



# DESTINATION STARTUP

## Beyond Copper

**One-Sentence Summary of What You Do:** Beyond Copper makes nano-functionalized copper strip, wire mesh, and powders to add to coatings and filters to neutralize microbes far faster than nearly all currently available disinfectants—and the result is safe and permanent.

**Affiliated Institution:** Colorado School of Mines

**Have you formed a company yet?** Yes

**Funding/Financing:** Angel Funding (including Self or Friends/Family), Series A Venture

**Please describe your company and the problem you are trying to solve:** People have known for millennia that copper will keep surfaces free of contamination and wounds clear of infection. The US EPA recognizes it as a safe and permanent antimicrobial. For example, one peer-reviewed study showed that covering high touch surfaces in intensive care rooms with traditional copper reduced hospital acquired infections (HAI) by 60%. HAI have caused 100,000 deaths per year in the US alone, even before COVID. However, copper is not particularly fast acting, especially compared to the rate at which pathogens can spread in high traffic environments. In over 400 experiments with an EPA-recognized SARS-CoV-2 surrogate, Beyond Copper's Nano-Functionalized Antimicrobial Copper (NAC) removed over 99.99% of the virus in one minute compared to only 8% for traditional copper and essentially none for stainless steel. This is faster than most disinfectant sprays. We currently have four patent filings at the USPTO, with two of them being licensed from the Colorado School of Mines.

We completed a paid demonstration for one of the largest HVAC filter manufacturers in the world and are showing that a combination of their present antimicrobial filters and our NAC improves their product by a factor of 30 or more, making inexpensive hospital, industrial, office, and home HVAC a source of air purification rather than cross contamination. We also have strong expressions of interest from a hospital bed remanufacturer and a very large medical equipment company.

Seed funding will allow us to expand manufacturing and accelerate addressing additional market verticals.

**What is/was your go-to-market strategy?** Even with its much slower disinfection time, traditional antimicrobial copper products are a \$2.5 billion/yr set of markets today. NAC shows strong promise for expanding those traditional uses and creating many new ones.



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We have chosen to address two verticals initially. The first is the \$12.5B HVAC market, which already offers more traditional antimicrobial products, often at high prices and using active technologies such as UV radiation. The low cost and easy scalability of our foundational technology allows us to rapidly expand production of Nano-Functionalized Copper powders and wire mesh for filters in our industrial facility in Golden, Colorado. We will sell our products to market leaders, such as we describe above, and also work with them to accelerate their product development, new application development and product testing.

We also have an offer to implement a similar project with the largest hospital bed manufacturer in the US. While this is a smaller vertical, it gives us the opportunity to bring our powder product to market with a manufacturer already deeply familiar with copper/polymer spray-on technology.

In all, we have identified at least a dozen nonoverlapping verticals. In some, such as long-lived Personal Protective Equipment, analysts are predicting “explosive” growth although the CAGR is largely a matter of conjecture since we are at an inflection point in growth rates.

**How will/do you generate revenue?** As we are demonstrating with the HVAC manufacturer now, we can integrate our technology directly into their existing products or into the materials they receive from upstream suppliers. In this way we maintain our control of our antimicrobial treatment methods and retain extraordinary margins of profitability. Our customers are then able to make their products highly antimicrobial, but with essentially no change to their existing manufacturing processes. In some cases our technical staff will work with the customers on new product development. Dr. Terry Lowe, Beyond Copper’s CTO, has a long, successful track record at new product development including producing nano-titanium dental implants, nano-magnesium coronary stents, and nano-enhanced intramedullary nails for bone repair.

Beyond Copper will generate nearly all its revenue by manufacturing and direct sales of powders, mesh, and foils or strip that have been treated with our nano-functionalization processes. We may in some cases obtain additional revenue from co-development of new products and subsequent licensing.

In addition, there will be an opportunity to generate revenue from the Federal and State grant-making agencies such as NSF and NIH.

Because the manufacturing methods have already been piloted and are easily scaled, we expect to be solidly profitable by our second year of operation.

**How will this showcase benefit your company or technology?** Because we started Beyond Copper with an unproven technology and no intellectual property in April of 2020, the founders have financed the company themselves and with a seed investment from the Colorado School of Mines.



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After successful validations of the technology, in November 2021 we signed a term sheet for a Series A investment of \$5 million which is presently being executed into definitive agreements. We have laid the groundwork for an operating company, demonstrating we can create value for customers. Our optimal growth path will require \$2.5 million of additional capital as part the Series A investment that we are presently raising to rapidly expand our sales and manufacturing. We are particularly interested in adding financial partners who have experience in our present markets or can help drive development of additional markets.

Because of our association with the Colorado School of Mines and the long startup and manufacturing technology experience of the founders, we believe Beyond Copper is well positioned to grow swiftly.

We expect Destination Startup at the University of Colorado to be a particularly rich source of prospective financial partners and individuals to help drive market development.

## Who are the members of your team and why is this the right team to get the job done?

- **Frank Thibodeau** will be CEO of Beyond Copper. He holds a Ph.D. from Tufts and spent five years on the biology faculty at Harvard. Later, he received an MBA from Stanford Graduate School of Business and for the last twenty-five years he has led early stage startups based in biotechnology, Internet, and materials technologies. He has also held related venture roles.
- **Terry C. Lowe** will be CTO. Terry was formerly Deputy Director of Materials Science and Technology at Los Alamos National Laboratory and has been a professor and researcher at the Colorado School of Mines since 2013. His research focuses on the interaction between biological and abiotic systems. Thompson-Reuters named him one of the “Top 100 Materials Scientists of the 21st Century” and as mentioned previously, he has had several nano-based commercial successes, generating over \$30 million of revenue.

## ADVISORS

- **Charles W. Keevil.** Bill is perhaps the best known and most respected academic expert on the interaction between metals and pathogens. He is a Fellow of the Royal Societies of Biology, Medicine, and Public Health.
- **Peter Sharpe** was one of the primary consultants to the Copper Development Association (the CEO-level trade organization for the US copper industry) when they obtained EPA listing for over 500 high copper alloys as safe and effective antimicrobials. Peter has CEO-level contacts across the industry.
- **Michael Danaher.** Mike has been a member of the Corporate Practice at Wilson, Sonsini, Goodrich and Rosati for more than twenty years. He is one of the most well-known and respected startup attorneys in the field.