Master's on new gene reporters for molecular imaging with optoacoustic tomography

Are you interested in discovering dynamic patterns of cellular processes across entire organs in living organisms? Then you should be interested in this joint Master's project between the Westmeyer Lab https://www.westmeyerlab.org/ and the Stiel Lab https://www.helmholtz-muenchen.de/ibmi/laboratories/cell-engineering/index.html on using new genetically controlled reporters for multispectral optoacoustic tomography (MSOT), an innovative technique to obtain "color information" with deeper tissue penetration than any other optical method.

Summary

Development and validation of new gene reporters for *in vivo* optoacoustic tomography.

Keywords

Optoacoustic imaging, gene reporters, protein engineering, biological engineering, biomedical engineering, advanced microscopy, molecular imaging

Your Profile

- an excellent and recent Bachelors's degree in (bio-)physics, biochemistry, biological engineering, biomedical engineering, or related academic programs,
- genuine interest in the powerful applications of MSOT (https://en.wikipedia.org/wiki/Multispectral_optoacoustic_tomography)
- previous experience with microscopy and mammalian cell culture, and ideally work in animal models
- the ability to be self-motivated and work with an interdisciplinary team of bioengineers, biochemists, neuroscientists, and data scientists,
- excellent English language and organizational skills.

TUM

The Technical University of Munich (TUM) combines top-class facilities for cutting-edge research with unique learning opportunities for students. It is committed to finding solutions to the major challenges facing society as we move forward: Health & Nutrition • Energy & Natural Resources • Environment & Climate • Information & Communications • Mobility & Infrastructure. The university thinks and acts with an entrepreneurial spirit. Its aim: to create lasting value for society. All this combines to make it one of Europe's leading universities.

Applications from disabled persons with essentially the same qualifications will be given preference. TUM strives to raise the proportion of women in its workforce and explicitly encourages applications from qualified women.

Please send your letter of motivation and your complete CV to **andre.stiel@tum.de**.

Please also note https://portal.mytum.de/kompass/datenschutz/Bewerbung/

References:

[1] Stiel A.C., Deán-Ben X.L., Jiang Y., Ntziachristos V., Razansky D. and Westmeyer G.G. High-contrast imaging of reversibly switchable fluorescent proteins via temporally unmixed multispectral optoacoustic tomography. Optics Letters 40(3):367-370, 2015 https://www.osapublishing.org/ol/abstract.cfm?URI=ol-40-3-367

[2] Sigmund, F., Massner, C., Erdmann, P., Stelzl, A., Rolbieski, H., Desai, M., Bricault, S., Wörner, T.P., Snijder, J., Geerlof, A., Fuchs, H., Hrabe de Angelis, M., Heck, A.J.R., Jasanoff, A., Ntziachristos, V., Plitzko, J., Westmeyer, G.G., 2018. Bacterial encapsulins as orthogonal compartments for mammalian cell engineering. Nat Commun 9, 1990. https://doi.org/10.1038/s41467-018-04227-3

[3] Weidenfeld, I., Zakian, C., Duewell, P., Chmyrov, A., Klemm, U., Aguirre, J., Ntziachristos, V. and Stiel, AC. Homogentisic acid-derived pigment as a biocompatible label for optoacoustic imaging of macrophages. Nat Commun 10, 5056 (2019) https://doi:10.1038/s41467-019-13041-4

[4] Mishra K., Stankevych M., Fuenzalida-Werner JP., Grassmann S., Gujrati V., Huang Y., Klemm U., Buchholz VR., Ntziachristos V., Stiel AC. Multiplexed whole-animal imaging with reversibly switchable optoacoustic proteins. Science Advances 2020-06 (2020). DOI: 10.1126/sciadv.aaz6293