



# Hybrids

# Chances and Challenges of New Genomic Combinations

# Institute of Plant Science and Microbiology

## **University of Hamburg**

### 12.-14.06.2019

# **Preliminary Programme**

www.biologie.uni-hamburg.de/hybridsymposium



The Hybrid-Symposium was funded by:



Landesforschungsförderung Hamburg "Hybride – Chancen und Herausforderungen neuer genomischer Kombinationen"

#### **ABOUT THE CONFERENCE**

Hybrids, crosses between species, are much more common in nature than was assumed only some decades ago. Apparently they play a decisive, yet so far little investigated role in evolution. In addition, hybrids often are invasive species and pose challenges for many ecosystems. In times of global climate change and the resulting shift of habitats we can expect an increase in hybridization events.

Recent studies show that hybridization is omnipresent in nature and that hybrids are often fertile. Thus, it seems that all forest ants that have emerged in the last two million years seem to be able to cross fertile. At present it is assumed that more than 25 percent of all plant species and more than 10 percent of all animal species hybridize naturally.

Nevertheless, hybridization between individuals of different species is still considered a marginal phenomenon and is a little addressed topic in biology. This is partly due to the fact that it is often not known what the distribution rate of hybrids is and which parents form the basis of hybridization. Hybridization and the associated introgression of new alleles or even genes into existing populations by crossing hybrids with individuals of parental populations play an important role in evolution. First estimates suggest that introgressions cause ten times the rate of genome alteration per base pair compared to point mutations. However, we are still a long way from understanding the extent and significance of hybridization in the evolutionary context.

Therefore, we cordially invite you to this conference and look forward to outstanding presentations and lively discussions that will contribute to a better understanding of hybridizations and their significance in evolution.

Susanne Dobler

Arp Schnittger

#### **ORGANISING COMMITTEE**

#### Coordinators from the Universität Hamburg (UHH) Department of Biology

Prof. Dr. Susanne Dobler Molecular Evolutionary Biology

Prof. Dr. Arp Schnittger Developmental Biology

Dr. Susanne Stirn Developmental Biology

#### The Hybrid-Consortium in Hamburg

Molecular Biology and Immunology Prof. Dr. Thorsten Burmester, UHH, Molecular Animal Physiology Jun. Prof. Dr. Mathilde Cordellier, UHH, Molecular Evolutionary Biology Prof. Dr. Kathrin Dausmann, UHH, Functional Ecology Prof. Dr. Susanne Dobler, UHH, Molecular Evolutionary Biology Prof. Dr. Jörg Fromm, UHH, Wood Biology Prof. Dr. Jörg Ganzhorn, UHH, Animal Ecology and Conservation Prof. Dr. Dieter Hanelt, UHH, Aquatic Ecophysiology and Phycology Prof. Dr. Bernhard Hausdorf, UHH, Central of Natural History Prof. Dr. Stefan Hoth, UHH, Molecular Plant Physiology Prof. Dr. Daniela Jacobs, Helmholtz-Centre Geesthacht, Climate Service Centre Prof. Dr. Kai Jensen, UHH, Applied Plant Ecology Prof. Dr. Julia Kehr, UHH, Molecular Plant Genetics Prof. Dr. Myron Peck, UHH, Centre for Earth System Research and Sustainability Prof. Dr. Sigrun Reumann, UHH, Plant Biochemistry and Infection Biology Prof. Dr. Jutta Schneider, UHH, Behavioural Biology

PD Dr. Minka Breloer, Bernhard-Nocht-Institute of Tropical Medicine,

Prof. Dr. Arp Schnittger, UHH, Developmental Biology

#### THE VENUE

The Hybrid-Symposium will be held at the Institute of Plant Science and Microbiology of the Universität Hamburg.

#### How to get there:

By train:

From the central station or the train station Altona, take the S1 (green line, direction Blankenese/Wedel) or the S11 (green line, direction Blankenese) to the stop Klein Flottbek (Botanischer Garten) (approx. 10 minutes).

By car:

Coming from north or south: A7 exit Bahrenfeld, then to the west on Osdorfer Weg/B431, after 2.4 km turn left into Heinrich-Plett-Straße, after 1.5 km turn right into Ohnhorststraße

#### By plane:

From the airport, take the S1 direction Blankenese/Wedel to the stop Klein Flottbek (Botanischer Garten) (approx. 50 minutes)

Institute of Plant Science and Microbiology, Ohnhorststr. 18, 22609 Hamburg:



Foto: UHH/Kober

#### For your orientation:



The location of the institute directly at the S-Bahn station Klein Flottbek

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The surroundings of the Institute of Plant Science and Microbiology

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CAP SAN DIEGO

The conference dinner on Friday night will be on board of the "Cap San Diego", a maritime monument that now anchors at the Überseebrücke quay in Hamburg. The Cap San Diego, built in 1961, is a unique testimony to seafaring. She is the last of the classic cargo ships, referred to as the "White Swan of the South Atlantic." Since 1986 she is moored in her old home harbour as a »museum you can touch«. We will enjoy a BBQ Sea Food Buffet inclusive all drinks on the pool deck of the "Cap San Diego". We promise an unforgettable evening in this unique location.

Don 't miss it!

#### How to get there:

After the farewell address, we will take the S-Bahn together to "Landungsbrücken", which are also served by the S1 line in the direction of Hauptbahnhof (main station). From there it is a 5 minutes' walk along the flood protection boulevard to the "Überseebrücke" and the Cap San Diego.

After dinner there will be no problems returning to the hotel or home since the S-Bahn runs all night long!

#### Attention:

Don't forget to bring some warm clothes, as the evening on board can get chilly!



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Copyright Cap San Diego

#### ACCOMODATION

The Institute of Plant Science and Microbiology is located in the west of Hamburg. In the vicinity of the institute there is only one hotel:

Hotel Schmidt Reventlowstraße 60, 22605 Hamburg T +49 (0)40-88 90 70 reservierung@hotel-schmidt.de Prices: Sunday to Thursday: single room from 92 € / double room from 122 € Friday to Sunday: single room from 102 € / double room from 142 €

Alternatively, there are several hotels in located in Altona, which is only 8 minutes with the S 1/S11:

Hotel Stephan Schmarjestraße 31, 22767 Hamburg T +49 (0)40-3895108 www.hotel-stephan.de From 75 €

Hotel-Hamburg-Altona Hahnenkamp 8, 22765 Hamburg T +49 (0)40-39908954 info@hotel-hamburg-altona.de From 50 €

Meininger Hotel, Hamburg City Center Goetheallee 11, 22765 Hamburg T +49 (0)40-28464388 ga@meininger-hotels.com From 40 €

#### PRELIMINARY PROGRAMME

Wednesday, June 12, 2019

16:00 - 17:15	Registration
17:15 – 17:30	Welcome Address Susanne Dobler & Arp Schnittger, Universität Hamburg
17:30 - 18:30	<b>Opening Lecture</b> Jim Mallet, Harvard University Hybridization and gene flow among Heliconius butterfly species and relevance for other taxa
18:30	Welcome Reception at the Institute

#### Thursday, June 13, 2019

Chair: Mathilde Cordellier, Molecular Evolutionary Biology, Universität Hamburg

09:00 – 09:25	<b>Nick Barton, Institute of Science and Technology, Austria</b> <i>The role of hybrid zones as barriers to gene flow</i>
09:25 – 09:50	<b>Mario Vallejo-Marin, University of Stirling</b> Hybridization and rapid speciation in invasive monkey flowers
09:50 – 10:15	<b>Kenneth Whitney, University of New Mexico</b> <i>Hybridization speeds adaptation: experimental evolution in</i> <i>sunflowers</i>
10:15 – 10:45	Coffee Break

Chair: Elisa Schaum, Institute of Marine Ecosystem and Fishery Science, Universität Hamburg

10:45 – 11:10	<b>Arne Nolte, University of Oldenburg</b> Changes in the genetic makeup of sex through admixture
11:10 – 11:25	<b>Ingo Schlupp, University of Oklahoma</b> Ecology and Evolution of a unisexual fish, the Amazon molly
11:25 – 11:40	<b>Anja Westram, Institute of Science and Technology, Austria</b> What can replicate hybrid zones tell us about adaptive divergence and speciation?

11:40 – 11:55	Jürgen Gadau, University of Münster The role of hybridization in genetic caste determination and the evolution of social parasitism in harvester ants of the genus Pogonomyrmex
11:55 – 13:30	Lunch Break
Chair: Sigrun Reumann, Plant Biochemistry and Infection Biology, Universität Hamburg	
13:30 – 13:55	Luca Comai, University of Davis Chromosome remodeling during hybridization
13:55 – 14:20	<b>Paul Grini, University of Oslo</b> Imprinting revisited: Genetic and phenotypic routes to post- zygotic hybrid barriers and bridges
14:20 – 14:45	<b>Arp Schnittger, Universität Hamburg</b> Regulation of the spindle check point as a gateway to polyploidization in plants
14:45– 16:45	Coffee Break & Poster Exhibition
Chair: Julia Kehr, Molecular Pl	ant Genetics, Universität Hamburg

16:45 – 17:10	Jeffrey Chen, University of Texas Evolution and Function of Polyploid and Hybrid Genomes
17:10 – 17:35	Richard Abbott, University of St. Andrews, UK
	Climate change, hybridization and consequences

#### Friday, June 14, 2019

Chair: Cynthia Tedore, Behavioral Biology, Universität Hamburg

09:00 - 09:25	Zachariah Gompert, Utah State University
	Connecting pattern to evolutionary process with a comparative analysis of ancient versus contemporary hybrid zones in Lycaeides butterflies
09:25 – 09:50	Simon Martin, Cambridge University
	Male killing in a butterfly hybrid zone: cause, consequence or coincidence?
09:50 – 10:15	Susanne Dobler, Universität Hamburg
	Genetic Conflicts over Sex Determination and Sexual Reproduction in Hybridogenetic Beetles

10:15 - 10:45 **Coffee Break** Chair: Stefan Hoth, Molecular Plant Physiology, Universität Hamburg **Eunyoung Chae, National University of Singapore** 10:45 - 11:10 Natural Variation in the Plant Immune System and its **Contribution to Hybrid Performances** 11:10 - 11:35 **Kirsten Bomblies, ETH Zürich** Adaptive alleles derived from hybridization among natural populations of Arabidopsis arenosa Wei Yuan, Max-Planck Institute for Developmental Biology 11:35 – 11:50 Do hybrids have magical properties? Susanne Edelmann, University of Hohenheim 11:50 - 12:05 The impact of DNA methylation on heterosis formation in a Brassica napus population 12:05 - 12:20 **Rike Stelkens, Stockholm University** *Recombining your way out of trouble: The genetic architecture* of hybrid fitness under environmental stress 12:20 - 14:00 Lunch Break Poster Exhibition & 14:00 - 16:00 **Coffee Break** 

Chair: Jutta Schneider, Behavioral Biology, Universität Hamburg

16:00 - 16:25	Gerald Heckel, University of Bern
	Host hybridization at the onset of pathogen speciation
16:25 – 16:50	Diethard Tautz, MPI for Evolutionary Biology
	Shared regions of phylogenetic discordance between subspecies and species suggest continued adaptive genetic exchanges after lineage splits
16:50 – 17:50	Closing Lecture
	Rosemary Grant, Princeton University
	The Causes and Evolutionary Consequences of Hybridization in Darwin's Finches
17:50 – 18:00	Farewell Address
19:00	Conference Dinner