Stem Cells from Teeth Produce Insulin in Diabetes Study

***Store-A-Tooth ™statement on new dental stem cell research published in the* Journal of Dental Research**

Lexington, MA (March 9, 2011) -- Store-A-Tooth™ commends the scientists who report in the *Journal of Dental Research* (JDR) that stem cells from teeth can be transformed into cells that produce insulin in a glucose-dependent manner—a significant step toward developing stem-cell therapies for diabetes.[1]

The finding is particularly important for type 1 diabetes, which results from a failure of the pancreas to produce enough insulin, the hormone that plays a vital role in the body's use of glucose (blood sugar). In the United States alone, the CDC estimates that nearly one million people have type 1 diabetes, with more than 15,000 children and teenagers newly diagnosed each year.[2] Intensive research is under way to determine whether insulin-producing cells derived from stem cells might one day be used as part of a cure for type 1 diabetes.

"This work is further evidence that research into medical as well as dental applications of stem cells from teeth, though early, is steadily progressing toward what we believe will be a new generation of therapies for conditions that impact millions of Americans. We are pleased to see dental stem cell research aimed at one of the most serious diseases affecting young people: type 1 diabetes," said Peter Verlander, Ph.D., chief scientific officer of Provia Laboratories, LLC.

Provia is the provider of Store-A-Tooth (www.store-a-tooth.com), a service that enables parents to preserve stem cells from their children's teeth, allowing families to take advantage of future medical breakthroughs from stem cell research.

In 2000, scientists from the National Institutes of Health first reported isolating stem cells from dental pulp.[3] In 2009, it was shown that stem cells from periodontal ligament could produce insulin.[4] The new research takes the next step: showing that stem cells from teeth can be used to generate cells that secrete insulin in a glucose-dependent manner; that is, when exposed to more glucose, the cells produced more insulin.

According to the paper in the *JDR*, scientists at Stempeutics Research Malaysia and the University of Malaya isolated stem cells from deciduous molars (baby teeth). These teeth were extracted as part of routine dental care, for the management of occlusion (crowded teeth). The scientists then cultured these dental stem cells under conditions that led the cells to turn into islet-like cell aggregates like those in the pancreas that secrete insulin.

The authors of the paper comment, "(We) anticipate that our finding will create a benchmark toward cell replacement for type 1 diabetes… by autologous transplantation of islet-like cell aggregates (ICAs) differentiated from a patient's own teeth."

Today, standard treatment for type 1 diabetes (also called insulin-dependent or juvenile-onset diabetes) includes frequent blood glucose monitoring and daily insulin injections or use of insulin pumps. Looking forward, doctors are focusing on ways to cure the disease, such as by transplantation of pancreatic islet cells from a donor, but this approach is often hindered by a shortage of donor organs and by potential side effects caused by immunosuppressive drugs needed to prevent transplant rejection. If a patient's own dental stem cells had been preserved, both of these problems might be resolved: the patient's own cells could be used to generate islets for autologous transplantation (meaning tissues are used from the same individual, not a donor, eliminating the need for immunosuppressive drugs).

As the authors of the paper in the *JDR* note, limitations with donor transplants have led to a search for alternative cell-replacement therapies. They comment that dental stem cells "are considered to be an appealing source" because "they are non-controversial, readily accessible, have a large donor pool, and pose no risk of discomfort for the donor." Every person typically loses 20 baby teeth, each of which can provide a source of stem cells.

Store-A-Tooth, a dental stem cell banking company based in Massachusetts, works with families and their dentists to collect teeth removed during normal dental procedures, such as baby teeth that come loose during childhood, wisdom teeth extracted from teens or young adults, and teeth that need to be pulled for orthodontic reasons – like the teeth reported in this study. Store-A-Tooth then preserves the tissue at very low temperatures, until the day when new stem cell therapies become routinely available.

"We applaud these researchers for demonstrating that stem cells from one's own teeth may play a critical role in enabling new therapies for type 1 diabetes. The pace of dental stem cell research around the world is accelerating, and we look forward to seeing a growing number of potential applications in the future," Dr. Verlander said. "We encourage families living with type 1 diabetes to learn more about options for preserving dental stem cells, so that they can make an informed decision while their children are losing teeth."

About Provia Laboratories LLC

Provia Laboratories, LLC (www.provialabs.com) is a healthcare services company specializing in high quality biobanking (preservation of biological specimens). The company's Store-A-Tooth™ service platform enables the collection, transport, processing, and storage of dental stem cells for potential use in future stem-cell therapies. The company advises industrial, academic, and governmental clients on matters related to the preservation of biological specimens for research and clinical use. In addition, Provia offers a variety of products for use in complex biobanking environments to improve sample logistics, security, and quality. Provia Labs is a member of ISBER, the International Society for Biological and Environmental Repositories.

For more information about Store-A-Tooth, call 1-877-867-5753 or visit www.store-a-tooth.com.

Footnotes:

[1] Govindasamy V, et al. (2011) Differentiation of Dental Pulp Stem Cells into Islet Like Aggregates. J Dent Res. published online 18 February 2011. http://www.ncbi.nlm.nih.gov/pubmed/21335539

[2] 2011 National Diabetes Fact Sheet, Centers of Disease Control and Prevention. http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2011.pdf

[3] Gronthos S, Mankani M, Brahim J, Robey PG, Shi S. Postnatal human dental pulp stem cells (DPSCs) in vitro and in vivo. Proc Natl Acad Sci U S A. 2000 Dec 5;97(25):13625-30.

[4] Huang CY, Pelaez D, Dominguez-Bendala J, Garcia-Godoy F, Cheung HS. Plasticity of stem cells derived from adult periodontal ligament. Regen Med. 2009 Nov;4(6):809-21.

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