DEPARTMENT OF HEALTH AND HUMAN SERVICES NATIONAL INSTITUTES OF HEALTH

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Witness appearing before the Senate Health, Education, Labor, and Pensions Committee

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April 28, 2015

Mr. Chairman and Members of the Committee:

I am pleased to present this testimony to you for the hearing on Biomedical Innovation. I am Roderic I. Pettigrew, Ph.D., M.D., Director, National Institute of Biomedical Imaging and Bioengineering (NIBIB). We are one of 27 Institutes and Centers **Atathe**nal Institutes of Health. NIBIB is a relatively new IQt wascreated in December 2000 awd awardecbur first grants in 2002. NIBIB supports more than 800 grants and theodombore than 5,000 researchersand an Intramural Research Program at NIH. At NIBIB we focus on creating biomedical technologies to improve health.

Our mission is to lead the development and accelerate the application of biomedical technologies to improve health we are advancing medical carethrough better understanding, prevention detection and treatment of disease. We conduct and support emerging technology research and development the disease. We conduct and support emerging technology and physical sciences with life sciences bijding partnerships with industry, academia, and other Federal agencies a high priority for the institute in this testimony bharea few examples from the many exciting NIBIB-funded researchefforts, which are leading to practical innovations that advance below the latth.

Once thought of asrainjury with no hope of recoverya novel therapy that involves electricalstimulation of the spinal cord hassstored function an unprecedented degree in 7 patientstreated to date. This is a firef-its-kind experimental studiunded by NIBIB Following treatment, severely patryzed patients recovered everyday bodily functions, including bowel, bladder and sexual function he return of thesian portant basic functions has dramatically improved the quality of life of all who were treated. These patients also regained the ability to voluntarily stand and achieve limited be movement, providing hope that further recovery may be possible with improvements to this treatment approximate this research is still in its infancy and not yet tathe clinical trial staget has given real hope to people living with paralysis around the world. They have seen the positive imparcthe small group of tudy participants and are eager to have such technologic advances transform their lives as well.

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antigens or drugtso treata range of cancers infectious diseases This research promises a new class of the rapeutic agents which harness and enthat pewer of our natural defense mechanisms against disease.

percentage of U.S. adultswho own them Interfacing snartphones with a variety of biosensors may allow the linkage of DQ LQG LeNettr@nicDnedictal reconstant genomic data with information captured by the smartphone on environmental exposure and bethavioure done with appropriate security and privacy protection in sommeasuring secondary smoke exposure to counting stepsor testingvision, smartphones canecord track, and transmit significant amount of healthinformation. Smartphones can loobe used as a tool foliabilitier living. They can be programmed to search to take a medication or an alert when a dose is missed. The overarching otential application relevant to the Precision Medicine it into its to link and enrich the genomics and electronic health record data white a range of medical exposure and lifestyline formation. 7 KLV VHW RI 3 ELJ BIDD DVODX DFVD HQG WRKUH QPE QHH

completely new way to characterized understandhanges inbrain circuitfunction in mental and neurological disease.

CONCLUSION

NIBIB drives technological innovation to expand biomedical knowledge and create improved diagnostics and therapeutics for this and future generately integrating engineering with the physical and life sciences, NIBIB developmentical solutions to complex biomedical problems.

These advances are proving human health across obtation and worldwide.