

Materials Science and Engineering

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Better materials for a better world: Silk without spiders and leather without cows

Nature has created many natural protein polymeric materials suitable for use as fibers – like spider silk. Bolt Threads has developed a molecular biology platform to mimic and/or tune the properties and inherent environmental compatibility of these materials and manufacture them via large-scale fermentation. Our platform includes genetic-level control over the amino acid sequence, allowing us to fine tune the polymer processing windows and functional material properties. Today, Bolt Threads is capable of producing a recombinant spider silk protein at commercial scale and spin this material into filament and staple yarns. Bolt Threads filaments exhibit spider silk biomimicry and can be generated with high consistency and at large volumes. This first fiber demonstrates the baselined capability of Bolt Thread's designer protein polymer pipeline. The mission of Process Development is to continue to optimize and deploy scalable, economically viable processes for the production of the natively-inspired bio-derived materials with sustainability, performance, and market advantages. This session will describe our approach used to accelerate the launch of our first commercial products: 1. A recombinant spider silk protein which we spin into filament and staple yarns, and 2. Mylo™ a mycelium leather. A little more about

Bolt Threads: Bolt Threads is a vertically integrated company driven by 100+ dynamic scientists, engineers, artists, and operations specialists. At Bolt, our endeavors include molecular biology and materials science R&D, polymer production, fiber manufacturing, product development, marketing, merchandising, and direct to consumer sales. Bolt Threads operates direct to consumer through Best Made Co. and partners with well-known brands such as Stella McCartney and Patagonia.

Speaker Biography

Alex Patist has over 20 years of experience in directing new product, process development, and scale-up in the food, nutraceutical, biochemical & biofuels industries. Since 2017, he took on the role of VP of Process Development & Manufacturing at Bolt Threads. Before Bolt, he spent 4 years at Genomatica in San Diego, a leading biotech innovator for the chemical industry. He has been a catalyst in mainstreaming a whole process approach to deliver economic advantaged bioprocesses. Previously, he was at Cargill R&D in Minneapolis. During his tenure as Director of Technology he worked with major partners such as Pepsico, Coke and Kraft taking ideas from concept to realization (for example the high intensity sweetener Truvia®). Originally from the Netherlands, he has a BS from Hogeschool Utrecht, MS from TU Eindhoven and a Ph.D. from the University of Florida, all in Chemical Engineering.

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