

InVivo CEO Overcame Spinal Cord Injury, Now Aims to Create Better Treatment For Same Problem

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Frank Reynolds, the CEO of Cambridge, MA-based InVivo Therapeutics, says he still feels pain in his lower back when he steps off a curb. The pain stems from the spinal cord injury Reynolds suffered in an auto accident in 1992. It's no coincidence that today he is running a medical technology firm with an implant that could prevent some cases of paralysis.

This week InVivo launched a second study to test its polymer-based device—implanted at the site of the spinal cord injury—in monkeys, Reynolds says. If successful, the study could provide enough evidence to get the “green light” from the FDA to begin human testing next year. Reynolds also aims to raise \$15 million in a Series A financing round in the next few months to fund the company through human clinical trials and the cost of a factory to mass-produce the device. (Thus far, the company has raised nearly \$3 million from family and friends.)

“The rest of the world is focused on regeneration.” Reynolds says. “We take a different path than the rest of the world.”

Initially developed in the lab of prolific MIT inventor Bob Langer—a scientific advisor of InVivo—the company's fingertip-sized device is intended to be implanted within days of a spinal cord injury to limit tissue damage, or secondary injuries, that most often cause patients to become paralyzed. The device is made of biodegradable polymers engineered to dissolve in the body in weeks. Reynolds says the fabrication and use of the materials and not the materials themselves make the device unique.

Today's limited options to treat spinal cord injuries include stabilizing patients' bodies to prevent further damage, anti-inflammatory drugs, and, if needed, surgeries to decompress injured areas and to remove bone fragments.

With mixed results, many experimental treatments for spinal injuries have focused on treating damaged neurons. Hopkinton, MA-based Alseres Pharmaceuticals (NASDAQ:ALSE), for example, is developing a protein-based drug—injected once onto the injured area of the spinal cord during post-trauma surgery—to repair damaged nerves and restore movement and sensory functions. Acorda Therapeutics (NASDAQ:ACOR), a Hawthorne, NY-based biotech firm, had advanced to late-stage clinical trials with a molecule called fampridine, intended to prevent damage to nerves after spinal cord injuries, yet the drug failed to meet goals of the studies.

The market for such treatments is small compared with those for cardiovascular disease and cancer. About 11,000 Americans suffer spinal cord injuries annually, according to the Centers for Disease Control and Prevention. Reynolds says that, due to the billions of

dollars spent per year to care for these patients, he thinks health insurers are likely to provide reimbursements for InVivo's device if approved for the market.

I'm often skeptical of market projections for treatments that haven't entered human clinical trials. Still, InVivo has attracted some big-named scientific advisors such as MIT's Langer and company director Richard Roberts, a biochemist who shared a Nobel Prize in medicine in 1993 with MIT professor Phillip Sharp for their discovery of split genes.

Reynolds, a former business development executive for Siemens, says that Langer recruited him to be the "business guy" for his spinal implant project when Reynolds was studying at the Sloan School of Management at MIT. Reynolds, 44, says he had been introduced to Langer because of the MIT professor's research of spinal cord injuries with Harvard Medical School neurosurgeon Yang Teng. The project became Reynolds' MBA thesis and he founded InVivo in November 2005.

When I first met Reynolds in late 2006, his clinical evidence to show the utility of the device was from rodent studies. Then last month, I saw him at MassMEDIC's annual investor conference in Boston, where he showed the audience a video of a monkey dragging a leg that had been surgically paralyzed. The video then showed the same monkey, two weeks after InVivo's device had been implanted in its spine, moving around with barely a limp.

The recently launched primate study of InVivo's implant will include 12 to 16 Rhesus monkeys, expanding from the pilot study of four monkeys. However, the real test for the implant will be human trials, which Reynolds expects to begin next year. That study would include patients with severe spinal cord injuries who are at high risk of paralysis. There are other models of the implant that deliver neural stem cells or drugs, he says, but those would likely be next-generation products.

Reynolds sounds extremely confident about his company's future: "We only need \$15 million and that's it. We'll definitely be an IPO company with one round [of funding]," he says. "If it works, we have maybe the biggest IPO in health care in a long time."