Angel Krittinan Kongsomboonvech, PhD

Palo Alto, CA • angelkko@stanford.edu • www.linkedin.com/in/angel-kongsomboonvech

SUMMARY Detail-oriented Scientist with 9+ years of experience in immunology and molecular biology, with expertise in cell-based and immunological assays (e.g. flow cytometry, ELISA). Consistently demonstrates the ability to quickly adapt to new challenges and contribute meaningfully to complex team efforts. Seeking a translational research position to apply my skills and contribute to the development of novel therapeutic strategies for life-altering diseases.

TECHNICAL SKILLS SUMMARY

Immunology: Multi-color flow cytometry (Miltenyi MACSQuant, BD LSR II), ELISA, immunofluorescence assays, T cell activation and cytokine response assays.

Cell culture: immune cells (e.g. T cells, macrophages), stem cells (human, mouse), fibroblasts, immortalized cell lines, and parasites; cell viability assays, co-culture assays.

Cell differentiation: erythropoiesis (*ex vivo*), bone marrow cell differentiation into macrophages and dendritic cells.

Cell engineering: CRISPR/Cas9 (human hematopoietic stem cells, parasites), lentivirus transduction.

Molecular biology: PCR, molecular cloning, Western blot and phospho-Western Blot.

In vivo work: mice handling, colony maintenance, breeding, dissection, organs harvest, tail bleeds.

Software: GraphPad Prism, FlowJo, Benchling, Sequencher, SnapGene.

EDUCATION

2024 Postdoctoral Scholar (emphasis: host-pathogen interactions)
Stanford University School of Medicine (Stanford SOM)

2020 PhD, Quantitative & Systems Biology (emphasis: immunology, host-pathogen interactions)
University of California, Merced (UC Merced)

2014 MHS (Masters of Health Science), Biomedical Sciences
Quinnipiac University

2012 Postgraduate Certificate, Infectious Diseases
London School of Hygiene and Tropical Medicine

2009 BS, Biochemistry
University of California, Los Angeles (UCLA)

RESEARCH EXPERIENCE

09/2024 – Present **Research Scientist**; Stanford University SOM

- Exploring CD44-dependent signaling in malaria parasite invasion through generation of truncated CD44 mutant erythrocytes from human hematopoietic stem cells, aiming to identify novel therapeutic strategy for malaria.
- Managing lab operations, including equipment maintenance, inventory and SOP updates, optimizing laboratory efficiency and minimizing research downtime.
- Organized and facilitated bi-weekly joint lab meetings for various Stanford parasitology research groups, fostering a strong sense of community and facilitating productive information exchange among researchers at different career stages.

01/2021 – 08/2024 **Postdoctoral Scholar**; Stanford University SOM

- *Project 1: Investigating the function of erythrocyte CD44 during malaria parasite invasion.*
  - Doubled CD44-null cell yield (as validated by flow cytometry) by optimizing the post-CRISPR/Cas9 enrichment protocol, increasing downstream assay efficiency.
  - Discovered a novel interaction promoting malaria parasite invasion, providing key insights into erythrocyte infection mechanisms.
  - Optimized and executed phospho-Western blot of ghost erythrocytes to determine novel CD44-dependent phosphorylation of erythrocyte cytoskeletal proteins.
  - Secured $200,000+ in external and internal fellowships.
  - Mentored undergraduate students from Stanford's DRIVE program, fostering their research skills development and promoting diversity in STEM.
- *Project 2: Investigating host erythroid progenitor cell responses to parasite infection.*
  - Developed and optimized assays to analyze *Plasmodium falciparum* effects on erythroid progenitors.
  - Led efforts to design and improve cyTOF panels of 40 markers.
  - Generated a GFP-expressing *P. falciparum* strain for improved infection tracking in erythroid progenitors.
  - Improved flow cytometry-based parasite detection in infected erythrocytes by 20%, enhancing the sensitivity and accuracy of infection studies.
  - Supervised and led the project to successfully assess perturbations of erythroid development through synchronization of parasite cultures and infection of various stages of primary erythroid progenitor cells.
- *Project 3: Developing innovative therapy for heart failure: Mitochondria-rich extracellular vesicles from erythroid progenitor cells.*
  - Established and led collaboration with an academic partner, enhancing our lab's collaborative profile.
  - Optimized assay for isolating erythroid-derived mitochondria-rich extracellular vesicles (EVs).
  - Updated SOPs, instituted new processes, and trained the collaborator on streamlined EV production.
  - Generated essential preliminary data securing a $50,000 grant.

06/2015 – 12/2020 **Doctoral Student Researcher**; UC Merced

- *Project: Investigating host and parasite requirements for CD8 T cell interferon-gamma responses to Toxoplasma gondii parasite.*
  - Utilized a forward genetic screen of 50+ *T. gondii* strains, identifying candidate genes affecting host immune response. Subsequently, generated CRISPR/Cas9-edited strains to validate these candidates.
  - Identified novel *T. gondii* protein(s) modulating host adaptive immunity using genetic crosses and QTL mapping (R).
  - Maintained and synchronized 100+ *T. gondii* strains in culture.
  - Differentiated murine bone marrow into macrophages and isolated CD8 T cells for T cell activation assays.
  - Designed, optimized, and executed T cell activation assays (ELISA, flow cytometry) to assess *T. gondii* immune responses.
  - Discovered that NLRP3, independent of its canonical inflammasome, is crucial for adaptive CD8 T cell responses to *T. gondii*.

- Served as lab manager, training and supervising postdocs, graduate, and undergraduate students, and managing lab resources.
- Coordinated department seminar speakers (2 years), ensuring timely and relevant presentations.

PUBLICATIONS

Kongsomboonvech A.K., Valissery, P., Egan E.S. Cross-linking of erythrocyte CD44 promotes *Plasmodium falciparum* invasion. *In Prep.*

Kongsomboonvech, A., Takizawa, C. (2024). Let me in: Interpreting graphs of parasite infection in red blood cells. BioGraphI FMN Fall 2023, QUBES Educational Resources. DOI:10.25334/D8TG-E410.

Baro B., Kim C.Y., Lin C., **Kongsomboonvech A.K.**, Tetard M., *et al.* (2023) *Plasmodium falciparum* exploits CD44 as a co-receptor for erythrocyte invasion. *Blood*. DOI: 10.1182/blood.2023020831. **Commentary:** *Blood* (2023) 142 (23): 1942–1944; DOI: 10.1182/blood.2023022781.

Kongsomboonvech A.K.*, Garcia-López L.*, *et al.* (2023) Variation in CD8 T cell IFNγ differentiation to strains of *Toxoplasma gondii* is characterized by small effect QTLs with contribution from ROP16. *Front. Cell. Infect. Microbiol.* DOI: 10.3389/fcimb.2023.1130965. *Co-first authors.

Kongsomboonvech A.K., Rodriguez F., *et al*. (2020) Naïve CD8 T cell IFNγ responses to a vacuolar antigen are regulated by an inflammasome-independent NLRP3 pathway and *Toxoplasma gondii* ROP5. *PLOS Pathogens* 16(8): e1008327. DOI: 10.1371/journal.ppat.1008327.

AWARDS

2024	Best Poster, 15th Annual Pediatrics Research Retreat; Stanford University SOM
2022 – 2024	Postdoctoral Support; Stanford Maternal & Child Health Research Institute
2021 – 2023	NIH NIDDK T32 Postdoctoral Research Training Grant in Pediatric Nonmalignant Hematology and Stem Cell Biology (T32 DK098132-06)
2022	Poster Finalist, 13th Annual Pediatrics Research Retreat; Stanford University SOM
2020 – 2021	University of California President's Dissertation Year Fellowship; UC Merced
2018	School of Natural Sciences Distinguished Scholars Fellowship; UC Merced
2018	The AAI Young Investigator Award, 22nd Annual Woods Hole Immunoparasitology Meeting
2016	Best Poster, Quantitative and Systems Biology Spring Retreat; UC Merced