

A new way to deliver light-sensitive drugs to combat the problem of antibiotic resistance

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Queen's University researcher P. Andrew Evans has uncovered a new process to deliver antibiotics using pollen to shield them.

Antibiotics are powerful medication that are used to fight infections, but the ongoing and well publicized issues with [resistance](#) has made the search for new medicines critical to [human health](#).

Queen's University researcher and Canada Research Chair in Organic and Organometallic Chemistry, Dr. P. Andrew Evans (Chemistry), in collaboration with groups from the universities of St. Andrews and Hull, has discovered a new way to deliver light sensitive drugs that could combat the problem of antibiotic resistance.

Dr. Evans has shown that wrapping a new class of antibiotics, called the marinomycins, in the outer shell of plant pollen can protect these antibiotics from rapid decomposition in the presence of light. Antibiotics are normally handled in light, so it would be impossible to avoid exposure—much like taking 35 millimetre film out of a old fashioned camera on a sunny day.

"Everyone is likely going to get an infection at some point during their life-span and will require an antibiotic," explains Dr. Evans. "There is an urgent need for new antibiotics to tackle the rising tide of microbial resistance in existing antibiotics. We have taken a powerful and potentially useful new antibiotic that disintegrates in sunlight within seconds and packaged it into a pollen shell, which then protects the antibiotic for hours against UV radiation."



P. Andrew Evans has discovered wrapping antibiotics in pollen could protect them from light. Credit: Queen's University

Different sized pollen spores are produced by different plant species,

which can potentially be used to protect and deliver different drugs. Dr. Evans says all the allergens are removed from the pollen first to make space for the binding and protection of the [drug](#) molecule.

Pollen has been approved by the Federal Drug Administration for oral consumption, which makes this a very attractive strategy for drug delivery.

"The World Health Organization has recognized antibiotic resistance as a priority," says Dr. Evans. "We are facing the possibility of a future without effective [antibiotics](#), which would fundamentally change the manner in which modern medicine is practiced. Additionally, there are other drugs that have been abandoned because of light-sensitivity issues that could be reexamined using this strategy."

This research is published in *Chemical Science*, the Royal Society of Chemistry's peer-reviewed flagship journal.

More information: Christopher S Bailey et al. A Natural Solution to Photoprotection and Isolation of the Potent Polyene Antibiotic, Marinomycin A., *Chemical Science* (2019). [DOI: 10.1039/C9SC01375J](https://doi.org/10.1039/C9SC01375J)

Provided by Queen's University

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