

Video: Tobacco plant genetically modified to produce cocaine

A tobacco plant relative called *Nicotiana benthamiana* has been genetically modified to produce cocaine in its leaves.

Cocaine is produced naturally in the leaves of the *Erythroxylum coca* plant, and scientists set out to recreate this process in *N. benthamiana*.

A team from the Kunming Institute of Botany in [China](#) altered *N. benthamiana* to produce two enzymes that generate cocaine when its leaves are dried.

The breakthrough could lead to a way to manufacture cocaine, or produce chemically similar compounds for medicinal purposes.

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While cocaine is notorious as an illegal drug, it has also been used in medical practices as a local anaesthetic or to narrow blood vessels to stem bleeding.

However, pharmaceutical companies are limited in ways they can produce the drug, as key steps in its biosynthesis have remained a mystery.

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In their paper, published in the [Journal of the American Chemical Society](#), the scientists finally discovered what was missing.

Two enzymes, EnCYP81AN15 and EnMT4, are essential for this conversion reaction to form methylecgonone.



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