

A collaboration between Northwest Kidney Centers and UW Medicine



LEFT: Investigator Dr. Cathy Yeung presents on the development of the kidney-on-a-chip at the first annual Patient Advisory Committee meeting Feb. 11 in Seattle.

RIGHT: Committee member Glenda Roberts, far right, and others listen to investigator presentations. Turn to page 2 to learn more about the committee.

2016: Off and running

A message from the director

DR. JONATHAN HIMMELFARB

2016 marks new directions at the Kidney Research Institute. In early February, we held our inaugural Patient Advisory Committee meeting in Seattle. The PAC, a group of eight local and national transplant recipients actively involved in patient advocacy, education and community outreach, listened to investigator presentations and provided feedback on research projects. In particular, PAC members suggested that investigators continue to focus on studies that will directly impact patient care. A great success, the PAC helps us ensure our studies align with patient priorities. Read more about it on page 2.

In January, KRI Investigator Dr. Matthew B. Rivara was selected as one of three of the Institute of Translational Health Sciences' KL2 Multidisciplinary Clinical Research Career Development Program scholars. Matt's research will explore new ways to accurately assess symptoms in patients with kidney disease and incorporate information on symptoms into clinical decision-making.

Dr. Benjamin "Beno" Freedman was recently awarded a 2016 research grant from the PKD Foundation. Beno's work will focus on human pluripotent stem cells that have dual value as personalized laboratory models for human kidney disease and as a potential source of on-demand, immunocompatible kidney replacement tissue. The goal of the proposed research is to further understand how human PKD mutations cause cystic disease, to test drugs that intervene with this process and to generate patient-matched stem cell products for application in future clinical trials.

We're also proud to sponsor Northwest Kidney Centers annual Breakfast of Hope, held May 5 in Seattle and fundraising for patient support services and charity care.

We're off to a great start in 2016 and thank you for your continued support of the Kidney Research Institute.

ON THE HORIZON

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TRANSFORMING LIVES THROUGH
INNOVATION AND DISCOVERY

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Kidney Research Institute forms Patient Advisory Committee, holds first meeting to hear patient perspective on research

Investigators from the Kidney Research Institute presented current research to a committee of kidney patients Feb. 11 to gain patient input and better inform research projects.



KRI investigator Dr. Bessie Young discussed kidney disease and the Apolipoprotein (APOL1) gene.

Hosted by Northwest Kidney Centers, the purpose of the Patient Advisory Committee—the first of its kind for kidney patients—is to hear directly from patients, understand their priorities and see if current research meets those priorities.



PAC member Bobbi Wager.

“We want our findings to translate directly towards improving the lives of people with kidney disease and, in order to best do this, we need patient input early on in the research process,” says Dr. Jonathan Himmelfarb, director of the Kidney Research Institute.

At the meeting, nine investigators presented on a variety of research projects including advanced care planning, stem cells and kidney disease, and the kidney-on-a-chip, a device that uses kidney tissue to test medications.

“I strongly believe that there needs to be major changes in options for people on dialysis,” says PAC member Tami Sadusky. “The KRI is working on those options. I believe the kidney patient and families need to be involved in any change, progress or advancement that takes place and the KRI is doing that too.”

PAC member Emmett Smith was on dialysis for three years before receiving a transplant Jan. 27.

“My introduction to dialysis was rough—my fistula wasn’t as mature as it could have been. It was a little too narrow and very painful to get the needle in. I dreaded dialysis.”

Emmett designed a new intravenous catheter that may help people in a similar situation.

“No, I don’t work in the medical field,” he says, “but going through dialysis, I understand how it feels and how we might be able to improve things.”



Committee member Kevin Fowler presented on TapCloud, an app that aims to improve patient/provider communication.

PAC member and advocate Sam Pederson, on the inaugural board of the Kidney Health Initiative, is currently living with his second transplant.

“I was on dialysis in 1996 but got a transplant after three years,” says Sam. “12 years later it failed and when I went back on dialysis, I swear it was the same machine. That really showed me things hadn’t changed much. We definitely need more innovation.”

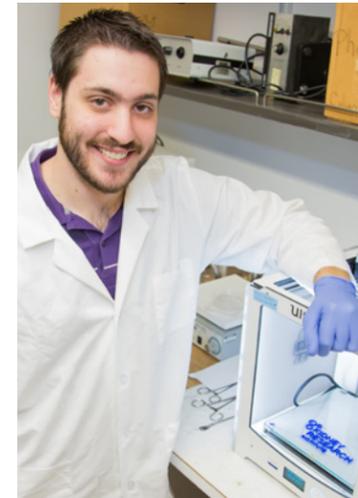
“The meeting was valuable on both sides—I got a lot out of it and I think the investigators did too.”



L to R: Dr. Jonathan Himmelfarb with PAC members Kevin Fowler, Glenda V. Roberts, Bill Peckham, Bobbi Wager, Sam M. Pederson, and Tami Sadusky. Not pictured: Kimberly Major Delaney and Emmett Smith.

Investigators continue work on the kidney-on-a-chip project, combine forces to create chips with complete filtration unit

Since 2012, investigators at the Kidney Research Institute have been working on the kidney-on-a-chip, a tissue engineered human kidney microphysiological system that could provide a better way to test kidney disease medications.



Christian Mandrycky, a student in Dr. Ying Zheng’s lab, with a 3D printer.

Dr. Ed Kelly, associate professor in the Department of Pharmaceutics at the University of Washington and a primary investigator on the project, has been leading a team developing chips with the renal tubule while, across campus, investigators in Dr. Ying Zheng’s lab build chips with the kidney vasculature.

Now they are working on integrating different microphysiological platforms to determine how best to model

the intricate anatomy of the kidney proximal tubule.

“In the beginning, we had some hurdles but now we’re at the stage where the vasculature and tubule are working together,” says Ying, “and we’ve even started putting drugs through the structures to see how they react.”

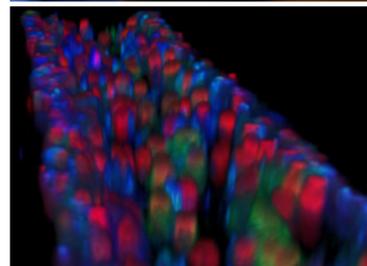
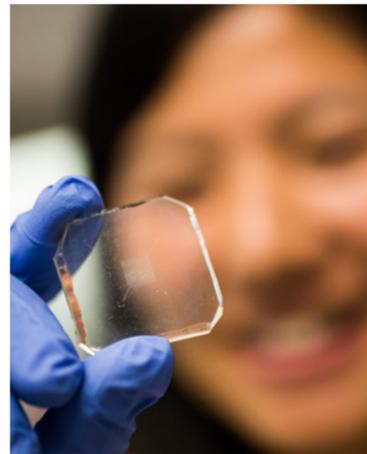
Students in Ying’s lab are also utilizing 3D printing technology.

“For our group, the benefit of 3D printing is efficiency,” says Christian Mandrycky, a second year Ph.D. student.

“With the 3D printer, we are able to rapidly prototype components for the kidney-on-a-chip, usually within a few hours and at a dramatically lower cost. This lets us quickly iterate our designs, honing onto one that exactly fits our needs and can then be made using more conventional techniques with more conventional materials.”

According to Ying, involving young researchers has brought more innovative minds to the project.

“The kidney has a very fascinating structure and function. That makes it challenging but also exciting, and students are very motivated to figure out how things work.”



TOP: Dr. Ying Zheng holds a mold for making the network of vessels.

BOTTOM: An image of human kidney tubules in a 3D microphysiological system, taken by Dr. Ed Kelly’s students.

Two student teams present creative solutions for kidney patients, take part in University of Washington’s first ever Health Innovation Challenge

Two teams, made up of chemical and bio-engineering students and focused on solutions for issues kidney patients face, made the finals of University of Washington’s Health Innovation Challenge. On March 3, one member from each of the 18 finalist teams gave a 60-second pitch to judges, hoping to encourage them to visit their booth to learn more.



Le Zhen, a Ph.D. candidate in chemical engineering, explained 6ixS Vascular Solutions’ synthetic blood vessel replacement device to a judge.

\$20,500 was awarded in total, with \$1,000 of that going to 6ixS Vascular Solutions for their long-lasting, low-cost synthetic blood vessel replacement device that could help prevent clotting and infection.

“We started the project about a year ago,” says Le Zhen. “We wanted to develop a new vascular graft, hopefully without some of the complications of grafts used today.”

Z-ion+ Technologies also presented their potential solution for vascular grafts—patent-pending technology that makes non-stick, long-lasting, durable coatings that can be applied to any vascular medical device to prevent complications due to blood clots.

Congratulations to both teams!



Marvin Mecwan pitched Z-ion+ Technologies’ solution that could be applied to vascular grafts for kidney patients.

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Dr. Bessie Young evaluates views surrounding testing at-risk populations for kidney disease gene mutation

In September 2015, Kidney Research Institute investigator Dr. Bessie Young received a three-year grant to evaluate views concerning providing genetic testing information, about a specific gene mutation, to patients and family members who may be at risk for kidney disease.

Apolipoprotein (APOL1) is a new polymorphism associated with end-stage renal disease. Gene mutations in APOL1 may cause up to 40 percent of kidney disease in African Americans who receive renal replacement therapy with either dialysis or kidney transplantation.

"We've long known that ESRD disproportionately affects racial and ethnic minority populations," says Bessie, also a professor of medicine at the University of Washington, "but it hasn't been clear why that is."

"Now we know that certain APOL1 gene

mutations have been associated with a much greater risk of non-diabetic ESRD in African Americans, and we need to figure out what to do with that information."

As part of the study, Bessie and her team will reach out to people in the community, research professionals and healthcare providers to gain their perspective on providing genetic testing information to those at risk, as well as develop educational materials and potential guidelines for patients and providers deciding about transplantation and kidney donation.

"Because of uncertainties regarding the clinical implications of APOL1 variants, testing could potentially generate confusion, anxiety or stigma," says Bessie.

"We need to better understand the risks and benefits of sharing genetic testing information with people before we create policies that might do so."