

FEATURE STORY

THE ROLE OF OSTEOCALCIN AND ITS IMPLICATIONS FOR DIABETES AND METABOLIC SYNDROME



A TEAM LED BY DR. GERARD KARSENTY, Professor and Chair of the Genetics and Development Department at Columbia Medical School, has uncovered a surprising new relationship between bones and obesity with groundbreaking implications. As featured in *Time* magazine and *The Economist*, Karsenty's research revealed a direct link between osteocalcin

produced by osteoblast cells in bone and insulin levels in the bloodstream. In mice, osteocalcin not only boosts insulin levels in the blood, but also increases cell sensitivity to insulin. Accordingly, this discovery has major implications for the treatment of diabetes and metabolic syndrome. The research team is eager to see if osteocalcin will have the same effects in humans, as diabetes affects over 190 million people worldwide and costs the US roughly \$132 billion a year.

In early December, STV and Dr. Karsenty created a new start-up company in partnership with Biogen Idec to pursue the development of therapies leveraging osteocalcin. The company, named Escoublac, will be located in the Biogen Idec Innovation Incubator (bi3) in Cambridge, Mass., and began operations in early January 2008.

Read the feature story in *The Boston Globe*, December 19th, 2007, as well as further coverage in *Time* and *The Economist* online.

OUR MISSION

Science and Technology Ventures (STV) serves to patent and license technologies developed by researchers at Columbia University. Through commercialization, STV transfers advances made in academic research into technologies that benefit the public good.

This year, STV received 324 inventions, closed 70 new licenses and options, formed 12 new start-up companies and completed 104 new sponsored research agreements with industry.

FEATURED TECHNOLOGIES

Read full stories online at www.STV.columbia.edu

BIOLOGICAL PACEMAKER BASED ON GENE AND CELL THERAPIES

A biological pacemaker that can vary heartbeat as required during variations in exercise and emotion . . .

TREATMENT FOR BLINDNESS DUE TO GLAUCOMA OR MACULAR DEGENERATION

A therapeutic peptide that prevents neuronal cell death . . .

VISIBLE UNCAGING OF BIOACTIVE MOLECULES

A compound that cages biomolecules such as neurotransmitters to prevent them from being absorbed . . .

AUTOMATIC PROTECTION SWITCHING FOR LINK FAILURE IN OPTICAL NETWORKS

A system for an automatic protection switching system that protects against link or node failure in a network is described . . .

METHOD OF DESENSITIZING HYPERSENSITIVE DENTIN EMPLOYING COMPOSITIONS

A method for reducing sensory nerve activity in a hypersensitive tooth by applying an appropriate potassium salt . . .

BISPHOSPHONATE BONE GRAFT COMPOSITE FOR THE TREATMENT OF OSTEOLYTIC BONE TUMORS

A bone graft suitable for treating bone destruction that is made of pamidronate, bone graft and carrier material . . .

CHIMERIC ANTIBODIES HAVING AT LEAST A PORTION OF THE CONSTANT REGION R

A modified chimeric monoclonal antibody comprising two molecules of each of two polypeptides . . .

ENDOSCOPIC GASTRIC BYPASS STENT FOR TREATMENT OF OBESITY

A method and device for treating obesity by Gastric Bypass . . .

COLUMBIA SLS TECHNOLOGY: IMPROVING VISUAL DISPLAY TECHNOLOGY

James Im, a professor in the Material Science and Engineering Department, has patented a revolutionary technology known as Sequential Lateral Solidification, or SLS. SLS is an innovative method of producing crystalline material that outperforms its rival methods for creating lower cost/higher quality substrates for liquid crystal displays (LCDs). The technology employs a unique method of melting and solidifying specific substrates, thus allowing silicon-based transistors to be placed on inexpensive transparent glass or plastic substrates, and eliminating the need for expensive silicon wafers. The new material can be used to create a variety of devices, from solar cells to thin film transistors for flat panel computer displays, built on glass or plastic sheets. The innovation is also applicable to smart cards, image sensors, and three-dimensional integrated circuit devices. In theory, the discovery may eventually allow for an entire computer to be put on a sheet of glass or plastic. Leading display manufacturers, including Samsung and LG Philips LCD Co. Ltd., have licensed Dr. Im's technology.

FROM THE ARCHIVES—COLUMBIA'S BIG HITS: MPEG-2 Technology Sets International Standard for Digital Audio and Video: A Success Story

The next time you marvel at the detail on a high-definition TV, consider the fact that some of the key technology that created those sophisticated television signals originated at Columbia University. Dimitris Anastassiou, Ph.D., professor of electrical engineering at Columbia, led the team that developed one of the most important MPEG-2 (Motion Picture Expert Group) algorithms of the early 1990s. Professor Anastassiou's groundbreaking research has been incorporated into the international video compression-coding standard. The MPEG-2 technology algorithm, is actually a set of mathematical manipulations that send and compress quality video and audio for sending over limited bandwidth channels, and then decompress it for display. MPEG-2 is now used in many forms of consumer digital technology including high-definition TV (HDTV), DVD disks, Video on Demand, personal computing, direct satellite TV and digital cable systems. Columbia was the only academic institution involved in the development of the MPEG-2 technology, and this innovative work has since spawned a prolific research area. Anastassiou's pioneering work has led to the creation of a patent pool of nearly 800 patents held by 23 companies, representing \$700 million of royalty income and a consumer market in the billions of dollars.

ZOLINZA™: A NOVEL TREATMENT FOR CANCER

The technology behind Zolinza™ (vorinostat), a cancer therapy that aims to stop the growth of cancer cells by inhibiting the activity of some enzymes that are abnormally active, was first conceived and made in the 1980s in the laboratories of Ronald Breslow, PhD, at Columbia University and Paul A. Marks, MD, at Memorial Sloan-Kettering Cancer Center. This treatment, which was the first oral drug in its class to reach the market, provides a novel option for cancer treatment. In 2001, Drs Breslow and Marks co-founded Aton Pharma, a privately held biopharmaceuticals company, to develop and commercialize Zolinza™ and other cancer therapeutics. In February 2004, Merck & Co., Inc., of Whitehouse Station, NJ, USA—one of the world's leading research-based pharmaceutical companies—acquired Aton as a wholly-owned subsidiary. Zolinza™ was given FDA "fast track" status and received approval on October 6, 2006, based on the results of a pivotal and supportive study. Zolinza™ was approved for the treatment of cutaneous T-cell lymphoma (CTCL), an aggressive form of non-Hodgkin's lymphoma which affects the skin; about three in every million people are diagnosed with it each year. The medication is used when the disease persists, gets worse, or recurs during or after other treatments. The technology behind Zolinza™ targets the cancer cells where excess amounts of the enzyme histone deacetylase (HDAC) prevent the functioning of genes that control normal cellular function. Zolinza™ is able to decrease the activity of HDAC, thus allowing for the reactivation of genes that may assist in slowing or stopping the growth of cancer cells. The technology is being studied for the treatment of many other types of cancer, including leukemia, multiple myeloma, advanced Hodgkin's lymphoma, and solid tumors.

* Zolinza is a registered trademark of Merck & Co., Inc., Whitehouse Station, NJ, USA

IN THE NEWS

AUTM, the *Association of Technology Managers*, features three Columbia Technologies in their "Technology Transfer Works: 100 Innovations from Academic Research to Real-World Application."

Professor Karsenty's Osteocalcin research featured in *BBC News*.

Professor Klaus Lackner's research helps reduce global warming. *Arizona Daily Star*.

Professor Califano's work with the Serious Adverse Events Consortium featured by *Pharmaceutical Executive*.

UPCOMING EVENTS

STV Lecture Series

All faculty, MBA, and graduate students are encouraged to attend.

Patenting 101

Presented by Jeff Sears, Columbia University Patents and Legal Group (PLG)

As Columbia's technology transfer experience demonstrates, patents can provide a successful vehicle for generating research funding for university inventions. Unfortunately, many seemingly harmless events occurring after the inventive process can jeopardize the right to file for a patent. Jeff Sears, Assistant General Counsel for Columbia University, will give an overview of the power of patenting, and present a primer focusing on what you need to know to preserve patent protection for your inventions.

DATE: January 17th, 2008

TIME: 12:00PM

LOCATION: Satow Room, 567 Lerner Hall,
114th & Broadway

Columbia Science and Technology Ventures (STV) and the Columbia Business School Entrepreneurship Program invite you to attend a special panel discussion:

Insights from Venture Capital:

What VCs are Looking for in Early Stage Companies

- Ron Hunt, partner at New Leaf Venture Partners
- Ron Lennox, partner at CHL Medical
- Anders Hove, partner at Venrock Associates
- Paul Felhner, Baker Botts
- Maria Gotsch, CEO of NYC Investment Fund (moderator)

This panel discussion features prominent members of the local VC community. The panel will discuss what areas of science VC are currently looking to fund, as well as what needs to be in place before a company approaches a VC to make a pitch for funding. Paul Felhner from Baker Botts will provide a perspective on patent-related issues that early-stage companies in particular should be aware of.

DATE: January 31st, 2008

TIME: 4PM – 5PM

LOCATION: Russ Berrie Conference Center,
168th and Broadway