

A new family of tunable light-emitting materials will disrupt the display market by enhancing organic light-emitting diode (OLED) display quality



IMPACT

The displays used in smartphones, televisions, and wearables have made significant leaps in the past decade due to OLED advancements and other display technologies. However, improving their colour gamut and manufacturing costs remains challenging due to the industry's reliance on phosphor-based technologies.

Amber Molecular is commercializing a set of innovative red and orange-light emitting materials that provide tunable, efficient, with pure-colour light emission, all without the rare metals used in phosphors. The team's philosophy is to design their materials atom by atom, using a proven synthetic toolkit developed over ten years, to meet the needs of specific display applications. Their goal is to provide customers and partners with a tailor-made light-emitting molecule, built to work in existing OLED designs.

HOW WE DID IT

Amber Molecular's licensed technology was developed over ten years in Prof. Timothy Bender's lab at the University of Toronto. The company was founded in 2017 by Dr. Bender and two of his recent graduates, Trevor Plint and Richard Garner. Later in 2017, the team was joined by James Stuart, a Rotman MBA who reinforced the team's technical expertise with proven business experience. Knowing the technical challenges faced by the display industry, the group began building their understanding of the business landscape.

In December 2017, Amber Molecular had its first draft business plan and reached out to the RIC Centre (RICC) for external input. Amber Molecular co-founder Richard Garner states, "At the time, it was just the four co-founders, pre-capital-funding, with no employees. With our draft business plan in hand, we participated in a panel pitch series to seek advice. In return, we got valuable connections to experienced individuals who knew the chemicals business, how to secure venture capital, and how to identify and connect into global supply chains." The team received balanced feedback from a room of RICC's advisors and volunteers. "That group of experts was able to give detailed insights on where our plan was good and where it still needed work. It's vastly more effective to have a thirty-minute conversation with an expert than to spend two weeks trying to figure out an answer from first principles, and that's a strategy we'll follow whenever we're breaking new ground," Trevor comments.

Advice from their RICC advisor, James Sbrolla, helped guide the team's outreach as their plans solidified through 2018. They participated in RICC events with venture capital investors, which enabled the team to present their pitch for thorough evaluation and refinement. James Stuart recalls, "It was informative for us to understand what parts were exciting to VCs and which parts of our plan made them nervous. We learned a lot from those sessions and honed our business plan into something extremely compelling and prepared for funding."

RICC 360 Virtual Advisory Board member Trevor Bingham also proved to be a pivotal connection for Amber Molecular. Richard states, "Trevor helped us pursue significant business development and networking opportunities at global technology conferences. Trevor's knowledge and expertise in the function of global supply chains is invaluable, and Trevor has since agreed to be an advisory board member for Amber Molecular." One such connection put Amber Molecular on the path to their eventual fundraising with Phoenix Venture Partners, a 5M USD fundraising round that concluded in June 2020. <http://www.ambermolecular.ca/news.html> <http://www.ambermolecular.ca/news.html>

LOOKING AHEAD

Today, the Amber Molecular team numbers eight people, including the four co-founders, three full-time employees, and an intern. The team is leveraging their molecular technology to produce tailor-made red and orange emissive materials for entities commercializing Thermally Activated Delayed Fluorescence (TADF)-based OLEDs, which are seen by many as the future of OLED technology.

Their goal is to become the global leader in fluorescent light-emitting materials for OLED applications, and in doing so, to build Amber Molecular into a hub for market-driven advanced materials innovation in Ontario and Canada.