

BIOGRAPHICAL SKETCH

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NAME: Balandya, Emmanuel Cornelius

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

POSITION TITLE: Senior Lecturer, Department of Physiology, MUHAS - Tanzania

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)	Completion Date MM/YYYY	FIELD OF STUDY
University of Dar-es-salaam, Tanzania	M.D	09/2005	Medicine
Dartmouth College, USA	Ph.D	06/2012	Physiology and Immunology
Harvard Medical School, USA	Postdoctoral	08/2014	Immunology and Vaccinology

A. Personal Statement

I am an Ivy-league mentored physician-scientist with expertise in biomedical sciences, currently faculty at the Muhimbili University of Health and Allied Sciences (MUHAS; <http://www.muhas.ac.tz>). My doctoral work at Dartmouth College on a Fogarty AITRIP support provided novel insights on the role of soluble factors in seminal plasma on T cell phenotype and HIV infectivity. I subsequently joined Harvard Medical School on a 2-year Post-doctoral fellowship where I was able to participate in characterizing the safety, immunogenicity and protective efficacy of investigational Adenovirus-based HIV-1 vaccines.

Following my return to Tanzania in 2014, I have joined forces with Prof. Julie Makani at the Sick Cell Program at MUHAS, and was able to initiate immunology studies in children with sickle cell disease (SCD) through the NIH-Fogarty/NHLBI Global Health Fellowship. This work was recognized by the Fogarty International Center (<https://www.fic.nih.gov/News/GlobalHealthMatters/january-february-2017/Pages/emmanuel-balandya-sickle-cell-immunity.aspx>).

We subsequently collaborated with colleagues from Ghana and Nigeria in applying for NHLBI funding for the Sickle Pan African Research Consortium (SPARCO) where I have served as Tanzania PI since inception in 2017 (<http://www.sickleinafrica.org/>). During my 4 years as PI, SPARCO-Tanzania has made major strides including expansion beyond Dar-es-salaam to Bugando Medical Center in Mwanza (catchment population of 18 million), enrolment of over 3,000 patients into the electronic database, initiation of electronic data collection using tablets, conduct of public sensitization and mass screening events using point-of-care diagnostics and collection of longitudinal data. Furthermore, we have trained 172 healthcare workers and researchers on clinical care and research in SCD and have established partnerships with national and international stakeholders, including Tanzania Ministry of Health, patient groups, Sickle Data Coordinating Center (SADaCC), Novartis International AG and International Center for Genetic Engineering and Biotechnology (ICGEB). Recently, SPARCO-Tanzania has been awarded a U01 grant by NHLBI for the period 2021-2026 where I serve as PI.

Academically, I am actively involved in teaching and mentoring Bachelor, Master, PhD and Post-doctoral students in a variety of health sciences programmes at MUHAS. I am also involved in designing and conducting short courses in research ethics and grant writing to MUHAS and the Tanzanian research community. Since 2017, I have been serving as Acting Director of Postgraduate Studies at MUHAS with responsibility for overseeing curricula design, student recruitment and quality of the Masters, PhD and Post-doctoral programmes. I am also Co-Investigator on several NIH/FIC-funded projects, including role as Leader of the Community of Young Research Peers in HEPI- Transforming Health Professions Education in Tanzania (THET); Immunology Director for the Dartmouth-BU HIV-TB Research Training for the Infectious Disease Institute at MUHAS and Member of the Local Training Committee for Patient-Centered Outcomes Research (PCOR) grant. I am a Member of MUHAS Scientific Conference Organizing Committee; Board Member of Young Scientist Tanzania

(YST) - a nation-wide science outreach program, and consult with the National Institute for Medical Research (NIMR) and Tanzania Commission for Universities (TCU) on matters related to health research and education. I have reviewed for Tanzania Journal of Health Research (TJHR), Allergologia et Immunopathologia, Lancet Haematology and PLOS ONE.

B. Positions and Honors

Positions and Employment

2005 - 2006 Intern, Kilimanjaro Christian Medical Center (KCMC), Tanzania
2006 - 2007 Study Coordinator, Duke-KCMC Research Collaboration, Tanzania
2007 - 2012 Tutorial Assistant, Department of Physiology, Muhimbili University of Health and Allied Sciences (MUHAS), Tanzania
2012 - 2018 Lecturer, Department of Physiology, MUHAS, Tanzania
2018 - Senior Lecturer, Department of Physiology, MUHAS, Tanzania

Administrative Experience

2015 - 2017 Deputy Director, Postgraduate Studies, MUHAS, Tanzania
2017 - Acting Director, Postgraduate Studies, MUHAS, Tanzania
2014 - 2017 Co-Investigator, Sickle Cell Program, MUHAS, Tanzania
2017 - Principal Investigator, SPARCO-Tanzania

Other Experiences and Professional Memberships

2004- Member, Friends of Commonwealth Foundation, UK
2007- Registered Physician, Medical Council of Tanganyika, Tanzania
2009- Member, International AIDS Society
2016- Member, MUHAS Scientific Conference Organizing Committee

Awards and Honors

2004 Friends of Commonwealth Medical Elective Bursaries, Princes Marina Hosp., Botswana
2005 University Prize, Best student in MD degree, University of Dar-es-salaam, Tanzania
2005 Muhimbili University College of Health Sciences Prize, Best student in discipline and practical expertise in MD degree, Dar-es-salaam, Tanzania
2005 Ministry of Science, Technology and Higher Education Prize, Best student in MD degree, Dar-es-salaam, Tanzania
2007 Certificate: Reducing mortality from HIV-TB in Tanzania, Dartmouth/BU AITRIP, Dar-es-salaam, Tanzania
2007 Certificate: Clinical trial design and analysis, Duke University/University of North Carolina at Chapel Hill/University of Malawi Collaboration, Blantyre, Malawi
2008 AITRP-Fogarty Fellowship, Geisel School of Medicine at Dartmouth, USA
2009 Young Investigator Award, 4th International Workshop on HIV Transmission, Cape Town, South Africa.
2010 Young Investigator Award, XVIII International AIDS Conference, Vienna, Austria.
2011 Young Investigator Award, 18th CROI, Boston, U.S.A.
2011 Young Investigator Award, 6th International Workshop on HIV transmission, Rome, Italy.
2012 Travel Award, Joint International Congress of the ASRI and ESRI, Hamburg, Germany.
2015 Certificate: Ethical issues impacting HIV/AIDS research and care, Fogarty Dartmouth/Penn Research Ethics Training Program, Dar-es-salaam, Tanzania
2015 NIH-Fogarty/NHLBI Global Health Fellowship, Immune phenotype of children with SCD in Tanzania, Bethesda, MD, USA and Dar-es-salaam, Tanzania
Certificate: Intellectual property in the global economy for lead developed countries, WIPO-Sida Training and Advisory Program, Stockholm, 2016
2016 Alumni Presentation, NIH-Fogarty/NHLBI Global Health Fellowship Orientation and Training Program, Bethesda, MD, USA.
2016

- 2017 Certificate: Project Management, University Leadership and Management Training Program (UNILEAD), University of Oldenburg, Germany
- 2017 Certificate: Finance and Investment, University Leadership and Management Training Program (UNILEAD), University of Oldenburg, Germany
- 2019 Invited Speaker, Sickle Cell Disease: What Africa can contribute, Novartis Social Business-sponsored Symposium, 68th ASTMH Annual Meeting, Maryland, USA

C. Contributions to Science

1. My thesis work focused on evaluation of the **impact of semen on mucosal transmission of HIV**. Sexual transmission continues to be the most important mode of global spread of HIV, and this work helped shed light on this often forgotten facet of HIV transmission. During this work, we were able to establish novel *in-vitro* assays for studying the effect of soluble factors in human semen on the phenotype and HIV infectivity of CD4+ T cells. We discovered that soluble mediators in human semen reduced HIV infectivity of CD4+ T cells and promoted the non-proliferative increase in the proportion of regulatory T cells. This work received considerable attention in the field and was presented at numerous international HIV and immunology meetings.

- a) **Balandya E**, Wieland-Alter W, Sanders K, Lahey T. Human Seminal Plasma Fosters CD4+ Regulatory T-cell Phenotype and Transforming Growth Factor- β 1 Expression. *Am J Reprod Immunol*. 2012; 68 (4): 322-30.
- b) **Balandya E**, Sheth S, Sanders K, Wieland-Alter W, Lahey T. Semen Protects CD4+ Target Cells from HIV Infection but Promotes the Preferential Transmission of R5 Tropic HIV. *J Immunol*. 2010; 185 (12): 7596-604.

2. My postdoctoral work was on evaluation of the **immunogenicity and protective efficacy of novel adenovirus vector for SIV/HIV vaccines** using a non-human primate model. I led a collaborative project on evaluation of foreskin immunogenicity of novel adenovirus serotype 26 and 35-based SIV vaccines in rhesus macaques from inception to a publication. I also led a project on genome-wide evaluation of T cell responses in the acutely SIV-infected rhesus monkeys in a multicenter study, and developed a B-cell ELISPOT protocol for evaluation of B-cell responses to monomeric and trimeric SIV/HIV Envelope proteins following infection and vaccination.

- a) **Balandya E**, Miller A.D, Beck M, Liu J, Li H, Borducchi E, Smith K, Cabral C, Stanley K, Maxfield L.F, Barouch D.H. Adenovirus Serotype 26 and 35 Induce SIV-Specific T-Lymphocyte Responses in the Foreskin in Rhesus Monkeys. *J Virol*. 2014; 88 (7): 3756-65.

3. My NIH-Fogarty/NHLBI Global Health Fellowship focused on **investigation of T and B lymphocyte phenotypes in children with sickle cell disease** (2015-2016). Since 2017, I have participated in building up the multi-national SPARCO SCD electronic database which is now one of the largest in the world.

- a) Makani J, Sangeda RZ, Nnodu O, Nembaware V, Osei-Akoto A, Paintsil V, **Balandya E**, Kent J, Luzzatto L, Ofori-Acquah S, Olopade OI, Pallangyo K, Minja IK, Jonas M, Mazandu GK, Mulder N, Ohene-Frempong K, Wonkam A. SickleInAfrica. *Lancet Haematol*. 2020 Feb;7(2):e98-e99. doi: 10.1016/S2352-3026(20)30006-5.
- b) Munung NS, Nembaware V, de Vries J, Bukini D, Tluway F, Treadwell M, Sangeda RZ, Mazandu G, Jonas M, Paintsil V, Nnodu OE, **Balandya E**, Makani J, Wonkam A. Establishing a Multi-Country Sickle Cell Disease Registry in Africa: Ethical Considerations. *Front Genet*. 2019. doi: 10.3389/fgene.2019.00943. eCollection 2019.
- c) **Emmanuel Balandya**, Teri Reynolds, Said Aboud, Stephen Obaro, Julie Makani. Increased Memory Phenotypes of CD4+ and CD8+ T cells in Children with Sickle Cell Anaemia in Tanzania. *Tanzan J Health Res*, 2017 (doi: <http://dx.doi.org/10.4314/thrb.v19i2.3>).
- d) **Emmanuel Balandya**, Teri Reynolds, Stephen Obaro, Julie Makani. Alteration of Lymphocyte Phenotype and Function in Sickle Cell Anemia: Implications for Vaccine Responses. *Am J Hematol*. 2016; 91 (9): 938-46.
- e) Julie Makani, Josephine Mgaya, **Emmanuel Balandya**, Khadija Msami, Deogratias Soka, Sharon E Cox, Albert N Komba, Stella Rwezaula, Elineema Meda, David Muturi, Jesse Kitundu, Gregory Fegan, Fenella J Kirkham, Charles R Newton, Robert W Snow, Brett Lowe. Bacteremia in Sickle Cell Anemia is

associated with low haemoglobin: A report of 890 admissions to a tertiary hospital in Tanzania. *Br J Haematol.* 2015; 171(2):273-276.

4. Since 2017, I have served as **Principal Investigator for SPARCO-Tanzania**. During this period, I was able to lead the Tanzania Team in registering over 3000 SCD patients into the online REDCap database and coordinate our participation in formulating the SSSC as well as SCD research and training activities in Tanzania. Recently, SPARCO-Tanzania has been awarded a U01 grant by NHLBI for the period 2021-2026.

- a) Makani J, Sangeda RZ, Nnodu O, Nembaware V, Osei-Akoto A, Paintsil V, **Balandya E**, Kent J, Luzzatto L, Ofori-Acquah S, Olopade OI, Pallangyo K, Minja IK, Jonas M, Mazandu GK, Mulder N, Ohene-Frempong K, Wonkam A. *SickleInAfrica. Lancet Haematol.* 2020 Feb;7(2):e98-e99. doi: 10.1016/S2352-3026(20)30006-5.
- b) Fredrick Luoga, Agness Jonathan, Lulu Chirande and **Emmanuel Balandya**. Newborn Screening for Sickle Cell Disease in Tanzania: The Past, Present and Future. *Tanzania Medical Journal.* 2020. Doi: 10.4314/tmj.v31i2.405

5. Since 2018, I have served as **Lead of the Community of Young Research Peers**, and innovative mentoring group as part of the NIH-funded HEPI-THET (Transforming Health Professions Education in Tanzania).

- a) **Balandya E**, Sunguya B, Gunda DW, Kidenya B, Nyamhanga T, Minja IK, Mahande M, Mmbaga BT, Mshana SE, Mteta K, Bartlett J, Lyamuya E. Building sustainable research capacity at higher learning institutions in Tanzania through mentoring of the Young Research Peers. *BMC Med Educ.* 2021. 21(1): 166.
- b) Ngowi BN, Sunguya B, Herman A, Chacha A, Maro E, Rugarabamu LF, Bartlett J, **Balandya E**, Mteta KA, Mmbaga BT. Prevalence of Multidrug Resistant UTI Among People Living with HIV in Northern Tanzania. *Infect Drug Resist.* 2021; 14: 1623-1633. Doi: 10.2147/IDR.S299776.eCollection 2021.

Complete List of Published Work in MyBibliography

<https://www.ncbi.nlm.nih.gov/myncbi/1ZSkq0aROedQu/bibliography/public/>

D. Additional Information: Research Support and/or Scholastic Performance

1. U01 HL 156853 (Balandya) 05/15/2021 – 04/30/2026
NIH/NHLBI
Sickle Pan-African Research Consortium (SPARCO)-Tanzania
Role: PI

The major goal of SPARCO is to promote, strengthen and develop research as a strategy for improving health, advocacy and training in sickle cell disease (SCD) in Tanzania as part of the SCD in Sub-Saharan Africa Network.

2. R25 TW011227 (Kaaya) 09/19/2018 – 08/31/2023
NIH/FIC
To Reach the People: Transforming Health Professions Education in Tanzania (THET)
Role: Leader-Community of Young Research Peers

The major goal of THET is to produce health professionals through innovative education strategies, who are competent and ready to practice interprofessionally whenever they are in Tanzania to take care of patients including those with HIV/AIDS.

3. D43 TW009573 (Adams) 08/01/2013 – 05/31/2023
NIH/FIC
Dartmouth-Boston University HIV-TB Research Training for the Infectious Disease Institute at Muhimbili University of Health and Allied Sciences (MUHAS)
Role: Immunology Director

The major goal of the project is to build research capacity for HIV and HIV/TB epidemiology for faculty at MUHAS in order to support the MUHAS Infectious Disease Institute.

4. D43 TW010946 (Hawkins/Hirschhorn)

04/01/19 – 03/31/24

NIH/FIC

Building capacity for patient centered outcomes research to improve the quality and impact of HIV care in Tanzania.

Role: Member-Local Training Committee

The program will build capacity among Tanzanian investigators to lead Patient-Centered Outcomes Research (PCOR) in HIV disease prevention, care and treatment and HIV-related comorbidities.

5. 69940 (Moen, Kare)

2021 – 2026

NORHED

Strengthening Doctoral Education for Health in Tanzania (DOCEHTA)

Role: Co-Investigator

The aim of DOCEHTA is to improve PhD training at the Muhimbili University of Health and Allied Sciences (MUHAS) and University of Dodoma (UDOM) in Tanzania through development of Research Training short courses, postgraduate guidelines, online application system, training of PhD supervisors and PhD scholarships.