

Plant kingdom provides two new candidates for the war on antibiotic resistance

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Scientists have isolated peptides (strings of amino acids) with antibiotic effects on bacteria that spoil food and cause food poisoning, after turning to the plant kingdom for help in boosting our arsenal in the ongoing war against antibiotic resistance.

The scientists found two small peptides from widely cultivated crop species (one from broad beans and one from cowpea) that were especially effective.

Further work then confirmed that when these peptides were used together, and with a human peptide that is also an antimicrobial, their protective effects were beefed-up in a one-two antimicrobial punch.

Associate Professor and Head of Microbiology at Trinity College Dublin, Ursula Bond, led the team that has just published its research in the journal *Applied and Environmental Microbiology*.

She said: "There are two major advantages to these small peptides in that no resistance mechanisms have emerged yet, and in that they can be inexpensively synthesised in the lab. Initially, our aim was to identify peptides that provide protection against food-spoiling [bacteria](#), but these peptides may also be useful as antibiotics against bacteria that cause serious human diseases."

The research team behind the discovery had previously isolated a human peptide that is a potent antimicrobial agent against many of the bacteria

that spoil beer during industrial fermentation. Instead of screening for other human peptides with similar desired effects, the scientists scanned plant peptides databases and focused on the peptides whose structural blueprints were similar to the [human](#) one with the desired characteristics.

Many of the most effective antibiotics are derived from proteins produced by plants, but there is a growing need to discover new therapeutic candidates as resistance is increasing in bacterial species that have major health and economic implications for society.

Professor Bond added: "We reasoned that natural [peptides](#) found in many plants and plant seeds might be useful new antibiotics, because plants have evolved these systems to protect themselves against the billions of bacteria and fungi they interact with in the soil every day."

More information: Joanna Kraszewska et al. Comparative analysis of the antimicrobial activities of plant defensin-like and ultrashort peptides against food-spoiling bacteria., *Applied and Environmental Microbiology* (2016). [DOI: 10.1128/AEM.00558-16](https://doi.org/10.1128/AEM.00558-16)

Provided by Trinity College Dublin

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