**181st Meeting of the Acoustical Society of America**

**Blood Bubbles Reveal Oxygen Levels #ASA181**

*Acoustic tools detect vibrating microbubbles, act as oxygen sensors*

EMBARGOED for release until November 29 at11:30 a.m. Eastern U.S.

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SEATTLE, November 29, 2021 – Blood carries vital oxygen through our circulation system to muscles and organs. Acoustic tools can create small bubbles in our blood, capable of changing in response to oxygen and signifying oxygen levels.

During the 181st Meeting of the Acoustical Society of America, which will be held Nov. 29 to Dec. 3, Shashank Sirsi, from the University of Texas at Dallas, will discuss how circulating microbubbles can be used to measure oxygen levels. The talk, "Hemoglobin Microbubbles for In Vivo Blood Oxygen Level Dependent Imaging: Boldly Moving Beyond MRI," will take place Monday, Nov. 29, at 11:25 a.m. Eastern U.S.

Microbubbles are smaller than one hundredth of a millimeter in diameter and can be made by emulsifying lipids or proteins with a gas. The gas filling of microbubbles causes them to oscillate and vibrate when ultrasound is applied, scattering energy and generating an acoustic response that can be detected by a clinical ultrasound scanner. They are routinely used in medical imaging to provide greater contrast in tissue.

Hemoglobin, the protein that gives red blood cells their signature color, will form a stable shell around microbubbles. It then continues to carry out its typical role of binding and releasing oxygen in blood.

Sirsi and his team developed microbubbles to acoustically detect blood oxygen levels, since the microbubble shells are altered by structural hemoglobin changes in response to oxygen. The hemoglobin shell is continually responsive to oxygen after surrounding the bubble and has been optimized to perform in living organisms' circulation.

"When oxygen binds to hemoglobin, there are structural changes in the protein that change the mechanical properties," said Sirsi. "The mechanical properties of the shell dictate the acoustic response of a bubble, so our hypothesis was that different acoustic responses would be seen as the shell gets stiffer or more elastic."

Preliminary results show a strong correlation between oxygen concentration and the acoustic bubble response, highlighting the potential use of microbubbles as oxygen sensors. This capability would have many benefits for medicine and imaging, including evaluating oxygen-deprived regions of tumors and in the brain.

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**----------------------- MORE MEETING INFORMATION -----------------------**

**USEFUL LINKS**

Main meeting website: <https://acousticalsociety.org/asa-meetings/>

Technical program: <https://eventpilotadmin.com/web/planner.php?id=ASAFALL21>

Press Room: <http://acoustics.org/world-wide-press-room/>

Follow conference highlights with social media hashtag #ASA181

**WORLDWIDE PRESS ROOM**

In the coming weeks, ASA's Worldwide Press Room will be updated with additional tips on dozens of newsworthy stories and with lay language papers, which are 300-500 word summaries of presentations written by scientists for a general audience and accompanied by photos, audio, and video. You can visit the site during the meeting at <http://acoustics.org/world-wide-press-room/>.

**PRESS REGISTRATION**

We will grant free registration to credentialed journalists and professional freelance journalists. If you are a reporter and would like to attend, contact the AIP Media Line at 301-209-3090. For urgent requests, staff at [media@aip.org](mailto:media@aip.org?subject=178th%20Meeting%20of%20the%20Acoustical%20Society%20of%20America) can also help with setting up interviews and obtaining images, sound clips or background information.

**VIRTUAL MEDIA BRIEFINGS**

Press briefings will be held virtually during the conference. Credentialed media can register in advance by emailing [media@aip.org](mailto:media@aip.org) and include your full name and affiliation in the message. The official schedule will be announced as soon as it is available and registered attendees will be provided login information via email.

**ABOUT THE ACOUSTICAL SOCIETY OF AMERICA**

The Acoustical Society of America (ASA) is the premier international scientific society in acoustics devoted to the science and technology of sound. Its 7,000 members worldwide represent a broad spectrum of the study of acoustics. ASA publications include The Journal of the Acoustical Society of America (the world's leading journal on acoustics), Acoustics Today magazine, books, and standards on acoustics. The society also holds two major scientific meetings each year. For more information about ASA, visit our website at <http://www.acousticalsociety.org>.