OptiNose Inc. Fact Sheet

OptiNose is a drug delivery company developing a breakthrough Breath Powered™ nasal technology set to transform the static nasal drug delivery market. OptiNose devices are designed to reliably deliver nasal medication to target regions of the nasal cavity, including the sinus and olfactory regions, while preventing lung deposition. The simple devices are intended to unlock the potential for significant new benefits, including better local activity, better systemic bioavailability and pharmacodynamics and for "nose-to-brain" delivery for treating neurologic and psychiatric disorders. The company offers multi-use intranasal devices for liquid and powder formulations.

How it works:

OptiNose's Breath Powered delivery technology is unique in that it uses the natural function of a user's breath to propel medications beyond the nasal valve into the deep, targeted areas of the nasal cavity more effectively, efficiently and consistently than current treatment approaches. A user exhales into the device, creating a naturally balanced closure of the soft palate and sealing off the nasal cavity completely. The exhaled breath carries medication from the device into one side of the nose through a sealing nosepiece. Narrow nasal passages are gently expanded and medication is transported well beyond the nasal valve to targeted sites. After delivering medication to the targeted sites, air painlessly flows around to the opposite side of the nasal cavity and exits through the other side of the nose rather than into the throat or lungs.

Why the Nose?

The lining of the nasal cavity has a rich blood flow, making it possible to achieve faster blood levels and an excellent place to introduce medication into the body without facing the historical drug development problems associated with drug inactivation or modification in the stomach and liver. The nose is also one of the body's natural first lines of defense against infection, making it a very desirable place to introduce preventive or therapeutic treatments designed to developing either blood or surface immunity. Interestingly, the nose is supplied by branches of more than one cranial nerve, and is thus sometimes called "the only place where the brain touches the outside world." This raises the interesting possibility, supported by a growing body of evidence, of delivering medication directly into the brain.

OptiNose Benefits:

- **Breath Powered**: This unique and simple OptiNose approach to self-administration is positively viewed by patients and results in strong interest to use the device. This approach to administration is likely to contribute to improved consistency, reliability and targeting of delivery of drug into the nasal cavity.
- **Improved Efficacy and Lower Doses:** Direct delivery of medication into the body without first passing through the stomach or liver may reduce doses. It may also make it possible to bring new or old medications to the public which would otherwise not be developed. This may also enable delivery of medications like proteins, peptides and vaccines without the need for needles and people trained to use them.
- **Reduced Side Effects:** While exhaling the soft palate is closed off resulting in a significant reduction in "drip" down the back of the throat. In addition to avoiding the historical nasal spray problem of bad taste, OptiNose delivery greatly reduces lung and gastrointestinal exposure to medication, which can improve safety. The ability to use lower doses of medication may also improve tolerability and safety of certain medications.
- **Convenience:** The device is comfortable because of its fixed position during use compared with a traditional spray pump. In addition, the naturally warmed and humidified air from the lungs may reduce the discomfort often experienced when a traditional spray is released alone into the nasal cavity. Patients viewed the OptiNose device as simple to use and comfortable.

- **Design and COGS:** The OptiNose drug delivery technology is ergonomic, takes advantage of several off-the-shelf components, and has no electromechanical or other costly design elements creating regulatory or manufacturing risk. The design is often referred to as “simple and elegant.” The devices are easy to manufacture and have a low COGS.
- **Patent Protection:** The OptiNose drug delivery technology is protected by a broad strategy including 36 patent families in the US, G5, Japan and BRIC markets through at least 2028. The strategy builds on the bi-directional delivery concept with key device features and provides both patent and exclusivity protection.
- **Platform Applications:** Central Nervous System disorders, pain, oncology, vaccine delivery, small and large (biologic) molecules for multiple therapeutic applications.

Headquarters: Yardley, PA

Founded: 2000 in Oslo, Norway

Founders:
The OptiNose delivery technology was created by internationally renowned ENT surgeon and Rhinologist, Per G. Djupesland, M.D., Ph.D. He founded OptiNose with his wife, Helena Kyttari Djupesland, who served as the initial CEO.

Current Leadership:
In 2009 Peter Miller, in coordination with the founders, led a significant capital raise allowing OptiNose to move forward with phase III clinical trials and the commercialization process. In 2010 he accepted the role of Chief Executive Officer. Since then, Mr. Miller has overseen the relocation of the Company’s headquarters from Oslo, Norway to Yardley, PA, and the expansion of the OptiNose team.

Investors Include:
Avista Capital Partners in New York, WFD Ventures LLC located in New York and Entrepreneurs Fund LP based in Jersey, Channel Islands.

Patents:
OptiNose currently holds 36 patent families surrounding this technology covering large commercial markets (US, EU5 and Japan) as well as emerging markets (Brazil, Russia, China and India).

Potential Applications: Central Nervous System disorders, vaccine delivery, small and large (biologic) molecules

Website: www.optinose.com

Current Leadership:
Peter Miller – Chief Executive Officer
Ramy A. Mahmoud, M.D., MPH – Chief Operating Officer
Per G. Djupesland, M.D., Ph.D. – Founder and Chief Scientific Officer
Frank Closurdo – Chief Marketing Officer
Helena Kyttari Djupesland – Vice President, Business Development
Michele Janis – Vice President, Finance
John Messina – Vice President of Clinical Development
Robert Useller – Vice President, Manufacturing and Supply Chain