

## Joel Paul

*University of Jos, Nigeria*

Joel Paul is an emerging research scientist, deeply rooted in molecular biology and bioinformatics, driven by a fervent passion for advancing knowledge in Biochemistry and Molecular Biology. His educational trajectory comprises a Postgraduate Diploma in Education, a B.Sc., and an M.Sc. in Biochemistry, along with his ongoing pursuit of a PhD at the University of Jos, Nigeria. Joel's passion is evident through his completion of numerous certificate courses and training programs, covering a wide spectrum from Global Health Research to Leadership and Program Management in Infection Prevention & Control.

Joel's professional journey encompasses a variety of research-focused roles that have finely honed his expertise. He currently serves as a Research Scientist at the Molecular Biology Laboratory Unit, University of Jos. His prior experiences include roles as a Research Student at the National Veterinary Research Institute (NVRI), Vom, Nigeria, and as a Research Intern at the AIDS Prevention Initiative Nigeria (APIN) Jos branch. Joel has also gained research exposure through industrial training at the National Institute for Pharmaceutical Research & Development, Abuja, broadening his understanding of pharmaceutical research and development. In research, Joel has left notable imprints, particularly in molecular biology and biomedical research. His master's research focused on molecular epidemiology and antimalarial drug resistance, resulting in publications and contributions to the NCBI database. Joel is currently pursuing his PhD programme in Biochemistry with research focusing on "Molecular Characterization of a Novel Plasmodium falciparum Trap-like Protein as a Potential Vaccine Candidate Against Malaria Infections in Jos, Nigeria," highlighting his dedication to combatting global health challenges posed by malaria.

Joel's prowess extends to grantsmanship, recently securing his first-ever research grant as the Principal Investigator with the International Society for Infectious Disease/Bill and Melinda Gates Foundation 2024 Research Capacity Building Grants. Additionally, he is part of the two research teams for the 2024 Tertiary Education Trust Fund (TETFund), and National Research Fund (NRF) grants award, further solidifying his standing as an early career researcher in molecular biology, with a distinct focus on malaria research. Beyond academia, Joel actively engages in leadership roles and community service, exemplifying a well-rounded and impactful professional.

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## Project

### **Molecular Characterization of a Novel Plasmodium falciparum Trap-like Protein as a Potential Vaccine Candidate Against Malaria Infections in Jos, Nigeria**

**Background:** Malaria remains a major global health challenge, causing approximately 608,000 deaths in about 85 countries in 2022. Africa, particularly Nigeria, bears the brunt of this burden, with Plasmodium falciparum being the deadliest and most prevalent species. While effective control strategies and new vaccines have shown promise, challenges like insecticide and drug resistance threaten their efficacy. Therefore, investigating the Plasmodium falciparum Trap-Like Protein (PfTLP), a crucial component of the parasite's invasion and movement, could provide valuable insights for vaccine development.

**Methodology:** The study will be conducted in Jos North Local Government Area, Plateau State, Nigeria. Ethical approval will be obtained from three hospitals in the study area. One hundred microscopically screened blood samples with 2 plus (++) and above will be collected and stored at 4°C before the DNA extraction. The DNA will be extracted using Zymo Research extraction kits. Polymerase Chain Reaction (PCR) and gel electrophoresis will be performed to amplify and identify the Plasmodium genus, Plasmodium falciparum, and the PfTLP. The PfTLP amplicons will be sequenced and analysed using bioinformatics tools.

**Expected Outcome:** The major expected outcomes of this study are to generate scientific data on PfTLP by investigating its conserved regions, genetic diversity, antigenic determinants, and key physicochemical properties, which will help to determine its vaccine potential to aid in the global fight against malaria. The sequenced data will be deposited in the National Center for Biotechnology Information (NCBI) database. The data generated in this study will also be published in peer-reviewed journals and presented at scientific conferences.

**Conclusion:** This study will unravel the potential of PfTLP as a vaccine target. Through the analysis of its genetic diversity and immunological properties, we aim to pave the way for novel malaria vaccines in Africa.