



ALTER **GREENER** **ALTERNATIVES** NATIVES

Tightening legislation and increasing consumer awareness of health, environmental, and ethical concerns associated with ingredients like animal-based fats, palm and coconut oil, and other mineral oils have led to a surge in demand for sustainable alternatives in the cosmetics and chemical industries. ÄIO's mission is to replace unsustainable and unethical oils in cosmetics formulations with its lipid-rich yeast-derived alternative.

? COSSMA: What inspired the founding of ÄIO, and how did the idea for yeast-based oil alternatives first come about?

Magdalena Koziol: ÄIO was born from a desire to reduce the environmental impact of widely used fats and oils like palm oil and coconut oil. As scientists at TalTech (Tallinn University of Technology), our co-founders Nemailla Bonturi and Professor Petri-Jaan Lahtvee saw an opportunity to use biotechnology, specifically fermentation with oleaginous yeasts, to create high-value oils from side-streams that are often discarded. The idea came from combining sustainability with scientific precision: turning food and forestry industry waste into a resource.

? How does your fermentation process work, and what makes it more sustainable than traditional oil production methods?

Our technology uses proprietary yeast strains to convert organic (agricultural, food and forestry industry) residues into biomass rich in fats and oils through fermentation. Unlike palm or coconut oil, our method does not require vast amounts of land, monoculture farming or long supply chains. Additionally, our process is efficient, substrate-flexible, and fits into regional circular value chains, drastically lowering the environmental footprint.

? What are the biggest challenges in replacing widely used ingredients like palm or coconut oil in cosmetics?

The biggest challenge we face is shifting mindsets. Palm and coconut oils are versatile and low cost, so many key industry players see little reason to explore alternatives. Change is happening – but slowly – and it's largely driven by consumer demand. Price competitiveness, performance, and regulatory approval also pose significant hurdles. In cosmetics, functionality and skin feel are key, so we work closely with our partners and continuously gather feedback to ensure our products match or surpass the emollient and sensory qualities formulators expect. Regulatory approval, particularly in the EU, remains a lengthy and complex process, especially for biotech-derived ingredients. That's why we've invested heavily in R&D – to replicate the texture, stability, and sensory experience of conventional oils while meeting the rising standards of clean beauty.

? How do your ingredients compare in terms of performance, cost, and scalability for beauty brands?

Our goal is to provide a true drop-in solution that makes transitioning away from conventional oils as easy as possible for the industry. Functionally, our oils are rich in beneficial fatty acids and can be tailored to suit a range of applications – from moisturizers and balms to emulsifiers

INTERVIEW



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and surfactants. They are stable, non-GMO, bioavailable, and free from common allergens. While our costs haven't yet reached commodity levels, but as we scale up production, we expect prices to become increasingly competitive with palm and other plant-based oils. For beauty brands focused on sustainability, traceability, and innovation, our oils offer a compelling and future-forward alternative.

? Can you walk us through how your solutions contribute to clean beauty and environmental responsibility?

Our ingredients are produced without the need for tropical agriculture (palm plantations), fossil-based or animal-derived inputs. They are biodegradable, traceable, and designed to meet clean beauty standards from source to skin. Because we upcycle low value side-streams, our process also contributes to circularity, transforming what was once waste into premium cosmetic ingredients. We meet clean beauty demands by delivering transparency, minimal environmental impact, and versatile functionality.

? What role does the recent EU deforestation regulation play in shaping the demand for your products?

It is a game changer. The new EU regulation is already reshaping sourcing strategies. This regulation has significant implications for industries that rely on the commodities covered under the EUDR, such as palm oil for the personal care industry. Currently, only about 19% of global palm oil is certified by the Roundtable on Sustainable Palm Oil (RSPO). Since even RSPO-certified palm oil must meet additional EUDR requirements, stricter sourcing regulations will likely lead to higher palm oil prices in the EU market. Brands in the EU, but also worldwide, should start thinking about the industry-wide shift away from these tropical fats and bring the focus onto locally sourced alternatives. Our biotech-derived oils offer an immediate and long-term solution. Because we can verify and control our supply chain from input to output, we help companies meet both regulatory compliance and consumer expectations.

? How do you see the cosmetics industry evolving over the next 5 – 10 years in terms of sustainability and regulation?

The personal care industry is at a pivotal moment. Sustainability and traceability – once considered “nice-to-haves” – are quickly becoming non-negotiables, driven by growing consumer demand. And I believe they will become embedded in regulatory frameworks within the next decade. Brands that act early will be well-positioned to lead in transparency and sustainability. At the same time, there



Yeast-derived oils are a sustainable alternative for cosmetics.

is an ongoing conversation in the industry about how to ease regulatory burdens without compromising safety and quality, and this will pave the way for more innovation. The future of innovation will increasingly depend on biotechnology, fermentation, and circularity. Companies that can demonstrate low environmental impact, end-to-end traceability, and local production models will be the ones to lead the next wave of change.

?? What types of partnerships or collaborations is ÄIO currently looking for in the beauty or biotech space?

We are seeking partners who share our values and are looking to co-develop sustainable formulations, whether in personal care, food or supply chain. This includes ingredient manufacturers, product developers, and other forward-thinking brands. We are also looking for joint venture partners and distributors. As we all come from a scientific background, we are always interested in R&D collaborations to explore new applications and functions of our oils.

?? How important is consumer education when it comes to acceptance of biotech-derived ingredients in personal care?

Crucial. While many are open to innovation in personal care and actively drive demand for ethical and sustainable products, there's still a lingering bias – “natural” is seen as good, while “biotechnology” can raise concerns. In reality, biotechnology often enhances natural processes, making

them safer and more efficient. And fermentation is one of the oldest and safest ways to make food and ingredients! Fermentation is a familiar and trusted process, so we don't see a big acceptance barrier from consumers – only surprise that lipids can be produced this way. By highlighting benefits like upcycling, local sourcing, and transparency, brands can build trust with conscious consumers. We are happy to support these conversations with clear narratives and data.

?? What's next for ÄIO – are there plans to expand beyond cosmetics into food, pharmaceuticals, or other industries?

Yes. Our first product line is focused on cosmetics, but we are actively preparing for market entry in the food sector, pending Novel Food approval. We are also actively exploring partnerships in functional foods, nutraceuticals, and even biobased materials. Our platform is flexible by design and highly adaptable. Our long-term vision is to be a cornerstone of sustainable ingredient supply across industries.

?? How do you ensure transparency and traceability across your supply chain?

Being a startup gives us a unique advantage – we can design transparency into our supply chain from day one. We carefully choose both our feedstock suppliers and production partners (including CMOs) based on shared sustainability values and strict traceability standards. Our feedstocks come primarily from side-streams of the forestry and food industries, and our fermentation process is

fully monitored and digitally documented. This means that every batch can be tracked from raw material to finished oil, giving our customers complete visibility into origin, process, and environmental impact.

? What kind of feedback have you received so far from beauty brands testing your oils?

The feedback has been overwhelmingly positive. Brands value that our oils meet their performance expectations while helping them advance their sustainability goals. Many have highlighted the texture, stability, and versatility of our products, noting that they perform on par with traditional oils. One of the first questions we often get is about price – our oils are still more expensive than palm oil today. But as a young company, we've invested heavily in optimizing our processes and scaling production, which has already led to a significant reduction in costs. This progress reassures our partners that pricing will continue to improve as we grow.

? How scalable is your technology, and what milestones are you working toward in production?

Our technology is inherently scalable because it leverages fermentation, a process already proven at an industrial level in other sectors. As a startup, we've been able to move

quickly – this year, we successfully scaled up to 10 m³ capacity and produced our first 1 ton of encapsulated oil. For large industrial players, that number might sound modest, but for us it was a truly defining moment – it proved that our idea works outside the lab and can be translated into real, tangible product. Our next milestone is 100 m³ scale, which will allow us to multiply volumes, drive costs down, and take another big step toward commercial-scale production.

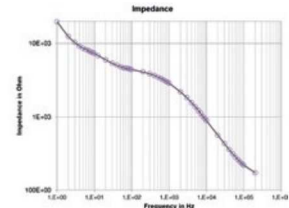
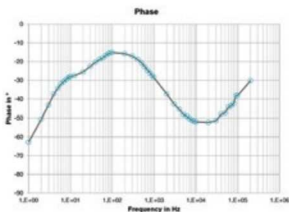
? Looking ahead, how do you see biotechnology reshaping the future of ingredient sourcing?

Consumer expectations are shifting rapidly – people now want ingredients that are not only sustainable but also scientifically proven to be effective. This is why biotechnology-derived ingredients are more than just a trend; they're here to stay. With biotechnology, we can do more than simply replicate natural ingredients – we can take what's good in nature and improve it in controlled environments, ensuring consistency, safety, and performance. Over time, this will allow us to surpass the limitations of natural sourcing and tailor-make cosmetic ingredients to deliver new functionalities that were never possible before. It's only a matter of time before this becomes the new standard in the beauty industry.

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