

Irene Kasumba

PATENT AGENT

Patents and
Innovations
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FOCUS AREAS

Intellectual Property
Patents and Innovations

EXPERIENCE

Dr. Irene Kasumba is a patent agent in the Washington, D.C., office of Wilson Sonsini specializing in patent prosecution, freedom-to-operate analyses, and intellectual property due diligence.

Before joining the firm, Irene was an academic scientific researcher at the University of Maryland, Baltimore, where she conducted research in Sharon Tennant's lab, advancing studies to understand the impact of vaccines on enteric disease transmission dynamics. Irene was also a Research & Alliances Officer in the New Ventures Office, where she fostered research partnerships for commercialization of IP assets.

With over 15 years of academic research experience, Irene has investigated host pathogen interactions, molecular mechanisms of disease transmission in disease vectors, and therapeutic targets of infectious diseases such as Malaria. She earned her Ph.D. under Dave Severson at the University of Notre Dame, where she explored molecular mechanisms of dengue infection in *Aedes aegypti* mosquitoes using differential transcriptomic studies

Irene completed her postdoctoral training under Patricia Rosa at the NIAID/NIH facility in Montana, where she identified molecular blood cues required for bacterial infectivity in rodents and ticks and developed genetic tools for functional studies of *Borrelia burgdorferi*.

Irene gained valuable skills in disease transmission and immunopathology at the London School of Hygiene & Tropical Medicine. She got her start conducting molecular research using Tsetse fly models in Serap Aksoy's Lab at the Yale School of Public Health in Connecticut.

A list of Irene's peer-reviewed publications is [accessible here](#).

CREDENTIALS

Education

- Ph.D., Biological Sciences, University of Notre Dame
Dissertation: "Comparative analysis of midgut transcriptomes of mosquitoes that are refractory or susceptible to Dengue viral infection"
- MSc., Medical Parasitology, London School of Hygiene & Tropical Medicine
- B.Sc., Zoology, University of Eastern Africa, Baraton
Minor in chemistry

Admissions

- U.S. Patent and Trademark Office

INSIGHTS

Select Publications

- Lead author with K. Tilly, T. Lin, S.J. Norris, and P.A. Rosa, “Strict Conservation yet Non-Essential Nature of Plasmid Gene *bba40* in the Lyme Disease Spirochete *Borrelia burgdorferi*,” 11(3) *Microbiology Spectrum (ASM)*, 2023
- Lead author with A. Bestor, K. Tilly, and P.A. Rosa, “Use of an endogenous plasmid locus for stable in trans complementation in *Borrelia burgdorferi*,” *Applied Environ Microbiology* 1038-46, 2014
- Lead author with A. Bestor, K. Tilly, and P.A. Rosa, “Virulence of the Lyme disease spirochete before and after the tick bloodmeal: a quantitative assessment,” 9 *Parasitology & Vectors* 129, 2016
- Co-author with B.M. Perez-Sepulveda, D. Heavens, C.V. Pulford, et al., “An accessible, efficient and global approach for the large-scale sequencing of bacterial genomes,” 10 KSG consortium, 22(1) *Genome Biology* 349, 2021
- Lead author with H. Badji, H. Powell, and M.J. Hossain, et al., “*Shigella* in Africa: New Insights From the Vaccine Impact on Diarrhea in Africa (VIDA) Study,” 19 *Clinical Infectious Diseases* 76(76 Suppl1), 2023
- Co-author with L.M. Schwartz, J. Oshinsky, and M. Reymann, et al., “Histo-Blood Group Antigen Null Phenotypes Associated With a Decreased Risk of Clinical Rotavirus Vaccine Failure Among Children <2 Years of Age Participating in the Vaccine Impact on Diarrhea in Africa (VIDA) Study in Kenya, Mali, and the Gambia,” 19 *Clinical Infectious Diseases* 76(76 Suppl1), 2023
- Lead author with H. Powell, R. Omere, M.J. Hossain, and S.O. Sow, et al., “Prevalence of *Salmonella* in Stool During the Vaccine Impact on Diarrhea in Africa (VIDA) Study, 2015-2018,” *Clinical Infectious Diseases* (76 Suppl1), 2023
- Lead author with C.V. Pulford and B.M. Perez-Sepulveda, et al., “Characteristics of *Salmonella* Recovered From Stools of Children Enrolled in the Global Enteric Multicenter Study,” 73(4) *Clinical Infectious Diseases* 631-641, 2021
- Co-author with C.E. Gabor, C.E. Chong, J.M. Lemme-Dumit, T.H. Hazen, K.S. Baker, K.L. Kotloff, and S.M. Tennant, et al., “*Shigella flexneri* serotype 6 strains from geographically diverse low- and middle-income countries,” 16(1) *mBio*, 2025
- Co-author with Z. Hao, M.J. Lehane, W.C. Gibson, J. Kwon, and S. Aksoy, “Tsetse immune responses and trypanosome transmission: implications for the development of tsetse-based strategies to reduce trypanosomiasis,” *Proceedings of the National Academy of Sciences of the USA* 12648-53, 2001
- Co-author with Z. Hao and S. Aksoy, “Proventriculus (cardia) plays a crucial role in immunity in tsetse fly (Diptera: Glossinidae),” *Insect Biochemistry and Molecular Biology* 1155-64, 2003
- Co-author with S. Meola, H. Sittertz-Bhatkar, P. Langley, and S. Aksoy, “Abdominal pericardial sinus: a neurohemal site in the tsetse and other cyclorhaphan flies,” *Journal of Medical Entomology* 755-65, 2003
- Lead author with A.J. Nalunkuma, et al., “Low birthweight associated with maternal anaemia and *Plasmodium falciparum* infection during pregnancy, in a peri-urban/urban area of low endemicity in Uganda,” 94(1) *Annals of Tropical Medicine & Parasitology* 7-13 2000
- Last author with C.F. Curtis, J.E. Miller, M.H. Hodjati, and J.H. Kolaczinski, “Can anything be done to maintain the effectiveness of pyrethroid-impregnated bednets against malaria vectors?” 353(1376) *Philosophical Transactions of the Royal Society Lond B: Biological Sciences* 1769-1775, 1998
- Co-author with R.M. Lagos, M.J. Sikorski, J.C. Hormazabal, A. Fernandez, S. Duarte, M.F. Pasetti, D.A. Rasko, E. Higginson, J. Nkeze, G. Dougan, M. Maes, A. Lees, S.M. Tennant, and M.M. Levine, “Detecting Residual Chronic *Salmonella Typhi* Carriers on the Road to Typhoid Elimination in Santiago, Chile, 2017-2019,” 230(2) *Journal of Infectious Diseases* 254-267, 2024
- Co-author with E.E. Higginson, J. Nkeze, J. Permala-Booth, R. Lagos, J.C. Hormazabal, A. Byrne, G. Frankel, M.M. Levine, and S.M. Tennant, “Detection of *Salmonella Typhi* in Bile by Quantitative Real-Time PCR,” 10(3) *Microbiology Spectrum (ASM)*, 2022
- Co-author with P.B. Pavlinac, J.A. Platts-Mills, J. Liu, and H.E. Atlas, et al., “Azithromycin for Bacterial Watery Diarrhea: A Reanalysis of the Antibiotics for Children With Severe Diarrhea (ABCD) Trial Incorporating Molecular Diagnostics (ABCD),” 229(4) *Journal of Infectious Diseases* 988-998, 2024
- Co-author with M.J. Hossain, H. Powell, S.O. Sow, R. Omere, A. Roose, J.C.M. Jones, S.M.A. Zaman, H. Badji, and G. Sarwar, et al., “Clinical and Epidemiologic Features of *Cryptosporidium*-Associated Diarrheal Disease Among Young Children Living in Sub-Saharan Africa: The Vaccine Impact on Diarrhea in Africa (VIDA) Study,” *Clinical Infectious Diseases* 76 (76 Suppl1):S97-S105, 2023
- Co-author with D. Nasrin, Y. Liang, J.R. Verani, H. Powell, S.O. Sow, R. Omere, M.J. Hossain, S. Doh, S.M.A. Zaman, J.C.M. Jones, A.O. Awuor, S.M. Tennant, U. Ramakrishnan, and K.L. Kotloff, “Stunting Following Moderate-to-Severe Diarrhea Among Children Aged <5 Years in Africa Before and After Rotavirus Vaccine Introduction: A Comparison of the Global Enteric Multicenter Study and the Vaccine Impact on Diarrhea in Africa (VIDA) Study,” *Clinical Infectious Diseases* 76 (76 Suppl1):S49-S57, 2023
- Co-author with P. Marcenac and A. Traoré, et al., “Giardia Detection and Codetection With Other Enteric Pathogens in Young Children in the Vaccine Impact on Diarrhea in Africa (VIDA) Case-

- Control Study: 2015-2018,” *Clinical Infectious Diseases* 76 (76 Suppl):S106-S113, 2023
- Co-author with D. Nasrin, Y. Liang, H. Powell, “Moderate-to-Severe Diarrhea and Stunting Among Children Younger Than 5 Years: Findings From the Vaccine Impact on Diarrhea in Africa (VIDA) Study,” *Clinical Infectious Diseases* 76 (76 Suppl):S41-S48, 2023
 - Co-author with A.O. Awuor, B. Ogwel, H. Powell, and J.R. Verani, “Antibiotic-Prescribing Practices for Management of Childhood Diarrhea in 3 Sub-Saharan African Countries: Findings From the Vaccine Impact on Diarrhea in Africa (VIDA) Study, 2015-2018,” *Clinical Infectious Diseases* 76 (76 Suppl):S32-S40, 2023
 - Co-author with D.M. Berendes and R. Omere, “Exploring Survey-Based Water, Sanitation, and Animal Associations With Enteric Pathogen Carriage: Comparing Results in a Cohort of Cases With Moderate-to-Severe Diarrhea to Those in Controls in the Vaccine Impact on Diarrhea in Africa (VIDA) Study, 2015-2018,” *Clinical Infectious Diseases* 76 (76 Suppl):S140-S152, 2023
 - Co-author with R. Omere, H. Powell, and S.O. Sow, “Norovirus Disease Among Children <5 Years in 3 Sub-Saharan African Countries: Findings From the Vaccine Impact on Diarrhea in Africa (VIDA) Study, 2015-2018,” *Clinical Infectious Diseases* 76 (76 Suppl):S114-S122, 2023
 - Co-author with J.B. Ochieng, H. Powell, and C.E. Sugerman, “Epidemiology of Enteroaggregative, Enteropathogenic, and Shiga Toxin-Producing *Escherichia coli* Among Children Aged <5 Years in 3 Countries in Africa, 2015-2018: Vaccine Impact on Diarrhea in Africa (VIDA) Study,” *Clinical Infectious Diseases* 76 (76 Suppl):S77-S86, 2023
 - Co-author with A.M. Keita, S. Doh, S.O. Sow, H. Powell, and R. Omere, “Prevalence, Clinical Severity, and Seasonality of Adenovirus 40/41, Astrovirus, Sapovirus, and Rotavirus Among Young Children With Moderate-to-Severe Diarrhea: Results From the Vaccine Impact on Diarrhea in Africa (VIDA) Study,” *Clinical Infectious Diseases* 76 (76 Suppl):S123-S131, 2023
 - Co-author with D.M. Berendes, K. Fagerli, S. Kim, D. Nasrin, H. Powell, and S.M. Tennant, et al., “Survey-Based Assessment of Water, Sanitation, and Animal-Associated Risk Factors for Moderate-to-Severe Diarrhea in the Vaccine Impact on Diarrhea in Africa (VIDA) Study: The Gambia, Mali, and Kenya, 2015-2018,” *Clinical Infectious Diseases* 76(76 Suppl):S132-S139, 2023

TECHNICAL FLUENCY

Biological Sciences and Biotechnology

- Cell therapy
- Genetic engineering
- Genetic medicine
- Genomics
- Host-immunity
- Host-pathogen interactions
- Immunoblot/biochemical assays
- Immuno-oncology
- Microbial genetics
- Microbiology
- Molecular biology
- Molecular genetics
- Molecular immunopathology
- Molecular parasitology
- Parasitology
- PCR/recombinant nucleic acid technologies
- Stem cell

Therapeutics and Drug Discovery

- Antibody technologies
- Antimicrobial agents
- Cell therapeutics
- Gene therapy
- Genetic medicine
- Immunotherapies
- Regenerative medicine
- RNA interference (RNAi) technologies/antisense
- Vaccines

Diagnostics and Medical Devices

- Biochemical assays/diagnostics

- Molecular diagnostics
- Point-of-care testing (POCT)

Genomics and Data Analysis

- Functional genomics
- Sequence analysis databases

Miscellaneous

- Biological data mining/analysis
- Biostatistics/epidemiological studies
- Clinical trials
- Generative AI
- Infection disease therapeutics
- Infectious disease control & transmission dynamics
- Molecular & infectious disease epidemiology