New molecules that promote *in vitro* plant regeneration through cell reprogramming towards plant embryogenesis or microcallus formation

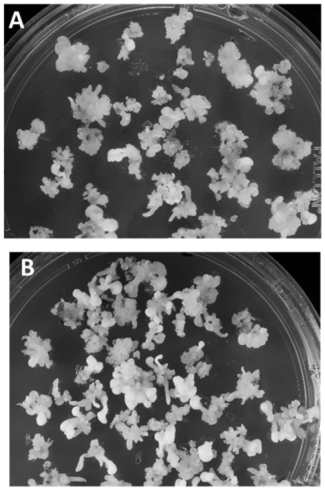
CSIC, the Albert-Ludwigs University of Freiburg and the ScreenSYS company have found several molecules and their protocols to promote in vitro plant cell reprogramming towards embryogenesis or microcallus formation, for further plant regeneration.

Industrial partners from companies for regeneration, propagation and selection of high quality/adapted plant material in agroforestry and industrial sectors are being sought to collaborate through a patent licence agreement.

An offer for Patent Licensing

A new technology to increase plant regeneration efficiencyis found

The increasing demand for global food security in the face of a warming climate and a growing population makes that agriculture in the 21st century faces significant pressure worldwide for more efficient and accelerated breeding to generate new crop varieties, with increasing yield and better adapted to adverse environmental conditions. In forestry, improvement programs search for trees better adapted to biotic and abiotic stress conditions. New gene editing and transformation techniques are able to improve agronomic traits in desired varieties, whilethese techniques require efficient plant regeneration methods after gene edition/transformation. *In vitro* plant embryogenesis and microcallus formation are systems that can be used in plant regeneration, wherein cell reprogramming and proliferation are crucial. Though the application of plant embryogenesis, either somatic or microspore embryogenesis, and microcallus formation are currently widely exploited, these processes are still highly, or even completely inefficient in many plant species of economic interest. The yield of these processes has several bottlenecks, being one of the major problems the low proportion of cells that are reprogrammed, but fortunately we have found a method to increase substantially this yield.



Effects of one of the molecules on somatic embryogenesis of Quercus suber.
(A) Untreated culture.
(B) Culture treated with the molecule.

Main innovations and advantages

- The molecules have been successfully applied in forest, crop and herbaceous plants, fostering plant cell reprogramming towards plant embryogenesis or microcallus formation which are widely used in breeding and agrobiotechnology for plant regeneration.
- The treatments with these molecules have been successfully applied in different *in vitro* protocols, in liquid and solid media.
- Application of these molecules in plant cultures induces a significant increase (more than 20% and even 40%) of embryogenesis induction rate in crop, forest and herbaceous species (somatic embryogenesis and microspore embryogenesis).

Patent Status

Priority European patent application filed.

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