

New technology eliminates plant toxins

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Plants produce toxins to defend themselves against potential enemies, from herbivorous pests to diseases. Oilseed rape plants produce glucosinolates to serve this purpose. However, due to the content of glucosinolates, farmers can only use limited quantities of the protein-rich rapeseed for pig and chicken feed. Now, a team of researchers from the University of Copenhagen has developed a method to hinder unwanted toxins from entering the edible parts of the plant. The breakthrough was published today in the prominent scientific journal *Nature*.

"We have developed an entirely new technology that we call 'transport engineering'. It can be used to eliminate unwanted substances from the edible parts of crops," says Professor Barbara Ann Halkier, head of the [Center of Excellence](#) for Dynamic [Molecular Interactions](#) (DynaMo) at the University of Copenhagen's Faculty of Science.

The oilseed rape plant is but one example of a crop whose use will be greatly enhanced thanks to the new technology. Unlike the healthy glucosinolates found in broccoli, oilseed rape additionally produces a glucosinolate that is harmful to most animals when consumed in larger amounts.

This means that protein-rich rapeseed cake produced using the [byproduct](#) of rapeseeds pressed for oil, can only be used in limited quantities for pig and chicken feed. Due to this, [Northern Europe](#) continues to import large amounts of soy cake for animal feed.

The breakthrough increases the potential of oilseed rape as a commercial

animal feed:

"We managed to find two proteins that transport glucosinolates into the seeds of the thale cress plant, a close relative of the oilseed rape. When we subsequently produced thale cress without these two proteins, the remarkable result was that their seeds were completely free of glucosinolates and thus suitable for feed," emphasises Barbara Ann Halkier.

Worldwide, oilseed rape is the third most widely grown oilseed-producing crop. 'Transport engineering', the new [technology platform](#), is so promising that one of the world's largest companies involved in plant biotechnology – Bayer CropScience – is now negotiating with the University of Copenhagen's Tech Transfer Unit to collaborate with the research group so as to deploy the new technology and produce an oilseed rape plant with glucosinolate-free seeds. According to Bayer CropScience project leader Peter Denolf such seeds will significantly enhance the use of oilseed rape meal as animal feed and bring along a more sustainable oilseed rape processing procedure.

The research results are the fruit of 16 years of basic research, an excellent example of how basic research can result in new discoveries of direct use for society.

More information: *Nature*, [DOI:10.1038/nature11285](https://doi.org/10.1038/nature11285)

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