

## Preliminary analysis of endogenous pectins and arabinogalactan proteins during ovule embryogenesis in sugar beet (*Beta vulgaris L.*)

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The production of haploid and doubled haploid plants (DH) is now recognized as the most convenient method to produce homozygous lines. As opposed to conventional inbreeding, which requires several cycles of self-pollination, in vitro cultures enables greatly time reduction during breeding process. Over the last decades, advances in sugar beet (*Beta vulgaris L.*) doubled haploid production have been achieved. Numerous endogenous and exogenous factors, which affect the embryo genic response of gametes in culture have been described and improved. But still, ovule embryogenesis efficiency in this species varies between 1 and 15%. The arabinogalactan proteins (AGP) and pectins have proved to play many important roles in the reproductive processes or differentiation and development of plant cells and tissues. As cell wall structural proteins, are one of the most widespread protein family in the plant kingdom. Based on this, we combine our own latest results describing the characterization of AGP and pectin extracts from unfertilized ovules from sugar beet genotypes of different embryogenic potential with the current achievements.

### Recent Publications

1. Pazuki A, Aflaki F, Gürel S, Ergül A, Gürel E (2018) Production of doubled haploids in sugar beet (*Beta vulgaris*): an efficient method by a multivariate experiment. *Plant Cell Tissue and Organ Culture* 132:85-97.
2. Leszczuk A, Koziol A, Szczuka E, Zdunek A (2019) Analysis of AGP contribution to the dynamic assembly and mechanical properties of cell wall during pollen tube growth. *Plant Science* 281:9-18.
3. Lin S, Huang L, Miao Y, Yu Y, Peng R, Cao J (2019) Constitutive overexpression of the classical arabinogalactan protein gene BcMF18 in *Arabidopsis* causes defects in pollen intine morphogenesis. *Plant Growth Regulation* 88:159-171.
4. Su S, Higashiyama T (2018) Arabinogalactan proteins and their sugar chains: functions in plant reproduction, research methods, and biosynthesis. *Plant Reproduction* 31:67-75.
5. Losada JM, Herrero M (2019) Arabinogalactan proteins mediate intercellular crosstalk in the ovule of apple flowers. *Plant Reproduction* <https://doi.org/10.1007/s00497-019-00370-z>.

### Biography

Sandra Cichorz is an adjunct at Plant Breeding and Acclimatization Institute – National Research Institute (PBAI-NRI), Poland, and head of Laboratory of Cytogenetics and Breeding Methods. Her current research focused on molecular, cytological and immunohistochemical analysis during the induction of gametic embryogenesis in sugar beet breeding lines. She is particularly interested in investigating the role of arabinogalactan proteins and pectins during embryo formation, with the aim of gaining better understand of the complex mechanisms that control gynogenesis for potential improvement of its efficiency.

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