Imaging Human Brain Function and Blood Flow with Photoacoustic Computed Tomography

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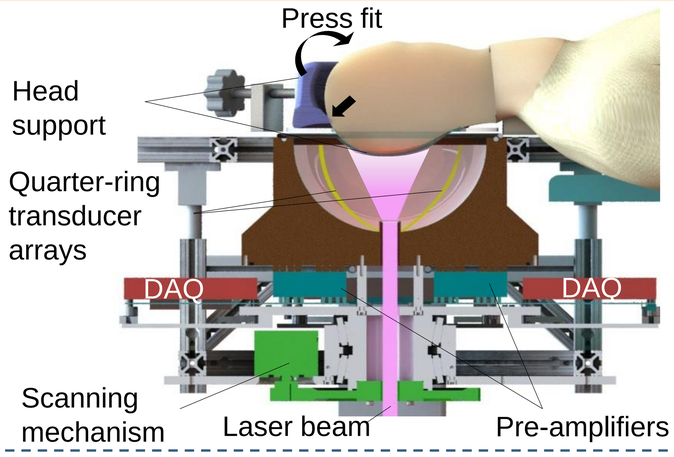
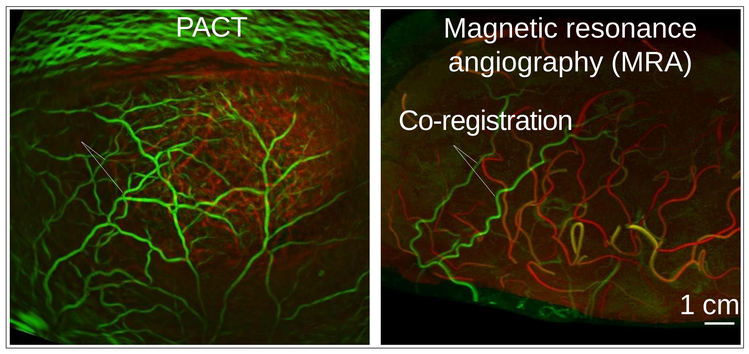
Abstract: Herein, we report in-human imaging of **brain function** and **blood flow** using photoacoustic computed tomography.

Photoacoustic computed tomography (PACT)[1]



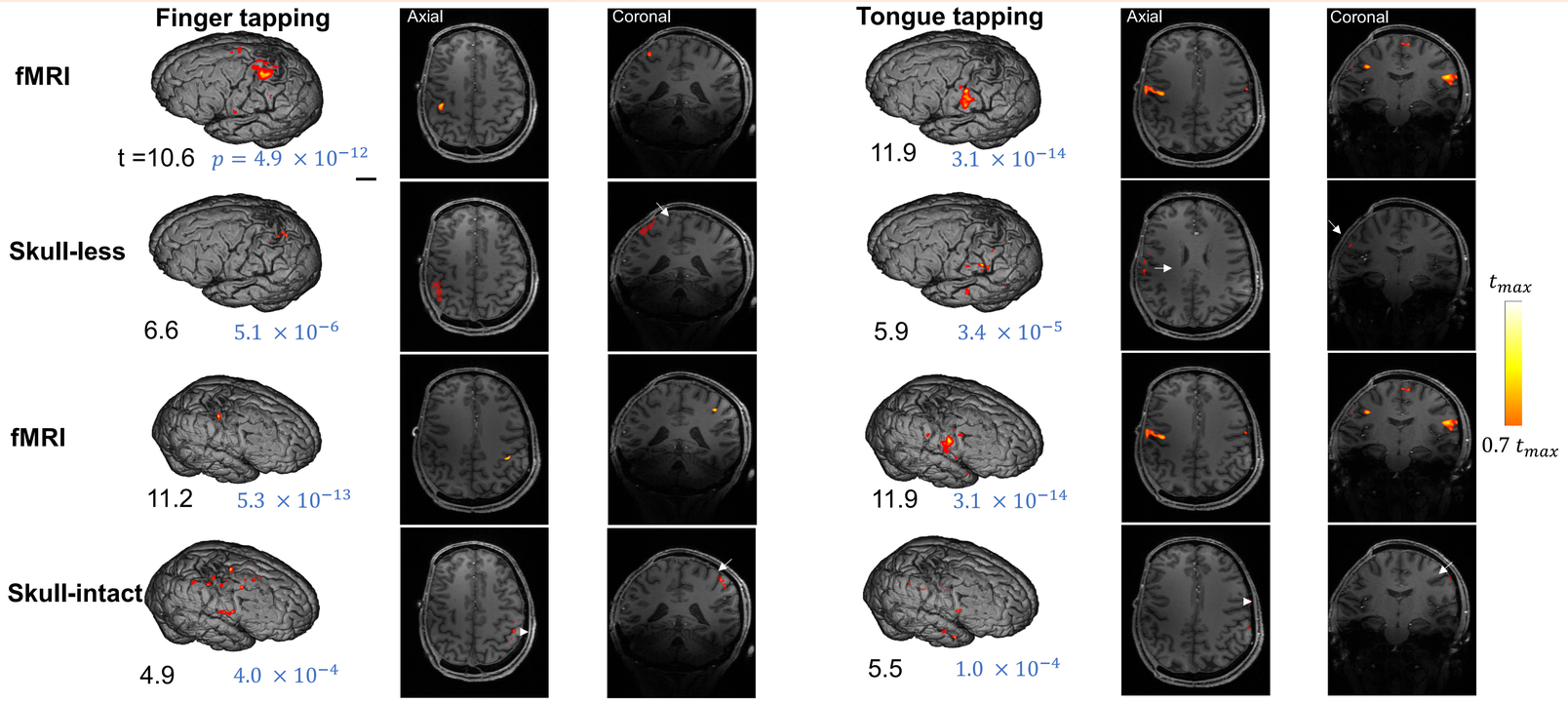
Brain angiography[1]



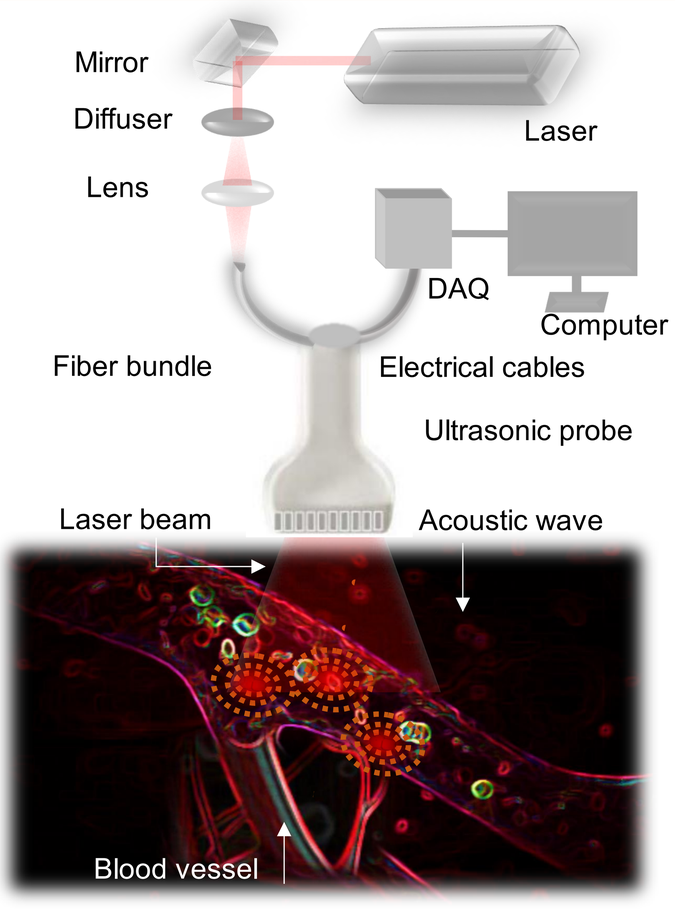
Functional photoacoustic computed tomography (fPACT) vs. Functional magnetic resonance imaging (fMRI)[1]

Modality	Contrast	Response	Background	Sens.	Linearity	Portability	Space	Sound	Costs	Magnet
fMRI	HbR	Early	High	Low	No	No	Close	Loud	High	Yes
fPACT	HbR, HbO_2, sO_2, CBV	Earlier	Low	High	Yes	Yes	Open	Quiet	Low	No

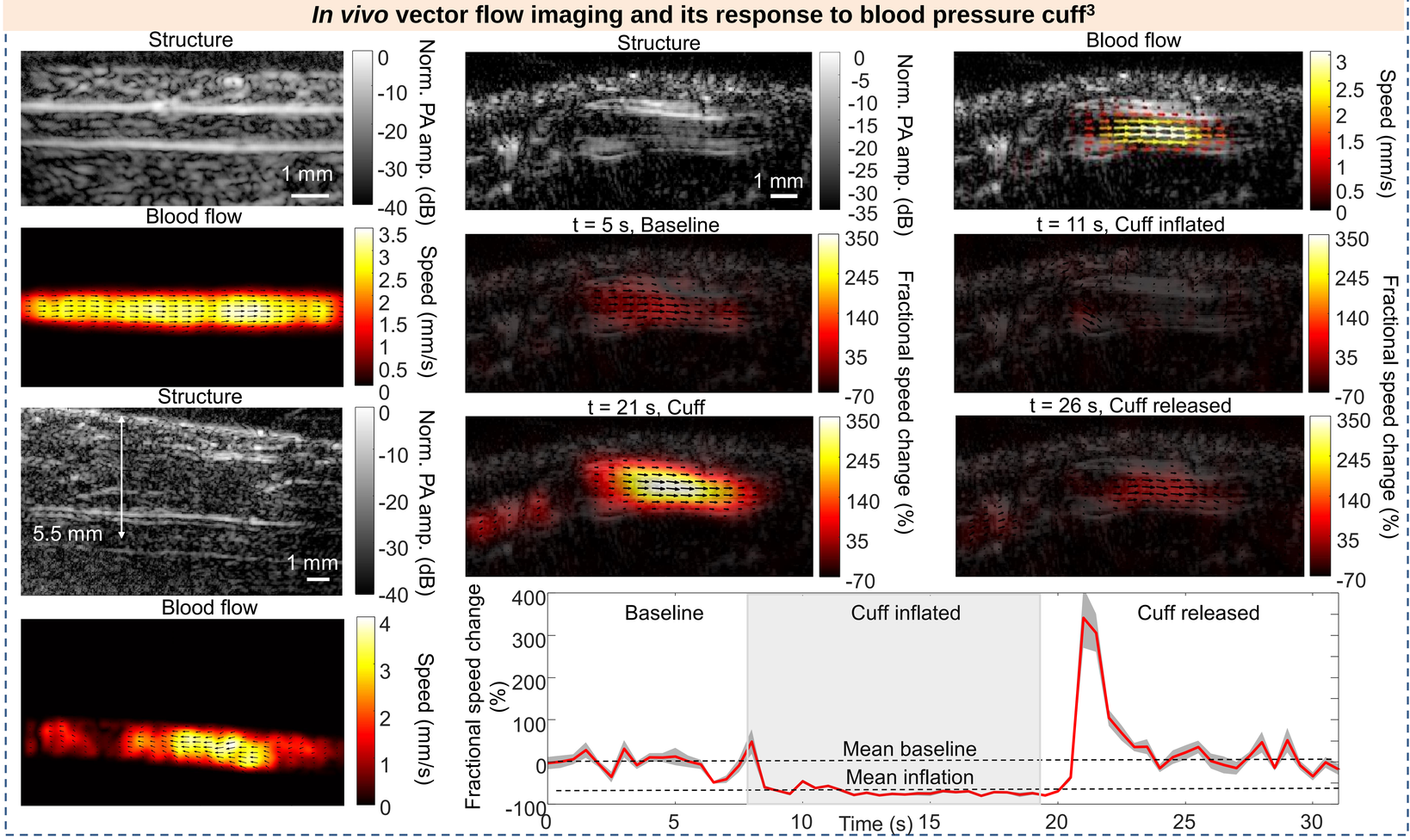
Mapping motor function of human brain[2]



Photoacoustic vector tomography[3]



In vivo vector flow imaging and its response to blood pressure cuff[3]



Reference: 1) S. Na, et al, *Nature Biomedical Engineering*, 2021; 2) Y. Zhang, et al, *arXiv*, 2022; 3) Y. Zhang, et al, *arXiv*, (*Nature Biomedical Engineering*, in press).

Grants: U01EB029823; R01NS102213A; R35CA220436A.