Joseph P. Kao, PhD

Academic Title:

Professor

Primary Appointment:

Physiology

Administrative Title:

Associate Director of BioMET

Email:

jkao@umaryland.edu

Location:

South Pharmacy Hall Room S501

Phone (Primary):

410-706-4167

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Education and Training

Arizona State University, BS, Chemistry, 1978

University of California, Berkeley, PhD, Chemistry, 1985

University of California, Berkeley, Postdoctoral Research, Cell Biology and Physiology, 1989

University of California, San Diego, Postdoctoral Research, Cell Biology and Physiology, 1990

Biosketch

Dr. Kao is an expert in the design, synthesis, and application of molecular probes for studying physiological function in biological systems. The molecular probes include fluorescent molecules for monitoring cellular physiology, and photosensitive “caged” molecules that enable the use of light to actively control physiology in vitro and in vivo. In addition, stable free radicals (so-called “spin probes”) enable physiologic imaging in vivo through electron paramagnetic resonance imaging (EPRI), while isotopically substituted metabolites enable metabolic imaging through hyperpolarized magnetic resonance imaging (hMRI). The optical probes have wide

application in cell biology and neurophysiology, whereas the magnetic imaging probes are useful in cancer biology.

Research/Clinical Keywords

Molecular probes, cellular physiology, neurophysiology, optical microscopy, fluorescence, caged molecules, spin probes, magnetic imaging modalities, electron paramagnetic resonance.

Highlighted Publications

Epel B, Sundramoorthy SV, Krzykawska-Serda M, Maggio MC, Tseytlin M, Eaton GR, Eaton SS, Rosen GM, Kao JPY, Halpern HJ. (2017) Imaging thiol redox status in murine tumors in vivo with rapid-scan electron paramagnetic resonance. Journal of Magnetic Resonance. 276:31-36. PMID: 28092786

Legenzov EA, Muralidharan S, Woodcock LB, Eaton GR, Eaton SS, Rosen GM, Kao JP. (2016) Designing Molecular Probes To Prolong Intracellular Retention: Application to Nitroxide Spin Probes. Bioconjugate Chemistry. 27(12):2923-2930. PMID: 28092786

Muralidharan S, Dirda ND, Katz EJ, Tang CM, Bandyopadhyay S, Kanold PO, Kao JP. (2016) Ncm, a Photolabile Group for Preparation of Caged Molecules: Synthesis and Biological Application. PLoS One. 11(10):e0163937. PMID: 27695074

Legenzov EA, Sims SJ, Dirda ND, Rosen GM, Kao JP. (2016) Disulfide-Linked Dinitroxides for Monitoring Cellular Thiol Redox Status through Electron Paramagnetic Resonance Spectroscopy. Biochemistry. 54(47):6973-6982. PMID: 26523485

Burks SR, Macedo LF, Barth ED, Tkaczuk KH, Martin SS, Rosen GM, Halpern HJ, Brodie AM, Kao JP. (2010) Anti-HER2 immunoliposomes for selective delivery of electron paramagnetic resonance imaging probes to HER2-overexpressing breast tumor cells. Breast Cancer Research and Treatment. 124(1):121-131. PMID: 20066490

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