

SECTOR WATCH: MEDICAL DEVICE

Neurostimulation Sector Charges Up VCs

By John Galante

In agreeing last fall to pay \$1.3 billion for publicly traded Advanced Neuromodulation Systems Inc., St. Jude Medical Inc. did a great deal more than acquire a treatment for spinal pain.

It cemented in the minds of venture capitalists that the major medical device corporations are indeed interested in neurostimulation – the delivery of electrical stimulation to nerve cells. Because in making the acquisition, St. Jude jumped into a field featuring industry pioneer Medtronic Inc., which is looking to grow its neurostimulation products into a \$10 billion business over the next decade, as well as Boston Scientific Inc., which bought another neurostimulation company, Advanced Bionics Corp., for \$740 million in 2004.

Additionally, Johnson & Johnson Inc., while not making any acquisitions yet, has waded into the sector through its venture arm, **Johnson & Johnson Development Corp.**, which has backed such neurostimulation companies as **Northstar Neuroscience Inc.**, **NeuroPace Inc.** and **Neuralieve Inc.**

Perhaps not surprisingly, VCs are feeling more confident backing companies utilizing battery-powered implantable pulse generators and electrodes to deliver electrical currents to

treat such conditions as pain, depression and obesity.

Said David Milne, a general partner at **SV Life Science Advisors Inc.**, and a former executive at Boston Scientific, “Now, instead of one acquirer, you know there’s at least three.”

Adds Daniel O’Connor, a director at **NeuroVentures Capital LLC**, “All the big guys are now building out these neurostim franchises.”

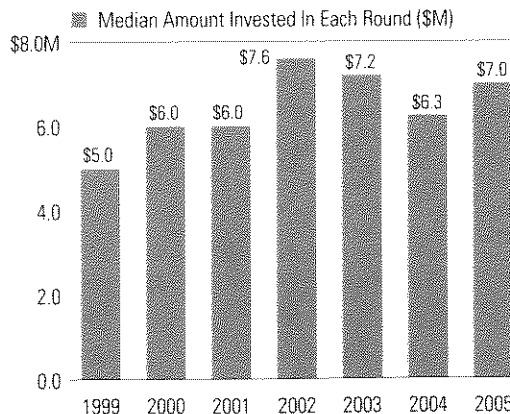
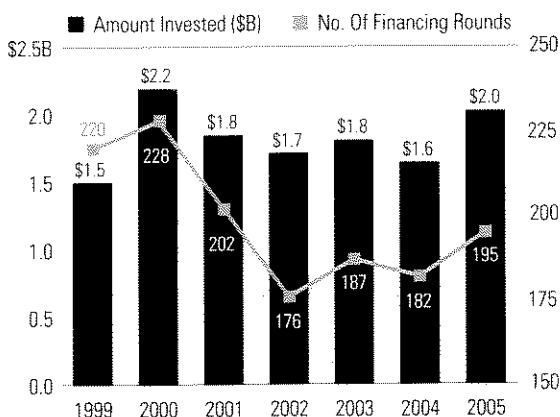
To date, there has been a bit of venture activity in the area as three companies with neurostimulation technologies have received funding in both 2004 and 2005, according to VentureOne, which like this publication is owned by Dow Jones.

Among the more notable start-ups in the area are NeuroPace, which is developing a device to treat neurological disorders such as epilepsy; Northstar Neuroscience, which is using neurostimulation to help stroke victims recover functionality; and **Neuronetics**, which is developing treatments for psychiatric and neurological disorders.

The pace of investing by VCs in the sector, however, is expected to increase thanks to not only the interest by St. Jude, Boston Scientific, Medtronic and others, but also to the general acceptance of the technology. No longer seen as something that might have come out of Victor

Hot Or Too Hot?

Hard core device investors continue to complain their sector is drawing too much attention. Well, their complains have some merit. It’s difficult to say the sector is suffering because of it, but medical device companies raised the highest amount of capital since 2000, which has the largest annual sum on record.



Source: VentureOne

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Frankenstein's lab, neurostimulation has reached the point where sales of related devices have passed the \$1 billion mark, according to a 2005 report by industry tracker NeuroInsights.

Neurostimulation, said **Technology Partners** General Partner Roger Quy, is the "cardiac opportunity of this decade" due to the number of maladies it can treat, but also the public's growing acceptance of the technology, advances in processing power and the increased knowledge of the brain and central nervous system.

In terms of opportunities for utilizing neurostimulation, there is a general sense that spinal cord stimulation for the treatment of neuropathic pain is probably not a strong option for start-ups. Presently, that is the largest market for the use of neurostimulation with annual revenue of around \$500 million and is dominated by Medtronic.

There may, however, be opportunities for companies exploring large and emerging therapeutic indications such as depression and obesity, as well as those developing better devices to deliver electronic currents.

The deep brain stimulation, or DBS, area presents more opportunity. Medtronic's Parkinson's tremors device leads the space. Yet, maturing VC-backed companies in the sector such as NeuroPace, Northstar Neuroscience and Neuronetics each raised late-stage financing during the past 18 months and has DBS products undergoing pivotal studies.

Many opportunities lie in disorders where drug treatment is absent, ineffective, or induces debilitating side effects. Steve LaPorte, a former Medtronic executive who recently joined the **Onset Ventures** investment team, said research conducted by the device juggernaut showed "over 100 [neurological disorders] could be treated using stimulation or drug delivery" technologies. Other notable applications for DBS include migraines, seizure, multiple sclerosis and paralysis treatment.

Depression appears to be on the mind of many as the next hot area. Publicly traded Cyberonics Inc. received a somewhat controversial approval for depression treatment in February 2005 for its vagus nerve stimulation therapy.

Vagus nerve stimulation is just one approach companies are taking to stimulate the brain through less invasive mechanisms. Existing DBS devices may be more precise than biopharmaceuticals – which also can have difficulty crossing the blood-brain barrier – but devices also involve invasive surgical procedures. Not unlike the rest of the device sector, DBS manufacturers are threatened with competition from less invasive technologies; Neuronetics and NeuraLieve Inc., for example, are developing transcranial magnetic stimulation technologies, which deliver impulses from a more external position.

Using neurostimulation for the treatment of central nervous system-related disorders is rather obvious, but many opportunities also lie in the stimulation of the peripheral nervous system in order to treat disorders not traditionally associated with the neurology space.

For example, among the areas Medtronic is interested in for using the technology are urinary retention, diabetes and obesity: "big problems that payers are going to have to deal with," said Rick Kuntz, a Medtronic senior vice president who is also president of the corporation's neurological business. The corporation, in fact, already sees itself as being in the obesity business thanks to its June 2005, \$260 million acquisition of TransNeuronix Inc., which developed a clinical neurostimulation device for the (growing) problem. Kuntz said Medtronic is now entering a second phase of development for its neurostimulation business, one that takes developed markets further and enables the penetration of the platform in other therapeutic areas of interest to payers.

Instead of looking to other indications, start-ups would rather improve upon existing treatments. One young company, **Medtrode Inc.**, seeks to build on Medtronic's device and the treatment of Parkinson's. "Our technology is completely revolutionizing the way that these electrodes are built and the way that they are used," said chief executive Souhile Assaf. Founded in 2004, the self-funded company is applying micro manufacturing techniques to create electrodes with more poles as well as pulse generators implanted in the patient's cranium rather than the collarbone, where Medtronic's device is inserted.

"Three of the four largest medical device companies in the world have contacted us in one form or another," Assaf said.

Another start-up **Gent Corp.** is pursuing new innovations in power source technology, while University of Michigan spinoff **NeuroNexus Technologies** is developing microelectrode technologies.

Investors also might want to keep an eye on **Synapse Biomedical**, which is developing a diaphragm pacing stimulation system as a possible replacement for mechanical ventilators. It received \$1.3 million in financing last November from backers including **Palo Alto Investors**.

Founded in 2004, the company has implanted its device in more than 25 patients, one of whom was the now-late actor Christopher Reeves. A pivotal trial should begin in the next few months and the company has received "some very good reception from the venture community," President Anthony Ignagni said, adding that increased investor interest in the space undoubtedly stems from acquisitive large device companies. ●