

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors. Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Oderinde M. Oluwaseyi

eRA COMMONS USER NAME (credential, e.g., agency login): soderinde

POSITION TITLE: Assistant Professor in Medical Physics

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
University of California San Diego, USA	Postdoctoral	09/2018	07/2020	Radiation Medicine
University of the Free State, Bloemfontein, South Africa	Postdoctoral	08/2017	09/2018	Medical Physics (Therapy track)
University of the Free State, Bloemfontein, South Africa	PhD	01/2015	12/2017	Medical Physics (Therapy track)
University of Ibadan, Nigeria	MS	01/2012	01/2014	Radiation and Health Physics
University of Ado Ekiti (Now Ekiti State University), Nigeria	BS	07/2005	07/2010	Physics

A. Personal Statement

I'm the principal investigator for advanced molecular imaging in radiotherapy (AdMIRe) research laboratory <https://hhs.purdue.edu/admire-research-lab/>. I focus on integrating molecular imaging, such as positron emission tomography (PET), into radiotherapy workflow, encompassing the entire spectrum from tumor delineation to tumor response assessment to achieve an optimized and personalized radiation treatment. My interest in molecular imaging stemmed from the desire to have a non-invasive approach to study the biochemical and immunologic activities of tumors and use the information to support clinical decision-making. In my industrial research experience, I investigated several PET radiotracers such as FDG, FMISO, 89-Zr panitumumab, FLT, and 68-Ga PSMA for real-time guidance of therapeutic doses to the tumor envelope. I worked on understanding the most effective radiotracer that can be used for biology-guided radiotherapy. Now, as I explore the integration of molecular imaging into radiotherapy to support clinical decision-making and personalized medicine, I leverage the computational approaches to extract molecular features from PET images and identify unique patterns to build a robust prediction tool to support clinical decision-making (turning data into knowledge). I am interested in developing PET-inclusive multimodal Artificial Intelligence/Machine Learning tools for accurate prognosis and prediction of response to radiation treatment. This tool will help clinicians make informed decisions and improve patient treatment outcomes.

Notable manuscripts are:

- Oluwaseyi Michael Oderinde**, Manoj Narayanan, Peter Olcott, Yevgen Voronenko, Jon Burns, Shiyu Xu, Ling Shao, Karine Al Feghali, Shervin M Shirvani, Daniel Chang, Murat Surucu, Gopinath Kuduvali (2024) Demonstration of real-time PET biology-guided radiotherapy delivery to targets
<https://aapm.onlinelibrary.wiley.com/doi/epdf/10.1002/mp.16999>
- A Natarajan, S Khan, X Liang, H Nguyen, N Das, D Anders, N Malik, **O Oderinde**, F Chin, E Rosenthal, G Pratz (2023) Preclinical evaluation of ⁸⁹Zr-Panitumumab for biology-guided radiotherapy
<https://pubmed.ncbi.nlm.nih.gov/36669541/>
- Z Hu, M Bieniosek, V Ferri, A Iagaru, N Kovalchuk, B Han, L Xing, L Vitzthum, P Olcott, M Narayanan, T Laurence, Y Ren, **O Oderinde**, S Shirvani, D Chang, M Surucu (2022) Characterization of a Positron

Emission Tomography designed for biology-guided radiotherapy (BgRT)- British Journal of Radiology <https://doi.org/10.1259/bjr.20220387>

4. SN Seyedin, R Bassalow, OR Mawlawi, LM Turner, RR Patel, SR Mazin, **OM Oderinde**, Y Voronenko, CA Wages, PD Olcott, JY Chang, PA Balter, JW Welsh (2022) The potential of biology-guided radiation therapy in thoracic cancer: A preliminary treatment planning study – Frontiers in Oncology <https://doi.org/10.3389/fonc.2022.921473>
5. **Oluwaseyi M Oderinde**, Shervin M Shirvani, Peter Olcott, Gopinath Kuduvalli, Samuel Mazin, David Larkin (2021); The technical design and concept of a PET/CT linac for biology-guided radiotherapy system Clinical and Translational Radiation Oncology April 2021 <https://doi.org/10.1016/j.ctro.2021.04.003>

B. Positions, Scientific Appointments and Honors

01/23 – Date: Assistant Prof. of Medical Physics, School of Health Sciences, Purdue University (Tenure Track)

01/23 – Date: Clinical Assistant Prof. of Radiation Oncology, School of Medicine, Indiana University (0.5 FTE)

12/18 – Date: Honorary Researcher, Dept. of Physics, University of Witwatersrand, South Africa

03/22 – 12/22: Manager of Clinical Science, RefleXion Medical, Inc, Hayward, California

02/21 – 12/22: Radiotherapy Medical Physicist, NSIA-LUTH Cancer Center, Lagos, Nigeria

08/20 – 03/22: Senior Clinical Research Scientist, RefleXion Medical, Inc, Hayward, California

C. Contributions to Science

The key developments and improvements I have achieved over the past five years have led to a portfolio of successful radiotherapy scientific and technical development studies, including (I've excluded the manuscript listed in my personal statement above):

• PET-guided Radiotherapy Delivery in Real-Time

1. Karine Feghali, Tanguy Perennec, **Oluwaseyi M. Oderinde**, Arjun Maniyedath, Alexandra Moignier, Caroline Rousseau, Ludovic Ferrer, Gregory Delpon, Matthieu Hatt, Yves Seroux, Melanie Dore, Stephane Supiot (2023) Dosimetric feasibility of dose-painting radiotherapy for targeting hypoxia in prostate cancer on a novel ring gantry radiotherapy system https://ascopubs.org/doi/abs/10.1200/GO.2023.9.Supplement_1.73
2. **O.M Oderinde**, C Han, Z Sun, T Cornwell, K Fagehli, A Amini, S Sampath, A Liu, S.M Shrivani (2022); Feasibility and dosimetric benefits of adaptive planning in prostate cancer radiotherapy using a novel treatment planning machine with integrated dual kVCT/PET imaging system [https://www.redjournal.org/article/S0360-3016\(22\)03033-4/fulltext](https://www.redjournal.org/article/S0360-3016(22)03033-4/fulltext)
3. **Oluwaseyi M. Oderinde**, Manoj Narayanan, Nataliya Kovalchuk, Bin Han, Murat Surucu (2023) Demonstration of in-silico biology-guided radiotherapy delivery using data acquired on the first installation of O-ring gantry PET/CT radiotherapy system <https://aapm.confex.com/aapm/2023am/meetingapp.cgi/Paper/4567>
4. T Zhuang, G Gibbard, X Duan, J Tan, Y Park, M Lin, Z Sun, **OM Oderinde**, W Lu, R Reynolds, A Godley, A Pompos, T Dan, A Garant, P Iyengar, R Timmerman, B Cai (2023) Evaluation of fan-beam kVCT image quality on a novel image-guided PET/CT linac – <https://pubmed.ncbi.nlm.nih.gov/36669541/>
5. Daniel Pham, Eric Simiele, D Breikreutz, D Capaldi, **Oluwaseyi Michael Oderinde**, Bin Han, Murat Surucu, Daniel Chang, Nataliya Kovalchuk (2022) IMRT and SBRT treatment planning study for the first clinical biology-guided radiotherapy (BgRT)- Technology in Cancer treatment and research journal <https://journals.sagepub.com/doi/full/10.1177/15330338221100231>

• Intrafraction Motion Management in Radiotherapy

1. **Oluwaseyi M. Oderinde**, Gregory Bartlett, Omar Ishaq, Ke Colin Huang, Yong Yue, Christopher Njeh (2023) Intrafraction motion in prostate patients with implanted SpacerOAR Hydrogel during hypofractionated radiotherapy: A single-site experience <https://doi.org/10.1002/mp.16525>
2. **Oluwaseyi M. Oderinde**, Hassan Mostafavi, Daniel Simpson, James Murphy, Grace Gwe-ya Kim and Laura Cervino (2022); Assessment of fiducial motion and motion modeling in CBCT projections of the abdominal tumor using template matching and sequential stereo triangulation <https://arxiv.org/abs/2211.05380>
3. Niclas Pettersson, **Oluwaseyi M Oderinde**, James Murphy, Daniel Simpson, Laura I. Cervino (2020); Intrafraction relationship changes between an external breathing signal and fiducial markers positions in

pancreatic cancer patients. Journal of Applied Clinical Medical Physics Vol 21(3), 153-161
<https://doi.org/10.1002/acm2.12841>

4. **Oluwaseyi M. Oderinde**, Hassan Mostafavi, Daniel Simpson, James Murphy, Laura Cervino and Grace Kim (2020); Evaluating patient setup accuracy using a subset of CBCT projections in fiducial tracking of abdominal SBRT. AAPM 1st Virtual Annual Meeting. Medical Physics Vol 47, Issue 6, p e768
<https://doi.org/10.1002/mp.14316>

- **Machine Learning/ Artificial Intelligence in Radiotherapy**

1. **OM Oderinde**, R Chimmula, K Huang, Y Yue, M Green, M Tann, M Koch, K Collins, C Njeh, JA Holmes, C Bahler (2024); Investigating the machine learning-derived nomogram models and biomarkers for side-specific prediction of extraprostatic extension of prostate cancer – Preliminary results. ASTRO Meeting
2. Z Jiang*, K Huang, Y Yue, C Njeh, **OM Oderinde** (2024); Predicting early chemotherapy response in breast cancer patients using PET/CT imaging and machine learning models – AAPM meeting
3. Y H Yue*, R Chimmula, K Huang, C Njeh, **OM Oderinde** (2024); Prediction of radiological response for head and neck combined therapy based on PET/CT radiomic signatures: A preliminary study – AAPM meeting
4. Mengying Shi, Sunan Cui Cynthia, **Oluwaseyi Oderinde**, Nataliya Kovalchuk, Murat Surucu, Lei Xing, Bin Han (2024) Time- and Space-saving Monte Carlo Simulation Method Using Generative Adversarial Network for Dose Calculation of an O-Ring Gantry Linac <https://doi.org/10.1016/j.ejmp.2024.103318>
5. Chunhui Han, Carson Wong, **Oluwaseyi M. Oderinde**, Tyler Watkins, Kun Qing, Bo Liu, Terence Williams, An Liu (2023) Comparison of AI-based auto-segmentation quality with different daily IGRT imaging modality for adaptive radiotherapy treatment planning.
<https://www.sciencedirect.com/science/article/pii/S0360301623065501>
6. **Oluwaseyi M Oderinde** and Grace Gwe-ya Kim (2020); Characterization of DMI response and prediction of Halcyon machine performance check using machine learning algorithms. American Society for Radiation Oncology (ASTRO), Maimi, USA. International Journal of radiation oncology biology and physics 108 (3) E328 [https://www.redjournal.org/article/S0360-3016\(20\)32202-1/fulltext](https://www.redjournal.org/article/S0360-3016(20)32202-1/fulltext)

*Students/volunteers in my research laboratory

- **Monte Carlo Simulation in Radiotherapy**

1. O Oderinde, D Zaks, C Huntzinger, S shrivani, T Laurence, M Lu (2021) Focal spot size effect of the RefleXion X1 radiotherapy machine: A Monte Carlo simulation study.
2. I. Setilo, Oluwaseyi M. Oderinde and Freek du Plessis (2019); The effect of SSD, Field size, Energy, and detector type for relative output factor measurement in small photon beams as compared with Monte Carlo simulation. Polish Journal of Medical Physics and Engineering, 25(2), 101-110
<https://doi.org/10.2478/pjmpe-2019-0014>
3. Nicholas Ade, Oluwaseyi M. Oderinde and Freek du Plessis (2018); Monte Carlo dose in a prosthesis phantom based on exact geometry vs. streak artefact contaminated CT data as benchmarked against Gafchromic film. Physica Medica; 5494-102. <https://doi.org/10.1016/j.ejmp.2018.09.124>
4. Oluwaseyi M. Oderinde and Freek du Plessis (2017); Sensitivity analysis of the integral quality monitoring system using Monte Carlo simulation. Computational and Mathematical Methods in Medicine; Vol 2017, Article ID: 7025281, pp 1-12. <https://doi.org/10.1155/2017/7025281>
5. Oluwaseyi M. Oderinde and Freek du Plessis (2017); Technical note: A new wedge-shaped ionization chamber component module for BEAMnrc to model the integral quality monitoring system®. Radiation Physics and Chemistry; Vol 141, pp 346-351.
<http://www.sciencedirect.com/science/article/pii/S0969806X17301949>

Complete list of published work is in My Bibliography:

<https://www.ncbi.nlm.nih.gov/myncbi/collections/mybibliography/>

D. Research Support

Ongoing Research Support

Co-Principal Investigator: RefleXion Medical, Inc. on evaluation of biological-guided radiotherapy in oligometastatic liver cancer patients (08/2024 – 07/2025).

Co-Principal Investigator: RefleXion Medical, Inc. on metastases-directed radiotherapy paradigms for cancer patients (08/2024 – 07/2025).

Principal Investigator: Purdue University Research Startup (01/2023 – 12/2028).