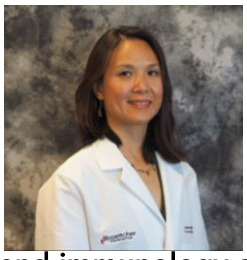
2016 Webb-Waring Biomedical Research Awards
Investigator Research Profile

Wen-Yuan Elena Hsieh, M.D.



University of Colorado Anschutz Medical Campus

Dr. Hsieh is currently an assistant professor in the department of immunology and microbiology and the department of pediatrics, division of allergy and immunology at the University of Colorado School of Medicine Anschutz Medical Campus. She earned her M.D. in medicine at the University of California, San Francisco, completed her residency in pediatrics at the University of California, Los Angeles and completed a fellowship in allergy and immunology at Stanford University.

Select Honors

Dr. Hsieh has been the recipient of numerous honors, including a Wasserman Scholar Award, a Volunteer Service Award, a Gates Millennium Scholar Award, the Golden Key National Honor Society, the UCLA Dean's Prize Award, a President's Undergraduate Fellowship Program, a Howard Hughes Undergraduate Research Program fellowship, a UCLA Women for Change Leadership Award, membership in Phi Beta Kappa, a French Foundation for Medical Research and Education Award, an American Academy of Pediatrics Resident Scholarship, an American Academy of Pediatrics Resident Research Award and a Pediatric Scientist Development Award.

Medical Focus

Systemic lupus erythematosus (SLE or lupus) is an autoimmune disorder with diverse clinical presentations, affecting multiple organ systems. Relapses and flares are unpredictable, frequent and cause significant morbidity and mortality. Variable and inconsistent patient responses to therapy make clinical management notoriously challenging. Approximately 20% of SLE cases are diagnosed in childhood, and children exhibit a more active and severe disease than adults, underscoring the need to better understand pediatric disease pathogenesis. The clinical heterogeneity of lupus is a reflection of the underlying dysregulation of both the innate and adaptive immune systems. Autoantibodies targeting self-proteins and nucleic acids form immune complexes that can activate other cells of the immune system, resulting in inappropriate immune responses, such as the overproduction of pro-inflammatory cytokines, which perpetuate lupus pathology. These dynamic relationships between different types of innate and adaptive immune cells and their dysregulated responses in SLE are still poorly understood.

Research Proposal

One aim of Dr. Hsieh's research will be to use patient peripheral blood samples to identify, at the single-cell level, specific cell subsets that produce cytokines aberrantly. These immune cellular measurements will be examined periodically along with standard clinical tests in order to correlate changes in cellular immune activation with changes in disease activity. Dr. Hsieh hypothesizes that a unique SLE-specific monocyte-cytokine signature identified in preliminary studies correlates with disease activity, with potential as a disease biomarker for prediction of disease flares and response to therapy. Her team's preliminary studies have also demonstrated that the monocyte-cytokine signature was reproduced when healthy donor blood was exposed to SLE serum, indicating that serum factors, particularly extracellular vesicles, drive immune activation.

The goal of Dr. Hsieh's research is to elucidate cellular and molecular mechanisms that govern immune derangements in the pathogenesis of pediatric SLE, which would provide the foundation for novel disease biomarkers to prognosticate disease activity, and select therapeutic interventions. Thus, the proposed research aims to improve human health by developing

fundamental knowledge that will help reduce morbidity and mortality in children with autoimmune disease.