

THE LASER

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Teaching, Science, and
the Nuance of Conviction

Dr. Vincent Poitout

Dr. Vincent Poitout is drawing on the whiteboard in one of the administrative offices at PNRI. The image takes shape deliberately, element by element, detailed but uncluttered. He's a natural teacher, isolating the elemental issues, clarifying their key relationships. There's a rectangle labeled PDX-1, a hexagon labeled MafA, a sketch of the DNA helix, arrows to mRNA transcription and translation, then the segment of a double-lined arc beneath them all.

"This is the nucleus," Poitout says. "All of this activity takes place in the nucleus of the cell." There, the key effects of fatty acids on the insulin gene are caused. He now thinks that this interaction contributes to the insulin deficiency fundamental to type 2 diabetes.

"What has been known," he says, orienting his listener to the research, "what other researchers have shown, is that islets exposed to elevated levels of fatty acids decrease insulin secretion and insulin gene expression." In other words, one of the

basic conditions of type 2 diabetes—that there is not enough insulin to process blood sugar efficiently—seems related to the levels of fatty acids in the system. "What we've observed is that this only occurs in the presence of high glucose."

"It's more than a correlation," Poitout insists. "It's a cause. We can hold everything constant in a precise laboratory experiment, change only one variable, the fatty acids, and measure the outcome. Fatty acids cause the results. What we want to understand now are the mechanisms of these effects."

But before Poitout has finished explaining, you see that his confidence is nuanced with uncertainty, his conviction animated by questions.

Teacher

Poitout has been a Principal Investigator at PNRI since 1998. He is also the Institute's Attending Veterinarian. He came to Seattle from INSERM in Paris, the French equivalent of the National Institutes of Health (NIH). In the seven years since then, he has established a laboratory dedicated to the understanding of pancreatic islet dysfunction—especially lipotoxicity, the subject of the whiteboard drawing of rectangles, hexagons, and helical braids—designed to help advance PNRI's mission to prevent and cure diabetes.

Among the signature qualities of Poitout's research are its clarity and patience, born at least in part of his passion for teaching.

Talk to his lab staff. They all say how helpful a mentor he is. Cynthia Kelpé, a former technician in his lab, tells how he

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PERSPECTIVES

by R. Paul Robertson, M.D.

Translational
Medicine in Peril

Economic, societal and academic forces are pulling the fabric of American medicine in opposite directions. Insurance companies unrelentingly short-change reimbursements to hospitals and physicians for patient care expenditures. The general public is dismayed about the increasingly depersonalized medical service it receives. Our government is concerned about excessive malpractice settlements awarded by juries. The academic sector schizophrenically trains more and more grad students to become highly focused basic scientists yet bemoans the disappearance of research physicians who historically bridge the gap between basic science and clinical practice. Disgruntled doctors in practice are retiring at younger and younger ages. Yet, translational medicine is held out as the great need for the future.

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FROM THE EDITOR:

The Discovery of Insulin and the Complex Process of Science

by Rich Murphy

In 1922, Frederick G. Banting and Charles H. Best published a paper describing one of the most important medical discoveries of the 20th century. The paper was entitled “The Internal Secretion of the Pancreas.” It appeared in the *Journal of Laboratory and Clinical Medicine*, VII, 5 (Feb. 1922): 256-271.

The preceding summer, Banting, a practicing doctor engaged in laboratory research, and Best, an undergraduate at the University of Toronto, undertook a series of experiments that disclosed what they called “isletin,” extracted from pancreatic islets. One of their colleagues called it “a mysterious something” because, though they were not too sure what it was, its properties were remarkable. This substance, when injected into diabetic animals and later humans, proved to be capable of reducing their blood sugar as well as other symptoms of diabetes. What the young researchers had discovered was insulin, and it changed forever the lives and hopes of people with diabetes.

Today, insulin research continues with great energy at non-profit and commercial laboratories around the world. Here at PNRI, one of the best beta cell institutions in the nation, investigators are conducting a series of research programs designed to broaden our understanding of insulin on the way to preventing and curing diabetes.

Vincent Poitout, for example, whose story leads this issue of *The Laser*, is uncovering the ways fatty acids affect insulin production and secretion. Paul Robertson’s laboratory is studying the mechanisms whereby high levels of glucose are toxic for insulin secretion. The investi-

gations of Chris Rhodes are focused on other basic questions: what are the signal systems in the pancreatic beta cell that control insulin biosynthesis and release? A fourth PNRI research group, headed by Peter Dempsey, is studying the ways that beta cells develop, flourish, and die. Barton Wicksteed, PNRI’s newest investigator, is exploring the mechanisms whereby glucagon and insulin complement one another in the regulation of glucose.

It is a broad and profound undertaking. And more. One of the truths of Michael Bliss’s fine book about the Banting and Best breakthrough, *The Discovery of Insulin* (University of Chicago Press, 1982), is that it is a collaborative effort. The popular romance of science, which Bliss debunks, is that the great discoveries are made by one person, and the more ordinary they are, the more unlikely their insight, the more heroic their success. The truth is otherwise.

The discovery of insulin was not the work of a heroic loner, nor even of two unlikely scientific geniuses. It was the product of a complex collaboration among many people with multiple talents. And it built upon the contributions of many scientists who preceded the team that finally made the discovery.

In its research today, PNRI is following suit. Its scientists collaborate with one another in the Institute and with colleagues around the world. They are part of an urgent collective effort to fulfill the promise disclosed more than eighty years ago: that if we can fully understand the mechanisms of insulin synthesis and secretion, we can cure diabetes. When the day comes that we do, it will be because we did it together.

PNRI is a 501(c)(3) organization and welcomes donations to help support its research in the basic biomedical sciences. All gifts to PNRI are tax deductible as provided by law. The Institute is registered with the Secretary of State, Olympia, Washington.



Dr. Derek Hagman

PROFILE **profile**

Protecting the Fragile

“We just happened to be at sea on one of our regular monitoring missions. Nothing extraordinary. It just turned out to be different that time. We just stumbled upon it, were completely awestruck, and have been going back each year since with the same degree of excitement and curiosity.” What they saw was the spawning of coral. Prior to their work, no one had ever observed first hand the reproduction of hard corals on reefs in the western Atlantic. “At this point, we can more or less predict, to within fifteen minutes, the one night each year a particular species of coral will spawn on reefs throughout the Caribbean.”

The path between this work and lipid metabolism is not a straight or obvious one, but it's rooted in science, in the appeal of puzzles, and in Hagman's love of the natural world.

“The toolbox of these different disciplines is essentially the same,” Hagman explains. “We can use the same techniques to help answer questions about marine life, developmental biology, or even protein expression and function.” Whether the question is about population distribution and growth—as it was in his studies of the sea—or about the function and mechanisms of proteins—as it is in his studies of diabetes—the scientific tools are the same.

It is his skill with these tools that brought him to PNRI, first to work in Dr. Chris Rhodes' lab, experimenting with the possibility of transdifferentiating adult stem cells into beta cells, then to join the Poitout group in the study of lipids in type 2 diabetes.

What moves Hagman to want to keep elevated lipids from damaging beta cells and thus leading to the inexorable complications of diabetes? The hope that healthier humans will work to ensure a healthier natural environment. It's not a necessary outcome, he knows. But the fragility of the earth is clear to him, and the preciousness of the marine world. And it will only be preserved by humans who care enough to understand and prize it. So his job now is to do what he can—with the tools and the passion that he learned in the sea—to foster a human world that can protect it.

When he meets a visitor to talk about his life as a researcher, Dr. Derek Hagman is carrying a copy of a scientific manuscript he has just sent off to be considered for publication. It concerns one of the molecular mechanisms that affect the interaction of fatty acids and insulin. Hagman has been working as a postdoctoral fellow in Dr. Vincent Poitout's laboratory at PNRI since May, 2003. He is studying the ways lipid metabolism can inhibit insulin gene expression and thus contribute to the deterioration of beta cell function in type 2 diabetes.

But it's not where his absorption in biology and the mechanisms of organic life began. Diabetes is a relatively recent interest. His enchantment with molecular biology began with the sea.

“I've been fishing since before I could walk,” Hagman says. Before he was six months old, he was floating in flat bottom boats in the Louisiana bayous, “getting bitten by bugs.” Growing up in Bellevue, Washington, he volunteered at the Seattle Aquarium. On the Alki peninsula across Elliott Bay from downtown Seattle, he trained as a scuba diver. He majored in marine biology at Texas A&M, a university with a renowned oceanography program. After graduation, and before his Ph.D. studies at the University of Texas at Austin, he worked for the National Marine Sanctuary program, monitoring coral reefs in the Caribbean.

“You can learn and experience a lot in classes and labs,” Hagman says, “but to be in the field, actually surrounded by the natural world intensifies, even personalizes, the experience.” It also affords investigators opportunities to see things that otherwise might be overlooked. In this regard, Hagman describes his and his Sanctuary colleagues' most important discovery about coral reproduction.

PNRI Laboratories and Their Major Areas of Research

■ Peter Dempsey, PhD

(Cellular communication, ErbB ligand trafficking and processing, disintegrin-metalloproteases, ErbB receptor signaling)

■ William A. Hagopian, MD, PhD

(Type I diabetes mellitus)

■ Senitiroh Hakomori, MD, PhD

(Aberrant cell recognition and signaling in cancer, based on changes in glycosylation)

■ Donald Malins, PhD, DSc

(Breast, ovarian, prostate cancer)

■ Vincent Poitout, DVM, PhD

(Pancreatic beta-cell dysfunction in Type 2 diabetes)

■ Christopher Rhodes, PhD

(Biochemistry of pancreatic beta cells)

■ R. Paul Robertson, MD

(Pancreas and islet transplantation, glucose toxicity of pancreatic beta cells)

■ Barton Wicksteed, PhD

(Alpha cell regulation)

Help Us Keep in Touch!

We are now using the ease and economy of the Internet to bring you current news, stories, research, and event announcements. The Institute's website posts the latest press releases and media stories at www.pnri.org/news. Links to on-line versions of the print *Laser* are sent to subscribers whose electronic addresses we have.

So please send us your address today. Subscription is easy. Just visit www.pnri.org/howtohelp/subscribe.html. When you do, we will be able to keep you even more closely in touch with our work.

In the meantime, we hope you will continue to enjoy *The Laser*. And we hope you will continue to share it with colleagues and friends.

e-mail

thank you!

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October through December 2004 (Tribute name is listed in bold)

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- Start-up support to attract the brightest and most talented scientists
- Funding for pilot projects for promising new directions in research
- Training fellowships to support post doc fellows — young scientists still in training
- Interim funding to maintain the integrity of existing research awaiting approval of grant renewal application

If you are interested in making a gift to PNRI, please contact the Development Office, at 206.726.1200 or by email at donations@pnri.org

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You can make your gift on-line at www.pnri.org. It takes only a few moments and your gift is complete. Your information is safe, secure, and confidential. Check it out!

PNRI

A Quest Worthy of Your Bequest... Become a Partner in Discovery

Individual supporters of PNRI already appreciate the tremendous value of the work we do in our quest to prevent and cure diabetes. Indeed, financial contributions and other forms of assistance received from many people each year provide a critical boost to PNRI's efforts to enhance the high quality of our research.

Moreover, even with all the money that comes to PNRI through grants from foundations, corporations, and government agencies, individual men and women have a unique opportunity to ensure that the excellence of our work will continue. This is because only real human beings can make charitable bequests and other estate gifts.

It is further true that only if certain steps are taken during life can charitable gifts be made upon death. Fortunately, including a bequest for PNRI as part of your estate plan is a relatively simple matter.

We can furnish suggested language to your attorney, and we are also able to work with you and your various advisors as you go about determining which particular arrangements are appropriate for you and your family.

In fact, quite often donors discover it can make sense to use a portion of their assets to make a gift now, sometimes in ways that result in a stream of life payments. The possibilities are numerous and frequently involve significant tax advantages.

If you are interested in learning more about your options, please contact PNRI's Development Office at 206.726.1200 or by email at donations@pnri.org. In addition, you become acquainted with the benefits of becoming a Partner in Discovery when you include a bequest or other charitable gift as part of your estate plan.

Partner in Discovery



TRUSTEE PROFILE *profile*

Rick Omata: Making a Real Difference

When PNRI Trustee Karl Aschenbach invited Rick Omata to consider joining the Institute’s Board, the timing was perfect.

Omata had spent more than twenty years helping to build the labor and employment practice of Seattle’s Karr Tuttle law firm, and he was again feeling the call of social service that had driven his youth. “The challenge of diabetes is enormous,” he says, “and its effects are felt especially by people who need our help to combat it.” So he said yes to the invitation, and this January marked the beginning of his fourth year as a Trustee.

The social motive emerges as soon as one asks Omata about his life, early training, and professional career. It’s a theme that threads them all together.

Imagining that he would become a specialist in international law and business after graduating from Wesleyan, he instead enlisted in the Navy and as a young officer found himself assigned to the Chief of Information’s office in the Pentagon. His task? To help devise programs to reduce racial strife in the Navy. He has great regard for the military and fond memories of his own service, but it was clear to him even then that the military establishment was not adequately acknowledging the practices

by which minority enlistees—especially African-American—were discriminated against.

When he was discharged, he remained in Washington, DC, taking a job with a small start-up non-profit called the National Committee on Household Employment. The Committee was striving to develop innovative ways to improve employment conditions for domestic workers in America. “These were women,” Omata says now, “who earned an average of 25 cents an hour, and table scraps, and no benefits. They had no one to advocate for them.” So along with a small group of colleagues, he set out to develop domestic worker cooperatives in places like Jackson, Mississippi, Youngstown, Ohio, and Huntsville, Alabama. In DC, the Committee developed legislation and built a coalition of legislators, union leaders, and policy officials to pass the first federal laws including domestic workers under the provisions of Social Security and the minimum wage laws.

In the course of this work, his early dream of international law studies at Columbia was transformed into night school at Georgetown, where he specialized in labor law. Degree in hand and the

domestic worker legislation passed, Omata took a job with the National Labor Relations Board (NLRB), and that brought him to Seattle as a trial lawyer. Within a year he had joined Karr Tuttle as a labor and employment attorney, representing clients in a whole host of labor-related issues—union affairs, contracts, discrimination, and minimum wage.

“At Karr Tuttle,” Omata says, “we expect all our lawyers to engage in some important social service. We need to be prepared to give back to the community in some significant way.” He means this. Omata is the son of Japanese-American parents who were interned during World War II. He has a special empathy for the dispossessed. It is on their behalf that he has conducted the work of much of his professional career.

But he is also drawn to PNRI because of the specific focus of its science. “Diabetes is an extremely important health problem,” he explains. “Its costs are staggering.” He goes on to say that it affects poor people dramatically, African-Americans, Native-Americans, and then adds, almost as an afterthought, “Asian-Americans, too. There is diabetes in my family. It is not a disease of the affluent. It touches people in all classes, from all backgrounds, in all walks of life. Some of us even more than others.”

So at a moment when the public challenge of diabetes is mushrooming, the invitation presents itself to Rick Omata to help guide a world-class diabetes research center, one that’s poised to make a real difference in the world. He said yes. It was irresistible. Because making a real difference is all he’s ever wanted to do.

PNRI

Board Appoints Three New Trustees

The Board of Trustees has welcomed three new members. Dr. Fred R. Appelbaum is Director of Clinical Research at the Fred Hutchinson Cancer Research Institute. He has also served, and will continue to serve, on PNRI’s Scientific Advisory Committee. Ms. Carol Heimkes, a community volunteer, takes her Board seat after serving on the planning committee for the 2004 Evening of Wine, the annual Institute fund-raising event, which she is co-chairing this year. Ms. Lois Broadway, a Principal with Taylor, Gregory, Butterfield Architects, returns to PNRI as Trustee after years of experience designing and building healthcare facilities and hi-tech laboratories. Ms. Broadway worked with the team that designed the present PNRI building in 1987, and she guided the modernization of six of the Institute’s current laboratory spaces in 2000.

We welcome these new Trustees and thank them for their dedication to PNRI’s important scientific mission.

trustees

Reflections on a Teacher

by Cynthia Kelpé Collins

Cynthia Kelpé Collins worked as a lab technician at PNRI for three and a half years. In 2002, she left to study veterinary medicine at Atlantic Veterinary College of the University of Prince Edward Island. She is now in her third year of that program. When she heard that The Laser was preparing a story about Dr. Vincent Poitout, she was moved to write:

I am continually reminded, here in vet school, that I alone was accepted into my class without having worked for a veterinarian in a clinic or hospital. This was at first a source of insecurity for me. I now understand. The Atlantic Veterinary College values research very highly, and I have been given an incredible amount of credit for the work I did for Vincent. What a gift! Credit becomes opportunity. Opportunity, for me, eventually presented itself as an avenue to pursue the work I was most passionate about. I consider myself very lucky to have worked for Vincent.

He invests so much enthusiasm and energy into training his staff. He inspires teamwork. He is friendly, personable, and exceptionally patient. In Vincent's laboratory, there is plenty of room to be human, to be individual, and to make mistakes. In return, he only expects genuine effort and a willingness to learn.

He works toward the highest standards in his research and was an excellent role model for me. I was an investment for him. In return for all of the personal instruction I received, I grew from an inexperienced technician to become the lab manager and also the primary trainer in islet isolation. I am now the co-author and primary author of papers published in journals highly respected in the diabetes research community. Vincent has shown me the personal and professional benefit of hard work and self-discipline, and his continued encouragement still shapes me. He is simply the greatest teacher I have ever had.

The Nuance of Conviction

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gave her technical training, the opportunity to write and publish, and the inspiration to pursue a dream she didn't know she had.

Derek Hagman, one of Poitout's current post-doctoral fellows, concurs. "He is very meticulous," Hagman says, "very correct. But he is very personable too. He always makes himself available, always adds the personal to the proper."

Patrick Moore, a lab technician in the group, led a team review last week of a *Nature Medicine* paper on cellular receptors. He was responsible for guiding the discussion, inviting commentary, fielding questions, assessing the paper's merit. But afterwards—noting how Poitout brought the larger implications of metabolism and experimental design into the discussion—Moore admired how effective a teacher he is.

You could have seen his teaching skill in May of 2002 when he was introducing diabetes to a group of middle school students at PNRI's first Scientist for a Day program. Or in 2003, when he was addressing a room full of leaders from the American Diabetes Association about the importance of ADA funding to his own career as a young researcher in the US. Or in 2004, when he received an award from the Northwest Association for Biomedical Research (NWABR) for his efforts to improve science education. In accepting the award, Poitout voiced the spirit with which he teaches.

"It's beautiful to see," he said of the student work he has reviewed and encouraged. "And it's a very important learning experience for me. Just because science is complicated, just because it is potentially dangerous, doesn't mean we can't explain it to kids. Doing so enriches both them and us." Then he provided a personal example of the enrichment he meant. "It deepens my

desire to teach my own children about science."

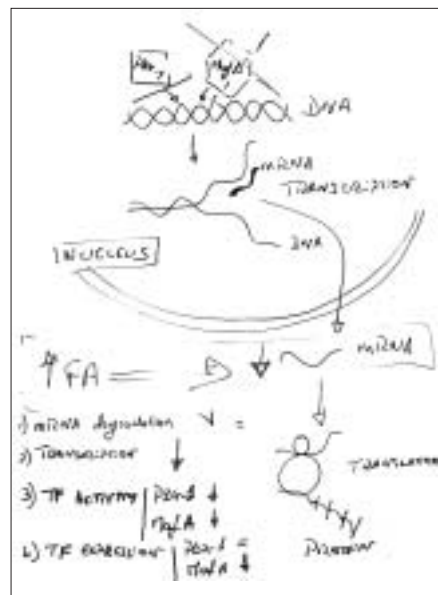
Most of those in the NWABR audience recognized the feeling in his words. Most did not realize the literal effect they would have. Late one afternoon in the week after the award, Julien Poitout, age 12, was in the lab with his father, dressed in a lab coat, gloved, wearing an ultraviolet light mask, examining photographs of gels.

Scientist

The whiteboard cartoon Poitout is sketching as he talks provides a glimpse into his quality as a scientist as well as his skill as a teacher. The sketch describes the most

recent phase of his investigations into the role of fatty acids—or "lipids"—in the system of glucose metabolism.

Under ordinary healthy circumstances, fatty acids promote insulin secretion from the pancreatic beta cell and thus help to effectively control glucose levels in the blood. The details of even this healthy process are not completely understood, however. Poitout is working to under-



Whiteboard sketch: proposed mechanisms of the effects of fatty acids on the insulin gene

stand what goes wrong—and how and why—when the system fails to function properly. Currently he is focusing on a hypothesis that involves the activity and expression of the transcription factors PDX-1 and MafA.

One early step on the way from DNA to insulin is the binding of certain proteins to the DNA. These proteins, called "transcription factors," affect the way DNA information is transcribed and ultimately translated into the myriad proteins that build a functioning organism. In the case of insulin, the two transcription factors PDX-1 and MafA are known to be normally activated by high glucose. Poitout has shown that their activity is decreased by high levels of fatty acids.

What he and his lab group have also observed is that these two transcription

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Perspectives

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Translational medicine is a paradigm in which basic scientists hand off their research observations to other scientists who are more attuned to physiology and pathophysiology. These scientists are often full-time research physicians who appreciate and understand both basic and clinical science. Other times they are physicians in full-time clinical practice who have maintained their research talents learned in medical school. The ideal outcome of translational medicine is a smooth and rapid transfer of information gathered by basic scientists to other professionals who are closer to drug development and clinical applications. The process depends on a seamless cooperation among diverse professionals at multiple levels.

Pick up *U.S. News and World Report*, Jan. 31-Feb. 7 issue. On its cover is an oncology nurse beside the provocative question “Who Needs Doctors?” The issue is chock full of articles that illustrate the substantial talents of non-doctors as they look after and care for a wide variety of patients in and out of hospitals. The article accurately describes the substantial knowledge that talented non-doctors have accrued. They clearly function at a much higher level of knowledge and medical proficiency than their counterparts fifty years ago, yet with the same warmth and sensitivity towards patients that have always characterized them. The consequence today is that many patients rarely see doctors.

Where are the doctors? What are they doing? They are coping with increasing amounts of paperwork related to insurance claims, disability claims, requesting permission to perform procedures for their patients from third party payers, and trying to deliver patient care in clinics that demand no more than 20 minutes be allotted to each patient. Even the 20 minutes is divided between the doctors and the non-doctors. Where are the doctors? Doing clerical work or going into early retirement.

So, who needs doctors? Let the nurse

practitioners and other paramedical personnel take care of America’s patients. Their services are cheaper and their personas are friendlier and warmer, goes the argument. OK. Let’s follow that argument to its logical conclusion. Doctors are out of the picture. Now, who does the paper work? The non-doctors, of course. Look down the road. The same fate will befall the non-doctors as did the doctors. They will become just as frustrated with the bureaucratic mess that surrounds clinical medicine in America, have less quality time to spend with patients, and then retire early, too. Given this trend, several generations from now patients may have to take care of each other.

And what about translational medicine? Are the non-doctors suitably educated about the science of medicine to converse with and transfer new information from basic researchers? Non-doctors are trained to deliver patient care, not formulate new therapeutic approaches. They do not have the knowledge base in basic science to understand basic scientists. The eventual outcome of no doctors on the scene? Blocked pipelines for translational medicine, and no further medical progress.

The best medicine is provided by a closely knit team that is interested in delivering and improving the best possible care all the time. This requires basic research by basic scientists, clinical investigation by research physicians, and clinical applications by clinical doctors and non-doctors. It is the business of medicine that is close to killing the excellence of medicine in America. The business interests in medicine are close to killing the goose that lays their golden eggs, close to compromising our medical care, and close to rendering the concept of translational medicine unrealizable. The question is not “Who needs doctors?” The question is, “How can we free up doctors?” They need to put down their insurance forms and refocus their energies on patient care. Only then will they be able to participate fully in developing tomorrow’s knowledge. Only then will translational medicine be able to do its job of improving medical care.

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factors appear to be affected differently by fatty acids. PDX-1 activity is reduced, but its quantity is unaffected. “It’s there in the system,” Poitout says, “but it doesn’t work.” It doesn’t do its normal job of regulating DNA transcription to produce insulin. MafA, on the other hand, also has its activity reduced, but for a different reason. In the presence of high levels of fatty acids, its quantity is sharply reduced. “It doesn’t work,” Poitout says simply, “because it is no longer there.”

“So we’ve gone up the chain of molecular events,” he explains, “found these two transcription factors that appear to have a mechanistic role in the effect of fatty acids.” And what’s next?

Among the signature qualities of Poitout’s research are its clarity and patience, born at least in part of his passion for teaching.

Ordinary experimental logic should lead him to ask how that mechanistic role works. But if you detect a pause here, a sort of hesitation in his voice, it’s rooted in a deeper conviction about the nature of science. He’s uncertain of what’s next, to be sure, but his uncertainty is strategic.

He wants what he calls a reality check. “I want what we are finding to be relevant in living organisms, not just in cell lines. I want to move away from molecular mechanisms for a while, back to physiology. Can we develop a model that will allow us to test these fatty acid observations in the more complicated environment of life? Designing experiments, controlling variables?”

Poitout admits he doesn’t know. But he invokes his first mentor in France to explain the motive that inspires him. “‘Always look critically at what you’re doing.’ That’s what he said to me. ‘Don’t get absorbed by the system. Always look at the disease you’re hoping to cure, not just at the model you’ve created to simulate it.’”

His was a humble mind, Poitout says of this mentor. Today, teacher and scientist both, he is trying to hold himself to that same standard.

translational medicine

ADDRESS SERVICE REQUESTED

THE **LASER**
MARCH 2005

**“When the day
comes that
[we cure diabetes],
it will be because
we did it together.”**

—*The Discovery of Insulin*

(see page 2, inside)

Langerhans-Virchow Lecture Slated for May 25

Dr. Jerrold Olefsky has been invited to deliver the 6th annual Langerhans-Virchow Lecture at PNRI. Dr. Olefsky is currently Head of Endocrinology and Metabolism at the University of California at San Diego where he also serves as Associate Dean for Scientific Affairs in the School of Medicine. He is the Scientific Director of the Whittier/UCSD Diabetes Institute in La Jolla and serves as a member of PNRI's Scientific Advisory Committee. Among other prestigious awards for his diabetes research, he is the recipient of three of the most distinguished: the Ely Lilly Award, the C. H. Best Award,

and the Banting Medal of the American Diabetes Association.

The title of Dr. Olefsky's lecture will be “The Role of Macrophages and the Proinflammatory Pathway in Insulin Resistance.”



Dr. Jerrold Olefsky

The Langerhans-Virchow Lecture will take place at 3:30 in the Glaser Auditorium of Swedish Medical Center. It will be followed by a reception at PNRI. The lecture and reception are free, and the public is invited to attend. Please see our website for more details.

<http://www.pnri.org/seminars/lang-vir>

join us in discovery..