Mechanisms of polyploidy-mediated postzygotic reproductive isolation

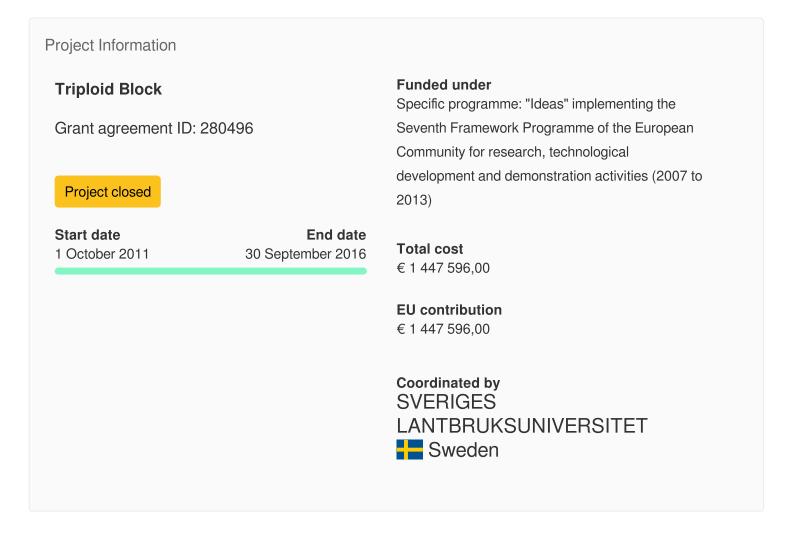


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# Mechanisms of polyploidy-mediated postzygotic reproductive isolation

## **Fact Sheet**



# **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) (3)

<u>natural sciences</u> > <u>biological sciences</u> > <u>biochemistry</u> > <u>biomolecules</u> > <u>proteins</u>

social sciences > sociology > demography > fertility

natural sciences > biological sciences > genetics > epigenetics



## Programme(s)

<u>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)</u>

## Topic(s)

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

# Call for proposal

# **Funding Scheme**

**ERC-SG - ERC Starting Grant** 

#### **Host institution**



#### **SVERIGES LANTBRUKSUNIVERSITET**

EU contribution

€ 1 447 596,00

Total cost

No data

Address

**ALMAS ALLE 8** 

750 07 Uppsala





Region

Östra Sverige > Östra Mellansverige > Uppsala län

Activity type

**Higher or Secondary Education Establishments** 

Principal investigator

Claudia Köhler (Prof.)

Links

Contact the organisation [2] Website 🛂 Participation in EU R&I programmes [2] HORIZON collaboration network

# **Beneficiaries (1)**



#### **SVERIGES LANTBRUKSUNIVERSITET**

Sweden

EU contribution

€ 1 447 596,00

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Participation in EU R&I programmes [2]

HORIZON collaboration network

Total cost

No data

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