

Plant-Based Leaders: CJ Biomaterials

For this edition of *Plant-Based Leaders*, we interviewed the team at [CJ Biomaterials](#), which invents and manufactures bio-based chemicals and biopolymers as part of a long-term vision to create a more sustainable future. We spoke with CJ Biomaterials Chief Commercial Officer Max Senechal and Lauren Scott, the company's Director of Corporate Affairs.



Max Senechal,
Chief Commercial Officer (L) &
Lauren Scott,
Director of Corporate Affairs (R),
CJ Biomaterials

CJ Biomaterials is a unit of CJ Bio, which got its start in biotechnology many years ago with a focus on providing amino acids for animal nutrition. In 2016, CJ Bio acquired Boston-based Metabolix, a pioneer in PHA technology. PHA stands for Polyhydroxyalkanoates, a family of biologically created polymers and it is one of the world's leading substitutes for petroleum-based plastic.

CJ Biomaterials is one of the many business units of CJ Group, a South Korean conglomerate. While the parent company may be unfamiliar to some, CJ Group has a significant presence in the US. Some of the places you may have seen them? As sponsors of the PGA golf tournament (2024 Byron Nelson Cup), and one of the company's food brands, Bibigo, appears on the NBA's Los Angeles Lakers' jerseys. You are likely also familiar with many of their other food brands including Red Baron Pizza, Mrs. Smith's pies, Schwann's, and more. CJ also holds the license agreement for the manufacturing, sales, marketing, and distribution of SPAM products in South Korea. The conglomerate's entertainment division was the producer of *Parasite*, the Academy Award-winning film for Best Picture in 2019.

This broad array of industries provides unique opportunities to CJ Biomaterials, which works with many of its other business units to develop sustainable packaging, including for food packaging on grocery store shelves

as well as popcorn buckets and cold drink cups in CJ Group's movie theaters.

Your biomaterials team is headquartered in Boston, and you have a footprint in South Korea as well. Talk to me about that unique arrangement.

MAX: Yes, we are right outside of Boston, and it speaks volumes about how important we believe the U.S. and North American market will be in spearheading the changes that are happening in sustainable packaging.

We also have a state-of-the-art biotechnology R&D facility in Korea with 800 staff. They develop new strains, scale up fermentation facilities to produce our products, and execute all the process engineering.

PHACT™
by CJ Biomaterials

In the U.S., our research is focused on PHA and its various applications, including how it can be converted to films, flexible packaging, injection molded rigid packaging, or blended with other materials for the best possible performance for our clients.

What properties of PHA drew your research to that particular polymer?

MAX: PHA is 100% marine and soil degradable and can be composted both at home and in industrial composting. It can perfectly mimic the performance of traditional plastics in a wide range of applications.

Most people today make a single polymer called PHB. We make a PHB 4HB, and it allows us to impart some interesting characteristics: a high amount of 4HB creates a rubbery, soft PHA material.



We make resins in two grades based on this technology: a semi-crystalline harder PHA, or scPHA, and – at the other extreme – a rubbery, soft PHA called amorphous PHA or aPHA. PHA is not only a great modifier to other polymers and biopolymers, but it can be a standalone polymer as well. aPHA, which was the first grade that we commercialized, is only a modifier. We are currently the only ones producing it at scale.

These two resins can be blended, or aPHA can be combined with other biopolymers, particularly PLA (Polylactic acid). aPHA improves PLA's impact resistance and combats brittleness.





For example, we worked with a noodle cup brand in Korea to develop a PLA-PHA blend paper coating. It replaced the petroleum-based polyethylene coating, so the package is now compostable. We worked with Clean it Zero on a PHA-PLA blended cosmetic container. We're also partnering with a leading food and beverage company that's been very vocal in recent years about their desire to migrate their flexible packaging to more sustainable packaging.

Those improved performance standards mean the industry is able to displace even more petroleum-based plastics in a broader variety of applications, correct?

MAX: Yes. Creating blends can also deliver products that are more affordable for manufacturers. Two years ago, we announced a new collaboration with NatureWorks specifically tailored around leveraging aPHA with PLA to develop new applications at a better price point.

aPHA can improve PLA while still maintaining bio content and accelerating compostability. This is the value proposition that we bring to the biopolymer world. We recently announced two grades of a PHA-PLA blend film for flexible packaging and other applications.



When a client approaches you, what kinds of consumer issues are they seeking to tackle?

LAUREN: A lot of our products are driven by an interest in addressing very specific problems. For example, clients often seek us out for applications where they're seeing a lot of litter or where their products are not suited for any end-of-life outcome other than landfill.

MAX: We work very closely with companies to innovate and design a final product that will be more sustainable and will be compostable at its end of life.



Your team also leads a consumer education program?

LAUREN: We want to make sure consumers don't dispose of their products in an improper way. It's very important to signal to consumers exactly what they need to do with the product. If you don't clarify whether a product is industrial or home compostable, consumers will generally not know how to handle it.

That is also why we are big proponents of green guides and certifications, but most certifications today look at industrial composting. There's a home compost standard but it's not a U.S. standard. Also, there aren't any marine degradable standards or certifications. We need more certifications to protect consumers against greenwashing and help customers with disposal.

Given the global reach of CJ Biomaterials, you have a unique perspective. How do different government regulations, standards, and incentives come into play?

MAX: We are a global business, and we try to leverage our global footprint as a supplier. We have 13 biomanufacturing plants around the world on three continents.

But the biomaterials sector is a multi-regional business rather than a global one, in part due to regulation. For example, Europe is pushing hard on recycling right now, but country to country there's different implementation within the EU.

Then you must qualify your products for bio content and food contact applications which vary by region as well. So, it becomes difficult to launch a single product globally.

LAUREN: Another issue is end-of-life. Consumers are willing to pay more but there needs to be infrastructure to dispose of this material responsibly.

That's a great segue to discuss your advocacy work and its importance.

LAUREN: The company quickly realized how important policy would be in shaping the success of the PHA business in the U.S. Broadly, we're focused on leveraging momentum and support for the biomanufacturing industry and working to support infrastructure buildout for industrial composting. We're also interested in proactive policies that would incentivize a shift from fossil-based materials to PHA and biopolymer products.



A primary focus of policy efforts to support the expansion of the compostable packaging industry is a focus on broader packaging policies, namely extended producer responsibility programs, ensuring that those programs support compostable materials as well as traditional recycled materials.

A lot of these programs overlook compostables because they're not as mainstream. We're interested in ensuring that funds are set aside for industrial composting infrastructure. We are also focused on policies that are thoughtfully written and ensure that compostable products aren't subject to the same sanctions and recycled content mandates as traditional plastics.

These policies will define and shape the future marketplace.

If you have a policy that a bag must be biodegradable, then that's an opportunity. But, if you have policies that ban bags inclusive of bioplastic materials, then there's no marketplace.

Is there a role for federal standards?

LAUREN: Today, there are no federal labeling or packaging management policies in place. It's up to individual states to manage packaging and reduce plastic waste. Because of the patchwork of state policies, it's difficult for industry and companies to buy-in and have any certainty as they consider investing in and shifting to compostable alternatives. A federal standard around the definition of "compostable" with a focus on third-party certification would ensure that contamination and consumer confusion are alleviated.

We also need policies that support and allow the time to develop our waste disposal infrastructure.

That's a tall order. How have you found membership with PBPC beneficial in that regard or others?

LAUREN: Our approach to advocacy is aligned with our commercial approach, which is to build everybody up across our industry. It's been critical to mobilize and work through associations to flag policy issues.

PBPC plays a crucial and unique role, offering a forum for supporting and driving discussions and policy that will benefit everyone in the plant-based products industry. Everybody wants to shift from fossil fuels, and PBPC is providing a collaborative and essential venue to work on policies that support that shift.