

NIBIB staff and POCT Research Network members recently gathered on campus. They include (front row, from l) Dr. Gonzalo Domingo of PATH; Dr. Tala de los Santos of PATH; NIBIB deputy director Dr. Belinda Seto; Dr. Charlotte Gaydos of Johns Hopkins University; NIBIB director Dr. Roderic Pettigrew; Dr. Gerald Kost of University of California, Davis; Dr. Joseph Clark of University of Cincinnati. At rear are (from l) Dr. Bernhard Weigl of PATH; Dr. Ben Hindson of Lawrence Livermore National Laboratory; Dr. Fred Beyette of University of Cincinnati; Dr. Mary Sullivan of Johns Hopkins University; Dr. Joany Jackman of Johns Hopkins University.



NIBIB Network Shares First-Year Progress, Plans

In 2007, the National Institute of Biomedical Imaging and Bioengineering launched a Point-of-Care Technologies Research Network to facilitate the development and application of these technologies to health care. The technologies would be developed through collaborative efforts among clinicians, biomedical researchers and engineers by merging scientific and technological capabilities with clinical needs. NIBIB funded four centers within the network, each with a different POC diagnostic focus. Recently, researchers from the four centers came together in Bethesda to share their early efforts and future plans.

NIBIB director Dr. Roderic Pettigrew noted that POC has the potential to change health care delivery, to expedite diagnosis and clinical testing of disease/conditions and ultimately may reduce health care costs.

“The idea of establishing a POC network,” he said, “emerged from a workshop sponsored by NIBIB in April 2006, which focused on improving health care accessibility through POC testing and new technologies.”

POC testing refers to the timely provision of clinical diagnostic information in decentralized (i.e., non-hospital) settings such as the primary care physician’s office, the patient’s home or in low-resource environments including natural disaster sites and economically disadvantaged areas.

“POC testing fits nicely,” he said, “into the emerging theme of decentralized health care delivery, with its emphases on a patient-centered approach, decreased dependence on hospitals, increased emphasis on primary care and home health care and cost-reduction.”

Dr. Gerald Kost, principal investigator at the University of California, Davis-Lawrence Livermore National Laboratory POC Technologies Center, focuses on rapid multipathogen detection and national disaster readiness. His team’s initial work involves the development of POC devices

that accelerate diagnosis and treatment of life-threatening bloodstream infections. To illustrate the need for such technologies, Kost pointed to the Hurricane Katrina disaster and the absence of POC diagnostic devices in the field; their availability could have greatly enhanced triage and mobilization efforts.

Dr. Charlotte Gaydos of the Center for POC Technologies for Sexually Transmitted Diseases at Johns Hopkins University emphasized that the new testing must be acceptable to the target population. She and her colleagues are collecting data from patients seen in Johns Hopkins Hospital and Cincinnati Children’s Hospital Medical Center emergency rooms pertaining to their willingness to use new POC STD testing. The researchers face a challenge: the development of new technologies that are affordable, sensitive, specific, user-friendly, rapid, robust and transportable, while at the same time deliverable to and maintainable by those who are meant to use them.

Somewhat unique among the four centers is the POC Center for Emerging Neurotechnologies, led by Dr. Fred Beyette of the University of Cincinnati. This group focuses on bringing POC testing to the ER doctor with rapid and reliable information related to a neurologic emergency. Dr. Joseph Clark, co-PI of the center, explained that 1 million brain cells die every minute during a stroke; an initial correct diagnosis results in a 91 percent likelihood of a good outcome, i.e., the ability to carry out all normal duties and activities. Conversely, an incorrect diagnosis results in only a 53 percent likelihood of a good outcome. Thus, correct diagnostic information needs to be made available to ER clinicians quickly. As Clark stated, “Time is brain.”

A challenge noted by all centers was lack of a shared language between, for example, clinicians and engineers. This obstacle may be initially difficult, but as the multidisciplinary research teams at each of the centers work to bring prototype technologies into the testing phase, the realization of potential field products supports a common understanding through common goals. ●