Mechanisms of polyploidy-mediated postzygotic reproductive isolation

Fact Sheet

Project Information

Triploid Block

Grant agreement ID: 280496

Project closed

Start date
1 October 2011

End date
30 September 2016

Funded under
Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Total cost
€ 1 447 596,00

EU contribution
€ 1 447 596,00

Coordinated by
SVERIGES LANTBRUKSUNIVERSITET
Sweden

Objective

Polyploidization is a widespread phenomenon among plants and is considered a major speciation mechanism. Before becoming evolutionary successful, newly formed polyploids often have to overcome fertility bottlenecks, because mating with partners of lower ploidy causes incompatibilities in the endosperm leading to the

formation of mainly non-viable progeny. This reproductive barrier is called the triploid block. Nevertheless, the most frequent route to polyploid formation is probably through unreduced gametes, suggesting that the triploid block can be overcome. Recent work from our laboratory uncovered a genetic pathway leading to unreduced gamete formation at high frequency and revealed that the triploid block is mainly caused by malfunction of Polycomb group (PcG) proteins. PcG proteins are evolutionary conserved proteins, which assemble into multimeric complexes with chromatin-modifying enzymatic activity, implicating epigenetic regulatory mechanisms as an important element of speciation. Here, I propose to unravel the underlying molecular mechanism(s) of the triploid block by identifying the responsible genes causing endosperm failure upon deregulation and their mechanism of regulation in response to interploidy crosses. I also plan to investigate whether genes that contribute to the triploid block are as well responsible for establishing interspecies incompatibilities within the Arabidopsis genus. This project will combine genetics, genomics and epigenomics and will make extensive use of knowledge and tools that we have been established in my laboratory over the recent years, making it likely that the proposed objectives can be achieved. The results of this project will be of interest to a broad scientific community, including biologists with a strong interest in epigenetic mechanisms as well as ecologists interested to understand mechanisms of plant speciation.

Fields of science (EuroSciVoc)

natural sciences > biological sciences > biochemistry > biomolecules > **proteins**

social sciences > sociology > demography > **fertility**

natural sciences > biological sciences > genetics > **epigenetics**

Programme(s)

FP7-IDEAS-ERC - Specific programme: "Ideas" implementing the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007 to 2013)

Topic(s)

ERC-SG-LS3 - ERC Starting Grant - Cellular and Developmental Biology

Call for proposal

ERC-2011-StG_20101109
See other projects for this call

Funding Scheme

ERC-SG - ERC Starting Grant

Host institution

SVERIGES LANTBRUKSUNIVERSITET

EU contribution

€ 1 447 596,00

Total cost

No data

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750 07 Uppsala
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Region

Östra Sverige > Östra Mellansverige > Uppsala län

Activity type

Higher or Secondary Education Establishments

Principal investigator

Claudia Köhler (Prof.)

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Beneficiaries (1)

SVERIGES LANTBRUKSUNIVERSITET

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