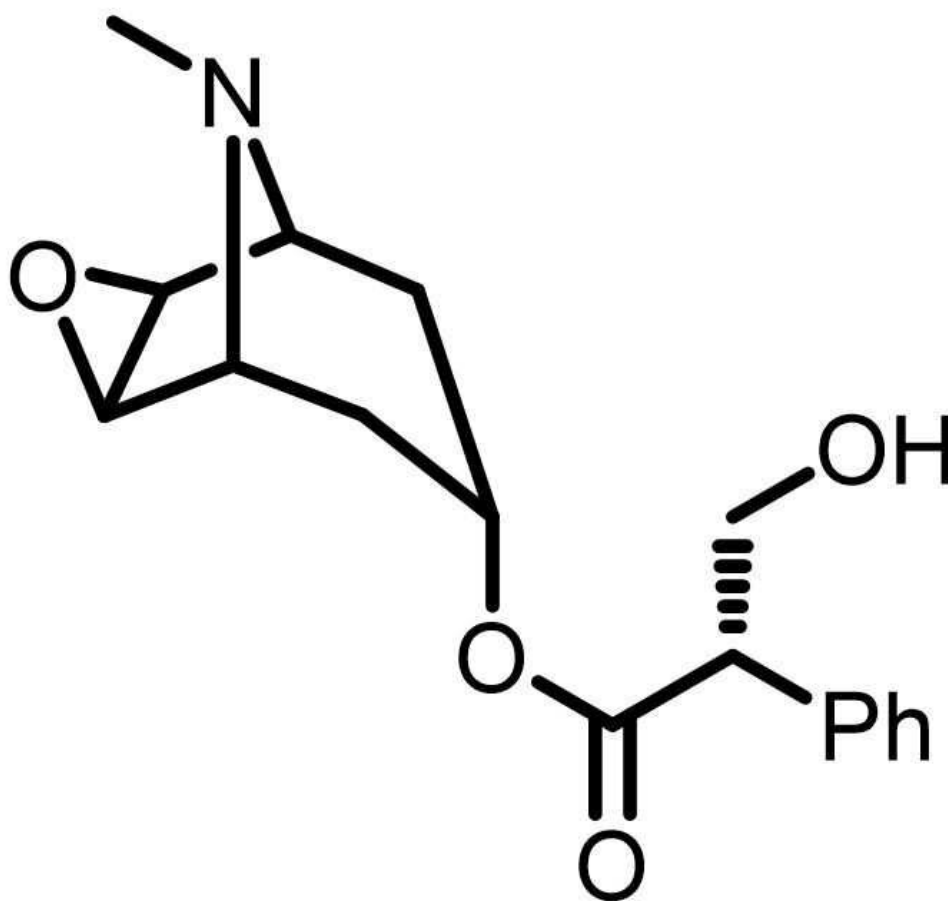


Researchers report fully synthetic route to scopolamine, anti-nausea drug

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SwRI develops cost-effective means of synthesizing new formulations for plant-based medicines, most recently a synthetic version of a popular antinausea treatment. Credit: Southwest Research Institute

Southwest Research Institute has developed an efficient, fully synthetic method to produce scopolamine, a plant-derived compound used to prevent nausea and vomiting from motion sickness and anesthesia. The accomplishment marks the first time SwRI has fully synthesized a drug compound that is naturally derived from plants.

The anti-nausea medication [scopolamine](#) is made from plants in the nightshade family and from the corkwood tree native to Australia. Although these plants are toxic, extracts have been used for centuries in herbal medicine. Today, scopolamine is delivered using transdermal patches placed on the skin and intravenously during surgery to prevent nausea. These compounds currently are derived from natural resources and depend on the success of medicinal crops.

"Half of all drugs are derived from natural compounds," said Dr. Shawn Blumberg, a senior research scientist in SwRI's Chemistry and Chemical Engineering Division. "Wildfires, inclement weather, pests, plant diseases and even [climate change](#) can significantly decrease [crop yields](#), affecting the availability and price of plant-based medicines. Developing a fully synthetic version of scopolamine decreases our reliance on medicinal crops and will increase availability, allowing us to investigate other uses."

SwRI used internal research funding to develop a novel synthetic pathway for scopolamine production using inexpensive materials. Although the process for synthesizing compounds is typically lengthy and complex, the SwRI technique achieved the highest yield to date using a short number of steps and can be scaled up indefinitely. An efficient, fully synthetic method for producing scopolamine also has potential application in commercial and government arenas. The current high demand for scopolamine coupled with limited agriculture-based production rates have made it difficult to explore other uses for the compound.

In addition to their current treatment uses, scopolamine, atropine and other derivatives from nightshades may be useful countermeasures for nerve agent exposure. SwRI aims to explore further use of these compounds and novel derivatives for nerve agent antidotes and other potential treatments.

"Developing the technology to create synthetic alternatives to natural drugs will help bring prices down and make us less vulnerable to geopolitical and environmental disruption of the supply chain," Blumberg said.

The development team is also exploring additional applications for fully synthetic [drug](#) compounds.

Provided by Southwest Research Institute

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