Biotech company uses research done at UCI to help the beauty industry transition to a sustainable future

The company, Debut, launches its first skincare line based on work done in the lab of UCI Professor Gregory Weiss.

Monday, January 22, 2024

Lucas Van Wyk Joel
UCI Physical Sciences Communications



DEINDE includes a molecule that, without chemical methods developed at UCI, would've made the skincare line much more costly to make for consumers and for the environment.

Picture Credit:
Debut

Joshua Britton, Ph.D. was a visiting graduate student in the UC Irvine Department of Chemistry working in the lab of Professor Gregory Weiss when he developed an efficient and green method of synthesizing molecules found only in minute quantities in plants.

Britton and Weiss then co-founded biotech company Debut, which subsequently attracted $70 million in investor funding, including from BOLD, the venture capital fund of L'Oréal. Debut just launched its first consumer brand, DEINDE, a skincare line that targets inflammaging, or inflammation that accelerates aging.

The key ingredient is a proprietary DEINDE molecule called naringenin – a compound found in plants known for its anti-oxidant, anti-inflammatory and anti-carcinogenic properties.

The technology used to make naringenin is the culmination of work that started in Weiss' lab. "While Joshua was visiting my lab from Colin Raston's lab at Flinders University in Australia, he invented a way to accelerate enzymes – the machines that make life possible by catalyzing chemical transformations," said Weiss, whose lab studies how molecules, including enzymes, operate.

Britton and Professor Weiss apply a method that lets them use enzymes to make materials outside the confines of a cell. The cellular environment imposes limitations on what kinds of chemicals enzymes can synthesize, and Debut uses both cell-free and fermentation approaches to biosynthesize otherwise-scarce natural molecules, including naringenin, at scales that make the production of skincare products like DEINDE feasible.

"This research inspired us to first imagine and then plan to start a company together after Joshua's graduation," Weiss added. "Specifically, we wanted to manufacture rare – but super-useful – molecules found in nature through a much greener, more sustainable approach than current technologies allow."

The approach is green because it sidesteps the need for the cultivation of naringenin-bearing fruits like grapefruit, which leads to decreased carbon emissions and which requires far less land and water to make naringenin.

Today, Debut applies both cell-free and conventional synthetic biology to make molecules like naringenin. "UCI, and especially the Weiss lab, has entrepreneurial energy whereby students are encouraged to think about commercializing

inventions,” said Britton. “Unlike most other schools, professors and staff are trained to encourage students to think bigger and place research in terms of actual value in the real world. That’s a very specific UCI thing, and is a key reason why Debut was founded.” said Britton, who today leads a rapidly-growing multidisciplinary team of 80 people at Debut that’s executing an aggressive commercialization strategy for products like DEINDE.

News Briefs
Press Releases
Chemistry
The Future of Fundamental Science
Alumni
View PDF