Daniel Coman

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SUMMARY

My current research interest is to develop molecular imaging methods to reveal the physiological and chemical alterations underlying disease in preclinical and apply them in clinical models. I have background in advanced MRI and MRS methods to conduct in vivo biomedical imaging research, from multi-nuclear MRS (^{1}H, ^{13}C, ^{31}P, ^{19}F) to multi-modal MRI (calibrated fMRI, DTI, ASL, CEST, BIRDS), from 3T to 11.7T. I possess diverse software expertise across various platforms, in MRI/MRS pulse sequence design and advanced programming in MRI/MRS data analysis. I also have teaching and mentoring experience in advanced MRI/MRS methods. One of my most significant achievements is pioneering an ultrafast chemical shift imaging technique (BIRDS) for mapping the acidic microenvironment of cancer.

HIGHLIGHTS

- Extensive experience with in vivo MRI and MRS for a wide range of preclinical models.
- Pulse sequence design on Varian, Bruker, and Siemens consoles.
- Research and teaching experience in organic chemistry, biochemistry, physics, and synthesis and characterization of contrast agents.
- Advanced programming skills for data analysis using Matlab and C++.

EDUCATION

- **Ph.D. Chemistry (2005)**, Wesleyan University, Middletown, CT 06459, USA
  Thesis title: *Structural Energetics of DNA Double and Triple Helices and Their Interactions with Metal Ions*. Advisor: Professor Irina M. Russu
- **B.S. Theoretical Physics (1997)**, University of Bucharest, Faculty of Physics, Romania
  Thesis title: *Adiabatic Theory and Gell-Mann Law*. Advisor: Professor Gheorghe Nenciu

CAREER/ACADEMIC APPOINTMENTS

2018-present: Assistant Professor, Department of Radiology and Biomedical Imaging, Yale University School of Medicine, New Haven, CT

2019-present: Lecturer, Department of Biomedical Engineering, Yale University, School of Engineering & Applied Science, New Haven, CT

2009–2018: Associate Research Scientist, Department of Radiology and Biomedical Imaging, Yale University School of Medicine, New Haven, CT

2012–2017: Adjunct Professor, Department of Biomedical Engineering, Bridgeport University, School of Engineering, Bridgeport, CT

2005–2009: Postdoctoral Research Associate, Department of Diagnostic Radiology, Yale University School of Medicine, New Haven, CT

1998-2004: Graduate Student/Research Assistant, Molecular Biophysics Program, Wesleyan University, Middletown, CT

1997-1998: Research Assistant, National Institute for Materials Physics and Engineering, Bucharest, Romania.

TEACHING EXPERIENCE

2019-present: Lecturer, Department of Biomedical Engineering, Yale University, School of Engineering & Applied Science, New Haven, CT
2012–2017: Adjunct Professor, Department of Biomedical Engineering, Bridgeport University, School of Engineering, Bridgeport, CT
2008-2011: NMR module for BENG 356 Laboratory at Yale University, New Haven, CT
1999-2003: Teaching Assistant, Molecular Biophysics Program, Wesleyan University, Middletown, CT

PROFESSIONAL HONORS & RECOGNITION

2009: "EPOS Cum laude award", 26th Annual ESMRMB Meeting
2006, 2007, 2008: Student Stipend, International Society for Magnetic Resonance and Medicine
2004: Peterson Fellowship for graduate studies in biochemistry, Wesleyan University, CT

ORAL PRESENTATIONS & SYMPOSIA

2020: International Society of Magnetic Resonance in Medicine, 2020, Virtual Conference; *"Extracellular pH Changes Induced by Immuno-Thermal Ablation in a Murine Colorectal Cancer Model"*
2019: International Society of Magnetic Resonance in Medicine, 2019, Montreal, Canada; *"Time evolution of extracellular pH with BIRDS in a rabbit model of liver cancer"*
2019: The World Molecular Imaging Congress 2019, Montreal, Canada; *"A Magnetic Resonance investigation of regional therapy effects in a rabbit model of liver cancer: time evolution of extracellular pH with BIRDS"*
2018: The World Molecular Imaging Congress 2018, Seattle, Washington; *"Extracellular pH mapping with BIRDS in a rabbit model of human liver cancer on a clinical 3T scanner"*
2018: The World Molecular Imaging Congress 2018, Seattle, Washington; *"Dissecting the rat brain tumor microenvironment: a multimodal in vivo magnetic resonance investigation"*
2017: 28th Symposium on Cerebral Blood Flow, Metabolism and Function, Berlin, Germany; *"The brain tumor microenvironment: a little sweet, but a little cool"*
2013: International Society of Magnetic Resonance in Medicine, Salt Lake City, Utah, USA; *"Selective brain cooling in sheep by intra-ventricular catheters: a 7T BIRDS study"*
2011: International Society on Oxygen Transport to Tissue, Georgetown, Washington DC, USA; *"Molecular imaging with MRS at the speed of MRI"*
2010: International Society on Oxygen Transport to Tissue, Ascona, Switzerland; *"Quantitative CEST with BIRDS"*
2010: Institut für Mikrosystemtechnik, University of Freiburg, Freiburg, Germany; *"Multivalent PARACEST agents for quantitative molecular imaging"*
2006: International Society of Magnetic Resonance in Medicine, Seattle, Washington, USA; *"Simultaneous ^{1}H MRS measurement of temperature and pH with a lanthanide complex"*
2003: 13th Conversation in Biomolecular Structure and Dynamics, Albany; *"Probing the interactions of a DNA triple helix with metal ions by proton exchange and NMR spectroscopy"*

JOURNAL REVIEWING ACTIVITIES

2008-present: *International Society of Magnetic Resonance in Medicine*
2009-present: *Magnetic Resonance in Medicine*
2010-present: *NMR in Biomedicine*
2012-present: *Magnetic Resonance Imaging*
2019-present: *Cancers*
2019-present: *Scientific Reports*

PATENTS

1. *"Transition metal macrocyclics as MRI contrast agents for molecular imaging",* Yale OCR# 7970
2. *"A Model for Paramagnetic Sodium NMR Biosensors"*, Yale OCR# 8114
3. *"Paramagnetic metal ion macrocyclic complexes as contrast agents and their use in magnetic resonance"*, Yale OCR# 5285, 9-24-2009 (U.S. PTO 61/277,413)
4. *"Estimating absolute heat deposition associated with radio frequency exposure in magnetic resonance imaging and spectroscopy studies"*, Yale OCR# 5545, 10-18-2010 (U.S. PTO 61/561,515)
5. *"Combined ratiometric PARACEST imaging and BIRDS for mapping extracellular pH and temperature using multivalent paramagnetic contrast agents"*, Yale OCR# 6150, 3-28-2013 (U.S. PTO pending)
6. *"Tumor detection and characterization by ultra-high speed spectroscopic imaging of paramagnetic contrast agents"*, Yale OCR# 6151, 3-28-2013 (U.S. PTO pending)

MENTORING/COACHING

2005-present: Mentor for 13 undergraduate and graduate students, 7 postdoctoral fellows and 5 visiting faculty and research scientists.

AFFILIATIONS

2019-present: Member of International Society for Cerebral Blood Flow and Metabolism
2018-present: Member of World Molecular Imaging Society (WMIS)
2005-present: Member of International Society for Magnetic Resonance in Medicine (ISMRM)
2006-2014: Member of International Society for Oxygen Transport to Tissue (ISOTT)
2005-2009: Member of New York Academy of Sciences
1999-2005: Member of Biophysical Society

THESIS COMMITTEES

- Thesis advisor for Jonathan Hanna, a medical student at Yale University School of Medicine.
- Member of the thesis committee for two graduate students, John Walsh and Muhammad Khan.
- Member of the thesis committee for Muneeb Mohideen, a medical student at Yale University School of Medicine.

COLLABORATIONS

- Currently collaborating with 8 research groups
- Past collaborations include finished projects with 12 research groups

PUBLICATIONS

- Over 50 peer-reviewed published articles. Complete list: https://www.ncbi.nlm.nih.gov/myncbi/daniel.coman.1/bibliography/public/