BIOGRAPHICAL SKETCH

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NAME: Payne, Kimberly J.

eRA COMMONS USER NAME (credential, e.g., agency login): KJPayne

POSITION TITLE: Associate Professor, Depts of Pathology and Human Anatomy, Pediatrics, and Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Corpus Christi State University, Corpus Christi, TX	B.S.	5/1985	Education
Tarleton State University, Stephenville, TX	M.S.T	8/1989	Biological Sciences
University of Oklahoma Health Sciences Center, Oklahoma City,	Ph.D.	7/1998	Microbiology & Immunology
Childrens Hospital Los Angeles, Los Angeles CA	Postdoctoral	2003	Immunology &Hematology

A. Personal Statement

The focus across my career from graduate school to now has been on B cell development (normal and malignant), cytokine effects on these cells (**Ref #1 & #2** below), and developing models of primary cell culture and xenograft models to facilitate translation from bench studies to the clinic. My work in areas directly related to this have been funded by NIH K01, R21, R43 and R01 awards, in addition to funding from pediatric cancer foundations. More recently my research has targeted its focus on a health disparity disease – high-risk B cell acute lymphoblastic leukemia (B-ALL) that overexpresses CRLF2 (CRLF2 B-ALL). This disease occurs 5 times more often in Hispanic children, which make up the majority of our patient base at Loma Linda University Medical Center. My current R01 studies have identified a novel biologic for the treatment of CRLF2 B-ALL, leading us to partner with the LLU incubator, N^3Eight, to startup a company (Elf Zone, Inc.) for commercialization of this treatment. Elf zone has secured an NIH R43 (small business) grant and submitted an NIH R44 application for the development of this technology into a therapeutic.

I have successfully collaborated across institutions on multiple projects. These include work with a PI of another small businesses (Cathy Swindlehurst, NovoMedix) on an NIH R43, as well as a Multi-PI NIH R01 award that I currently share with Dr. Sinisa Dovat, a pediatric/hematologist oncologist at Penn State Hershey (**Ref #3** below). My intramural clinical collaborations have resulted in publications and IRB-approved protocols for obtaining primary human hematopoietic tissues, including leukemia samples that I have used to establish PDX as preclinical models for CRLF2 B-ALL (**Ref #4** below).

1. Parrish YK, Baez I, Milford T-A, Benitez A, Galloway N, Willeman-Rogerio J, Sahakian E, Kagoda M, Huang G, Hao QL, Sevilla Y, Barsky LW, Zielinska E, Price MA, Wall NR, Dovat S, and **Payne KJ** (2009). IL-7 Dependence of human B lymphopoiesis increases during progression of ontogeny from cord blood to bone marrow. ***J Immunol.*** 2009, 182(7):4255-66. PMID 19299724.
2. Milford TA, Su RJ, Francis OL, Baez I, Martinez SR, Coates JS, Weldon AJ, Calderon MN, Nwosu MC, Botimer AR, Suterwala BT, Zhang XB, Morris CL, Weldon DL, Dovat S, and **Payne KJ.** TSLP or IL-7 provide an IL-7Ra signal that is critical for human B lymphopoiesis. ***Eur. J Immunol****.* 2016 Sep;46(9):2155-61. PMID: 27325567
3. Song C, Gowda C, Pan X, Ding Y, Tong Y, Tan BH, Wang H, Muthusami S, Ge Z, Sachdev M, Amin SG, Desai D, Gowda K, Gowda R, Robertson GP, Schjerven H, Muschen M, **Payne KJ,** Dovat S. Targeting casein kinase II restores Ikaros tumor suppressor activity and demonstrates therapeutic efficacy in high-risk leukemia. ***Blood.*** 2015. 126(15):1813-22. PMCID:PMC4600018

This article was featured in editorial highlight in *Inside Blood:* ***Blood*** 2015 126: 1735-1736. doi:10.1182/blood-2015-08-662544

4. Francis Francis OL, Milford TM, Martinez SR, Baez I, Coats JS, Mayagoitia K, Concepcion KR, Ginelli E, Beldiman C, Benitez A, Weldon, AJ, Arogyaswamy K, Shiraz P, Fisher R, Morris CL, Zhang XB, Filippov V, Van Handel B, Ge Z, Song C, Dovat S, Su RJ, and **Payne KJ.** A novel xenograft model to study the role of TSLP-induced CRLF2 signals in normal and malignant human B lymphopoiesis. ***Haematologica,*** 2016 Apr;101(4):417-26. doi: 10.3324/haematol.2015.125336.
   This article was featured in an editorial highlight at publication: *Editorial*: ***Haematologica.*** 2016. 101(4): 391-3. doi: 10.3324/haematol.2016.142448.

B. Positions and Honors

Positions

2003-2004 Res. Assist. Prof. Univ. Southern California Keck School of Medicine (USC KSOM) Div. of Research Immunology and Bone Marrow Transplantation, Childrens Hospital Los Angeles (CHLA).

2004-2006 Assistant Professor of Research, Dept. Pediatrics, USC KSOM, Div. of Research Immunology and Bone Marrow Transplantation CHLA

2006-2013 Assistant Professor, Departments of Pathology and Human Anatomy, Pediatrics and Medicine, Loma Linda University, School of Medicine

2013-present Associate Professor with tenure, Departments of Pathology and Human Anatomy, Pediatrics and Medicine, Loma Linda University, School of Medicine, Director of Translational Research Cancer Center and School of Medicine.

2013-present Director of Translational Research, Cancer Center and School of Medicine

2019- Research Director, Pediatric Leukemia Program

2019- Director, PDX Core Facility, Loma Linda University

Other Experience and Professional Memberships

1998-present Member, American Association of Immunologists

2001-present Member, American Society of Hematology

2006-present Member, American Association of Cancer Research
AACR Minorities in Cancer Research (MICR) Working Group
AACR Pediatric Cancer Working Group

2013-present Member, American Society of Pediatric Hematology/Oncology

2014-present Member, American Federation for Medical Research

2003-present *Ad hoc* reviewer for the journals: *Journal of Immunology, Stem Cells, Human Immunology, International Immunology, Immunology, Immunobiology, Arthritis and Rheumatism, PLOS ONE, Journal of Biomedicine and Biotechnology, Experimental Hematology, Leukemia and Lymphoma, Oncogene, Leukemia Research, Leukemia, Frontiers in Immunology, Nature Immunology, Oncotarget, Cancer Immunology Research,*

2004 Invited speaker, the Leukemia and Lymphoma Society, Stohlman Scholar Symposium

2009-2012 Co-Chair Block Symposia: American Association of Immunologists Annual Meeting

2010-2013 American Association of Immunologists, Education Committee member

2012 Chair AAI Committee Symposium: Academics and SBIR/STTR Grants: Seeking Opportunities, American Association of Immunologists Annual Meeting 2012

2014-present Member, FASEB Clinical and Translational Research Subcommittee

2013-present Grant Review Panels: Pediatric Cancer Research Foundation 2018; Special Emphasis Panel/Scientific Review Group 2018/10 MCH (ad hoc); NIH ZRG1 OBTA (55) Cancer Health Disparities/Diversity in Basic Cancer Research study section, 2016, 2017, 2018 (study section chair); Technical Evaluation Panel (TEP-7B) (study section chair); Bear Necessities Scientific Review Committee 2018; NCI Feasibility and Planning Studies for SPOREs to Investigate Cancer Health Disparities (P20) II; Molecular and Cellular Hematology (ad hoc) NIH NCI ZCA1 RPRB-F (M1) Program Project II (P01) Study Section, 2017, NCI Program Project (P01) study section, phone reviewer 2018; NIH Tumor Cell Biology Study Special Emphasis Panel 2016 (ad hoc); Department of Defense 2014 Peer Reviewed Cancer Research Program (PRCRP); Cancer TMOI of the French National Alliance of Life and Health Sciences (AVIESAN) jointly with French National Cancer Institute (INCa), Joint FAPESP (São Paulo State Science Foundation)

and FCT (Portugal Science and Technology Foundation) research project grant program.
Inserm, (French Institute of Health and Medical Research).

2015 Co-Chair Exp. Biology 2015 Symposium: *From Basic Science to Precision Medicine: The Use of Genomic, Epigenomic and Translational Research to Develop Personalized Treatments*, Boston 2015 Member, Development Committee, American Society of Pediatric Hematology/Oncology.

2015-2017 Member, Development Committee, American Society of Pediatric Hematology/Oncology.

2017-present Member, Scientific Committee, Bear Necessities Pediatric Cancer Foundation

2017-2020 Member, Membership Committee, American Society of Pediatric Hematology/Oncology.

2018 Participation in I-CORP™ at NIH, a commercialization training program, Boston, MA

2018-present Member, Congressman Pete Aguilar's Small business Advisory Committee

Honors and Awards

1995 **Predoctoral Scholarship,** Oklahoma Medical Research Foundation

1998 **Outstanding Academic Achievement Award**, Univ. of Oklahoma HSC Grad Student Ass.

1999-2001 **Career Development Fellowship Award** CHLA Research Institute

2000-2003 **NIH NRSA** National Research Services Award (NIDDK)

2003-2008 **NIH K01** Mentored Career Development Award (NIDDK)

2004-2006 Saban Research Institute Faculty Research Career Development Award

2004 **Travel Award** to the Federation of Clinical Immunology Societies (FOCIS) Center of Excellence Trainee Satellite Symposium, Montreal, Canada

2005, 209, 2012 **Junior Faculty Travel Award** Travel Award, American Association of Immunologists

2012 **Invited Speaker**, American Society of Pediatric Hematology Oncology Annual Meeting 2012

2015 **Invited Symposium Speaker**, FASEB Annual Meeting, Experimental Biology 2015

2016 **Invited Speaker**, International Cooperative Leukemia Group and International Cooperative Laboratory of Hematology, Zhongda Hospital and Southeast University, Nanjing, China

2018 **Best LLU Start Up Award**, from the LLU incubator, N^3Eight

2019 **Distinguished Researcher Award**, Loma Linda University School of Medicine 2019

2019 **Panelist** for "I-Corps at NIH: Getting Researchers Out of the Lab Creates Successful Start-ups" Annual meeting for Association of University Technology Managers, Austin Texas, 2019.

2019 **Panelist** for "Inland California Regional Summit", May 2019. served as a panelist in a session entitled "Advanced Manufacturing and High Tech."

C. Contributions to Science

1. B Cells and Cytokine Signaling in Normal and Malignant Hematopoiesis. My graduate studies focused on defining early stages of mouse B cell development and cytokines critical for regulating B cell development at these stages (**Ref. 1.1**). My goal was to translate this knowledge to understanding normal human immune cell development and treating diseases that arise when this process goes wrong. I developed extensive experience in the use of multi-color flow cytometry in identifying, isolating, and functionally assessing human hematopoietic cells. Human B cell development had been thought to differ from that in mouse with respect to the requirement for IL-7. As a junior faculty I developed a novel human-only *in vitro* model of hematopoiesis and used this model to identify IL-7 as a critical factor at early stages of human B lymphopoiesis (**see Ref #1 under personal statement**). Using surface markers common to both mice and humans my group performed the first comprehensive comparison of nonmemory B cells in mice and humans (**Ref. 1.2**). This model provides an important tool for translating information gained from the mouse to human disease. We went on to use the B cell identification schema in this model to evaluate the mechanisms of therapeutically blocking BAFF cytokine action in lupus (**Ref. 1.3**) Under NIH R21-studies we also developed a novel xenograft model that allows us to evaluate the role of an IL-7-like cytokine (TSLP) in normal and malignant B cell development (**Ref 1.4).** The major focus of research in my laboratory is aimed at identifying therapies to target a pediatric health disparity leukemia that arises from overexpression of CRLF2, a receptor component that pairs with the IL-7Rα to form the receptor for the IL-7-like cytokine, TSLP.

1.1 Payne KJ, Medina KL, Kincade PW (July 1999). Loss of c-kit accompanies B lineage commitment and acquisition of CD45R by most murine B lymphocyte precursors. ***Blood,*** 1999. 94: 713-723. PMID 10397738.

1.2 Benitez A, Weldon AJ, Tatosyan L, Velkuru V, Lee S, Milford TA, Francis OL, Hsu S, Nazeri Kavoos,Casiano CM, Schneider R, Gonzalez J, Su RJ, Baez I, Colburn K, Moldovan I, and **Payne KJ**. Differences in Mouse and Human Non-Memory B Cell Pools. ***Journal of Immunol.*** 2014. 192(10):4610-

4619. PMCID: PMC4046845

1.3 Benitez A, Torralba K, Ngo M, Salto LM, Choi KS, De Vera ME, and **Payne KJ**. Belimumab Alters Transitional B Cell Subset Proportions in Stable Systemic Lupus Erythematosus Patients. **Lupus.** 2019 Oct;28(11):1337-1343. PMID: 31423896

1.4 Francis Francis OL, Milford TM, Martinez SR, Baez I, Coats JS, Mayagoitia K, Concepcion KR, Ginelli E, Beldiman C, Benitez A, Weldon, AJ, Arogyaswamy K, Shiraz P, Fisher R, Morris CL, Zhang XB, Filippov V, Van Handel B, Ge Z, Song C, Dovat S, Su RJ, and **Payne KJ.** A novel xenograft model to study the role of TSLP-induced CRLF2 signals in normal and malignant human B lymphopoiesis. ***Haematologica,*** 2016 Apr;101(4):417-26. doi: 10.3324/haematol.2015.125336. PMID: 26611474

This article was featured in an editorial highlight at publication: *Editorial*: ***Haematologica.*** 2016. 101(4): 391-3. doi: 10.3324/haematol.2016.142448. PMID:27033235

2. Ikaros tumor suppressor in normal and malignant immune cell development. During postdoctoral studies my work focused on the Ikaros DNA binding protein. Ikaros had been described as a lymphoid specific DNA-binding protein. My work was the first to characterize multi-lineage expression of Ikaros in normal human hematopoietic cells (**Ref. 2.1**). It showed that Ikaros is abundant in myeloid as well as lymphoid cells and identified a novel Ikaros isoform that is selectively expressed in the myeloid lineage (**Ref. 2.2**). Ikaros defects have since been identified as a major tumor suppressor in both lymphoid and myeloid leukemia. I have continued studies of the Ikaros DNA binding protein in leukemia through collaborations with Dr. Sinisa Dovat (**Ref. 2.3, 2.4**). The Ikaros protein is mutated in the health disparity leukemia that is the major focus of research in my laboratory.

2.1 **Payne KJ**, Nicolas J-H, Zhu J, Amis J, Barsky LW, Crooks GM (2001) Cutting Edge: Predominant expression of a novel Ikaros isoform in normal human hemapoiesis. ***J Immunol*** 167:1867-1870. PMID 11489963.

Editorial highlight in *Inside Blood:* ***Blood*** 2015 126: 1735-1736. doi:10.1182/blood-2015-08-662544

2.2 **Payne KJ,** Huang GY, Sahakian E, Zhu J, Barteneva NS, Barsky LW, Payne MA, Crooks GM (2003). Ikaros isoform X is selectively expressed in myeloid differentiation. ***J Immunol*** 170:3091-3098. PMID 12626565

2.3 Song C, Gowda C, Pan X, Ding Y, Tong Y, Tan BH, Wang H, Muthusami S, Ge Z, Sachdev M, Amin SG, Desai D, Gowda K, Gowda R, Robertson GP, Schjerven H, Muschen M, **Payne KJ,** Dovat S. Targeting casein kinase II restores Ikaros tumor suppressor activity and demonstrates therapeutic efficacy in high-risk leukemia. ***Blood.*** 2015. 126(15):1813-22. PMCID: PMC4600018

This article was featured in editorial highlight in *Inside Blood:* ***Blood*** 2015 126: 1735-1736. doi:10.1182/blood-2015-08-662544

2.4 Ding Y, Zhang B, Payne JL, SongC, Ge Z, Gowda C, Iyer S, Dhanyamraju PK, Dorsam G, Reeves ME, Desai D, Huang S, **Payne KJ,** Yue D and Dovat S. Ikaros Tumor Suppressor Function Includes Induction of Active Enhancers and Super-Enhancers Along with Pioneering Activity. ***Leukemia.*** 2019 May 9; doi: 10.1038/s41375-019-0474-0. [Epub ahead of print] PMID 31073152

3. Enhancing translational research and core facilities. A major goal of my research activities at LLU has been to enhance translational research potential, both intramurally and through extramural collaborations. I have worked to achieve this by: 1) *Facilitating Transfer of Expertise in Mouse Transplantation Models* –I develop novel transplantation models to study hematopoiesis in normal and disease states. I have facilitated the transfer of these techniques to two laboratories extramurally which has resulted in R01 and R21 funding for those groups and 3 publications for those studies. I have worked with two companies in the development for PDX models for preclinical evaluation of therapies (one resulting in NIH SBIR (R43) funding). 2) *Establishing the CHDMM Flow Cytometry Education and Training core facility* – I wrote an R25 supplement that secured NIH funding for a 7-color flow cytometer and to establish the Flow Cytometry Education and Training Core Facility in the LLU Center for Health Disparities and Molecular Medicine (CHDMM). As current Director of this Core Facility I have facilitated 16 faculty in establishing flow cytometry techniques for studies in their laboratories through training of 53 faculty, students and staff. 3) *Facilitating access to patient samples for translational studies* – I have written multiple IRB-approved protocols for the collection of tissues to facilitate translational studies with collaborators both intramurally and extramurally. The publications below are examples of the scientific contributions that have come from activities described above as a part of extramural (**Ref 3.1**) and intramural (**Ref 3.2 – 3.4**) collaborations. 4) *Developing a Translational Research Training Course* that brings together graduate and medical students with clinical and basic science faculty and fellows in a small group setting where they 1) Identify clinical problems that can be addressed through basic science

research, 2) Define research questions to address these clinical problems, and 3) Develop research plans to answer the research questions.

3.1 Liu A, Wang Y, Ding Y, Baez I, **Payne KJ**, Borghesi L. Cutting Edge: Hematopoietic Stem Cell Expansion and Common Lymphoid Progenitor Depletion Require Hematopoietic-Derived, Cell Autonomous TLR4 in a Model of Chronic Endotoxin. ***J Immunol.*** 2015. 195 (6) 2524-2528. PMID: 2627687.

3.2 Meng X, Neises A, Su RJ, **Payne KJ**, Ritter L, Gridley DS, Wang J, Sheng M, Lau KH, Baylink DJ, Zhang XB. Efficient reprogramming of human cord blood CD34+ cells into induced pluripotent stem cells with OCT4 and SOX2 alone. ***Mol Ther.*** 2012. 20(2):408-16. PMCID: PMC3277237

3.3 Padilla A, Descorbeth M, Almeyda AL, **Payne KJ**, De Leon M. Hyperglycemia magnifies Schwann cell dysfunction and cell death triggered by PA-induced lipotoxicity. ***Brain Research.*** 2011. 1370:64-79. PMCID: PMC3018544

3.4 Nicholas DA, Zhang K, Hung C, Glasgow S, Aruni AW, Unternaehrer J, **Payne KJ**, Langridge WHR, De Leon M. Palmitic acid is a toll-like receptor 4 ligand that induces human dendritic cell secretion of IL-1β. **PLoS One** 2017 May 2;12(5):e0176793.

Complete List of Published Work in My Bibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/kimberly.payne.1/bibliography/41667695/public/?sort=date&direction=ascending

D. Additional Information: Research Support and/or Scholastic Performance

1 R01 CA209829-01 Payne and Dovat (Multi-PI) 07/01/16–06/30/21
Sponsor: NIH
Project Title: Targeting CRLF2 and Ikaros to Reduce Health Disparities in Childhood Leukemia
Goal: To evaluate the efficacy of targeting the Ikaros and CRLF2 pathways, both of which are mutated in high-risk CRLF2+ B-ALL, a leukemia that is 5X more common in Hispanic children than others.
Role: Principal Investigator

R25 GM060507 De Leon (PI) 01/01/17–12/31/22
Sponsor: NIH/NIGMS
Title: The NIH-LLU Initiative for Maximizing Student Development
Goal: To increase the number of students from underrepresented groups graduating with PhD degrees from Loma Linda University. The program supports and provides training for 10 PhD students per year.
Role on Project: Collaborator

Completed Research Support (Selected Research Support Last 4 years)

1 R43 CA224723-01 Payne (University PI) 09/25/17– 8/31/19
Sponsor: NIH/ NCI
Title: Biologic for the Treatment of High Risk B Cell Acute Lymphoblastic Leukemia
Goal: To evaluate efficacy a biologic for the treatment of CRLF2 B-cell acute lymphoblastic leukemia (B-ALL).
Total Direct Costs: $96,413
Role Principal Investigator

P20 MD006988 De Leon (PI) 07/01/12–01/31/17
Sponsor: NIH/NIGMS
Title: Loma Linda University Center for Health Disparities Research
Goal: Use innovative approaches to eliminate or reduce health disparities
Role on Project: Collaborator

Hyundai Scholar's Hope Grant Payne (PI) 01/01/15–12/31/16
Sponsor: Hyundai Hope on Wheels
Project Title: Novel Targeted Therapy for High-Risk Pediatric Leukemia
Goal: To evaluate the mechanisms and efficacy of drugs that target BCL2 family pro-survival molecules upregulated by TSLP-induced signaling in CRLF2 B-ALL as a part of novel combination therapy.
Role: Principal Investigator

R21CA162259 Payne (PI) 06/01/12–03/31/15
Sponsor: NIH/NCI
Project Title: Xenograft Model to Study Impact of CRLF2-Ligand in Hispanic Childhood B-ALL
Goal: To develop and evaluate an *in vivo* model of CRLF2 function in B-ALL
Role: Principal Investigator