**Elena (Wen-Yuan) Hsieh, MD**

**Curriculum Vitae**

# 1. PERSONAL HISTORY

**Current** Associate Professor

**Position** Department of Pediatrics, Section of Allergy and Immunology

Department of Immunology and Microbiology

University of Colorado Denver, School of Medicine

Children’s Hospital Colorado

**Address** 12800 East 19th Avenue

RC1 North P18-8117

Aurora, CO 80045

[elena.hsieh@cuanschutz.edu](mailto:elena.hsieh@cuanschutz.edu)

<https://medschool.cuanschutz.edu/immunology-and-microbiology/faculty/hsieh>

Phone: (303) 724-9650

# 2. EDUCATION

1997-2002 Bachelor of Science, Microbiology, Immunology and Molecular Genetics

University of California, Los Angeles (UCLA), Los Angeles, CA

Honors: summa cum laude, Golden Key National Society, Honors Collegium, Phi Beta Kappa

2003-2008 Doctor of Medicine

University of California, San Francisco (UCSF), San Francisco, CA

Additional training: Certificate Program for Biomedical Research

# 3. POST GRADUATE EDUCATION AND TRAINING

2008-2011 Pediatric Residency

University of California, Los Angeles. Ronald Reagan Medical Center. Los Angeles, CA

Education and mentoring housestaff award, American Academy of Pediatrics

2011-2014 Allergy and Immunology Fellowship

Stanford University. Lucile Packard Children’s Hospital. Stanford, CA

Pediatric Scientist Development Program (NIH K12 early career development)

**4. ACADEMIC APPOINTMENTS**

2014-2015 Instructor, Department of Pediatrics, Division of Allergy, Immunology, and Rheumatology, Stanford University, School of Medicine

2015-2021 Assistant Professor, Department of Pediatrics, Section of Allergy and Immunology; Department of Immunology and Microbiology, University of Colorado, Anschutz Medical Campus, School of Medicine (CU-AMC)

2016-Pres Experimental design consultant, Human Immune Monitoring Shared Resource, CU-AMC

2016-Pres Member, Colorado Clinical and Translational Sciences Institute, CU-AMC

2017-Pres Member, Biomedical Sciences Program, CU-AMC

2017-Pres Member, Medical Scientist Training Program, CU-AMC

2019-Pres Co-director, Immunology and Immunotherapy Advanced Science block, CU-AMC

2019-Pres Director, Jeffrey Modell Diagnostic and Research Center for Primary Immunodeficiencies

2018-Pres Co-director, Colorado Newborn Screen for Severe Combined Immunodeficiency

2020-Pres Director, Section of multiplexed imaging, Human Immune Monitoring Shared Resource, CU-AMC

2021-Pres: Clinical collaborator, Comprehensive Long-Term Follow-up for Newborn Screening

in Colorado and Wyoming (COLT)

2021-Pres: Associate Professor, Department of Pediatrics, Section of Allergy and Immunology; Department of Immunology and Microbiology, University of Colorado, Anschutz Medical Campus, School of Medicine (CU-AMC)

**5. HONORS, SPECIAL RECOGNITIONS, AND AWARDS**

2000-2001 Gates Millenium scholar

2001 Howard Hughes undergraduate scholar at UCLA

2002 UCLA Women for Change Leadership award

2004 Spitalny Medical Student Scholarship. French Foundation for Medical Research and Education

2009 American Academy of Pediatrics, 2009 Residency Scholarship UCLA Medical Center

2012-2015 Pediatric Scientist Development Program

2020 Women in STEM Leadership Award, CU-AMC

2021 Joseph St. Geme Jr Medical Student Award, Mentor/Mentee (with Isabel Fernandez MD PhD)

2021 COVID-19 Resilience Award: outstanding collaboration, CU-AMC

**6. PROFESSIONAL MEMBERSHIPS**

2011-Pres American College of Allergy, Asthma and Immunology (AAAAI) 2011-Pres American Academy of Allergy, Asthma and Immunology (ACAAI)

2012-Pres Clinical Immunology Society (CIS)

2017-Pres European Society for Immunodeficiency (ESID)

2018-Pres American Association of Immunologists (AAI)

2018-Pres Childhood Arthritis and Rheumatology Research Alliance (CARRA)

2022-Pres American College Rheumatology (ACR)

**7. MAJOR COMMITTEES AND SERVICE RESPONSIBLITIES**

**A. Departmental, SOM, Institutional University**

2016-Pres Genomics working group, Children’s Hospital Colorado

2019 Child Health Research Enterprise strategic planning committee

**B. National**

2017-2020 Early career immunologists committee, Clinical Immunology Society (CIS)

2019 Program committee member for the annual CIS meeting

**C. Community Service**

SACNAS Advancing Chicanos/Hispanics and Native Americans in Science

**8. MEDICAL LICENSURE AND BOARD CERTIFICATION**

Colorado State Medical Board—medical license. Expiration date: Apr 2023

American Board of Pediatrics—board certificate. Expiration date: Dec 2026

American Board of Allergy and Immunology—board certificate. Expiration date: Nov 2024

**9. INVENTIONS, INTELLECTUAL PROPERTY AND PATENTS HELD OR PENDING**

# 10. REVIEW AND REFEREE WORK

2018-Pres Ad hoc reviewer for the Journal of Pediatrics, Clinical infectious diseases

2018-Pres Peer review for Research Institute Children’s Hospital Colorado grants

2019 Peer review for Linda Crnic Institute grand challenge grants

2019 Peer review for Immune Deficiency Foundation grants

2019 Peer review for Colorado Clinical and Translational Sciences Institute grants

2019 Ad hoc reviewer for Nature Communications

2021 Ad hoc reviewer for NIH Study Section, Immuno-Oncology Research

2022 Frontiers Immunology Research Topic Editor (Inborn Errors of Immunity and Mucosal Immunity)

**11. INVITED EXTRAMURAL LECTURES, PRESENTATIONS, AND VISITING PROFESSORSHIPS**

May 2014: “Single-cell immune profiling in rheumatological disorders: clinical applications in SLE.” Wisconsin Rheumatology Association (WAR) Annual Meeting. Lake Geneva, WI

Feb 2016: “Innate Immune Dysregulation in Autoimmune and Inflammatory Disorders.” Allergy, Asthma and Immunology Foundation of Northern California (AAIFNC) Annual Symposium. San Francisco, CA (Alan Goldsobel)

Apr 2016: “Mass Cytometry: Next generation flow cytometry and clinical applications.” Update on Diagnostic Advances in Primary Immunodeficiencies. Clinical Immunology Society (CIS) Annual Meeting. Boston, MA (Troy Torgerson)

Jun 2016: “Understanding systemic lupus erythematosus (SLE) disease heterogeneity at the single-cell level.” Institute for Immunity, Transplantation and Infection (ITI) Annual Symposium. Stanford University, Stanford, CA (Mark Davis)

Oct 11, 2016: “The many faces of common variable immunodeficiency (CVID).” Colorado Asthma and Allergy Society (CAAS). Denver, CO (David Fleisher)

Oct 12, 2016: “Single-cell systems immunology: applications in pediatric immune disease.” National Jewish Allergy grand rounds. Denver, CO (David Fleisher)

Oct 15, 2016: “Primary antibody deficiencies: more than just a B cell problem.” Immune Deficiency Foundation (IDF) Annual Symposium. Denver, CO (Heidi Jensen)

Oct 25, 2016: “Single-cell systems immunology: applications in pediatric immune disease.” CyTOF Summit, CU-AMC. Denver, CO (Connie Inlay)

Apr 6, 2017: “Single-cell systems immunology: applications in pediatric immune disease.” Power of Informatics to Advance Health, CU-AMC. Denver, CO (Inge Wefes)

May 5, 2017: “Single-cell systems immunology: applications in pediatric immune disease.” Barbara Davis Center Seminar Series, CU-AMC. Denver, CO (Maki Nakayama)

May 8, 2017: “Single-cell view of pediatric immune disorders.” Department of Biological Sciences Seminar Series at the University of Denver. Denver, CO (Schuyler Van Engelenburg)

Jul 20, 2017: “Autoimmune conditions in Down Syndrome.” National Down Syndrome Congress. Sacramento, CA (Joaquin Espinoza)

Aug 14, 2017: “Live attenuated vaccines in cellular immune deficiency post bone marrow transplant.” The Association of Medical Laboratory Immunologists (AMLI) Annual Meeting. Denver, CO (Vijaya Knight)

Oct 18, 2017: “A day in the life of a clinical immunologist: an interesting case of type 1 diabetes.” Human Immunology and Immunotherapy seminar series, CU-AMC. Denver, CO (John Cambier)

Jan 24, 2019: “Single-cell systems immunology: application in autoimmunity and primary immunodeficiency.” 2nd German mass cytometry user forum. Berlin, Germany (Henrik Mei)

Jun 23, 2019: “Guidelines to implement mass cytometry in clinical trials.” International Cytometry annual meeting. Vancouver, Canada (Diana Bonilla)

Nov 9, 2020: “Tips on Developing your K-award Application.” Office of Research Development and Education at CU-AMC, virtual (Lynette Michael and Naomi Nishi)

Apr 16, 2021: “Flow 102: Mass Cytometry (CyTOF) and Beyond.” Clinical Immunology Society (CIS). Annual Meeting, virtual (Troy Torgerson)

Aug 16, 2021: “Application of Mass Cytometry: What can you Assess with 40+ Parameters per Single-cell?” The Association of Medical Laboratory Immunologists (AMLI). 2021 Annual Meeting, virtual (Vijaya Knight)

Sept 24, 2021: “Human *IL2RB* Mutations: Discovery of a Novel Immune Dysregulation Disorder.” Mount Sinai Immune Deficiency Program Research Talk, virtual (Rachel Miller)

Oct 25, 2021: “A multi-omics approach to understanding immune dysregulation in pediatric SLE.” Genentech seminar, Biomarker Discovery OMNI, virtual (William O’Gorman)

Nov 12, 2021: “*IL2RB* and Immune Dysregulation.” 16th International Symposium on Primary Immunodeficiency Diseases. Newport Beach, CA (Sudhir Gupta)

Dec 6, 2021: “COVID Vaccine Responses in Immunocompetence and Immunodeficiency.” COVID Human Genetic Effort talk, virtual (Jean-Laurent Casanova)

Jan 19, 2022: “MIBI and Visium: A Match made in Heaven?” Human Immunology and Immunotherapy seminar series, CU-AMC. Denver, CO (Leslie Berg)

Jan 28, 2022: “Threading the Needle you Found in the Haystack: What Inborn Errors of Immunity teach us about Precision Medicine.” Department of Pediatrics Grand Rounds at CU-AMC, virtual (Danielle Sorrano)

Mar 24, 2022: “Human IL2RB Mutations: from Clinical Enigma to Molecular Target.” Invited Seminar. Rockefeller University, New York, NY (Jean-Laurent Casanova)

Jun 10, 2022: “Human IL2RB Mutations & Immune Dysregulation” Invited Seminar. Institute Imagine, Paris, France (Jean-Laurent Casanova)

Jun 21, 2022: “Human IL2RB Mutations: from Clinical Enigma to Molecular Target.” International Cytokines and Interferon Society (ICIS), Human Cytokine Deficiencies and Cytokinopathies, Annual Meeting. San Francisco, CA (Dusan Bogunovic)

Jun 22, 2022: “Genetic Etiologies of Congenital Athymia” Immune Deficiency Foundation Lunch & Learn, virtual (Emma Mertens, Christopher Scalchunes)

Jun 23, 2022: “Batch Normalization in Mass Cytometry.” Mass Cytometry Best Practices session, Federation of Clinical Immunology Societies (FOCIS) Annual Meeting. San Francisco, CA (Holden Terry Maecker)

Aug 14, 2022: “**COVID-19 Vaccine Immune Responses in Immunocompetence and Immunodeficiency.” Association of Medical Laboratory Immunologists (AMLI) Annual Meeting. Salt Lake City, UT (Vijaya Knight)**

**12. TEACHING RECORD**

**A. Couse director**

Co-director, Immunology and Immunotherapy Advanced Science block, UCD SOM (2020-Pres)

**B. Graduate, medical school, residency and fellowship training lectures** (selected)

2016-Pres: Pediatrics residents teaching on immunology cases

2016-Pres: Immunology board review and core didactics for allergy and immunology fellows

2016-Pres: Problem based learning small group leader for the Blood and Lymph medical school block

2016-Pres: Pulmonary grand rounds to teach immunology to pulmonary fellows

Jan 3, 2016: Lecture “Antibody deficiencies” Lunch and Learn for Allergy and Immunology nursing staff

Jan 23, 2017: Lecture “Primary Immunodeficiency Disorders” for the Infectious Disease medical school block (2nd year medical school) (course Edward Janoff) – repeated yearly

Jan 31, 2017: Lecture “Deficiencies in Adaptive Immunity” for the Blood and Lymph medical school block (1st year medical school) (course director Jill Slansky) – repeated yearly

Feb 28, 2017: Webinar “Interstitial lung disease and inflammatory enteropathy: Is there a connection?” CIS early career immunologists webinar

Aug 14, 2018: Lecture “Severe combined immunodeficiency newborn screen program: the good, the bad, and the ugly” Peer Network Newborn Screen educational event (Darren Michael)

Oct 10, 2018: Lecture “Severe combined immunodeficiency newborn screen program: the good, the bad, and the ugly” Neonatal Intensive Care Unit grand rounds – repeated yearly

May 8, 2019: Lecture “Primary Immunodeficiency Disorders” for the Human Immunology course for graduate students, IMMUNO 7662 (course director Laurel Lenz) – repeated yearly

Sep 4, 2019: Genetics Grand Rounds “The Increasing role of Genetic Testing in Primary Immunodeficiency Disorders” (Austin Larson)

Oct 8, 2019: Lecture “Newborn Screening for Severe Combined Immunodeficiency” for Newborn Screen webinars

Mar 4, 2020: Digestive Health Institute Research presentation “Toward Precision Medicine: From Clinical Enigma to Molecular Target” (Edwin de Zoeten)

Mar 5, 2020: Lecture “Severe Combined Immunodeficiency” for pediatric hematology/oncology didactic series (Christopher McKinney)

Dec 1, 2020: Lecture “Managing infusion reactions/anaphylaxis” for pediatric rheumatology didactic series (Jennifer Soep)

Mar 22, 2022: Lecture “Inborn errors of immunity leading to autoimmunity” for the Special Topics in Autoimmunity course for graduate students, IMMUNO 7882 (course director Jordan Jacobelli) – repeated yearly

**C. Graduate student/postdoctoral fellow thesis advisor, clinical fellow scholarship oversight**

2018-2021 Katherine Waugh PhD, Immunology postdoctoral fellow: T32 Training program in cancer biology. “Deciphering the role of interferon signaling in the altered cancer spectrum of Down Syndrome”

2018-2021 Orlando Esparza MD, Pediatric Hematology/Oncology fellow. Scholarly project: “The role of bone marrow macrophages in aplastic anemia.” Research mentor Alisa Lee-Sherick MD in the department of pediatrics, division of hematology/oncology

2018-2021 Laura Cobb MD, Pediatric Hematology/Oncology fellow. Scholarly project:“The role of NK cells in graft vs. host disease.” Research mentor Michael Verneris MD in the department of pediatrics, division of hematology/oncology

**D. Research fellowship mentor**

2016-2018 Ryan Israelsen MD, pediatric allergy and immunology fellow. Scholarly project: “B cell reconstitution after rituximab therapy in the pediatric patients.” Current position as physician in private practice in Medford, Oregon

2016-2018 Pratyaydipta Rudra PhD, Biostatistics and Informatics postdoctoral fellow “Mixed model analysis in mass cytometry.” Co-mentored with Debashis Ghosh in Biostatistics and Informatics. Current position Assistant Professor in the Department of Statistics, Oklahoma State University

2016-2018 Yuko Okamoto MD, Rheumatology postdoctoral fellow. “Metabolic and immunological alterations in rheumatoid arthritis identified by mass cytometry.” Co-mentored with V. Michael Holers MD in the department of Medicine, section of rheumatology. Current position as Instructor in Tokyo Women’s Medical University, Division of Rheumatology

2017-2020 Josselyn Garcia-Perez PhD, Immunology postdoctoral fellow: “The role of a hypomorphic IL2Rβ in immune dysregulation.” *AAI Intersect Fellowship recipient (award declined due to additional funding).* Current position as principal scientist at Caprion Biosciences.

2017-2020 Xuhong Zhang PhD, Biostatistics and Informatics postdoctoral fellow. “Application of Bayesian methods to mass cytometry analysis.” Co-mentored with Debashis Ghosh PhD in the department of Biostatistics and Informatics. *K99 submitted.* Current position Assistant Professor in the Department of Statistics, Indiana University

2017-2022 Tusharkanti Ghosh PhD, Biostatistics and Informatics postdoctoral fellow. “Developing automated analytical pipelines in mass cytometry.” Co-mentored with Debashis Ghosh PhD in the department of Biostatistics and Informatics

2018-2021 Zoila Isabel Fernandez, Immunology MD PhD student: “CD122 in virtual T cell memory.” Co-mentored with Ross Kedl PhD in the department of Immunology and Microbiology

2018-2021 Erik Newman MD, pediatric allergy and immunology fellow. Scholarly project: “Immunological abnormalities after rituximab therapy in the pediatric patients.” *CSL Behring grant recipient*. Current position Assistant Professor in the Department of Dermatology, Division of Allergy and Immunology, University of Utah

2018-Pres Victor Lui, Immunology PhD student: “Understanding a hypomorphic LCK mutation in primary immunodeficiency” *NSF Graduate Student Fellowship awardee*

2020-Pres Olivia Bailey PhD, Immunology postdoctoral fellow: “Multiplexed ion beam imaging in pediatric lupus nephritis.” *T32 Fellowship recipient, Molecular Mechanisms of Immune Tolerance. AAI Careers in Immunology awardee (declined given T32 award), LRA Diversity Supplement awardee*

**E. Rotation mentor**

- UCD Immunology PhD graduate student Rina Villar (Winter 2016)

**F. Summer trainees**

- Colorado College undergraduate student Lidnsey Deringer (Summer 2017). *Boettcher collaboration grant*

- Denver University undergraduate student Valentina Larchenko (Summer 2019)

- Cornell University undergraduate student Ngoc Truong (Summer 2021)

- University of Colorado Denver undergraduate student Jennifer Nguyen (Summer 2022)

**13. GRANT SUPPORT**

**A. Current support**

05/15/17-04/14/22 (12/31/22 NCE), NIH National Institute of Arthritis and Muskuloskeletal and Skin Diseases (NIAMS), K23 Mentored Patient-Oriented Research Career Development Award, “Immune dysregulation in pediatric SLE pathogenesis,” PI (*impact score 10*), TDC $524,000

02/25/20-01/31/25, NIH National Institute of Allergy and Infectious Disease (NIAID), R01, “Role and mechanisms of the PI3K pathway in B cell tolerance,” Co-I, TDC $270,343/year

05/15/20-05/31/22 (12/31/22 NCE), Boettcher COVID Innovation Fund, “Understanding COVID-19 incidence, risk factors, humoral and cellular immune response in health care workers,” PI, TDC $250,000

09/01/20-12/31/22, Sanford Children’s Genomic Medicine Consortium, “Clinical Application of Whole Genome Sequencing in Patients with Primary Immunodeficiency Diseases,” PI, TDC $250,000

09/01/20-08/31/22 (08/31/23 NCE), Lupus Research Alliance, Lupus Innovation Award, “Multiplexed single-cell imaging in pediatric lupus nephritis,” PI, TDC $250,000

11/01/21-10/31/22, Lupus Research Alliance, Lupus Innovation Award, Administrative Supplements to Promote Diversity in Lupus Research, “Multiplexed single-cell imaging in pediatric lupus nephritis,” PI, TDC $30,000

06/02/22-05/31/26, NIH National Institute of Allergy and Infectious Disease (NIAID), R01, “SARS-CoV-2 vaccine responses in children with genetic or acquired B cell deficiencies,” PI, TDC $399,910

07/01/2022 – 06/30/2027, NIH National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), U01, “Spatial Mapping of Proteomic and Transcriptional Signatures in Kidney Disease,” Co-PI, TDC $555,864

**B. Training grants**

08/01/2017-07/31/2021, NIH National Institute of Allergy and Infectious Diseases, 5 T32 AI007405 “Training Program in Immunology,” PI Raul Torres. TDC $465,991

08/01/2019-07/31/2022, NIH National Institute of Arthritis and Muskuloskeletal and Skin Diseases, 5 T32AR007534, “Research Training in Rheumatology,” PI V. Michael Holers. TDC $311,477

**C. Pending research support**

NIH NOSI Molecular and Genetic Characterization of Inborn Errors of Immunity, R01 submitted Feb 2022, PI, TDC $500,000/year for 5 years

**D. Previous research support**

07/01/2012-06/30/2015, Pediatric Scientist Development Program, NIH Eunice Kennedy Shriver National Institute of Child Health and Human Development, K12, “Study of Toll-like-Receptor activation via single cell-signal profiling using mass cytometry,” PI, TDC $350,000

07/01/2014-06/30/2015, Stanford Child Health Research Institute, “Pediatric Systemic Lupus Erythematosus: Understanding Disease Heterogeneity at the Single-Cell level,” PI, TDC $35,000

07/01/2014-06/30/2015, Stanford Institute for Immunity, Transplantation and Infection Young Investigator Award, “Understanding Systemic Lupus Erythematosus (SLE) disease heterogeneity at the single-cell level via mass cytometry,” PI, TDC $25,000

07/01/16 – 06/30/19, Webb-Waring Investigator Award Boettcher Foundation, “The Immunomodulatory role of Exosomes in Pediatric SLE Pathogenesis,” PI, TDC $270,000

09/01/16-07/31/19, NIH National Institute of Diabetes and Digestive Kidney Diseases, 1 DP3 DK110845, “Insulin Specific T and B cells in Type 1 Diabetes,” Co-I, TDC $540,000

01/01/17-06/30/17, Immunology and Microbiology Pilot Grant, “Comparison of immune signature in SLE and malaria pediatric patients,” Co-PI, TDC $35,000

05/01/17-04/30/18, Linda Crnic Grand Challenge Grant, “Understanding the Hyperactive Interferon Response in Trisomy 21 at the Single-Cell Level,” PI, TDC $50,000

05/01/17-04/30/20, Takeda Investigator Initiated Sponsored Research, “Pulmonary Physiology and Systemic Inflammatory Signature Investigations into Early Onset Pulmonary Events Associated with Brigatinib use in Non-Small Cell Lung Cancer,” Co-I, TDC $350,000

06/01/18-12/31/21, Jeffrey Modell Foundation Translational Research Award, “Understanding Genetic and Immune Cellular-Signaling Defects in Common Variable Immunodeficiency (CVID) with Granulomatous Lymphocytic Interstitial Lung Disease (GLILD),” PI, TDC $250,000

04/01/19-03/03/20, CARRA-Arthritis Foundation Large Grant, “Exosomes and Immune Modulation in Pediatric SLE,” PI, TDC $50,000

04/01/20-03/31/21, CSL BehringInvestigator Initiated Sponsored Research, “Risk of Prolonged Immunodeficiency in Children after Receiving B Cell Depleting Therapy,” PI, TDC $25,000

09/01/20-08/31/21, RNA Bioscience Pilot Award, “Understanding IL-15/IL-2Rb interactions in a hypomorphic IL-2Rb mouse model,” PI, TDC $25,000

12/01/20-11/30/21, Linda Crnic Institute for Down syndrome Grand Challenge, “Understanding Immunologic and Structural Airway Abnormalities in Children with Down syndrome,” Co-PI, TDC $50,000

09/01/21-08/31/22, RNA Bioscience Pilot Award, “Understanding SARS-CoV-2 B cell responses derived from COVID-19 immunization,” PI, TDC $25,000

# 14. BIBLIOGRAPHY

**A. Papers in peer-reviewed journals**

Davis R.C., Shadt E.E., Smith D.J., **Hsieh E.W.**, Cervino A.C., van Nas A., Rosales M., Doss S., Meng H., Allayee H., Lusis A.J. (2005). A genome-wide set of congenic mouse strains derived from DBA/2J on a C57BL/6J background. Genomics.86(3):259-270. PMID: 16039824

**Hsieh E.W.**, Yeh R.F., Oberoi S., Vargevik K., Slavotinek A.M. (2007). Cleft lip with or without cleft palate: frequency in different ethnic populations from the UCSF Craniofacial Clinic. Am J Med Genet A. 143A(19):2347-51. PMID: 17726687

**Hsieh E.W.**, Vargervik K., Slavotinek A.M. (2008). Clinical and molecular studies of patients with characteristics of Opitz G/BBB syndrome shows a novel MID1 mutation. Am J Med Genet A. 146A(18):2337-45. PMID: 16039824

O’Gorman W.E.\*, **Hsieh E.W.\***,Savig E.S., Gherardini P.F., Hernandez J.D., Hansmann L., Balboni I.M., Utz P.J., Bendall S.C., Fantl W.J., Lewis D.B., Nolan G.P. & Davis, M.M. (2015). Single-cell systems-level analysis of human Toll-like-receptor activation defines a chemokine signature in patients with systemic lupus erythematosus. J Allergy and Clin Immunol. 136(5):1326-36. PMID: 26037552. PMC4640970

Frei A., Bava F.A., Zunder E., **Hsieh E.W.Y.**, Chen S.Y., Gherardini P.F., Nolan G.P. (2016). Highly multiplexed simultaneous detection of RNAs and proteins in single cells. Nat Methods. 13(3):269-75*.* PMID: 26808670. PMC4767631

**Hsieh E.W.Y.**, Hernandez J.D. (2016). Novel tools for primary immunodeficiency diagnosis: making a case for deep profiling. Curr Opin Allergy Clin Immunol. 16(6):549-556. PMID: 27749361

Bousfiha A.A., Duff C., **Hsieh E**. (2017). Ensuring access to immunoglobulin therapies for people with primary immunodeficiency: a need to improve individuals’ quality of life and the sustainability of health-care systems. Front Immunol. Sep 19;8:1165. PMID: 28974952. PMC5610678

O’Gorman W.E.\*, Kong D.S.**\***, Balboni I. M., Bolen, C.R., Rudra P., Ghosh D., Davis M.M., Nolan G.P., **Hsieh E.W.Y.** (2017). Mass cytometry identifies a distinct monocyte cytokine signature shared by clinically heterogeneous pediatric SLE patients. J Autoimmun. S0896-8411(16)30412-7. PMID: 28389038. PMC5628110

Heimall J.R., Hagin J., Henrickson S.E., Hernandez-Trujillo H.S., Tan Y., Kobrynski L., Paris K., Torgerson T.R., VErbsky J.W., Wasserman R.L., **Hsieh E.W.Y.**, Bleesing J.J., Chou J.S., Lawrence M.G., Marsh R.A., Rosenzweig S.D., Orange J.S., Abraham R.S. (2018). Use of genetic testing for primary immunodeficiency patients. J Clin Immunol. 38(3):320-329. PMID: 29675737

Baxter R.M.\*, Kong D.S.\*, Garcia-Perez J.E., O’Gorman W.E., **Hsieh, E.W.Y.** (2018). Single-cell analysis of immunophenotype and cytokine production in peripheral whole blood via mass cytometry. J Vis Exp. 2018 Jun 26;(136). PMID: 30010641. PMC6101995

Fernandez I.Z., Baxter R.M., Garcia-Perez J.E., Vendrame E., Ranganath T., Kong D.S., Lundquist K., Nguyen T., Ogolla S., Black J., Galambos C., Gumbart J.C., Dawany N., Kelsen J.R., de Zoeten E.F., Quinones R., Eissa H., Verneris M.R., Sullivan K.E., Rochford R., Blish C.A., Kedl R.M., Dutmer C.M., **Hsieh E.W.Y.** (2019). A novel human *IL2RB* mutation results in T and NK cell-driven immune dysregulation. J Exp Med. PMID: 31040184. PMC6547857

Garcia-Perez J.E., Baxter R.M., Kong D.S., Tobin R., McCarter M., Routes J.M., Verbsky J., Jordan M.B., Dutmer C.M., **Hsieh E.W.Y.** (2019). CTLA4 message reflects pathway disruption in monogenic disorders and under therapeutic blockade. Front Immunol. PMID: 31156616. PMC6532297

Chan E., Wooten W., **Hsieh E.W.Y.**, Johnston K., Shaffer M., Sandhaus R., van de Veerdonk F. (2019). Diagnostic evaluation of bronchiectasis. Respiratory Medicine.

Schuyler R.P., Jackson C., Garcia-Perez J.E., Baxter R.M., Ogolla S., Rochford R., Ghosh D., Rudra P., **Hsieh E.W.Y.** (2019). Minimizing Batch Effects in Mass Cytometry Data. Front Immunol. PMID: 31681275. PMC6803429

Waugh K.A., Araya P., Pandey A., Jordan K.R., Smith K.P., Grannath R.E., Khanal S., Butcher E., Enriqurez Estrada B., Rachubinsky A.L., McWilliams J.A., Minter R., Dimasi T., Colvin K.L., Baturin D., Pham A.T., Galbaraith M.D., Bartsch K.W., Yeager M.E., Porter C.C., Sullivan K.D., **Hsieh E.W.Y.**, Espinosa J.M. (2019). Mass Cytometry Reveals Global Immune Remodeling with Multi-lineage Hypersensitivity to Typer I Interferon in Down Syndrome. Cell Rep. PMID: 31722205. PMC6871766

Czechowska K., Lannigan J., Aghaeepour N., Back J.B., Begum J., Behbehani G., Bispo C., Bitoun D., Fernández A.B., Boova S.T., Brinkman R.R., Ciccolella C.O., Cotleur B., Davies D., Dela Cruz G.V., Del Rio-Guerra R., Des Lauriers-Cox A.M., Douagi I., Dumrese C., Bonilla Escobar D.L., Estevam J., Ewald C., Fossum A., Gaudillière B., Green C., Groves C., Hall C., Haque Y., Hedrick M.N., Hogg K., **Hsieh E.W.Y.**, Irish J., Lederer J., Leipold M., Lewis-Tuffin L.J., Litwin V., Lopez P., Nasdala I., Nedbal J., Ohlsson-Wilhelm B.M., Price K.M., Rahman A.H., Rayanki R., Rieger A.M., Robinson J.P., Shapiro H., Sun Y.S., Tang V.A., Tesfa L., Telford W.G., Walker R., Welsh J.A., Wheeler P., Tárnok A. (2019). Cyt-Geist: Current and Future Challenges in Cytometry: Reports of the CYTO 2019 Conference Workshops. Cytometry A. PMID: 31833655

Shaker M.S., Oppenheimer J., Grayson M., Stukus D., Hartog N., **Hsieh E.W.Y.**, Rider N., Dutmer C.M., Vander Leek T.K., Kim H., Chan E.S., Mack D., Ellis A.K., Lang D., Lieberman J., Fleischer D., Golden D.B.K., Wallace D., Portnoy J., Mosnaim G., Greenhawt M. (2020). COVID-19: Pandemic Contingency Planning for the Allergy and Immunology Clinic. J Allergy Clin Immunol Pract.  PMID: 32224232. PMC7195089

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**B. Other “products of scholarship”**

Small group development for the first-year medical students in the Blood and Lymph Block: Case on APS-1 (AIRE deficiency) in 2017 (collaboration with Jill Slansky), Case on SCID (RAG deficiency) in 2017 (collaboration with Cullen Dutmer)

Curriculum development for the fourth-year medical students Immunology and Immunotherapy Advanced Science block (collaboration with Aimee Bernard and Cullen Dutmer)

**C. Scientific abstracts (selected)**

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**Hsieh EWY**, Yeh RF, Oberoi S, Vargevik K, Slavotinek AM. A clinical retrospective study of orofacial clefting frequency in different ethnic populations from the UCSF craniofacial clinic database shows Hispanics have a high frequency of additional anomalies. The American Society of Human Genetics, New Orleans, LA. Oct 2006

**Hsieh EWY**, McGhee SA, Garcia-Lloret M, Chatila TA. Expression analysis of monocytes exposed to diesel exhaust particles (DEP) and ultrafine particles (UFP) reveals different transcription response in DEP-exposed monocytes only. Pediatric Academic Societies Annual Meeting, Vancouver, Canada**.** May 2010

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