December 7, 2011

Device promises nutrition diagnosis in minutes

By Sally James

Posted under: Health and Medicine, Research, Science, Technology

Bioengineer Buddy Ratner believes his labs latest device could be a powerful tool, capable of addressing health and child development issues by delivering a blood test in minutes to some of the most remote parts of the

Video about the UW device

Link to Biomarkers of nutrition for development (BOND) program

UW Today

Office of News & Information

Browse Articles

Contact Us

Community Photos

UW Classifieds

University Photography

globe.

The Bill and Melinda Gates Foundation also sees potential in the device, adding an additional $611,000 last month to prior funding for this work. The device could save lives by allowing faster diagnosis and instant treatment for some forms of malnutrition.

While it looks like something you might use to light a barbecue, the Plasma Pencil Atmospheric Mass Spectrometer is really a sophisticated tool that rapidly measures micronutrients – zinc, iron, folate, vitamin A and iodine. The results can then be displayed on a mobile phone or tablet computer within minutes, instead of the 24 hours typically required.

Ratner, who led the team that invented this new tool, says the University of Washington is currently pursuing a patent on the PPAMS device.

The plasma pencil creates a thin plume of charged gas – known as a cold plasma – similar in temperature to the neon signs in a bar or theater marquee. When the plasma touches the samples it forces charged particles, or ions,

Search UW Today

Search the UW

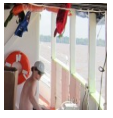
Browse Categories

Select Category

Latest Stories

New K-12 science standards add focus on practices, engineering and early learning

23 mins ago



Amazon River exhales virtually

Mary Levin/University of Washington

The plasma (purple) touches the blood sample and then a mass spectrometry analysis can reveal five crucial nutrients within minutes and display the results on a mobile device. On the screen each of five nutrients is shown as low or high on a scale where normal values are green.

in the sample to break free of the surface. The spectrometer measures the weight and charge of these ions, and that information pinpoints what is in the sample.

In Bangladesh, where the Gates Foundation is trying to reduce infant mortality and diagnose malnutrition in mothers and babies, a woman might walk 15 miles to see one of the rare medical professionals available. With this device, a health worker could know immediately whether that patient needed iron or folate and could deliver the nutrient treatment on the spot, before the patient leaves.

“This device could be transformative. Ive been in research for 39 years, and Im as excited about the significance of this as Ive ever been,” said Ratner, a professor of bioengineering and chemical engineering. Ratner also holds an endowed chair in technology commercialization.

In the research community, blood samples get this spectrometric analysis all the time –but the machinery might cost $300,000 and be bigger than a refrigerator. Those machines usually require the samples to be carefully prepared by a technician and held under high vacuum.

Ratner and his team combined some recent technological advances into a

all carbon taken up by rain forest

60 mins ago

Youth bullying because of perceived sexual orientation widespread and damaging

3 days ago

Arts Roundup: Dance, poetry, art, music — and slapstick ballet

4 days ago

Related Stories

New device can extract human DNA with full genetic data in minutes

May 6, 2013

New device could

package that delivers the same data – with this plasma pencil and a tablet computer or cell phone. The key advances are having a plasma pencil at body temperature, having a portable mass spectrometer and applying the right software analysis that allows for an enormous variety of data to be analyzed at one time – instead of analyzing one item at a time.

Giving results in a simple way, by cell phone, means workers with less education can give life-saving treatment accurately in places with few doctors, explained Jeanette Stein, senior researcher who helped design the PPAMS package. Stein holds a doctorate in bioengineering and is working on the analysis software that allows the plasma pencil to provide multiple results simultaneously.

Just as with other devices receiving Gates foundation grants, this one will not be sold for profit in developing nations, but some of its potential uses could bring profits in the developed world.

“Some people use the analogy of the tricorder device from the old Star Trek television show,” Ratner said. Just as those characters pointed their technology toward unknown substances while exploring planets, Ratner imagines wide uses for the wand, including finding contaminants in drinking water, finding lead in plastic toys, or even improving security screenings at airports.

The very first wands may cost about $100,000, but that price should fall with efficient manufacturing, Ratner said. He presented some of his


cut costs on household products, pharmaceuticals
April 12, 2013


Electrically spun fabric offers dual defense against pregnancy, HIV
November 30, 2012


Sticky paper offers cheap, easy solution for paper-based diagnostics
October 2, 2012

research earlier this year at a meeting of the Biomarkers of Nutrition for Development program, a part of the National Institutes of Health.

For more information, contact Ratner at ratner@uweb.engr.washington.edu

Tagged with: Global Citizens

0 comments

Comments for this thread are now closed.

Comment feed

Subscribe via email

Explore the UW

Admissions

- Undergraduates
- Graduates
- Paying for college
- Husky Promise
- Financial aid estimator
- Continuing Education
- Summer quarter

Academics

- Academic calendar
- Colleges/Schools
- Departments
- Undergraduate learning
- Graduate School
- Course catalog
- Undergraduate majors
- Online learning
- Evening degree program
- English language programs
- Study abroad

Campus Life

- Husky Card
- Dining
- Student housing
- Student groups
- The HUB
- Husky sports
- IMA
- Diversity
- Hall Health
- Counseling Center
- University Book Store
- Computing support

Leadership

- Board of Regents
- President's office
- Provost's office
- Vice presidents
- Vice provosts
- Deans and chancellors
- Government Relations
- Faculty Senate
- ASUW
- GPSS
- RHSA

Portals

- Business & Industry
- Diversity
- Educational Excellence
- Global Affairs
- Creating Global Citizens
- Healthy Lives
- Innovation Serving Society
- Research
- Sustainability of the Earth
- UW Foundation

Graduation requirements
Libraries

UW Police
Holidays