How to make high-end perfumes without whale barf

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University of British Columbia researchers have identified a gene in balsam fir trees that could facilitate cheaper and more sustainable production of plant-based fixatives and scents used in the fragrance industry and reduce the need for ambergris, a substance harvested from whale barf.

When sperm whales consume sharp objects, such as seashells and fish bones, their gut produces a sticky substance to protect their digestive organs. They then regurgitate the mixture – much like cats throwing up fur balls – and the vomit, reacting with seawater, turns into rock-like objects that wash ashore. These are collected and refined for their fixative properties. Called ambergris, the scented compound is added to high-end perfumes to help the fragrance stay on the skin longer.

The discovery was led by Prof. Joerg Bohlmann and postdoctoral research associate Philipp Zerbe at UBC's Michael Smith Laboratories. Details are published in the April 6 issue of the *Journal of Biological Chemistry*.

"The use of ambergris in the fragrance industry has been controversial," says Bohlmann, who is a professor of Botany and Forest Sciences. "First of all, it's an animal byproduct and the use of such in cosmetics has been problematic, not to mention it comes from the sperm whale, an endangered species."

Even though much of the ambergris approved for use today is manually

collected along the shorelines of known sperm whale habitats in the Atlantic and Pacific Oceans and in the Caribbean, it is still a costly venture. In the Mediterranean, sage has been cultivated for the production of a plant-based substitute of ambergris, but yields are variable and can be unpredictable, similar to manual collection of ambergris.

"We've now discovered that a gene from balsam fir is much more efficient at producing such natural compounds, which could make production of this bio-product less expensive and more sustainable," says Bohlmann.

The discovery and related technology is currently being commercialized through UBC's Industry Liaison Office. The research was supported by Genome Canada, Genome British Columbia, and Genome Alberta through the PhytoMetaSyn Project, and through grants from the Natural Sciences and Engineering Research Council of Canada.

Provided by University of British Columbia