

Cancer drug found hiding in sunflower seed protein

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University of Queensland scientists have found sunflower proteins and their processing machinery are hijacked to make rogue protein rings in a discovery that could open the door to cheaper, plant-based drug manufacturing.

Dr Joshua Mylne, who led the research, has a personal connection with sunflowers - his grandfather, Alan Lemon, introduced them to Australian farms, creating a multimillion-dollar industry.

Now, Dr Mylne hopes his research has uncovered another use for these plants through the manufacture of cheap [therapeutic drugs](#).

Dr Mylne and Professor David Craik from UQ's Institute for Molecular Bioscience unpicked the way sunflower seeds assemble [protein](#) rings, one of which has previously demonstrated potential as a drug for cancer.

The study, published overnight in the international journal *Nature Chemical Biology*, showed that the machinery used to process and mature otherwise dull seed storage proteins is commandeered by a protein ring, SFTI, for its own use.

Dr Mylne and Professor Craik used the model plant *Arabidopsis* for their research, demonstrating that the sunflower protein production system could be moved into another species and thus SFTI could be manufactured in a range of plants.

While this work is of interest to researchers by providing an understanding of how new proteins can evolve and how proteins are matured, it has wider applications for drug production. SFTI can be used in its natural form to block [breast cancer](#) enzymes, and in a modified form to block enzymes associated with other types of cancer.

These proteins have not been broadly adopted by drug designers despite their potential to fight cancer because of the expense of producing them using traditional, synthetic manufacturing methods.

“Although SFTI and related proteins show great promise as drug templates, the cost to manufacture them is a significant barrier to widespread use,” Dr Mylne said.

“This issue could be solved through plant manufacturing. Seeds are an attractive system for the production of pharmaceuticals, as they are cheap to grow and their contents are stable at room temperature, and sterile inside their coat.

“There are also established systems in place for their production, harvest, storage and transportation, meaning they could be the ultimate low-cost drug delivery system.”

More information: [dx.doi.org/10.1038/NChemBio.542](https://doi.org/10.1038/NChemBio.542)

Provided by University of Queensland

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