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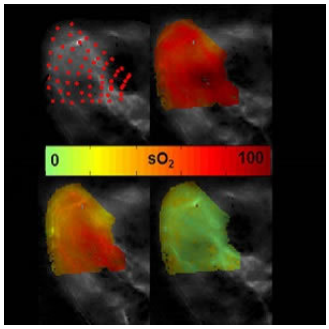
New Imaging Method for Showing Oxygen In Tissue



One of the biggest challenges in imaging is the ability to visualise oxygen in tissue. A research team led by Prof. Vasilis Ntziachristos, Chair for Biological Imaging at the Technical University of Munich (TUM) and Director of the Institute for Biological and Medical Imaging at the Helmholtz Zentrum München has developed an approach to tackle this task.

Imaging of tissue oxygenation is fairly complex. Over the years, different techniques have been used but none were completely successful. This new approach by Prof. Ntziachristos uses mutlispectral optoacoustic tomography (MSOT), a technique that turns light into sound and then into visual information. Theoretically speaking, MSOT can be used to tell how much oxygen can be found in the blood. However, there is one major issue with this method. The intentisy of light changes with depth mainly becuase different tissue structures have different properties that could affect how the light is scattered and absorbed. Due to the optical complexity of tissues, the approach could not be applied in optacoustic images of tissues.

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However, Prof. Ntziachristos and his team have come up with a completely different approach. They use an altered imaging method - eMSOT - where e stands for eigenspectra - that avoids stimulating the path of light through complex tissue altogether. eMSOT uses data from a conventional MSOT-device which is then combined with a new algorithm that is based on a new way of describing the light spectrum that corrects the effects of light propogation in tissue. This results in accurate images of blood oxygenation in tissues up to one centimetre below the skin surface.

"Information about the amount of oxygen in tissue is important when it comes to various fields in research and treatment - for example tumour growth or in measurements of metabolism" says Vasilis Ntziachristos. "It may be that eMSOT becomes the gold standard method, once it is ready for clinical use."

Source: Technical University of Munich
Image Credit: Technical University of Munich

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