

BIOGRAPHICAL SKETCH

NAME El Fakhri, Georges	POSITION TITLE Co-Director, Division of Nuclear Medicine & Molecular Imaging Director, MGH PET-Core, Massachusetts General Hospital		
eRA COMMONS USER NAME GNE123	Associate Professor of Radiology, Harvard Medical School Co-Director, Harvard JPNM Physics and Instrumentation		
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Ecole Centrale, France	M.Eng. (magna cum laude)	1994	Electronics, Mechanics
University of Texas, Austin, TX	M.S.	1994	Electrical & Computer Eng.
University of Paris XI, Paris, France	M.S. (summa cum laude)	1995	Biomedical Engineering
University of Paris XI, Paris, France	Ph.D. (summa cum laude)	1998	Medical Physics
Harvard Medical School and Brigham & Women's Hospital	Postdoctoral training	1999	Medical Physics

A. Personal Statement

Dr El Fakhri is an Associate Professor at Harvard Medical School, the Director of the MGH PET-Core and Co-Director of the Division of Nuclear Medicine and Molecular Imaging at MGH. Dr El Fakhri is an internationally recognized expert in SPECT and PET-CT and PET-MR imaging with a strong background in electrical and computer engineering. For the past 16 years, his lab has worked on developing novel approaches to compensate for many of the physical factors affecting quantitative SPECT and PET and objectively assessing the achieved improvement in image quality. The research efforts to achieve absolute quantitation in cardiac, brain as well as oncologic PET and SPECT in the clinical setting have resulted in more than 100 peer-reviewed articles, book chapters and proceedings. The methods developed have proven efficient, accurate and precise.

B. Positions and Honors

Positions and Employment

- 1999 - 00: Research Associate at the Brigham & Women's Hospital.
- 2000 - 02: Instructor in Radiology at Harvard Medical School.
- 2002 - 06: Research Affiliate, Nuclear Engineering Department, Massachusetts Institute of Technology.
- 2002 - 06: Assistant Professor of Radiology at Harvard Medical School.
- 2006 - : Associate Professor of Radiology at Harvard Medical School.
- 2007 - : Co-Director, Harvard Joint Program in Nuclear Medicine Physics and Instrumentation.
- 2008 - : Director, Molecular Imaging Physics and Instrumentation, Massachusetts General Hospital.
- 2011 - : Director, MGH PET Core;
- 2011 - : Co-Director, Division of Nuclear Medicine and Molecular Imaging (Research), Radiology, MGH.

Other Experience and Professional Memberships

- 1996 - : Member of the European Association of Nuclear Medicine (EANM).
- 1996 - 98: Elected member of the administrative board of the French Institute of Health, INSERM U494.
- 1999 - : Scientific reviewer for *IEEE Transactions on Nuclear Science*, *IEEE Transactions on Medical Imaging*, *Circulation*, *The Journal of Nuclear Medicine*, *The Journal of the Optical Society of America*, *The Journal of the American College of Cardiology*, *Medical Physics*, *Neurology*, *Physics in Medicine and Biology*, *The Journal of Nuclear Cardiology*.
- 1999 - : Member of the Society of Nuclear Medicine (SNM), IEEE Nuclear and Plasma Sciences Society (IEEE-NPSS), American Association of Medical Physicists (AAPM).
- 2004 - : Associate Editor for *IEEE Transaction on Nuclear Science*, *Medical Physics*
- 2005 - : Expert on SPECT & PET-CT with the United Nations, International Atomic Energy Agency (IAEA).
- 2005 - : Member of study section ZRG1 SBIB-J, NIH Center for Scientific Review.
- 2005 - : Ad-hoc member of US Army Medical Research and Material Command grant review panel.
- 2008 - : Ad-hoc member of study section BMIT, NIH Center for Scientific Review.
- 2009 - : President, New England Association of Physicists in Medicine (AAPM).
- 2011 - : President, Computer and Instrumentation Council Board of Directors, Society of Nuclear Medicine.

Awards and Honors

- 1995 - 98: Fellow of the French Cancer Foundation (ARC).
2001: Brigham Radiology Research and Education Award.
2001: Society of Nuclear Medicine Research Award.
2001: Partners' Radiology Research Award.
2004: Recipient of a "2004 Dana Foundation Brain and Immuno-Imaging Award".
2005: Recipient of the 2005 Society of Nuclear Medicine SNM Mark Tetalman Award.
2005: "Fast, Unique, and Robust Factor Analysis" (Patent # 7,127,095, PTO Serial No. 11/148,700).
2006: "Generalized 5D Dynamic and Spectral Factor Analysis" (Patent # 7,519,211).
2009: Keynote Speaker, Commencement Lecture, USEK Faculty of Medicine.

Licensure and Certification

- 2008: American Board of Radiology, Nuclear Medicine Physics.

C. Selected peer-reviewed publications (from more than 100 papers)

- El Fakhri G., Buvat I, Benali H, Todd-Pokropek A, Di Paola R. Relative impact of scatter, attenuation, collimator response and finite spatial resolution corrections in cardiac SPECT. *J Nucl Med* 2000 ; 41 : 1400-08.
- El Fakhri G., Moore S.C, Maksud P, Aurengo A, Kijewski M.F. Absolute activity quantitation in simultaneous I-123/Tc-99m brain SPECT. *J Nucl Med* 2001; 42: 300-08.
- El Fakhri G., Kijewski M.F., Johnson K.A., Syrkin G, et. al. MRI-Guided SPECT perfusion measures and volumetric MRI in prodromal Alzheimer's disease. *Arch Neurol* 2003; 60: 1066-72.
- El Fakhri G., Kijewski M.F., Albert M.S., et. al. Quantitative SPECT leads to improved performance in discrimination tasks related to prodromal Alzheimer disease. *J. Nucl. Med.* 2004; 45: 2026-31.
- El Fakhri G., Sitek A., Guérin B., Kijewski M.F., Di Carli M.F., and Moore S.C. Quantitative dynamic cardiac ⁸²Rb-PET imaging using generalized factor and compartment analyses. *J. Nucl. Med.* 2005; 46: 1264-71.
- El Fakhri G., Sitek A., Zimmerman R.E., Ouyang J. Generalized Five Dimensional Dynamic and Spectral Factor Analysis. *Med. Phys.* 2006; 33: 1016-24.
- El Fakhri G., Habert M.O., Maksud P., et. al. Quantitative simultaneous ^{99m}Tc-ECD/¹²³I-FP-CIT SPECT in Parkinson disease and multiple system atrophy. *Eur. J. Nucl. Med. Mol. Imag.* 2006; 33: 87-92.
- Trott C. and El Fakhri G. "Sequential and simultaneous dual-isotope brain SPECT: comparison with PET, for estimation and discrimination tasks in early parkinson disease". *Med. Phys.*, 2008; 35: 3343-53.
- Guérin B. and El Fakhri G. Realistic PET Monte Carlo simulation with pixellated block detectors, light sharing, random coincidences and dead-time modeling. *IEEE Trans Nucl Sci* 2008; 55: 942-52.
- Ouyang J., Zhu X., Trott C., El Fakhri G. Quantitative simultaneous ^{99m}Tc/¹²³I cardiac SPECT using MC-JOSEM *Med. Phys.* 2009; 36: 602-11.
- El Fakhri G., Kardan A., Sitek A., et. al.. Reproducibility and Accuracy of Quantitative Myocardial Blood Flow Assessment Using ⁸²Rb-PET: Comparison with ¹³N-Ammonia. *J. Nucl. Med.* 2009; 50: 1062-1071.
- Zhu X. and El Fakhri G. Monte Carlo modeling of cascade gamma rays in ⁸⁶Y PET imaging: Preliminary results. *Phys. Med. Biol.* 2009; 54 (13): 4181-4193.
- El Fakhri G., Surti S., Trott C.M., Scheuermann J., Karp J.S. Improvement in Lesion Detection with Whole-Body Oncologic TOF - PET. *J. Nucl. Med.* 2011; 52: 347-353.
- Catana C., Benner T, ... El Fakhri G., Schmand M., and Sorensen A.G. MR-assisted PET Motion Correction for Neurological Studies in an Integrated. *J. Nucl. Med.* 2010; 52: 154-161.
- Trott C.M., Ouyang J. and El Fakhri G. Comparison of simultaneous and sequential SPECT imaging for discrimination tasks in assessment of cardiac defects. *Phys. Med. Biol.* 2010; 55: 6897-6906.
- Guérin B. and El Fakhri G. Novel scatter compensation of list-mode PET data using spatial and energy dependent corrections. *IEEE Trans. Med. Imag.* 2011; 30:759-773.
- Guérin B., Reese T., Cho S., Chun S.Y., Zhu X., Catana C., Alpert N.M., El Fakhri G. Non-rigid PET motion compensation using tagged-MRI in simultaneous PET-MR imaging. *Med. Phys.* 2011; 38: 3025-3038.
- Surti S., Scheuermann J., El Fakhri G., et. al. Impact of TOF PET on whole-body oncologic studies: a human observer lesion detection and localization study. *J. Nucl. Med.* 2011; 52: 712-719.
- Zhu X, España S., Daartz J., Liebsch N., Ouyang J., Paganetti H., Bortfeld T., El Fakhri G. Proton beam range verification with in-room PET imaging. *Phys. Med. Biol.* 2011; 56: 4041-4054.
- Chun S.Y., Reese T., Guerin B., Catana C., Zhu X., Alpert N., El Fakhri G. Tagged MR-based Motion Correction in Simultaneous PET-MR. *J. Nucl. Med.* 2011; in press.