



Caffeine gets out of coffee and into personal care

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CONSUMER PRODUCTS

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by Craig Bettenhausen

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Afternoon cup: Paraxanthine seems to disrupt sleep less than caffeine does.



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like a brisk walk or 20 min of meditation could provide enough of an energy boost to finish the workday strong. But what would really hit the spot is **a dose of caffeine.**

That dilemma vexed scientist and biotechnology entrepreneur Jeffrey Dietrich. He had wandered into a coffee habit of several cups a day during graduate school and while cofounding the industrial biotech start-up Lygos. The java made him anxious and disrupted his sleep. Caffeine causes anxiety in about a third of the population, Dietrich says, a genetic trait that is tied to a single-letter difference in the human genetic code.

In 2019, he set out on his own in search of a problem that a biotech business could solve profitably while starting at a modest scale. Dietrich also wanted to find something that would have a direct impact on consumers. That's when he hit upon paraxanthine.

Paraxanthine is the first metabolite the human liver makes as it breaks down caffeine; it has one less methyl group than its better-known precursor. Paraxanthine is a central nervous system stimulant with a mechanism similar to that of caffeine, but it binds differently to the relevant cellular receptors and breaks down faster.

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Rarebird

Pour-over: Newscripts isn't sure how different pour-over coffee really is from a regular drip brew, but it sure looks fancy.

The result, Dietrich says, is a caffeine-like stimulant with a shorter half-life than caffeine's in the human body and fewer side effects.



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Paraxanthine is found in nature only in that metabolic pathway, but Dietrich found a supplier who could make it synthetically. When the cost of that synthesis got down to about ten cents for one cup's dose and the US Food and Drug Administration gave paraxanthine the status of generally recognized as safe, Dietrich launched Rarebird, a coffee containing paraxanthine instead of caffeine.

Rarebird sent Newscripts some beans to try. The resulting coffee is missing some of the deeper and more aromatic notes one would expect from normal caffeine beans at a similar price point. But it smells and tastes like a premium-quality, medium-roast decaf. Which is almost what it is.

The company currently buys conventional decaf beans and adds paraxanthine after roasting. That approach is Rarebird 1.0: good enough to bring a first product to market—a preground suitable for a French press or pour-over brew.

In Dietrich's vision, though, the company would start with raw beans and decaffeinate them in-house. Then while one team would roast the beans, another would use enzymes to convert the extracted caffeine into paraxanthine in a custom reactor. Further down the production line, the two streams would come back together to make finished paraxanthine beans. Unusual for the coffee world, Dietrich tells Newscripts, "we're a roaster up front, and the back of the house is a biotech."

Caffeinated personal care

Even if you swap out the caffeine in your cup, watch out. It may also be in your shampoo.



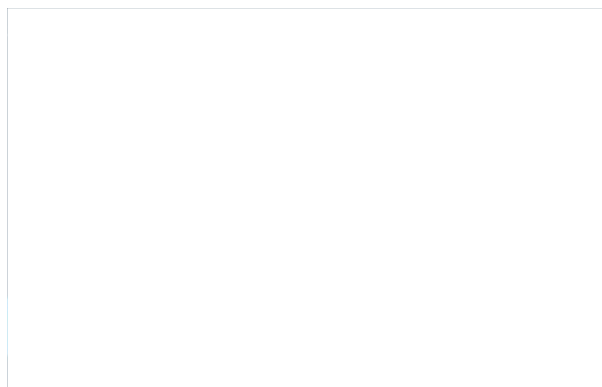
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Why, you might reasonably ask? Formulation chemist Kelly Dobos says the main claims are that caffeine can promote hair growth, fight cellulite, and tighten skin. “In hair care, I have seen good studies that show improvement in hair density and fullness,” she tells Newscripts, especially in combination with niacinamide, a type of vitamin B₃.



But she’s skeptical that a lotion or body wash could deliver enough caffeine to the skin layers that affect texture and tightness. “If an ingredient is popular, sometimes companies just add small amounts of it for what we sometimes call an ‘imagery claim,’ ” Dobos says.

Shaky claims aside, caffeine is used at very low concentrations in cosmetics and personal care, Dobos says. So if you do see caffeine in the ingredient list of your favorite pamper product, don’t lose any sleep over it.

Please send comments and suggestions to newscripts@acs.org.

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