR-Cas9 mutagenesis*
11:50-12:10	**Musa Kavas**; Ondokuz Mayıs University, Samsun/Turkiye *Application of genom-editing in tomato*
12:10-12:30	**Mahdi Morad Pour**; Tallinn University of Technology, Tallinn/Estonia *DNA-Free Transcriptional Activation of Heat Stress-Responsive Genes in Red Cabbage using CRISPR/dCas9 Ribonucleoprotein Activators to Enhance Heat Tolerance*
12:30-13:30	**Lunch – Botanical Garden**
13:30-13:50	**Alexander Fendel**; Thünen Institute of Forest Genetics, Grosshansdorf/Germany *Improvement of drought stress tolerance in poplars (Populus) by modification of candidate genes*
13:50-14:10	**Jeny Jose**; Centre for Agricultural Research, Martonvásár/Hungary *Harnessing S-gene candidates for conferring resistance against Ralstonia solanacearum in potato*
14:10-14:30	**Loredana Moffa**; Research Centre for Viticulture and Enology, Conegliano/Italy *New Plant Breeding Techniques to enhance grapevine sustainability*
14:30-14:50	**Kyoka Kuroiwa**; INRAE Avignon, Avignon/France *An iterative gene editing strategy broadens eIF4E1 genetic diversity in Solanum lycopersicum, triggering resistance to several potyvirus isolates*
14:50-15:10	**Allah Bakhsh**; Centre of Excellence in Molecular Biology, Lahore/Pakistan *Addressing cold induced sweetening of potato through knock out of vacuolar invertase gene*
15:10-15:40	**Coffee break – Botanical Garden**
15:40-16:25	**Keynote Thomas Jacobs**; VIB, University of Gent, Center for Plant Systems Biology, Gent/Belgium *Systematic optimization and development of plant genome editing techniques*
16:30-18:15	MC meeting

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Wednesday September 7, 2022

Session Chair – Götz Hensel – Lecture Hall 6L

What do we think? – GE perception	09:00-09:45	**Keynote Gabi Waldhof**; Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle/Germany *A Message of Hope? – Mitigating Polarization of Moral Debates about Genetic Engineering*
	09:40-10:30	**Keynote Ewa Woźniak-Gientka**; Institute of Bioorganic Chemistry, Polish Academy of Sciences, Poznan/Poland *Public perception of plant gene technologies worldwide in the light of food security*
	10:30-10:50	**Ayrton André Rosado Huaynasi**; KU Leuven, Leuven/Belgium *Interpreting Precision Breeding: Key legal concepts under international law and current domestic regulatory approaches*
	10:50-11:15	**Coffee break – Botanical Garden**
	11:15-11:45	**Ruth Fisher**; F1000 *Open Research Europe, the European Commission's Diamond open access publishing platform*

Session Chair – Vladislava Galovic – Lecture Hall 6L

STSM Session	11:45-12:00	**Aurelia Scarano**; CNR, Institute of Science of Food Production, Lecce/Italy *CRISPR/Cas9-mediated genome editing for Vitamin D biofortification in Solanaceous species*
	12:00-12:15	**Pouneh Pouramini**; University of Osnabrueck, Osnabrueck/Germany *Increased recombinant protein accumulation by targeted mutagenesis of HorB1 using CRISPR/Cas technology*
	12:15-12:30	**Tetiana Kyrpa**; Institute of Cell Biology and Genetic Engineering of NASU, Kyiv/Ukraine *Potato gene editing for improved pathogen resistance*
	12:30-12:45	**Alessia Cuccurullo**; Italy *Characterization of root architecture and of interactions with AM fungi of tomato edited lines for the strigolactone biosynthesis*
	12:45-13:00	**Poster prizes**
	13:00-14:00	**Lunch – Botanical Garden**

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Abstracts

Poster 14

Ana Marjanović Jeromela[1], Dušica Jovičić[1], Ankica Kondić Špika[1], Dragana Rajković[1], Milka Vujaković[2], Aleksandra Radanović[1], Dragana Miladinović[1]

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Potentials for Salt Tolerance Improvement in Rapeseed

Salt stress affects all phases of rapeseed growth and development, but seed germination and seedling growth are the most sensitive. In our previous studies, we have evaluated effect of salt stress on the germination process of rapeseed in controlled laboratory conditions. We tested eight rapeseed cultivars *Banaćanka, Jasna, Kata, Zorica, Slavica, Anna, Ilia* and *Zlatna* under salt stress (100, 150, 200 and 250 mmol/L NaCl). All tested cultivars had a certain level of tolerance to low NaCl treatments, while at higher concentrations significant damage was observed, which was reflected in the reduction of growth and the appearance of necrosis. *Banaćanka* and *Zorica* had the highest germination values in all salt stress levels, while *Jasna* and *Zlatna* varieties had the highest germination reduction. Between the tested genotypes, obvious differences were observed when analyzing the activity of antioxidant enzymes superoxide dismutase and guaiacol peroxidase (SOD, GPx), the amount of non - enzymatic antioxidants reduced glutathione (GSH) and the intensity of lipid peroxidation (LP), both in seedlings shoot and in the root. Induction of SOD activity by different concentrations of NaCl was observed in all examined cultivars. Tolerant varieties showed increased activity of antioxidant enzymes and in regard to this, higher SOD activity was found in cultivars *Jasna* and *Kata*. In all examined cultivars, there was a gradual increase in the intensity of LP with a higher concentration of NaCl. Cultivar *Banaćanka* showed the highest (237.21%) increase at the highest salt stress level, while *Kata* showed the lowest (147.73%), compared to the control.

So far, over 500 drought and/or high-salinity stress-inducible genes were identified in *B. napus* by using different approaches. Some of the rapeseed genotypes, which have been identified in our study as potential sources of salt and other abiotic stresses tolerance (*Banaćanka, Anna, Zorica*) are selected for further study of the role of stress-inducible genes and the detection of the most effective genes that would be of interest for targeted genome editing in order to improve salt and drought tolerance of commercial rapeseed varieties.

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