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Arginine biosynthesis and utilization in maritime pine

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Vegetative propagation through somatic embryogenesis in combination with the cryopreservation of embryogenic lines is a major tool in conifer biotechnology. An important process during the maturation phase of embryogenesis is the biosynthesis and deposition of storage proteins. The accumulation of some abundant storage proteins in maturing cotyledonary somatic embryos (SE) is much lower than in mature zygotic embryos (ZE) showing an important influence of storage compounds on the quality of SE. Arginine constitutes a large portion of the amino acid pool in storage proteins of conifers and therefore arginine biosynthesis and utiization is a relevant metabolic pathway during pine embryogenesis and early growth.

Research in our laboratory is focused on maritime pine (*Pinus pinaster* Ait.), a broadly planted conifer species in France, Spain and Portugal where it is distributed over approximately 4 million hectares. This conifer species is also one of the most advanced model trees for genetic and phenotypic studies and a large number of molecular and transcriptomic resources are currently available.

With the aim to understand the molecular basis of the differential accumulation of storage proteins in SE and ZE, the arginine metabolic pathway has been studied in maritime pine, in collaboration with the French private institute FCBA. A general overview of this research programme will be presented and discussed. The knowledge acquired from our studies will help to refine biotechnological procedures for clonal propagation of conifers via somatic embryogenesis.

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