

# No sex required: Team discovers gene trigger for asexual reproduction

January 18 2016

---



*Physcomitrella patens* moss plantlet with a spore capsule. Credit: Nelly Horst, Plant Biotechnology Freiburg

When a sperm and an egg cell merge a new life begins. This is the case in humans and in animals, but in principle also in plants. A German-

Israeli team led by the biologists Professor Ralf Reski from Freiburg and Professor Nir Ohad from Tel-Aviv has discovered a gene trigger in the moss *Physcomitrella patens* which leads to offspring without fertilization. The researchers assume that this mechanism is conserved in evolution and holds the key to answer fundamental questions in biology. The study is published in the journal *Nature Plants*.

"Just like humans and animals, mosses possess egg cells and motile sperm. That is why they are particularly well-suited to answer fundamental questions in biology", Reski says. After fusion of sperm and [egg cell](#), a network of genes is activated. That leads to the development of an embryo which grows into a new living being. Until now it was unclear whether a central genetic switch for this gene activation exists. In their latest publication the team describes the gene BELL1 as a master regulator for the formation of embryos and their development in *Physcomitrella*. After the researchers activated this gene in the [plants](#) by genetic engineering, embryos developed spontaneously on a specific cell type. These embryos grew to fully functional moss sporophytes. These spore capsules could even form spores, which grew into new moss plants. Thus, the team identified BELL1 as a master regulator for [embryo development](#) in mosses.

The protein encoded by this gene belongs to the class of so-called homeobox transcription factors. Similar homeotic [genes](#) are also present in humans and animals, where they also control pivotal developmental processes. Whether a congener of BELL1 is a master regulator of embryo development in humans is not yet known. "Our results are important beyond mosses", Reski says. "On the one hand they can explain how algae developed into land plants and thus shaped our current ecosystems. Secondly, they may help to revive the concept of genetic master regulators in the [development](#) of plants, animals and humans." Ohad explains, "Moreover, our results may help to modernize agriculture through the creation of genetically identical offspring from high-yielding

crop plants. In seed plants such offsprings are formed by parthenogenesis or apomixis."

Provided by Albert Ludwigs University of Freiburg

Citation: No sex required: Team discovers gene trigger for asexual reproduction (2016, January 18) retrieved 25 April 2024 from <https://phys.org/news/2016-01-sex-required-team-gene-trigger.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.