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Medtronic and Eli Lilly in Drug-Device Pact for Parkinson's Disease

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Eli Lilly has formed an early-stage, drug-device collaboration with the world's largest medical device maker, Medtronic, to research and develop a Parkinson's disease treatment using Lilly's modified form of glial cell-derived neurotrophic factor (GDNF) and Medtronic's implantable drug infusion device. Previous attempts to deliver GDNF effectively across the blood-brain barrier have been unsuccessful and the companies will hope to overcome the technical challenges presented by this novel approach to the treatment of Parkinson's disease.

Eli Lilly has formed an early-stage, drug-device collaboration with Medtronic, the world's largest medical device maker, for the research and development of a novel approach to the treatment of Parkinson's disease (Deal no. 40408). The partnership represents Medtronic's latest attempt to deliver drugs successfully across the blood-brain barrier for the treatment of neurodegenerative disease. Under the terms of the collaboration, the companies will develop a new therapeutic approach for the treatment of Parkinson's disease that involves the delivery of Lilly's biologic, a modified form of glial cell-derived neurotrophic factor (GDNF), to the brain using Medtronic's implantable drug infusion system technology. The collaboration, the financial details of which were not disclosed, will cover early research through product development and potential commercialisation and it is expected to be approximately 5 years before the therapy enters human clinical trials.

GDNF is a neurotrophic protein that supports survival of neurones. As such, it is believed to have potential in the treatment of Parkinson's disease, which is caused by the progressive loss of neurones that produce dopamine, a chemical messenger responsible for transmitting signals that allow for coordination of movement. GDNF, however, has yet to achieve this potential owing to difficulties in its effective delivery to the part of the brain where dopamine-producing neurones are located and it has previously failed in clinical trials with various delivery approaches. In 2004, Amgen halted a 48-patient trial of a formulation of GDNF delivered using Medtronic implantable pump technology owing to a risk of irreversible brain damage and the lack of any demonstrable medical benefit.

Lilly has biosynthetically engineered its GDNF variant with the hope of achieving increased distribution in targeted brain regions and therefore to overcome the technical hurdles posed by the anatomy of the brain that have been observed in previous studies of GDNF. Moreover, Medtronic's improved drug pump and specially designed catheter will help ensure the precise delivery of Lilly's modified GDNF variant into the targeted area of the brain consistently over time. As such, the drug-device combination has the potential to affect the neurodegeneration that leads to worsening symptoms and disease progression.

In January 2010, Biovail and MedGenesis Therapeutix formed a collaboration on the development of GDNF in Parkinson's disease, and potentially other CNS indications, and MedGenesis granted Biovail a licence to its Convection Enhanced Delivery (CED) platform for use with GDNF in CNS indications (Deal no. 34609). The parties were awarded a US$2.1 M grant, to be made over a 3-year period, from The Michael J. Fox Foundation in June 2010 (Deal no. 36491) but they subsequently agreed to terminate the collaboration in November 2010, with all rights returning to MedGenesis. Biovail and MedGenesis had both licensed certain rights to GDNF from Amgen (Deal nos. 34610 and 34606).

Medtronic has formed a number of neurodegenerative disease collaborations. In 2005, it collaborated with Neurologix to develop micro-infusion catheters designed to deliver gene therapy into the brain and CNS for Parkinson's disease and temporal lobe epilepsy (Deal no. 20291). In the same year, it also partnered with Alnylam Pharmaceuticals to develop novel drug-device combinations incorporating RNAi therapeutics to treat neurodegenerative disorders (Deal no. 19331). Lilly has also been active in the development of therapeutics for neurodegenerative diseases. Phase III trials of semagacestat, a gamma secretase inhibitor in development for Alzheimer's disease, were stopped in August 2010 after results showed that the drug did not halt disease progression. The company has another Alzheimer's disease drug candidate in Phase III development; solanezumab is a monoclonal antibody that binds to soluble beta amyloid and thereby may draw the peptide away from the brain through the blood. In December 2010, Lilly bought Avid Radiopharmaceuticals in a transaction worth up to US$800 M and in doing so acquired a diagnostics development platform covering several disease areas, including Parkinson's disease (Deal no. 38046).