Session Number: P07-1
Session Title: Probe Design: Novel Activation Strategies
Session Type: Poster
Session Start: 9/12/2004 4:15:00 PM
Session End: 9/12/2004 6:00:00 PM
Location:

Presentations:
- Rajesh Shinde -- 197. In-Vivo Bioluminescence Protease Assay Using Aminoluciferyl Derivatives
- Michael A. McDonald -- 198. Temperature-Sensitive Protein Nanospheres for HIFU Mediated Gene Delivery and Molecular Targeting
- Ralph Mason -- 199. A New Frontier for Proton MRI: Quantitative Tissue Oximetry
- Ralph P. Mason -- 200. S-GalTM, a Novel 1H MRI Reporter for b-Galactosidase
- John Chen -- 201. Myeloperoxidase-mediated activation of paramagnetic imaging probes.
- Xiaobing Tian -- 202. Radiolabeled and Fluorescent Tumor-Targeting PNA-peptide Chimeras for Imaging Overexpressed Oncogene mRNAs
- Jim Delikatny -- 203. Multimodality Detection of Phospholipase Activity
- Marit Nilsen-Hamilton -- 204. Aptamers regulated by specific nucleic acid sequences for imaging gene expression
- Omar Zurkiya -- 205. Numerical Study of the Effect of Magnetic Nanoparticle Clustering in MRI-Based Molecular Imaging
- Helmut R. Maecke -- 208. Targeted MRI Contrast and Radiopharmaceutical Agents Based on Poly-DOTA Conjugated Somatostatin Analogs
- Anil K. Mishra -- 209. Novel Smart MR Contrast Agents for In Vivo Molecular Imaging of pH, Calcium, and Enzyme Activity
- Gang Zheng -- 210. New Photodynamic Therapy Concept Based on Singlet Oxygen Quenching and Activation
- Evan J. Boote -- 211. An Investigation of the Acoustic Properties of Au Nanoparticles
- Che-Wei Chang -- 212. A New Specific Enzymatic Contrast Agent of Magnetic Resonance Imaging
- Jyh-Horng Chen -- 213. The RGD Peptide-conjugated Liposomes Containing Gadolinium DTPA for Tumor Imaging
- Tamara Troy -- 214. In vivo Characterization of Quantum Dot Reporters

Vikram D. Kodibagkar -- 216. Magnetic resonance chemical shift imaging of gene-reporter molecule OFPNPG

Dar-Bin Shieh -- 217. Anti-Her-2 Monoclonal Antibody Conjugated Non-polymer Coated Iron Oxide Nanoparticle as Dual Purpose Contrast Agent for Targeted Anti-cancer Therapy and MR Imaging

Dar-Bin Shieh -- 218. Design of A Novel Non-polymer Coated Iron Oxide Nanoparticle and Its Application in Hepatic MR Imaging


Michael A. McDonald -- 220. Temperature-Sensitive Nanoparticles for HIFU Mediated Gene delivery, MR and Optical Imaging

Philip J. Santangelo -- 221. Sensitive Detection of RNA in Living Cells Using Molecular Beacons

Add Selected Presentations to My Itinerary
Novel Smart MR Contrast Agents for In Vivo Molecular Imaging of pH, Calcium, and Enzyme Activity

Anil K. Mishra, Josef Pfeuffer, Nikos K. Logothetis, Max-Planck Institute for Biological Cybernetics, Germany.
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Presentation Number: 209

Two novel gadolinium-based magnetic resonance (MR) contrast agents for molecular imaging were designed and synthesized. They have the potential to trace physiological changes of extracellular pH, calcium concentration, and enzymatic activity.

DO3A-EP; 1,4,7 tris(carboxymethyl)-10-(2-phosphono-ethyl)-1,4,7,10-tetraazacyclododecane (L1) and DO3A-EA-P5P; 1,4,7 tris(carboxymethyl)-10-{2-[(3-hydroxy-2-methyl-5-phosphonoxyethyl-pyridin-4-ylmethylene)-amino]-ethyl}-1,4,7,10-tetraazacyclododecane (L2) were synthesized from 1,4,7,10-tetraazacyclododecane (Cyclen) by reaction with tert-butyl bromoacetate, giving an excellent yield of 80%.

L1 was prepared by reaction with diethyl 2-bromoethyl phosphonate. L2 was prepared by the reaction of 1,4,7-tris(carboxybutoxymethyl)-10-(4-aminoethyl)-1,4,7,10-tetraazacyclododecane and pyridoxal 5’ phosphate monohydrate. The corresponding carboxylate derivative was obtained by cleaving the tert-butyl group by trifluoroacetic acid and anisole at 0°C. All the derivatives and final chelates were characterized on the basis of \(^1\)H, \(^{13}\)C, and \(^{31}\)P NMR and ESI-MS mass spectrometry.

For initial MR results, the gadolinium complex of DO3A-EP was prepared in aqueous conditions at pH 6.3. In vitro MR relaxivity studies were performed at 300 MHz to probe relaxivity changes with different pH. For Gd-DO3A-EP at 21°C, r1 increased by 70% from 2.3 to 3.9 s\(^{-1}\)mM\(^{-1}\) (pH 7.5 to pH 5.5) and r2 increased by 57% from 2.8 to 4.4 s\(^{-1}\)mM\(^{-1}\) (pH 7.5 to pH 5.5).
Commercial Relationship: A.K. Mishra, None.