FAU
BOARD OF TRUSTEES
Florida Atlantic University

Item: AS.A1

March 24, 2015

SUBJECT: APPROVAL OF HONORARY DOCTORATE

PROPOSED Board ACTION

Requesting recommendation to approve the conferral of Honorary Doctorates on Dr. Richard DiMarchi

BACKGROUND INFORMATION

University Policy 2.3 (Honorary Doctorates) specifies that those nominated for Honorary Doctorates be recommended to the FAU Board of Trustees by the University Faculty Senate Honors and Awards Committee, the Provost and the President. One candidate is being recommended at this time.

Dr. DiMarchi earned a B.S. in Chemistry from Florida Atlantic University and a Ph.D. in Biochemistry from Indiana University. Dr. DiMarchi is the first FAU graduate to be inducted into the National Inventors Hall of Fame for his contribution to the field of medicine. Specifically, he was recognized for discovering a drug that significantly reduced the risk of life-threatening complications for diabetes patients. The discovery led to a more precise drug for glucose control that is currently used daily by more than a million patients with diabetes. The work established a precedent for using proteins to create drugs superior to those found in nature.

Dr. DiMarchi is currently the Standiford H. Cox Professor of Chemistry and the Linda and Jack Gill Chair in Biomolecular Sciences at Indiana University. He is co-founder of Ambrx, Inc. and Marcadia Biotech. He is scientific advisor to Ferring, Merck, Roche and three venture funds: 5 AM, TMP and Twilight. He is a retired Group Vice President at Eli Lilly & Company where he provided leadership in biotechnology, endocrine research and product development.

A lifetime member of the FAU Alumni Association, Dr. DiMarchi is a generous supporter of the University, and has a room named after him in the Marleen & Harold Forkas Alumni Center. He was inducted into the Alumni Hall of Fame in 1999 and is a member of the parliament of OWLs. Dr. DiMarchi's philosophy "that we learn, earn and return" has greatly benefitted FAU over the past 40 years. He is a role model for our students and a testament to the caliber of student that we foster at FAU.

IMPLEMENTATION PLAN/DATE

If approved, this Honorary Doctorate will be conferred at a future commencement ceremony.

FISCAL IMPLICATIONS

N/A.

Supporting Documentation: **Nomination materials**

Presented by: **Dr. Russell Ivy, Associate Provost**
Phone: 561-297-3062

FAU
FLORIDA ATLANTIC UNIVERSITY

Charles E. Schmidt College of Science
Office of the Dean
777 Glades Road
Boca Raton, FL 33431-0991
tel: 561.297.3035
fax: 561.297.3792

Dr. Russell Ivy
Interim Dean

TO DIANE

November 10, 2014

Dear President Kelly and Provost Perry,

On behalf of the Charles E. Schmidt College of Science, I would like to nominate Richard DiMarchi for an honorary Ph.D. from Florida Atlantic University. Dr. DiMarchi embodies all the qualities we aim to develop in our students here at FAU. He is truly an exemplary individual who has gone on to accomplish much in his career while positively impacting millions of people's lives.

Dr. DiMarchi is the first FAU graduate to be inducted into the National Inventors Hall of Fame for his contribution to the field of medicine. Specifically, he was recognized for discovering a drug that significantly reduced the risk of life-threatening complications for diabetes patients. The discovery led to a more precise drug for glucose control that is currently used daily by more than a million patients with diabetes. The work established a precedent for using proteins to create drugs superior to those found in nature.

Dr. DiMarchi graduated from the College of Science in 1974 with a degree in chemistry and received a Ph.D. in biochemistry from Indiana University in 1979. A lifetime member of the FAU alumni Association, Dr. DiMarchi is also a generous supporter of the University, and has a room named after him in the Marleen & Harold Forkas Alumni Center. He was inducted into the Alumni Hall of Fame in 1999 and is a member of the parliament of OWLs. Dr. DiMarchi's philosophy "that we learn, earn and return" has greatly benefitted FAU over the past 40 years.

Dr. DiMarchi is currently the Cox Distinguished Professor of Biochemistry and Gill Chair in Biomolecular Sciences at Indiana University. There he has received international recognition for discoveries in the treatment of diabetes and obesity. He is also a retired group vice president at Eli Lilly & Company and is the recipient of numerous awards. He is co-founder of three biotech companies: Ambrx, Marcadia and Calibrium.

Dr. DiMarchi is a role model for our students and a testament to the caliber of student that we foster at FAU. I strongly support Dr. DiMarchi's nomination for an honorary Ph.D. from FAU.

Regards,

Dr. Russell Ivy
Interim Dean
Charles E. Schmidt College of Science

FAU
NOV 12 2014
PROVOST

FAU
FOUNDATION INC.
Florida Atlantic University

July 8, 2014

Dear President Kelly and Provost Perry,

Please accept this nomination of Richard DiMarchi for an honorary Ph.D. from Florida Atlantic University. Dr. DiMarchi graduated from the Charles E. Schmidt College of Science in 1974 with a degree in chemistry and received a Ph.D. in biochemistry from Indiana University in 1979. He has gone on to play an integral part in the field of medicine and was recently inducted into the National Inventors Hall of Fame for his development of the synthetic insulin Humalog. I have enclosed a few supporting documents attesting to Dr. DiMarchi's success.

Dr. DiMarchi is the first FAU graduate to be inducted into the National Inventors Hall of Fame. His discovery lead to a more precise drug for glucose control that is currently used daily by more than a million patients with diabetes. His work also established a precedent for using proteins to create drugs superior to those found in nature.

Dr. DiMarchi is the Cox Distinguished Professor of Biochemistry and Gill Chair in Biomolecular Sciences at Indiana University. There he has received international recognition for discoveries in the treatment of diabetes and obesity. His other professional achievements include serving as Group Vice President at Eli Lilly & Company and co-founding three biotech companies: Ambrx, Marcadia, and Calibrium. Dr. DiMarchi is also the recipient of numerous awards.

A lifetime member of the FAU Alumni Association, Dr. DiMarchi is also a generous supporter of the University, and his name is proudly displayed on the Dr. Richard DiMarchi '74 Room in the Marleen & Harold Forkas Alumni Center. He was inducted into the Alumni Hall of Fame in 1999 and is a member of the Parliament of OWLs.

It seems fitting that FAU award Dr. DiMarchi an honorary Ph.D. in recognition of his excellent work. He brings great pride to our university and is more than worthy of such an honor.

Thank you for your consideration.

Sincerely,

Joanne Davis

Joanne Davis
Interim Vice President for Institutional Advancement
CEO of the FAU Foundation, Inc.
Executive Director for Government Affairs

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Richard DiMarchi

Richard DiMarchi is the *Standiford H. Cox Professor of Chemistry and the Linda & Jack Gill* Chair in Biomolecular Sciences at Indiana University. He is a co-founder of Ambrx, Inc. and Marcadia Biotech. He is a scientific advisor to Ferring, Merck, Roche and three venture funds; 5AM, TMP, and Twilight. He is a retired Group Vice President at Eli Lilly & Company where he provided leadership in biotechnology, endocrine research and product development.

Recent Lectures and Recognitions

2011 American Peptide Society Merrifield Award
2011 Distinguished Faculty Research Lecturer, Indiana University
2010 Co-organizer of Peptide Therapeutic Symposium, La Jolla, CA
2010 Plenary Lecture European Peptide Society Symposia, Copenhagen
2010 Plenary Lecture Keystone Symposia on Molecular and Cellular Biology, Whistler, British Columbia
2009 Watanabe Biotechnology Leadership Award
2009 State of Indiana Biocrossroads Award
2009 Keynote Lecturer, Roche Peptide Symposium
2009 Co-organizer 21st American Peptide Symposium
2009 Co-organizer of International Symposium in Diabetes & Metabolism, India
2007 Am. Chem. Soc. Carothers Award for Excellence in Industrial Chemistry, Wilmington
2007 Honorary Doctorate, Valparasio University
2006 Am. Chem. Soc. Esselen Award for Outstanding Chemistry in Public Interest, Boston
2006 Am. Chem. Soc. Barnes Award for Excellence in Chemical Research Management, Atlanta
2005 Am. Assoc. Pharmaceutical Scientists Career Achievement Award in Biotechnology
2005 Purdue University, Andrew Mellon Named Lecture in Analytical Chemistry
2005 Plenary Lecture AAPS "rDNA Optimization of Endocrine Hormones," San Francisco

Employment

2003-Present – Indiana University: Standiford H. Cox Professor of Chemistry & Gill Chair in Biomolecular Science
2005-2007 – Chairman of Chemistry

1981-2003 – Lilly Research Labs
1996-2003 – Group Vice President Biotechnology and Product Development
1992-1996 – Vice President, Endocrine Research and Clinical Investigation
1987-1992 – Director, Biochemistry & Diabetes
1981-1987 – Senior Research Scientist

Education

1979-1981 – Rockefeller University, Post-Doctoral Fellowship Solid Phase Chemical Synthesis (laboratory of Dr. Bruce Merrifeld, Ph.D.)

1974-1979 – Indiana University, Ph.D. in Biochemistry Protein Semisynthesis (laboratory of Dr. Frank Gurd, Ph.D.)

1970-1974 – Florida Atlantic University, B.S. in Chemistry, with Honors

Masters of metabolism: Matthias Tschöp and Richard DiMarchi

On June 26, 2011, in San Diego, the Merrifield Award of the American Peptide Society was given to Richard DiMarchi of Indiana University. A day later, again in San Diego, the Outstanding Scientific Achievement Award of the American Diabetes Association was given to Matthias Tschöp of the University of Cincinnati. Those attending both lectures might have witnessed many similarities; the Tschöp and DiMarchi laboratories had been working as a single integrated unit across two universities for the last seven years, designing and optimizing new therapeutics for the treatment of diabetes and obesity (Figure 1).

JCI: How did the two of you start collaborating?

Tschöp: We met at the Eli Lilly Research Laboratories, where Richard led drug discovery as a group vice president, while I was a postdoctoral fellow. Years later, when I had moved back to the US from Germany and Richard had left Lilly to be a chair of chemistry at Indiana University, we reconnected – our labs suddenly were just a two-hour drive apart.

JCI: What avenue of research do you think has the greatest potential to improve the outlook for the obesity epidemic?

Tschöp: It seems increasingly clear that more than one neuroendocrine signal may have to be modulated at the same time in order to achieve beneficial metabolic effects with curative potential. Richard and I have been working on a series of approaches in which we are combining two or three gastrointestinal hormones into a single molecule.

JCI: So are you both optimistic that we'll find a drug-based cure for metabolic syndrome?

DiMarchi: I am a perpetual optimist, supported by three decades of personal experiences. This kind of work requires steady progress made through contributions from many laboratories establishing a foundation for the discovery of transformative medicines. We believe that our work is contributing to the identification of a novel formula that might define a successful prescription for treatment.

Tschöp: More skeptical colleagues frequently point out to me that evolutionary pressures drove the development of redundant systems to efficiently ingest and store calories. My answer is always that reproduction is a pretty important requirement for the survival of the species too, but endocrinologists figured out how to interrupt it by tricking the brain into believing that there was already an ongoing pregnancy. We need to figure out how to trick the brain into believing that the stomach has been bypassed without actually cutting patients open.

JCI: Your work at Lilly and now at Indiana University is largely based on macromolecules and, in particular, peptides – in spite of the limitation that peptide-based drugs almost always require injection. What are the advantages?

DiMarchi: In many ways the peptides and proteins that have emerged as drugs are nature's medicines. They have a high specificity of action with minimal off-target toxicity and natural routes of metabolic clearance. While injection is a limitation, the huge benefit is performance. However, it is important not to frame the question of drug discovery as an either/or option of conventional small molecules versus macromolecules. The combination of the two can deliver unprecedented efficacy with fewer adverse effects.

JCI: Given that you moved from pharma to academe, you're perhaps well positioned to answer the question of whether scientists will be successful in drug discovery outside of the pharmaceutical industry.

DiMarchi: Large organizations may be required for cost-efficient drug development and production and marketing of drugs. However, it is individual scientists who deliver breakthrough discoveries. A laboratory composed of broadly trained chemists and pharmacologists can make a huge difference, if properly funded and appropriately nurtured. I am quite certain that Bruce Merrifield, the father of solid-phase chemical synthesis, could not have invented the concept if employed in a less supportive environment than an academic center like The Rockefeller University.

JCI: You're moving back to Germany this year. Will that be a challenge for your collaboration?

Tschöp: My wife and I are both from Munich, so when the Munich Hemholtz Centre together with the Technical University and the Ludwig Maximilians University Munich invited us to help build a new German Diabetes Center, it turned out to be an offer we couldn't refuse. With our history of intense collaboration, Richard and I are both confident that the most fun is still ahead of us. And, Richard has a standing invitation for a sabbatical in the Bavarian Alps!

JCI: How important have these collaborations been to shaping your science?

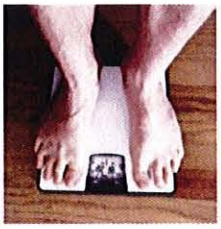
Tschöp: The most important lesson I have learned is that interdisciplinary and translational teamwork is – at least for us – key to every single breakthrough. It was painful at times, since we all speak different languages (literally and figuratively!) – but it always paid off.

Figure 1
Richard DiMarchi (left) and Matthias Tschöp.

Kathryn Claiborn

New Drug May Someday Battle Obesity and Diabetes

Mouse studies found it did double duty; human trials too short to see effect, researchers report



By Dennis Thompson
HealthDay Reporter

WEDNESDAY, Oct. 30, 2013 (HealthDay News) -- A new diabetes drug may one day perform double duty for patients, controlling both their blood sugar levels and helping them lose weight, researchers report.

In mouse trials, doctors found the drug prompted weight loss, in addition to managing blood sugar levels.

"That [weight loss] is not what this drug was designed to do, but it's a very attractive additional benefit," said study co-author Richard DiMarchi, a research chemist at Indiana University in whose lab the drug was created.

The injectable medication is based on a single molecule that combines the properties of two hormones that send chemical signals to the pancreas, said DiMarchi.

"They signal to the pancreas that you are taking a meal," DiMarchi said. "The pancreas then responds by secreting insulin and to synthesize additional amounts of insulin for subsequent use."

People with type 2 diabetes have lower levels of these pancreas-signaling hormones, which are known as incretins, explained Dr. John Anderson, president of medicine and science at the American Diabetes Association.

"The incretin defect in type 2 diabetes is well known, and it's only within the last few years we have had agents to treat it," Anderson said.

Human and primate trials revealed that the new drug controls blood sugar with fewer side effects than other diabetes medications. Those side effects can include nausea, vomiting and stomach pain.

"In this study, the degree of gastrointestinal discomfort is much more modest than is experienced in conventional drugs," DiMarchi said. "We get beneficial glycemic control with this combination drug, and it seems to be with less adverse drug effect."

The medication combines the action of the hormones GLP-1 and GIP. Current diabetes medications of this sort target GLP-1 receptors in the body; studies involving GIP have produced mixed results.

GLP is known to suppress appetite, and DiMarchi said the weight loss observed in mice might be occurring because the second hormone, GIP, is somehow "turbo-charging" that appetite suppression.

In the mouse trials, a drug based on GLP-1 alone decreased body weight by an average 15 percent. But the new drug combining GLP-1 and GIP decreased body weight by nearly 21 percent, as well as controlling blood glucose and decreasing appetite.

HealthDay Video

Does having the so-called obesity gene increase your desire for calorie-rich foods as you age?

» watch this video

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- When School's Out, Weight Can Pile On

A six-week human trial involving 53 patients with type 2 diabetes found that the medication effectively controlled their blood sugar levels. However, the researchers did not note any change in weight during the relatively short study period.

The higher potency of the combined molecule suggests it could be administered at lower doses than other incretin-based medications, reducing side effects and making the drug easier to take.

"Currently approved drugs are quite effective," DiMarchi said, "but they are insufficient in normalizing glucose, and they certainly don't cause much loss of body weight."

The next step will be to hold human trials in which the new medication is administered alongside a current drug, to compare effectiveness, he said.

Roche, which makes the drug, funded the study. It will be up to five years before the drug might receive approval from the U.S. Food and Drug Administration, DiMarchi said.

The FDA issued a safety alert in March regarding incretin diabetes drugs, citing unpublished findings that suggest an increased risk of pancreatitis and pancreatic cancer by using the drugs. The American Diabetes Association has called for an independent review of these medications to evaluate these claims.

The initial findings regarding the combination medication are "promising, I think," said Dr. Spyros Mezitis, an endocrinologist at Lenox Hill Hospital in New York City.

"The question now becomes the weight loss in human subjects, how much weight loss, because that's going to be preferable if there will be weight loss," Mezitis said. "The good thing is this agent is not only treating diabetes but also is treating obesity. People would be losing weight and also maintaining glucose control."

Noting that the human trial involved only a handful of people for a short period of time, Anderson said he looks forward to seeing further research on the combination therapy.

"While it's an interesting concept and something that could be very promising, we're a long way from knowing whether targeting both hormone receptors will be incrementally better or a lot better," he said. "There's obviously a lot they're going to have to do with this molecule from this point forward."

The study findings were published Oct. 30 in the journal *Science Translational Medicine*.

More information

Visit the American Diabetes Association for more on the blood sugar disease.

SOURCES: Richard DiMarchi, Standiford H. Cox Distinguished Professor of Chemistry and the Linda & Jack Gill Chair in Biomolecular Sciences, Indiana University Bloomington College of Arts and Sciences; Spyros Mezitis, M.D., endocrinologist, Lenox Hill Hospital, New York City; John Anderson, M.D., president, medicine and science, American Diabetes Association; Oct. 30, 2013, *Science Translational Medicine*

Last Updated: Oct 30, 2013

Indiana University says DiMarchi holds 111 patents.

updated: 3/5/2014 7:49:01 AM

DiMarchi Headed to Hall of Fame

InsideINdianaBusiness.com Report

An Indiana University chemistry professor will be inducted into the National Inventors Hall of Fame. Richard DiMarchi co-founded Marcadia Biotech, which was eventually sold to Roche for more than $500 million. He also spent more than 20 years at Lilly Research Labs.

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Pence Offers Little

DiMarchi will be honored for his discovery and development of the designer insulin Humalog.

March 4, 2014

News Release

BLOOMINGTON, Ind. - Indiana University Distinguished Professor of Chemistry Richard DiMarchi has been named an inductee into the National Inventors Hall of Fame for his work on the drug Humalog, a synthetic analog of the human hormone glucagon that has been used by millions around the world to address the complications of diabetes.

The Jack and Linda Gill Distinguished Chair at the IU Bloomington College of Arts and Sciences' Gill Center for Biomolecular Science and professor and chair of the College's Department of Chemistry, DiMarchi is among a class of 11 inductees announced today by the National Inventors Hall of Fame in partnership with the U.S. Department of Commerce's United States Patent and Trademark Office.

The National Inventors Hall of Fame was established in 1973 to honor the individuals who have conceived, patented and advanced great technological achievements. The criteria for induction requires candidates to hold a U.S. patent that has contributed significantly to the nation's welfare and the advancement of science and useful arts. DiMarchi joins a list of past inductees that includes Eli Whitney, Thomas Edison, Orville and Wilbur Wright, Henry Ford, Albert Einstein, George Eastman, Steve Jobs, Steve Wozniak and John Harvey Kellogg.

IU College of Arts and Sciences Dean Larry Singell lauded DiMarchi for both a deep intellect that has positively affected the lives of millions and for being a unique educator and mentor.

"Richard has a rare ability to ask and answer deep scientific questions and to translate scientific discoveries into products that benefit millions of people every day," Singell said. "Moreover, he has a special gift for teaching the next generation of big problem solvers, ensuring that his scientific legacy continues to grow.

"His work demonstrates the 'art of science' in the College and the power of the liberal arts in the world. On behalf of his colleagues and students, I congratulate Richard on his induction into the National Inventors Hall of Fame."

DiMarchi earned a Ph.D. in chemistry from IU Bloomington and then went on to a 24-year career at Lilly Research Labs, eventually running one of the world's largest and most successful biotechnology laboratories before leaving as vice president of biotechnology and product development and returning to IU in 2003. He has 111 patents, co-authored over 135 scientific papers, led development of five new Eli Lilly medicines and founded the IU-licensed Marcadia Biotech, which was eventually purchased by Roche for a reported $537 million.

Considered one of the leading peptide chemists in the world, DiMarchi has also been honored with the 2012 Phillip E. Nelson Innovation Award; the 2011 American Peptide Society Merrifield Award; the 2009 Watanabe Award for Life Sciences Research; the

print email newsletters

Related News

- CICP to Honor Innovator of the Year

2007 Carothers Award for Excellence in Polymer Sciences; the 2006 American Chemical Society Barnes Award for Leadership in Chemical Research Management; the 2006 ACS Esselen Award for Chemistry in the Service of Public Interest; and the 2005 American Association of Pharmaceutical Scientists Career Research Achievement Award in Biotechnology.

His induction recognizes his discovery and development of rDNA-derived Humalog (LisPro-human insulin), a designer insulin that represents the first demonstration that structurally altered rDNA-derived biosynthetic proteins can improve pharmacological performance without increasing the risk of an abnormal immunological response.

The entire class of new inductees will be honored during a special induction ceremony scheduled for May 21 at the U.S. Patent and Trademark Office.

Source: Indiana University

***NATURE* | NEWS**

Dual-action drug shows promise against diabetes

Molecule controls blood sugar effectively in humans and also promotes weight loss in rodents.

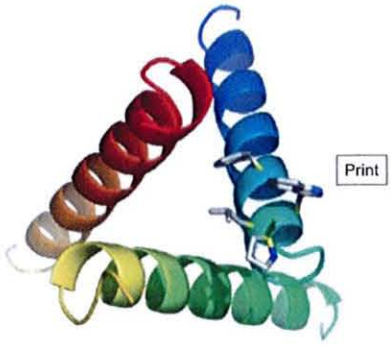
Chris Woolston

30 October 2013

An experimental diabetes treatment that packs the action of two natural hormones into a single injectable agent has been shown to successfully lower blood sugar in humans, monkeys and rodents. Marking a new approach in the treatment of the disease, the currently unnamed molecule also seems likely to cause fewer gastrointestinal side effects in humans than did other diabetes medicines.

"We aimed for achieving the best glycaemic control with as little effect on the gut as possible," says Richard DiMarchi, a biomolecular scientist at Indiana University in Bloomington, and a member of the international team that publishes the results today in *Science Translational Medicine* [1].

The molecule, which targets receptors for the two hormones, glucagon-like peptide 1 (GLP-1) and glucose-dependent insulinotropic polypeptide (GIP), was developed in DiMarchi's lab. Swiss pharmaceutical company Roche, based in Basel, supported the research and has licensed the agent.



Print

Joe Chabenne, Faming Zhang, Richard DiMarchi/Indiana University

A peptide similar to the one pictured was effective at treating type-2 diabetes in a small clinical trial.

As part of the study, 44 patients with type 2 diabetes received once-weekly injection of the dual-action molecule at various doses for six weeks while nine others received placebo injections. Blood tests showed a dose-dependent response; at the highest doses, a standard marker of blood glucose levels dropped an average of 1.1 percentage points from the baseline (which ranged from 7.4% to 7.9%; normal levels are below 5.7% in non-diabetic patients). In the placebo group, the marker dropped by just 0.16 points.

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Looking for loss

There were no significant changes in body weight in the human trial, but the animal studies suggest that a long-term treatment at higher doses could also treat obesity. Obese mice receiving the highest doses of the molecule lost nearly 19% of their body weight in just one week, compared with about 9% for mice treated with equivalent amounts of a commonly prescribed diabetes drug called liraglutide.

Both GLP-1 and GIP naturally respond to spikes in blood sugar by stimulating insulin production. GLP-1 also decreases appetite and suppresses glucagon, a hormone that raises blood sugar. Several current diabetes drugs, including exenatide and liraglutide, work by mimicking GLP-1. But as DiMarchi notes, about 10–30% of people taking such drugs develop gastrointestinal distress, including nausea, flatulence and sometimes vomiting. In the latest trial, just two people in the treatment group complained of mild nausea.

Related stories

- Gut microbe may fight obesity and diabetes
- Liver hormone offers hope for diabetes treatment

DiMarchi and his colleagues have previously shown that combining GLP-1 and oestrogen could reverse risk factors for diabetes in mice[2]. But there have been few attempts to create drugs that harness the power of GIP. The hormone clearly has a natural role in controlling blood sugar, says DiMarchi, so it should not be ignored in drug development. "The best pharmacology replicates physiology," he says. "This a key that works on both locks."

- Debate on diabetes drugs gathers pace

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By combining human trials with thorough rodent and monkey studies in a single paper, the researchers have "delivered a complete package", says Philipp Scherer, chair of diabetes research at the University of Texas Southwestern Medical Center in Dallas. "Usually, if you just have complete rodent data, you can make quite a splash." However, the suggestion that the treatment causes relatively few side effects needs to be confirmed in a larger clinical trial, he says.

DiMarchi says that the next step will be a long-term study that compares the latest approach to an established GLP-1 mimic. "This is still years away from being an approved drug," he adds.

Nature doi:10.1038/nature.2013.14062

References

1. Finan, B. *et al. Sci. Transl. Med.* **5**, 209ra151 (2013).
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2. Finan, B. *et al. Nature Med.* **18**, 1847–1856 (2012).
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