

The Regents of the University of California

NATIONAL LABORATORIES SUBCOMMITTEE

May 23, 2018

The National Laboratories Subcommittee met on the above date at UCSF–Mission Bay Conference Center, San Francisco.

Members present: Regents Mancina, Napolitano, Ortiz Oakley, Tauscher, and Zettel; Advisory Member White; and Chancellor Block

In attendance: Regent Kieffer, Secretary and Chief of Staff Shaw, General Counsel Robinson, Vice Presidents Brown and Budil, Chancellor Hawgood, and Recording Secretary McCarthy

The meeting convened at 3:45 p.m. with Subcommittee Chair Tauscher presiding.

1. APPROVAL OF MINUTES OF PREVIOUS MEETING

Upon motion duly made and seconded, the minutes of the meeting of March 14, 2018 were approved.

2. UPDATE ON THE NATIONAL LABORATORIES

[Background material was provided to Regents in advance of the meeting, and a copy is on file in the Office of the Secretary and Chief of Staff.]

Subcommittee Chair Tauscher commented that since the last Subcommittee meeting in March, Vice President Budil and her team had been hard at work on the competition for the Management and Operations contract for the Los Alamos National Laboratory. Subcommittee Chair Tauscher thanked Ms. Budil and her team for all their efforts, and said they had the full support of the Subcommittee.

Ms. Budil said her office was awaiting the government’s decision, which she expected shortly.

3. APPLYING SUPERCOMPUTING TO DEVELOP MORE EFFECTIVE TREATMENTS FOR TRAUMATIC BRAIN INJURY

[Background material was provided to Regents in advance of the meeting, and a copy is on file in the Office of the Secretary and Chief of Staff.]

Vice President Budil introduced this presentation about a new project that grew out of the powerful partnership among UC campuses, medical centers, and National Laboratories. She introduced Lawrence Livermore National Laboratory (LLNL) Deputy Associate Director for Computation James Brase, who leads LLNL research in large-scale data

analytics; Benjamin Brown, a statistical biologist serving as Department Head for Molecular Eco-Systems Biology at Lawrence Berkeley National Laboratory (LBNL) and UC Berkeley Adjunct Professor of Statistics; Dr. Geoffrey Manley, UCSF Professor of Neurosurgery and Chief of Neurosurgery at San Francisco General Hospital; and Keith Yamamoto, UCSF Vice Chancellor for Science Policy and Strategy, Vice Dean for Research at the UCSF School of Medicine, and UCSF Professor of Cellular and Molecular Pharmacology.

Mr. Yamamoto briefly described this partnership for precision medicine in traumatic brain injury (TBI) between the National Laboratories and UC campuses to advance precision medicine, using high-performance computing to aggregate and analyze vast amounts of biomedical data and health information to define biological processes, understand disease mechanisms, and use artificial intelligence (AI) to draw inferences about medicine that can affect individual diagnosis, treatment, and care. This approach is revolutionary and would advance the practice of medicine and the way drugs are discovered. Dr. Manley added that this Partnership, funded by the National Institutes of Health and the Department of Defense, has collected the largest precision medicine data set in clinical neuroscience and would use the computational capability of the National Laboratories in its analysis.

Mr. Brase stated that the National Laboratories use their high-performance computing on the world's most difficult problems. TBI is one of the most complicated injuries to the most complicated organ in the body. Combining imaging data and clinical data to focus on clinical diagnostics requires massive computing. LLNL, LBNL, and Argonne National Laboratory have worked to combine the nation's best capabilities to analyze these astonishing new data sets to develop a new capability in precision diagnosis and therapy. This would further enhance the National Laboratories' capability to analyze complicated data sets in a broad variety of missions.

Mr. Brase reported that the TBI project had made impressive progress in just a few months. Computations from medical images that had taken ten hours to process previously could be done in three minutes on a high-performance system at LLNL. This high-speed computation of special maps of connections in the brain could be used as a clinical tool for doctors and their patients, allowing much more precise diagnoses, instead of just as a research tool.

Mr. Brown discussed the complexity of data interactions. Machine learning has made it possible to identify interactions across disparate data types, which was previously unimaginable. The goal now is to bring precision medicine into personalized care and precise treatment strategies.

Regent Zettel asked when these capabilities would be available for clinicians. Mr. Brase said the partnership had the goal of demonstrating the capability on a real patient by the end of the summer. Dr. Manley added that data transfer capability had been established. Research was ongoing and the infrastructure for UCSF clinical care using this new capability was being established in a parallel fashion.

Subcommittee Chair Tauscher commended this amazing innovation. She commented that the agreements allowing cooperation among medical institutions, National Laboratories, and private sector participants were ponderous. She noted the importance of ensuring that the business models and contracting issues were supportive of such collaborative innovation. Mr. Yamamoto agreed that the ability to address problems that were not part of the Department of Energy's (DOE's) mission, such as TBI, but apply the investments made in the DOE to those problems was challenging, but could be done. He would welcome any support in streamlining funding integration for such collaborative projects. Subcommittee Chair Tauscher said finding ways to reducing barriers to more predictable funding for such breakthrough collaborations should be an area of focus for the Subcommittee and the UC Office of the President. Mr. Yamamoto commented that funding was traditionally siloed according to specific missions of government departments, but this time of innovative collaborations in health and medicine represented an enormous opportunity.

Ms. Budil added that there had been similar collaborative projects in the past, such as the Human Genome Project, sponsored by the DOE, which had a long history of projects in the field of human health. She commented that the partnership for precision medicine in TBI had made dramatic progress in just two months, showing the power of bringing these systems together under the aegis of the University.

The meeting adjourned at 4:15 p.m.

Attest:

Secretary and Chief of Staff