

## THE LASER

720 BROADWAY • SEATTLE, WA 98122 • 206.726.1200 • www.pnri.org

Hagopian Studies Type 1  
Diabetes and the Environment

Dr. Bill Hagopian

One of the most important but least understood aspects of the autoimmune diabetes that afflicts children is the environment that fosters it. The genes that give some children special susceptibility to this condition are reasonably well identified.

But scientists still do not know why only a few of those children develop the disease while most do not. A new study is designed to make a major contribution to our understanding of this phenomenon, and thus to help us prevent and cure type 1 diabetes.

**TEDDY**

This summer researchers at PNRI—along with those at six other sites in the United States and Northern Europe—are inaugurating the largest and most ambitious research study of its kind ever undertaken to learn about the environmental causes of type 1 diabetes. The program will span almost two decades and involve the experiences of hundreds of thousands of families and children.



TEDDY logo

The lead investigator of the Seattle research is Dr. Bill Hagopian, Principal Scientist at PNRI. His team will be working in tandem with scientists in Colorado, Georgia, and Florida, as well as with other teams in Germany, Finland, and Sweden. He and his colleagues in Seattle will screen 44,000 participants over the next four years, and then follow 1200 of those children and their families for up to fifteen years. At each of the other clinical study sites, large numbers of additional children and families will also participate in the research.

Dubbed the TEDDY study (The Environmental Determinants of Diabetes in Youth), it is being funded generously by the National Institute of Digestive and Diabetes and Kidney Diseases (NIDDK), a division of the National Institutes of Health. During the first five-year period of funding, each of the seven sites will receive \$1 million per year to cover operating costs of the research. This amounts to a \$35 million initial federal investment in trying to unlock the environmental puzzle of type 1 diabetes.

Still, Hagopian says readily, as significant an investment as this is, it will barely cover the costs of the study. The research goals are so ambitious and the scope so vast that even funding at this level will barely be sufficient. A look at the aims and methods of the study will show why.

**Methods and Aims**

Those infants who have been identified as possessing one or another of the genes

*continued on page 7*

## PERSPECTIVES

by R. Paul Robertson, M.D.

Discovery by  
Design vs. Science by  
Serendipity

More and more pressure is being brought to bear on scientists to go about their business of discovery as members of a group. Consortial science complete with roadmaps and milestones is getting to be all the rage. The premise is that scientists working side by side, paying fastidious attention to a common plan, will produce more in a shorter period of time. This is a concept that bears close consideration.

Is it true that collective thought is reliably more productive than individual thought? Is a novel, scintillating thought, once flashing in the fore of a single mind, more or less likely to flourish with other scientists close by? Could prompt discussion and incisive judgment about an idea have adverse effects? Could road maps with predetermined milestones favor taking avenues that lead away from creativity because they seem safer and less risky?

*continued on page 7*

## PNRI BOARD OF TRUSTEES

Robert Brine, Chairman of the Board

R. Paul Robertson, MD, President

John L. Hutchinson, Vice-Chairman

Stanley D. Savage, Treasurer

Gail Allison-Sanderson, Trustee

Karl L. Aschenbach, Trustee

William B. Hutchinson, Jr., MD, Trustee

Ardythe Johnson, Trustee

Åke Lernmark, MD, Trustee

James M. Norman, Trustee

Richard J. Omata, Trustee

Gene F. Williams, Trustee

**PNRI** PACIFIC NORTHWEST  
RESEARCH INSTITUTE

*The Laser* is published three times a year by Pacific Northwest Research Institute. Copyright 2004. All rights reserved. Address correspondence to *The Laser*, 720 Broadway, Seattle, WA 98122, or [laser@pnri.org](mailto:laser@pnri.org). To subscribe or unsubscribe, please visit our website <http://www.pnri.org/howtohelp/subscribe.html>.

Special thanks to the following for their help in preparing and distributing this issue: Salwa Al-Noori, Carolyn Anderson, Linda Bonomi, Isabelle Briaud, Bridget Haba, Lori Hays, John Hussman, Ardy Johnson, Jean Pasche, Chris Rhodes, Paul Robertson, and Casi Zurawski.

Photo credits—Nancy Levine. Design—Sheila Van Nortwick. Printing—Alphagraphics.



FROM THE EDITOR:

## A Love Affair with Insulin

by Rich Murphy

Approaching its first centennial, 1905-2005, *The Journal of Biological Chemistry* is publishing a series of papers this year by eminent scientists, recounting stories of their lives as researchers. One of the recent papers, by Nobel laureate Christian de Duve, is titled “My Love Affair with Insulin” (*J Biol Chem* 279 (21): 21679-21688).

In the paper, de Duve describes his college studies at the Catholic University of Louvain in Belgium, his first work on insulin as a student in the laboratory of J.P. Bouckaert, the interruptions created by World War II, his surprising postwar discoveries of the mechanisms and effects of glucagon, and the subsequent work on lysosomes, for which he was awarded one of the 1974 Nobel Prizes in Physiology and Medicine.

It is a dramatic story, full of personality and chance, discipline and intuition. Like the initial refusal of Carl and Gerty Cori to permit de Duve to join their laboratory at Washington University in St. Louis because he had a different view of the action of insulin than theirs. Like the day after the Allied liberation of Louvain in 1944, when de Duve hurried to American military headquarters to ask for some samples of Eli Lilly insulin, which he needed for an experiment he had been waiting to complete. Like the accidental yet important fact that this source of insulin was contaminated with another major pancreatic hormone, glucagon, leading him to conflicting and confusing results. Like the powerful influence of teachers and co-workers on him—in Belgium, St. Louis, Stockholm, Toronto, Chicago, New York. It is a story of the

environment of science, as well as a retrospective of one of the most important developments in the history of diabetes research.

Scientists in the Robertson lab at PNRI today are advancing the understanding of glucagon and alpha cell function pioneered by de Duve. The Hagopian laboratory is collaborating with scientists around the world to map the environmental triggers of type 1 autoimmunity. Chris Rhodes is helping pharmaceutical companies and research laboratories pool their understanding of signal transduction in beta cells. And young researchers—like Isabelle Briaud and Lori Hays—are pursuing scientific careers by exploring some of the most promising problems in the development and operation of diabetes.

By way of a moral for his *Journal* story, de Duve highlights three observations about his experience that he believes are important for the advancement of science. First, good mentors are indispensable. Second, it is the unexpected result that is most likely to lead to a breakthrough (“My greatest luck came from the unforeseen”). Third, the skill and imagination of the scientist are more important than the particular project he or she is working on. “Basic research explores the unknown,” de Duve says, so it is “instinct, curiosity, and motivation” that produce the most important results.

He is talking about his own distinguished career here. But he is also defining the ways scientists at PNRI are moving us toward a deeper and more promising understanding of diabetes.

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.

# PROFILE profile

## Isabelle Briaud: Immersed in the Impossible



“It went very well,” Dr. Isabelle Briaud says when describing her dissertation defense at the University of Paris. The modest, self-effacing PNRI scientist from France speaks simply about her experience. “I was definitely stressed before meeting with my six committee members. But during the presentation? I felt surprisingly confident.”

She attributes that confidence to the help of many scientists over the years, especially Dr. Vincent Poitout, her Ph.D. advisor. Early in her university studies, she supposed that she would become a pharmacist selling prescription medications. But she moved on to get specialized training in biology and did a hospital internship, which introduced her to research. A fellow student urged her to consider the daring step of applying for graduate school in cell science at Paris XI, the branch of the university famed for its biology studies.

“This was unusual,” Isabelle says. “My

friend and I, we had to overcome much uncertainty. We didn’t think we could do it. In France, a lot of people discourage you. We thought research was for geniuses, that we would not belong.”

In the course of her studies, however, she joined the lab of a young investigator working on diabetes research, Vincent Poitout. When he was recruited to the United States by Dr. Paul Robertson, to establish a new laboratory at PNRI, he asked Isabelle if she would like to come along to complete her Ph.D. She did.

With Poitout’s direction, Isabelle worked on a very complex question about diabetes. She investigated whether high levels of fatty acids in the blood are in themselves toxic to the beta cell, or whether fatty acids need hyperglycemia to do their damage.

The general rules for a Ph.D. program at Paris XI require that a student must publish at least one scientific paper in order to be

ready to defend the research. Isabelle published four. Her project results were so compelling that, with Vincent’s help, she selected a committee, wrote a 100-page dissertation, and returned to France to defend it.

Now she is Dr. Isabelle Briaud, a post-doctoral research fellow here at PNRI in the lab of Dr. Chris Rhodes. “I didn’t think it was possible,” she says in wonder and gladness. She thought it was beyond her reach. She came to the U.S. knowing little English. She participated in lab meetings, made presentations, wrote papers, drew help and advice from different scientists at PNRI. She became fluently bilingual while becoming an accomplished cell biologist. “I can’t achieve this,” she remembers worrying with her undergraduate friend in Paris. “Research is something special. It’s untouchable.”

Yet, here she is, fully immersed in the impossible, with success and satisfaction that were beyond her dreams.



# PROFILE profile

## Lori Hays: Patience, determination, and the guidance of great mentors

This spring, Lori Hays completed her doctoral dissertation in cell regulation, reporting work she has been conducting for several years under the direction of Dr. Christopher Rhodes, PNRI’s Associate Scientific Director.

“Chris has been a great mentor,” Lori says. “He has pushed me to excel, helped me develop as a scientist, kept me focused. It’s what scientists need,” she says. “Discipline. You need to carry through, all the way.” She has two stories to illustrate.

As an undergraduate at Texas A&M University, Lori worked in the laboratory of Dr. James Hu on a small independent applied science project. “I worked for a year and couldn’t get results that made sense. It

was a great lesson for me. Even though I couldn’t get the data I needed, I kept working, kept trying.”

Throughout the effort, Hu was patient with her failure and confident of her success. “He was an excellent teacher,” Lori says. “He inspired me.” By the time she graduated, she had enough results to present a poster at the Lost Pines Molecular Biology Conference and her first scientific paper, which was later published in *Biotechniques*.

She has had a similar experience working with Rhodes on proteins involved in beta cell regulation of insulin secretion. She embarked on the project with expectations that didn’t materialize. “The protein I began studying turned out not even to be expressed

in beta cells. But I didn’t let go. Instead, I discovered a novel protein implicated in directing insulin granules to the areas of the cell where insulin secretion occurs.”

This patient, determined research has earned her a Ph.D., a result she attributes in part to Rhodes’ valuable guidance. Her own desire and commitment she knows were indispensable. She has diabetes in her family, and for many years she has been striving to make an impact on people’s health. But she knows that Rhodes’ advice and direction gave purpose to her desire. Like her undergraduate mentor, Dr. Hu, Rhodes has helped her achieve not only valuable scientific results, but a career with integrity and purpose.

# Murdock Charitable Trust to Fund Laboratory Expansion

PNRI has received a grant of \$67,500 from the Murdock Charitable Trust for the purchase of new instrumentation for its confocal microscope facility. The new instrumentation will enhance research into the subcellular mechanisms of disease, particularly diabetes.

The Murdock Trust grant specifically funds the acquisition of a new diode laser, an automated stage, and new supplemental equipment, which will permit enhanced live-cell imaging, improved imaging of vesicular trafficking, and greater intracellular discrimination.

PNRI's confocal microscope is the only one in the region devoted especially to the work of an integrated diabetes research program. According to Dr. Peter Dempsey, the facility director, "the Murdock Trust grant will assist us in making key improvements to the confocal microscope. It will permit us to accelerate and deepen our study of some of the key problems of beta cell development and function, problems that must be solved in order to prevent and cure diabetes."

confocal microscope

PNRI

## An Evening of Wine first flight



Picture yourself on a warm August evening in the Clubhouse at The Golf Club at Newcastle where you'll experience that "top of the world" feeling looking out at the panoramic views of Mt. Rainier, Lake Washington and the Seattle skyline. Imagine the finest wines from Washington State available for you to enjoy — paired with an abundant variety of delicious appetizers. And in the company of good friends, you will have the opportunity to personally contribute to the advancement of diabetes research through a spirited live auction focused on wine-related items. This is what you will experience if you attend PNRI's new event, *An Evening of Wine – First Flight*, in Newcastle's St. Andrews Ballroom on Thursday evening, August 5, 2004. Evening highlights include:

### Name That Wine

*Name That Wine*, a blind tasting of a flight of seven red wines, will challenge the taste buds of event guests to match the wine in their glasses with the correct wine labels. The game is sponsored by AWineStore.com and moderated by our event wine expert, Richard Kinssies, wine columnist for the Seattle P-I and director of The Seattle Wine School. The game winning table will receive a special award.

### Sip and Sample

During Sip and Sample, each guest will have the opportunity to taste fourteen additional wines from our eight featured wineries, visit with the winery owners and winemakers, as well as enjoy hearty appetizers prepared especially for the occasion by Newcastle's award winning Calcutta Grill.

### Live Auction

Washington wines are the theme of fifteen fabulous packages, including getaways, winery tours, cult wines, catered picnics, and more, available in the Live Auction. A Fund-the-Need segment will raise money to support a post-doctoral fellow in diabetes research for one year at PNRI. Auctioneer Mark Schenfeld, of Stokes Auction, Inc., will ensure that there is some spirited bidding to raise money for diabetes research at PNRI.

### The Finishing Touch

The final segment of the evening will be highlighted by a dessert wine from Three Rivers Winery, voted a gold medal and "best in class", served with a selection of fruit and sweets. A musical finishing touch to a lovely evening will be provided by David Mesler, an award-winning pianist and Emmy-nominated composer who uses his classical training and sense of adventure to explore jazz-classical hybrids in unconventional and dramatic ways.

### Elegant but Casual

We hope you will join us for a memorable evening. The suggested attire is elegant casual, which for gentleman simply might be an open collar shirt, and slacks; a jacket or tie is NOT required. For the ladies, a summer sheath and sandals would be perfect. Tickets are \$150, a table of ten is \$1,500, and a Winemaker Table is \$2,500 which provides preferred seating for 8 with a winery owner or winemaker representing one of our Winery Partners. Contact Development at 206.726.1200 or [donations@pnri.org](mailto:donations@pnri.org) for your invitation. Space is limited to 200 guests.

## Volunteer Opportunity

We are looking for volunteers to help out from 4:00 p.m. to 11:00 p.m. at *An Evening of Wine – First Flight*. If you are interested, please send an email to [donations@pnri.org](mailto:donations@pnri.org).

## Special Thanks to our Winery Partners

Andrew Will Winery  
Chandler Reach Vineyards  
Dunham Cellars  
Owen-Sullivan Winery

Pepper Bridge Winery  
Saviiah Cellars  
Sheridan Vineyard  
Three Rivers Winery

## John P. Hussman, PhD: Improving Lives

Reading the March 1st *Wall Street Journal* about Dr. Bill Hagopian's diabetes research at PNRI—"Researchers Goal: Stopping Diabetes Before Kids Get It"—John Hussman saw another way to improve lives. He phoned Hagopian, learned about what was needed, and offered PNRI more than \$170,000 to support the research.

"Part of my mission," Hussman says, "both professionally and personally, is to help improve lives. That's what Dr. Hagopian is doing also."

Hussman is president of the Hussman Funds, a family of mutual funds that he manages from Maryland. He holds a Ph.D. in economics from Stanford. He sees success as both reward and responsibility. "I look at the success of our funds as a result of serving shareholders well. If I can take that success and channel it back into serving others, by easing suffering and improving lives, that's worth doing."

The son of a surgeon father and pediatrician mother, he has particular interest in areas of medical science where he sees that an important difference is possible. What excites him about Hagopian's research is just that possibility. The prediction and prevention studies Hagopian is conducting at PNRI are helping parents and families to

understand, prepare for, and postpone the onset of the disease.

Hussman explains, "Dr. Hagopian's research demonstrates that it is possible to do all these things on a large scale, reasonably inexpensively. This is research that will help people face a better future. Even if we don't cure diabetes soon," he says, "we can help people to better predict, manage and control it. That itself would be an incredible result."

John Hussman knows about results. His mutual funds have grown to more than a billion dollars in assets. His strategic management is watched closely and appreciatively by *Money Magazine* and *Business Week*. But he also knows about diabetes. He lost both his father and one of his dearest friends to its complications. By supporting Hagopian's research, he says, he hopes to help ensure that patients' and families' first experience with diabetes "isn't in a hospital or a diabetic coma."

Hussman's professional and personal goals are of a piece. "I don't think we were meant to be receptacles," he says, "but channels." When he read about Hagopian's innovative diabetes research, he saw the possibility of opening that channel toward a better future for many.

## 2004 Annual Seattle Friends Reception

PNRI's Board of Trustees held their 2004 Seattle Friends Reception at the home of Trustee Ardy Johnson and her husband Ray, on Thursday evening, May 13, 2004. The nearly sixty guests included Trustees' friends and associates and PNRI scientists and donors.

Dr. R. Paul Robertson, President and Scientific Director of PNRI, shared some of the exciting and innovative research of PNRI's dedicated scientists and future directions of the Institute.



Frederick Scheetz, Patrick Dineen, and George Simmons (L-R)



Sherrill and Gilliat Schroeder, Pauline Smetka, Ann Kelson (L-R)



Erika Johnson and Carol Heimkes (L-R)

## PNRI Tribute Gifts

January through May 2004 (Tribute name is listed in bold)

### MEMORIALS

#### Larry Wayne Cressell

Dr. and Mrs. William H. Lucas, Sr.

#### Joseph W. England, Sr.

Mr. and Mrs. Walter D. Dobbins, Jr.

#### Virginia G. Eshelman

Virginia G. Eshelman Trust

#### Frank and Bonnie Forbes

Dr. and Mrs. William B. Hutchinson, Jr.

#### Stanley D. Golub

Mrs. Adele Golub

#### Alyssa Harrison

Philip G. Kelly

#### Mr. and Mrs. Ken G. Harrison

Philip G. Kelly

#### Charles Holdorf

Anonymous

#### William B. Hutchinson, M.D.

Mr. and Mrs. Axel Druggé

Dr. and Mrs. William B. Hutchinson, Jr.

#### Bill Jenks

Anonymous

#### Ethel Jensen

Ms. Esther Schaute

#### Ray Kalinowski

Anonymous

#### Don Kinnee

G. A. and Virginia Anderson

Sam and Jo Simone

#### Betty W. Koch

Mr. Lowell G. Koch

#### John Lavinder

Mrs. Jane A. Ferris

#### Harold G. "Hal" Lewis

Mr. and Mrs. John J. Bombino

Pat Boos

Dora G. Brooks and Ernest F. Brooks

Mr. and Mrs. Kenneth W. Falk

Mr. and Mrs. Donald C. Hawley

John and Harriet Koster

Pete and Ellie Landoni

Mr. and Mrs. Delbert Latham

Ken and Mary Lovejoy

Joy Mason

Glenna Perry

#### Harold G. "Hal" Lewis continued

Mr. and Mrs. Don E. Rettinghouse

R. A. and Lillian Sonju

United Methodist Church of Kent

#### Mike Nickerson

Dr. and Mrs. William H. Lucas, Sr.

#### Janice Lynne Pullman

Ms. Jean Pasche

#### Nelda D. Rockey

Mr. Michael Rockey

#### John Schack

Dr. and Mrs. William H. Lucas, Sr.

#### Edward Wilbur

Dr. and Mrs. William H. Lucas, Sr.

### HONORS

#### Mrs. Julia Brueggeman

The Seward Park Walkers

Mrs. Edith T. Younger

#### Mrs. William B. Hutchinson

Dr. and Mrs. William B. Hutchinson, Jr.

## Rhodes Chairs Signal Transduction Research Conference

PNRI's Associate Scientific Director, Dr. Chris Rhodes, is serving as chair of this year's inaugural Signal Transduction Research Conference, July 22-23, in Philadelphia. The conference brings together leading scientists from industry and life-science research to explore promising treatment options for diabetes and obesity.



Sponsored by Pharmaceutical Education Associates, the conference highlights the value of signal transduction research in developing new therapies for diseases affecting millions of patients.

## 2003 Annual Report Available On-line

PNRI's annual report for fiscal year 2003 is available on-line at [www.pnri.org](http://www.pnri.org). Scientific accomplishments, financials, the research programs of our laboratories, and achievements of Institute staff. It's all there at [www.pnri.org](http://www.pnri.org).



## PROFILE **profile** Ardy Johnson: Abiding by Her Promise

PNRI Trustee Ardy Johnson's son, Jeff, was diagnosed with type 1 diabetes on Christmas Eve when he was 11 years old. That was twenty-three years ago. Ardy has been working tirelessly ever since to advance diabetes research.

Now in her third year on PNRI's Board of Trustees, she is active in developing the Board's operational structure. She serves on the Development Committee and the Nominating Committee. She also contributes great energy and experience to PNRI's fundraising and Board development.

But Ardy is also a mother, and this more than anything motivates her. "Managing diabetes is very, very difficult," she says. "Just when you think you have it under control something/anything can throw it off, creating blood sugars that are either too high or too low. People who don't have diabetes, or who don't have it in their family, can't possibly understand this. It is a disease the whole family must share in."

She and Jeff worked together from the beginning. She woke him, checked his blood glucose. He gave himself the insulin shot. They planned meals together. At first, she kept the records. Then as he grew older and could manage more, he took over more and more of the record-keeping and management. He and Ardy closely watched the patterns of his blood sugar levels; together they decided how to control them. "It was a collaborative effort," Ardy says. "We were real partners." Once in college, Jeff unexpectedly disappeared for a weekend (as college students have been known to do). "I was panicked," Ardy said. She couldn't reach him. Didn't know where he was. Couldn't be sure he was OK. "So we made

a deal," she says now: she didn't have to know where he was or what he was doing. She just needed to know when he'd be out of reach, and for how long. And when he asked why, she said, having no other words for the fear, "Because I'm the mom. That's why."

One of the greatest sources of satisfaction for Ardy these days, now that Jeff is grown, is working to help individuals and families deal with type 1 diabetes. She helped found and now co-chairs an on-line diabetes support team. She works with families all across the country who are participating in local organizations dedicated to advancing diabetes research.

"These people understand," she says, "They're motivated. They want this disease cured, and they know the only way that's going to happen is through the support of research."

So, along with all the other work she does—serving for many years in many capacities for the Juvenile Diabetes Research Foundation, and helping develop a scholarship endowment for Bellevue Christian School in memory of her uncle—Ardy Johnson is working to advance the diabetes research of PNRI as well. Beta cell biology, signal transduction, islet transplantation, in all these areas and others, PNRI scientists are closing in on diabetes. And Ardy is doing all she can to help.

"This is a life-threatening disease," she says. "I have friends who have already lost their children due to the complications. People with type 1 diabetes die—at 7, at 14, at 33. They die. We can't be patient. We've made a promise to them. We can't rest."

*This is a life-threatening disease...  
We've made a promise to them. We can't rest.*

## Hagopian studies

*continued from page 1*

that put them at high risk for developing diabetes will be followed from the time they are 3 months old until they are fifteen.

For the first four years of their lives their blood will be drawn every three months. For the next eleven years it will be sampled every six months. Red blood cells, white blood cells, and serum will all be banked for later study. Every month until they are four years old, stool samples will be collected from each child; then once every six months between the time they are four and fifteen. Like the blood samples, the stools will also be frozen and stored. Toenail samples will be taken from each child as well. The tap water in their family's home will also be collected and saved.

It is clear from this initial list that participating in the study will take an enormous commitment on the part of the children's families.

In addition to collecting samples, the families will also provide important records of the physical and social environment in which the child is living. They will be asked to provide detailed records of many of the features of the child's world. This may include the presence of pets, for example, or possible exposure to pesticides, if for instance the family lives on a farm. Diet will also be monitored, and logs will be kept to document the introduction of certain foods. When, for example, did the child move from breast milk to formula? When did he or she first begin drinking cow's milk? When were wheat products first introduced?

Beyond diet, families will be asked to record all the child's vaccinations and to track all illnesses. They will be asked to document family dynamics as well—the instances of marriage and divorce, the presence of siblings, the experience of day care, occasions of particular family stress such as the death of a close family member. Like the physical samples that will be taken and stored, these documentary records will also be banked.

Among all the children in the study who are at an elevated genetic risk for type 1 diabetes, only a relatively small number will actually develop the disease. When they do—usually before they are fifteen years old—the TEDDY researchers will have a

considerable body of data ready to study in search of the environmental factors that may have triggered the disease. Thanks to years of collecting and storing biosamples and family histories, Hagopian and his colleagues will be able to look for unique environmental conditions that may distinguish the child with diabetes from similar children in the study who never develop the disease.

As complex and daunting as the “environment” is—comprising vitamin levels, viruses, infections, bacteria, allergies, and a host of other biological and psychological features—the TEDDY study has a sharply defined set of aims. Its principal objective is to identify the environmental factors that contribute to, or protect against, the development of type 1 diabetes. It will achieve this objective by detecting the appearance of autoantibodies in the child's system and monitoring their progress toward the full onset of the disease.

### Theory

This approach is guided by researchers' belief that something—or some combination of things—elicits an immune response that mistakenly views the child's insulin-producing beta cells as hostile. The immune system then turns against those beta cells and destroys them, completely eliminating them over time.

The rich record of material the Hagopian team gathers will enable them to stop time and examine a complex picture of the child's environment at exactly the moment when his or her system is veering toward type 1 diabetes.

Nothing like this—on this scale, with this complexity—has ever been done before. “Millions of dollars have been spent on the genetics of type 1 diabetes,” Hagopian says. “But family studies clearly show that environmental factors are equally important in causing the disease. And it is only now that we will be able to look at those factors in great detail.”

The results will be years in coming, but the potential public health benefits are enormous. Hagopian believes that the TEDDY study will provide us with critical new insight into the way type 1 diabetes develops. It will help us better predict the disease, prevent or delay its onset, and introduce more effective measures to cure it.

## Perspectives

*continued from page 1*

Implicit in the road map approach is that it will get us where we need to go faster and cheaper with more accountability. But how well does this apply to science? Success in business is measured in dollars. Success in biomedical science is measured by its impact on disease. While prevention of disease usually saves money, improved therapies of existing disease often do not. Corporate values are not usually kind to the creative voice in the back of the room. In science it is often the naïve thinker whose mind is not so cluttered with expectations and paradigms who comes up with the fresh, invaluable idea.

*“We train people to fully consider unanticipated results...”*

How does this happen? How is it that throughout medical history some of our most important discoveries have been uncovered by individuals, not groups? And isn't it interesting that often scientists will tell you they have no idea where their most profound insights came from? Very significant experiments are often the product of pure serendipity. Chance observation, pure and simple. We train people to fully consider unanticipated results before they are discarded because they do not fit the initial hypothesis. Groups of people with their noses stuck in roadmaps are less likely to consider kindly the maverick thought.

My point is that it is harder for the individual scientist to be reflective and attentive to serendipitous observations if there are too many expectations about following road maps and counting milestones. Consortial efforts certainly have their place in some types of research that require and benefit from massive group efforts. But we also need to preserve time and silence for individual thought and reflection. Just ask yourself whether any group has equaled the output of Leonardo. Did a group discover penicillin? Was insulin discovered by a drug company? Was the first oral agent for treating diabetes discovered by design or by serendipity?

ADDRESS SERVICE REQUESTED



## Diabetes Expo 2004— Research That Matters

by Casi Zurawski

*progress*  
*research*

“What are you doing to cure diabetes?”

That was one of the recurring questions on May 15th when PNRI joined the American Diabetes Association for the 3rd Annual Diabetes Expo. Over 3,500 people came to Seahawks Exhibition Center in Seattle to learn about type 1 and type 2 diabetes. Participants attended a variety of talks, gathered information, sampled new food products, and most importantly asked questions.

“I have this disease; what about my kids? Will they get it? What is the progress of the islet transplantation program? What is the TEDDY study?”

A grandmother with diabetes was worried for her grandchildren. Another woman was looking for information on the connection between obesity and diabetes. One visitor leads a support group for people newly diagnosed. She was gathering

materials to pass out to them. The Diabetes Expo gave PNRI staff a chance to meet and hear the stories of people struggling daily with diabetes while at the same time letting them know about the critical research we are conducting.

A big thank you to PNRI scientists and staff who helped with the Expo. Dr. Chris Rhodes delivered a plenary talk on insulin deficiency in both type 1 and type 2 diabetes. Others who helped include Dr. Salwa Al-Noori, Linda Bonomi, Michael Brantley, Melissa Jackson, Rich Murphy, Elizabeth Oseid, Jean Pasche, Dr. Melissa Smith, and Mike Toney.

“What are we doing to cure diabetes?” Advancing science in our labs and reaching out to the community. Doing research that matters and making progress towards a cure.

*community*