

A method for the transformation of plant cells

Teagasc (with University College Dublin collaborators) is seeking partners within the ag-biotech industry to validate and commercialise a novel method of transforming plant cells for a range of plants and crops. This novel process should be of interest to companies working on genetic transformation of plant species for agronomic, nutraceutical and pharmaceutical purposes, while also allowing academic institutes/universities to acquire a novel transformation platform for gene discover studies.

Summary

A novel method of transforming plant and fungal cells has been recently developed in Teagasc, in collaboration with University College Dublin (UCD). It was proven that this technology produces stable transformants at a rate equivalent to current systems when applied to potato, tobacco and the model plant Arabidopsis. This process is of significant interest to companies working on the genetic transformation of plant species, as current procedures for the transformation of plant cells are heavily restricted by existing patents controlled by multinationals.

Problem Addressed

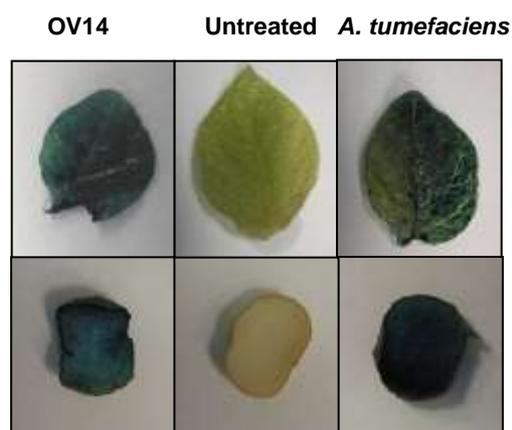
The primary technique for the generation of genetically modified (GM or 'biotech') crops utilises the bacteria *Agrobacterium tumefaciens* in a process termed *Agrobacterium tumefaciens*-mediated transformation (ATMT). ATMT is used worldwide by thousands of scientists in public-sector agencies and institutions, private industries (SMEs and international corporations) and universities. Yet, to the end-user of ATMT, adopting the technology for a specific task is problematic as the key patents for this technology have placed a stranglehold on transformation technology.

Solution

A novel bacterium (OV14) was identified that successfully transfers a gene(s) of interest into plant cells at rates equivalent to standard ATMT. By substituting OV14 for *Agrobacterium* in a standard ATMT transformation protocol, stable transgene integration and expression in the model species Arabidopsis and a number of crop species including potato and tobacco was confirmed, at rates equivalent to that achieved with ATMT. OV14 is genetically distinct from *Agrobacterium* and does not require challenging conditions or processes for its growth and the bacterium will willingly uptake plasmids of varying size.

Competitive Advantages

1. OV14 is genetically distinct from *Agrobacterium* (circumventing existing transformation patents).
2. OV14 does not require challenging conditions or processes for its growth and can be integrated into existing ATMT-based protocols with no additional optimisations required.



Comparative transformation of potato leaf (upper) and tuber (lower) tissues with OV14 and *A. tumefaciens* (GUS staining.)

Opportunity

Teagasc, as lead is seeking to partner with multiple companies for validation/optimisation for various crops and plants, with a view to licensing opportunities.

Patent details

Method of transforming cells, WO2011/076933

Funding/Principal Investigators

Dr Ewen Mullins, Teagasc, and Dr. Fiona Doohan, UCD

How to Proceed:

Contact: Dr. Miriam Walsh, Head of Intellectual Property, Teagasc TTO, miriam.walsh@teagasc.ie

