BioMarin InvestorRoom

BioMarin Demonstrates Normalization of Carbohydrate Storage in Brain Tissue Using an MPS I Model

Data Warrants Further Study of Intrathecal Injection of Enzyme for Treating Neurological Symptoms of MPS I

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BioMarin Pharmaceutical Inc. announced results from studies indicating that intrathecal injection of recombinant human alpha-L-iduronidase (rhIDU) can reduce carbohydrate storage in brain tissue in the canine model of MPS I (mucopolysaccharidosis I). Emil Kakkis, M.D., Ph.D., Senior Vice President of Business Operations at BioMarin, presented the data at the 9th International Congress of Inborn Errors of Metabolism, on September 3rd in Brisbane, Australia.

Results from the studies are summarized below:

- Intrathecal injection (injections directly into the cerebrospinal fluid) of rhIDU once-weekly for four weeks delivered high levels of enzyme to the brain leading to normalization of glycosaminoglycan (GAG) carbohydrate levels in all four MPS I dogs treated. Results were based on a quantitative measure of GAG carbohydrate levels in addition to histological analysis of stained sections of brain tissue in treated MPS I dogs and normal dogs.
- Penetration and activity of rhIDU in canine brain tissue was dose-dependent as indicated by enzyme analysis of brain tissue from treated dogs.
- Delivery of enzyme via intrathecal injections also penetrated the scarred and thickened meninges (outer membranes of the brain and spinal cord) in MPS I dogs resulting in substantial reductions in GAG storage. GAG storage in the meninges can lead to spinal cord compression, a debilitating symptom of MPS I.
- Injection of rhIDU into the cerebrospinal fluid in rats resulted in significant penetration and activity in brain tissue as well as uptake into neurons confirming results observed in the canine model.

Dr. Kakkis commented, "This evidence suggests that administration of alpha-L-iduronidase directly into the cerebrospinal fluid delivers enough enzyme to normalize GAG accumulation in the brain and meninges of the canine model of MPS I. Currently, bone marrow transplantation is the only available treatment that possibly addresses the neurological components of MPS I, but it is associated with significant morbidity and mortality."

BioMarin Brain Disease Research

BioMarin is evaluating two approaches to treat the neurological components of lysosomal storage diseases: direct injection of the enzyme into the cerebrospinal fluid (intrathecal administration), and use of the company's proprietary NeuroTrans(TM) program that uses carrier molecules to actively transport enzymes across the blood-brain barrier. NeuroTrans may also be applicable to a variety of other diseases in which the inability to deliver adequate doses of intravenously infused drugs to the brain limits efficacy. BioMarin develops and commercializes therapeutic enzyme products to treat serious, life-threatening diseases and other

conditions.

This press release contains forward-looking statements about the business prospects of BioMarin Pharmaceutical Inc., including without limitation, statements about: current preclinical research related to alpha-L-iduronidase and NeuroTrans and expectations regarding further preclinical research in such programs. These forward-looking statements are predictions and involve risks and uncertainties such that actual results may differ materially from these statements. These risks and uncertainties include, among others: actual results and timing of current and future preclinical trials; the results of possible future clinical trials related to alpha-L-iduronidase and NeuroTrans; the content and timing of decisions by the FDA, the European Commission and other regulatory authorities; and those factors detailed in BioMarin's filings with the Securities and Exchange Commission, including, without limitation, the factors contained under the caption "Factors That May Affect Future Results" in BioMarin's 2002 Annual Report on Form 10-K and the factors contained in BioMarin's reports on Forms 10Q and 8K. Stockholders are urged not to place undue reliance on forward-looking statements, which speak only as of the date hereof. BioMarin is under no obligation, and expressly disclaims any obligation, to update or alter any forward-looking statement, whether as a result of new information, future events or otherwise.

BioMarin's press releases and other company information are available online at http://www.bmrn.com/ . Information on BioMarin's website is not incorporated by reference into this press release.

CONTACT:

Joshua A. Grass	Susan Ferris
Manager, Investor Relations	Manager, Corporate Communications
BioMarin Pharmaceutical Inc.	BioMarin Pharmaceutical Inc.
+1-415-506-6777	+1-415-506-6701

SOURCE: BioMarin Pharmaceutical Inc.

CONTACT: Joshua A. Grass, Manager, Investor Relations of BioMarin Pharmaceutical Inc., +1-415-506-6777, or Susan Ferris, Manager, Corporate Communications, +1-415-506-6701, both of BioMarin Pharmaceutical Inc.

Web site: http://www.bmrn.com/

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