Sonde Health Advances Novel Vocal Biomarker Analysis Platform

Company licenses MIT technology and collaborates with experts to objectively diagnose and monitor medical concerns through vocal cues

Boston, Massachusetts, June 28, 2016 - Sonde Health Inc., a company developing a voice-based technology platform for monitoring and diagnosing mental and physical medical conditions, today announced an exclusive license to an award-winning health monitoring audio analysis technology. The technology, licensed from the Massachusetts Institute of Technology (MIT) Lincoln Laboratory, is designed to enable analysis of brief voice samples to screen and monitor for a range of mental and physical medical concerns based on subtle changes in acoustic characteristics of the speaker's voice. Sonde's focus areas include mental health conditions like depression as well as a number of other mental health, respiratory and cardiovascular conditions where remote, passive monitoring could be impactful.

Saying a single phrase requires complex coordination of multiple neural circuits in the brain, precise control of the respiratory system, and carefully timed and coordinated activation of the musculoskeletal system elements that control articulation along the entire vocal tract. Disease-specific disruptions in any one (or more) of these systems produce subtle, but characteristic changes in the non-linguistic features of the voice that are consistent across individuals and can be analyzed computationally.

"The ability to help recognize early signs of psychiatric illness and monitor treatment responses on devices that people already own is an important step in moving from reactive to preventive care," said Aimee Danielson, Ph.D., Director, Women's Mental Health Program at MedStar Georgetown University Hospital. "This would be particularly useful in conditions that are chronically underdiagnosed, like perinatal mood and anxiety disorders, including postpartum depression, and in other mental health and central nervous system disorders where there is a lack of objective and reliable screening and monitoring technologies."

The licensed technology was created by a team led by Thomas Quatieri, Ph.D., at MIT Lincoln Laboratory, and won the most recent Audio/Visual Emotion Challenge (AVEC) sub-challenges for depression award (http://sspnet.eu/avec2013/, http://sspnet.eu/avec2014/) demonstrating best-in-class accuracy for recognizing depression in individuals and estimating the severity of their symptoms from brief samples of speech. Pilot studies using the same core technology have also demonstrated the potential to detect and objectively measure symptoms in a range of important conditions including depression, mild traumatic brain injury (mTBI), concussion, cognitive impairment and Parkinson's disease. Growing evidence suggests that a much wider range of mental and physical health conditions impact the major systems involved in speech production and produce distinct vocal biomarkers that may extend the utility of this technology platform far beyond these initial demonstrations.

"Sonde is developing the technology platform to extract clinically meaningful health information from everyday voice interactions people have on a range of devices they already own," said Jim Harper, Co-Founder and Chief Operating Officer of Sonde Health. "The analysis does not require the content of the speech to be retained, and can readily

support the strong security and privacy features users demand with regard to potentially sensitive health information."

The licensed MIT Lincoln Laboratory technology uses computer analysis of non-linguistic vocal characteristics (e.g., dynamic changes in pitch and harmonics, articulation timing and hoarseness or breathiness) to define objective "vocal biomarkers" that potentially signal changes in health or disease status for a range of conditions. Importantly, the biomarker analysis is achieved without examining the content or meaning of the speech being analyzed. This enables strong privacy and security to be built into Sonde's products from the start.

Sonde is collaborating with distinguished experts in the areas of population health, mental health, disease monitoring and information technology. The company's newly appointed clinical and commercial advisors include:

- Maurizio Fava, M.D. – Director of the Division of Clinical Research of the Massachusetts General Hospital (MGH) Research institute, Executive Vice Chair of the MGH Department Psychiatry, Executive Director of the MGH Clinical Trials Network & Institute (CTNI), a Harvard teaching hospital; associate member of the Broad Institute's Stanley Center for Psychiatric Research; Slater Family Professor of Psychiatry at Harvard Medical School. Dr. Fava has received several awards, including the 2015 Depression and Bipolar Support Alliance (DBSA) Senior Investigator Gerald L. Klerman Award. He is the immediate past president of the American Society of Clinical Psychopharmacology and is on the editorial board of five international medical journals, including the Journal of Affective Disorders and the Journal of Clinical Psychiatry.
- Aimee Danielson, Ph.D. – Founder and Director of the Women's Mental Health Program at MedStar Georgetown University Hospital, an outpatient treatment program in Washington, DC, devoted exclusively to treating perinatal psychiatric disorders. Dr. Danielson is an Assistant Professor of Clinical Psychiatry at Georgetown University School of Medicine, and actively involved in medical education. She teaches medical students, residents and fellows about women's mental health, including the motherhood transition and perinatal psychiatric disorders. Dr. Danielson is co-founder of the DC Women's Reproductive Mental Health Consortium and also an active member of the DC Collaborative for Mental Health in Pediatric Primary Care.
- Harry Leider, M.D., MBA – Chief Medical Officer and Group Vice President of Walgreens. Before joining Walgreens, Dr. Leider was Chief Medical Officer of Ameritox, and prior to that he was Chief Medical Officer of XLHealth. Leider also served as the Chief Medical Officer for HealthNet and was a physician executive at Harvard Pilgrim Health Plan. Dr. Leider is on the editorial boards of *Physician Executive* and the *Journal of Population Health Management*. He is also a founding board member of the Disease Management Association of America (DMAA) and served on the board of the Institute of Aging at the University of Pennsylvania. Dr. Lieder also served for six years as an attending physician at Brigham and Women's Hospital and faculty member at Harvard Medical School, and more recently as a faculty member at the Johns Hopkins Carey School of Business.
- Helen Christensen, Ph.D. – Director and Chief Scientist of the Black Dog Institute; Professor of Mental Health at the University of New South Wales; National Health

and Medical Research Council (NHMRC) John Cade Research Fellow; member of the Academy of Social Sciences, Australia; past President of the Australasian Society for Psychiatric Research; immediate past President of the International Society for Research in Internet Interventions. Dr. Christensen is also the Chief Investigator for the NHMRC Clinical Research Centre for Excellence in Suicide Prevention.

- Ian Gotlib, Ph.D. – David Starr Jordan Professor and Chair of the Department of Psychology at Stanford University and Director of the Stanford Mood and Anxiety Disorders Laboratory. Dr. Gotlib studies depression and risk for disorder in children, adolescents and adults. He has received the Distinguished Investigator Award from the National Alliance for Research in Schizophrenia and Affective Disorders, the Joseph Zubin Award for lifetime research contributions to the understanding of psychopathology, the APA Award for Distinguished Scientific Contribution and the APS Distinguished Scientist Award.
- Julien Epps, Ph.D. – Associate Professor in Signal Processing with the School of Electrical Engineering and Telecommunications at UNSW Australia and Contributed Principal Researcher with Data61, CSIRO, Australia.

About Sonde Health

Sonde Health is a PureTech (PureTech Health plc, PRTC.L) initiative developing a voice-based technology platform with the potential to transform the way mental and physical health is monitored and diagnosed. Sonde is advancing its proprietary technology developed internally and licensed from the Massachusetts Institute of Technology (MIT) Lincoln Laboratory that has demonstrated potential to effectively screen and monitor for disease using information obtained from the voice.

Forward Looking Statement

This press release contains statements that are or may be forward-looking statements, including statements that relate to the company's future prospects, developments and strategies. The forward-looking statements are based on current expectations and are subject to known and unknown risks and uncertainties that could cause actual results, performance and achievements to differ materially from current expectations, including, but not limited to, those risks and uncertainties described in the risk factors included in the regulatory filings for PureTech Health plc. These forward-looking statements are based on assumptions regarding the present and future business strategies of the company and the environment in which it will operate in the future. Each forward-looking statement speaks only as at the date of this press release. Except as required by law and regulatory requirements, neither the company nor any other party intends to update or revise these forward-looking statements, whether as a result of new information, future events or otherwise.

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