



# How Resonant Link Medical Helped Longeviti Establish a Path to Product

## Understanding What's Possible

Longeviti Neuro Solutions was created by industry leaders to bring promising neuro-therapies from the lab to the commercial market. Longeviti's mission is to develop innovative solutions for complex brain surgery to return patients to anatomical normalcy while providing innovative functional neurotechnology.

When Longeviti approached Resonant Link Medical, they wanted to understand whether a new device design they were working on would deliver the required performance. Key to their functionality was the ability to send wireless power into a miniaturized implant while meeting the FDA's tissue temperature limits.

Longeviti found that there were no commercially available tools that could capture the key performance metric—tissue temperature rise—for a wirelessly charged implantable device because to do so would require complex electromagnetic, thermal, and electric circuit modeling. Instead of guessing and checking, they opted to use Resonant Link Medical's proprietary implantable-specific modeling and design tools—BioPWR™ and BioPRD™—and collaborative Opportunity Study process to determine the best design and ensure a single design iteration from concept to commercialization.

## To Customize or Not to Customize

Resonant Link Medical offers two options for companies who want to integrate the best wireless power into their application. The first is an Opportunity Study, which is what Longeviti chose to do, where Resonant Link Medical evaluates the unique application and determines the best system architecture to maximize wireless power performance. The Opportunity Study is most useful for novel devices unlike others commercially available.

The second is to adapt and integrate one of Resonant Link Medical's product platforms into your device, giving you working hardware to use for preclinical testing and validation in months, not years. Product platforms include Eterni™ for miniaturized implants, the Vivigo™ 20-Minute Universal Charger for the fastest and easiest wireless implantable charging, and Cardessa™, which wirelessly charges high power implants such as total artificial hearts, ventricular assist devices, and drug delivery pumps.

Longeviti wanted to understand exactly what they would need to do to safely and reliably deliver the wireless power their device needed, and how to design their implant to optimize for power. Because of that, the Opportunity Study process was a perfect fit.



## Tools, Technology, and Team

What makes working with Resonant Link Medical unique is the unmatched combination of the best tools, technology, and team, which leads to a high degree of trust. The Opportunity Study process leverages Resonant Link Medical's leadership in all areas of wireless medical device power and lasts for 5 weeks, with weekly 1-hour check-ins to share insights and feedback.

The Resonant Link Medical team of wireless power experts, including electromagnetics, electrical engineering, and power electronics PhDs, use a proprietary tool called BioPWR™ to model various designs and understand how different parameters affect performance. BioPWR™ was built to optimize wireless power systems for implantable medical device designs, and it's the only tool that combines EM, power electronics, tissue heating, and thermal dissipation to more quickly determine high-performing designs that can be replicated in the lab. BioPWR™ has proven particularly valuable for medical device makers at the concept stage and it's also been used by established device teams to save years of engineering and get the next generation of their device to market faster. The result is that device makers know what will and will not work before they build.

Resonant Link Medical's wireless technology platform, Aurion WPT™, is the only technology platform combining patented innovations in coils, power electronics, magnetics, and data transfer for unprecedented performance and a lower-risk path to market. It delivers 10x faster charging than conventional wireless over double the range, and has been adapted to more than 50 medical device types.

The cornerstone of the Aurion WPT™ technology platform is a first-of-its-kind coil technology with integrated capacitance, called the multi-layer self-resonant structure (MSRS™), which along with best-in-class power electronics, magnetics, and power-link-integrated data and communications enables smaller, smarter, longer lasting, and easy to use implants that clinicians and patients want.

Beyond its novel, implantable-first tools, technology, and team, by collaborating closely and listening to what success looks like, Resonant Link Medical builds trust with their medical device partners. That's exactly what happened with Longevity.

## A Challenge and An Opportunity

Once the Opportunity Study started, Resonant Link Medical quickly identified a challenge and an opportunity with Longeviti's wireless design. Losses in the transmit coil were limiting the implant depth and misalignment of the system, while losses in the receive coil were limiting recharge speed. Furthermore, the location of the PCBs and battery led to excessive heat generation due to magnetic fields inducing eddy currents.

Resonant Link Medical analyzed the fundamental problem space independent of its Aurion WPT™ technology to understand the optimal placement of components and operating frequency. Analysis showed that by balancing losses between the coils, increasing frequency, shielding electronics, and incorporating the MSRS coils there was a path to deliver the maximum power and spatial freedom specifications. Over the course of the coming weeks, different designs were configured to consider key patient experience tradeoffs such as transmit coil size versus misalignment tolerance, and receive coil size versus power delivered.

By the 5th week, Longeviti had identified their preferred path to wireless power out of several options Resonant Link Medical had presented. The time spent working with the Resonant Link Medical team and the information shared over the course of the Opportunity Study process helped them understand the benefits and tradeoffs of the different options and they were confident in their new approach. In less than two months, Longeviti had a path to productizing their device, with a deep understanding of the tradeoffs for wireless power, the space required, the budget and timeline needed for development, and next steps.

“ Resonant Link evaluated alternatives of safe wireless power and framed the model within our use case...Their recommended solution exceeded our expectations and validated Resonant Link's extraordinary expertise.

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—Brad Rabinovitz, COO of Longeviti Neuro Solutions

## Partners in Power

Resonant Link Medical is the medical device industry's partner in power, on a mission to enable the next generation of implantables—smaller, smarter, and longer lasting—to help people get well and stay well, by adapting our innovative Aurion WPT™ platform to deliver fast, convenient, and uninterrupted wireless power. That means creating not only the best wireless technology platform from a performance perspective, but also optimizing it for manufacturability, supply chain, and cost. Resonant Link Medical performs the Opportunity Study at-cost so our customers get the outputs they need, and accelerated R&D for their medical device, at a fraction of what it would cost to work with a contract manufacturer, build an in-house team, or even dedicate in-house resources to a similar project. From our fee structure to the ongoing support provided through testing, trials, and design hand-off for volume manufacturing, Resonant Link Medical is invested in our partners' long-term success, and that's good for everyone.