

DNA molecules in moss open door to new biotechnology

November 6 2009

Plasmids, which are DNA molecules capable of independent replication in cells, have played an important role in gene technology. Researchers from Uppsala University in Sweden have now demonstrated that plasmid-based methods, which had been limited to single-cell organisms such as bacteria and yeasts, can be extended to mosses, opening the door to applications of a number of powerful techniques in plant research.

The findings have been published in the distinguished journal [Proceedings of the National Academy of Sciences](#) of the USA (*PNAS*).

Professor Hans Ronne's research team at the Department of Medical Biochemistry and [Microbiology](#) at Uppsala University works with the diminutive *Physcomitrella* moss, which is widely used in research because its genes are easier to "knock out" than those of other plants. Previous work has also shown that DNA introduced into *Physcomitrella* cells is capable of self-replication through an as yet uncharacterised process.

The new study, which was led by Dr. Eva Murén and Ph.D. student Anders Nilsson, shows that plasmids introduced into moss cells can be rescued back to [bacteria](#) without affecting the plasmids' original structures, provided that certain conditions are met. Up to now, various kinds of rearrangements have sharply limited the use of plasmids in animal- and plant-cell research.

"Our work with plasmids in moss suggests that it will be possible to use

powerful methods such as gene cloning by complementation and overexpression directly in plant [cells](#) without recourse to single-cell organisms like bacteria or yeasts," says Professor Hans Ronne. "This, in turn, may simplify basic and applied research and biotechnology involving plants."

More information: *PNAS* article: [www.pnas.org/content/early/200.../0908037106.abstract](http://www.pnas.org/content/early/2009/11/03/0908037106.abstract)

Source: Uppsala University ([news](#) : [web](#))

Citation: DNA molecules in moss open door to new biotechnology (2009, November 6) retrieved 19 April 2024 from <https://phys.org/news/2009-11-dna-molecules-moss-door-biotechnology.html>

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