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Teaching area: Parasitology, Immunology, Molecular biology, Biotechnology and General biology

Research area: Multi-Omics, Genome editing, CRISPR-Cas system, Host-parasite interactions and Mucosal immunity

Education and Qualification

2022-2024	Guangzhou University	Postdoctoral Fellow (Genome editing)
2018-2022	Chinese Academy of Agri-cultural Sciences	PhD, Preventive Veterinary Science (Molecular Parasitology)
2013-2016	Obafemi Awolowo University	M.Sc., Medical Parasitology
2006-2010	Obafemi Awolowo University	B.Sc., (Honours) Zoology
2004-2005	Federal Polytechnic Offa	ND., Science Technology

Scholarship/Grant Awards

2024	The Mississippi IDeA Network of Biomedical Research Excellence/National Institute of Health Grant, USA
2023	Guangzhou Municipality Postdoctoral Research Grant, China.
2023	International Society for Extracellular Vesicles, ISEV2023 Award, USA.
2018	Chinese Scholarship Council (CSC).

Work Experience

2024-2025	Associate Lecturer, Department of Medical Microbiology and Parasitology, Obafemi Awolowo University, Nigeria.
2022-2024	Postdoctoral Research Fellow, Precise Genome Center, School of Life Sciences, Guangzhou University, China.
2019-2022	Research Assistant, Key Laboratory of Innovative Team for GI Infection and Mucosal Immunity, State Key Laboratory of Veterinary Disease Control and Prevention, Lanzhou Veterinary Research Institute, CAAS, China.
2017-2018	Online Tutor/Teaching Assistant, Centre for Distance Learning, Obafemi Awolowo University, Ile-Ife, Nigeria.
2016-2018	Program Officer/Biology Teacher, Parent Assisted Rudimentary Program, Department of Mathematics, Obafemi Awolowo University, Nigeria.
2014-2015	Laboratory Instructor, Department of Medical Microbiology and Parasitology, Obafemi Awolowo University, Nigeria.

Project proposal

I. Bio-activities of *Plasmodium*-derived EVs in gametogenesis

Plasmodium gametocytes are important stages being targeted for the control of malaria. Preventing or halting gametogenesis would disrupt the disease transmission cycle. Therefore, *P. falciparum*-derived EVs (PfEVs) *in vitro* interaction with host erythrocytes and/or *Plasmodium* trophozoites may deepen our understanding of gametocyte development or differentiation. Identification of specific PfEVs proteins or nucleic acids involved in gametocyte differentiation may offer additional prospective vaccine or therapeutic targets. Evaluating PfEVs bio-activities may also include how PfEVs alter (or their involvement in) host cell lipid metabolism, erythropoiesis or dyserythropoiesis, as well as how PfEVs secretions influence the development of other intraerythrocytic stages or maturation of gametocytes.

Modulation of host immunity

Parasite pathogeneses and host immune responses are important outcomes of hostparasite interactions in which EVs are important mediators. Protozoan parasite EVs have been shown to carry immunosuppressive and immune activating molecules. PfEVs proteins could help the parasite to evade host immune detection during maturation. It

has also been shown that EVs cargoes may trigger strong proinflammatory response in host macrophages, contributing to the clinical symptoms or parasite multiplication. The mechanism(s) by which PfEVs activate or suppress inflammasomes and associated cytokines in endothelial cells (with respect to barrier breakdown (blood-brain barrier) can be investigated. The study would provide additional insight into the immunoregulatory activities of parasite-secreted EVs in malaria.

EVs and Drug Resistance

Resistance to drug is a major factor militating against the control of malaria. It may be interesting to investigate how PfEVs contribute to drug resistance/susceptibility in parasite strains using in vitro model. Functional selective secretion mechanisms (under selective pressure) or causal mechanisms of genetic/epigenetic triggers by which PfEVs secretions confer drug resistance on parasite can be investigated. This may include the use of chemical inactivation and/or CRISPR-Cas based genome modifications.

II. Mechanisms of EV Biogenesis in *Cryptosporidium*

Molecular mechanisms of Extracellular Vesicle biogenesis in *Cryptosporidium* species have not been completely deciphered. Identifying *Cryptosporidium* machinery involved in EVs production could be probed through the use of EVs inhibitors or gene knockdown. Such work may also involve the identification of EV-specific proteins or RNAs to evaluate biomarkers for early detection or drug/vaccine targets. The investigation could also span the uptake of EVs by host cells (using fluorescent labelling, confocal microscopy) and identification of host signalling pathways affected or involved.