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## Editorial board member

#### **Zhen Yuan**

Director of Bioimaging Core

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University of Macau

Macau





Biosensors Journal

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# Biography

Dr. Yuan is an assistant professor and Director of Biomedical Imaging Core with Faculty of Health Sciences at University of Macau (UM). Before joined UM, he had worked as a research assistant professor in the Biomedical Engineering Department at University of Florida (09/2007-09/2012) and assistant professor in School of Communication with Arizona State University (9/2012-6/2013). He received his PhD degree in Mechanical Engineering from University of Science and technology of China in 2002. Between 2002 and 2007, he had received several postdoc trainings in different institutes including National University of Singapore (2002-2004), Clemson University (2005) and University of Florida (2005-2007

His academic investigation is focused on cutting-edge research and development in laser, ultrasound and EEG/fMRI-related biomedical including biomedical technologies imaging and signal processing/spectroscopy, biomedical optics, bioMEMS, computational science, neural engineering and nano medicine. He, as the principal or coinvestigator for the above research activities, has achieved national and international recognition through more than 50 publications in high ranked journals and over 1000 independent citations. He was selected to be an active reviewer for over 30 top journals. He is a guest associate editor of Medical Physics and Applied Optics, and editorial board members of Journal of Biosensors and Bioelectronics and Biochips and Tissues Chips. He is a senior member of OSA and senior member of SPIE.

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#### **Research Interests**

- Neurosciences and Neuroimaging
- Optical Molecular Imaging and Cancer



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- **Z. Yuan**, "Listening to light scattering in turbid media: quantitative optical scattering imaging using photoacoustic measurements with one-wavelength illumination," **J. Opt.**, 065301 (**2014**).
- Yin Tian, Shan Liang, **Z. Yuan** (Corresponding author), "White matter structure in loneliness: preliminary findings from diffuse tensor imaging," **Neuroreport**, 25(11), 843-847 (**2014**).
- J Zhang, **Z. Yuan** (Corresponding author), "Quantification of the power changes in bold signals using welch spectrum method during different single-hand motor imageries," **Magnetic Resonance Imaging** (2014).
- **Z. Yuan,** "A systematic investigation of CW reflection diffuse optical tomography using nonlinear reconstruction methods and CW measurements," **Biomedical Optics Express**, 5(9), 3011-3022 (**2014**)
- <u>Yin Tian</u>, Fali Li, Peng Xu, **Zhen Yuan** (corresponding author), Dechun Zhao, Haiyong Zhang, "Combining canonical correlation analysis and infinite reference for frequency recognition of steady-state visual evoked potential recordings: A comparison with periodogram method," <u>Bio-Medical Materials and Engineering</u> 24, 2901-2908 (**2014**).
- Yubin Liu, Zhifang Li, Hui Li and **Zhen Yuan** (corresponding author), "Quantification of the chemical composition variations of tumors in photothermal therapy by photoacoustic spectroscopy: An in vitro study," **Bio-Medical Materials and Engineering** 24, 3411-3418 (**2014**).
- **Z. Yuan**, "Osteoarthritis and psoriatic arthritis: Findings in three-dimensional biophotonics imaging," **Bio-Medical Materials and Engineering** 24, 3063-3071 (**2014**).
- **Z. Yuan**, "A spatiotemporal and time frequency analysis of fNIRS brain signals using ICA method," **Journal of Biomedical Optics 20** 18(10), 106011 (**2013**).
- **Z. Yuan**, "Combing ICA and Granger causality to capture brain network dynamics with fNIRS measurements," **Biomedical Optics Express** 4(11), 2629-2643 (**2013**).
- **Z. Yuan**, J. Ye, "Fusion of fNIRS and fMRI: Identification when and where hemodynamic responses are changing in human brain," **Frontier in Human Neurosciences** 7: 676 (**2013**).

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#### Molecular imaging

A. Zerhouni, MD, former director of the National Institutes of Health, has described molecular imaging as having "...the potential to define itself as a core interdisciplinary science for extracting spatially and temporally resolved biological information at all physical scales from Angstroms to microns to centimeters in intact biological systems." (Eugene P. Pendergrass New Horizons Lecture, Radiological Society of North America meeting, 2007)(1). Even in its early stages of development, molecular imaging is revolutionizing our ability to see and monitor specific proteins and genes, and characterize molecular pathways within the living organism.

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#### **Purpose**

- 1)Noninvasively characterize the stages and progression of a disease process and establish signature biomarkers;
- 2) Assess the efficacy of standard or experimental treatment modalities in small-animal models of human disease;
- 3) Characterize the trafficking of stem cells and immune cells;
- 4) Analyze the biodistribution of drugs and the dynamics of drug/receptor interactions;
- 5) Investigate the cellular and subcellular basis of brain disorders;
- 6) Assess metabolic changes, particularly in the brain, heart and tumors;
- 7) Detect tissue hypoxia.

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#### As a tool in Cancer Imaging

It helps particularly to predict which tumor is aggressive or going to invade locally, more severely;

Node size is not the criteria of detection;

Cancer early detection

#### **Cancer Treatment**

Localized tumors-Radio therapy
Systemic or diffused tumors-chemo therapy or hormonal therapy
Amputation in case of person becoming hormone refractory

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#### Molecular imaging techniques

Optical Molecular Imaging: Bioluminescence imaging, fluorescence imaging, optical coherence imaging and photoacoustic imaging.

SPECT.

PET.

MRI and CT.

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