BioSpectrum
the business of Bio & Health Sciences
ASIA EDITION

Korea designs transparent ultrasound transducer to revolutionise biomedical imaging technology

March 11, 2024 | News

A novel transducer that can achieve simple and seamless integration is crucial for practical application



Researchers from the Department of Convergence IT Engineering, the Department of Mechanical Engineering, and the School of Convergence Science and Technology) at Pohang University of Science and Technology (POSTECH), South Korea have developed a novel transparent ultrasonic transducer (TUT) showcasing high performance.

Conventional ultrasound transducers are typically made using multiple opaque layers to maximise acoustic performance, and they cannot be seamlessly integrated into light pathways. This fundamental limitation always diminishes the performance of both optical and ultrasound systems.

The novel TUT exhibits exceptional optical transparency (>80%) and maintains the same bandwidth (±30% at the center frequency) as conventional opaque ultrasound transducers. Using the novel TUT in the ultrasound-photoacoustic dual-modal system resulted in depth-to-resolution ratios, surpassing 500 for ultrasound imaging and 370 for photoacoustic imaging.

This imaging system also easily conducted intricate structural and functional imaging of live animals and humans.

The application of this technology extends across various medical devices, encompassing tasks like using light stimulation for cell manipulation, employing laser surgery for tumor removal, and employing ultrasound for the examination of residual tissue.

The team hope that this research will be beneficial in diverse fields including those employing ultrasound and optical sensors such as mobile devices and robotics.