



CURRICULUM VITAE

NAME: Elsa Sanchez-Lopez, PhD

CURRENT POSITION: Assistant Professor in Residence
Department of Orthopaedic Surgery
University of California, San Diego

OFFICE ADDRESS: UC San Diego Altman Clinical and Translational Research Institute
L2W505
9452 Medical Center Dr,
La Jolla, CA 92037

BUSINESS TELEPHONE: Cell phone +1 6193158608
Office +8582463624

E-MAIL: esl023@health.ucsd.edu
Elsasanchezlopez19@gmail.com

SUMMARY

- Cellular and molecular biologist with more than 10 years of experience
- Research interest in innate immunity, immune metabolism and inflammation
- More than 35 scientific articles (h-index 28) in high quality international journals such as *Cell Metabolism, Cell, Nature, Immunity, Cell Death & Differentiation, Oncogene and JASN*
- Experience managing research projects and teams

EDUCATION

1996-2001 B.Sc. in Biology. University Complutense. Madrid, Spain.
2003-2008 PhD in Biochemistry, Molecular Biology and Biomedicine. University
Autonoma of Madrid, Spain.

PROFESIONAL EXPERIENCE

2001-2003	Research assistant at Renal and Vascular pathology laboratory at IIS-Fundación Jiménez Díaz. University Autonoma of Madrid, Spain.
2003-2008	PhD in Biochemistry, Molecular Biology and Biomedicine. IIS-Fundación Jiménez Díaz. University Autonoma of Madrid, Spain.
2008-2009	Postdoctoral Researcher. IIS-Fundación Jiménez Díaz. Madrid, Spain.
2009-2012	Postdoctoral Fellow. Translational Oncology Unit. IIB-CSIC. Madrid, Spain.
2012-2016	Postdoctoral Fellow. University of California San Diego. La Jolla, CA, USA
2016-2021	Assistant Project Scientist. University of California San Diego. La Jolla, CA, USA
2021-	Assistant Professor In Residence. Department of Orthopaedic Surgery. University of California San Diego. La Jolla, CA,USA.

HONORS AND AWARDS

2001	<u>B.Sc. in Biology</u> . University Complutense. Madrid, Spain
2003	<u>Hospital Nephrology Research award from Spanish Society of Nephrology</u> to the work “The connective tissue growth factor is the mediator of Angiotensin II-caused fibrosis”. Co-author.
2003-2007	<u>PhD Fellowship</u> for Research Education funded by Health Institute "Carlos III. Madrid. Spain
2007	<u>Accreditation of competition for the use and handling of experimental animals</u> , Ministry of Agriculture and Comunidad Autonoma de Madrid. Spain
2007	<u>Novartis Award</u> from the Spanish Society of Cardiology, Madrid. Spain
2008	<u>Outstanding “Cum Laude” PhD degree in Biochemistry, Molecular Biology and Biomedicine</u> , University Autonoma of Madrid. Spain
2009	<u>Extraordinary Doctorate award</u> , School of Medicine of University Autonoma of Madrid. Spain
2010-2013	<u>Postdoctoral Fellowship</u> under the program "Sara Borrell" Health Institute "Carlos III". Spain
2019-2021	<u>Microenvironment in Arthritis research center (MARC) pilot project award</u> . UCSD.
2020	<u>K01 mentored research scientist development award</u> . NIAMS NIH.

PROFESIONAL DEVELOPMENT

Specialization Courses

2001	Techniques and Applications for cell culture. Spanish National Research Council-CSIC. Madrid, Spain
2002	Medicinal Chemistry. Spanish National Research Council-CSIC. Madrid, Spain.
2002 - 2003	Teaching Certificate (CAP). Complutense University. Madrid, Spain
2009	DNA Array Data Analysis. Biomol Informatics. Autonoma University. Madrid, Spain

External Professional activities

2017 - Reviewer for Leukemia (IF: 10.023).
2017 - Reviewer for BMC Cancer (IF: 3.288).
2017 - Reviewer for Biology Letters (IF: 3.345).
2017 - Reviewer for Scientific Reports (IF: 4.122).
2019 - Reviewer for Arthritis Research & Therapy (IF: 4.14).

Societies

Member of Spanish Society of Immunology.
Member of The American Association of Immunologist (AAI).
Member of International Cytokine & Interferon Society (ICIS).

Invited lectures

03/16/2009 “The role of CTGF in kidney damage: Implications in fibrosis and inflammation”. Research discussions in the Physiology Department at Alcala University, Madrid, Spain.

08/17/2018 “Mitochondrial metabolism as a Positive and Negative Regulator of the NLRP3 Inflammasome”. FASEB: Immunological aspects of Metabolic Syndrome. Aspen, Co, USA.

03/29/2021 “Choline metabolism shapes macrophage type”. La Jolla Arthritis Conference. La Jolla, Ca, USA.

04/12/2021 “Metabolic control of inflammation”. Microenvironment in Arthritis Resource Center Seminar series. La Jolla, Ca, USA.

Teaching

BIOM275 Seminars in Pharmacology (2020-2021)- discussion facilitator.

PUBLICATIONS (selected in the last 6 years)

1. Hongxu Xian, Yuan Liu, Alexandra Rundberg Nilsson, Raphaella Gatchalian, Timothy R. Crother, Warren G. Tourtellotte, Yi Zhang, German R. Aleman-Muench, Gavin Lewis, Weixuan Chen, Sarah Kang, Melissa Luevanos, Dorit Trudler, Stuart A. Lipton, Pejman Soroosh6, John Teijaro, Juan Carlos de la Torre, Moshe Arditi, Michael Karin, **Elsa Sanchez-Lopez**. Metformin inhibition of mitochondria ATP and DNA synthesis abrogates NLRP3 inflammasome activation and pulmonary inflammation. Accepted. *Immunity*. 2021. Online June 8th.
2. **Sanchez-Lopez E***, Ghia EM*, Antonucci L, Sharma N, Rassenti LZ, Xu J, Sun B, Kipps TJ, Karin M. NF-kB-p62-NRF2 survival signaling is associated with high ROR1 expression in chronic lymphocytic leukemia. *Cell Death Differ*. 2020 Jan 28. * These authors have contributed equally.

3. Alique M, **Sanchez-Lopez E**, Bodegas G, Giannarelli C, Carracedo J, Ramirez R. Hypoxia-inducible factor-1a: The master regulator of endothelial cell senescence in vascular aging. *Cells*. 2020 Jan 13;9(1). pii: E195. Review.
4. Chen Y, Chen L, Yu J, Ghia EM, Choi MY, Zhang L, Zhang S, **Sanchez-Lopez E**, Widhopf GF 2nd, Messer K, Rassenti LZ, Jamieson C, Kipps TJ. Cirmtuzumab blocks Wnt5a/ROR1 stimulation of NF- κ B to repress autocrine STAT3 activation in chronic lymphocytic leukemia. *Blood*. 2019 Sep 26;134(13):1084-1094.
5. Oliveira PG, Farinon M, **Sanchez-Lopez E**, Miyamoto S, Guma M, Fibroblast-like synoviocytes glucose metabolism as a therapeutic target in rheumatoid arthritis. *Front Immunol*. 2019 Aug 2;10:1743. eCollection 2019. Review.
6. **Sanchez-Lopez E**, Cheng A, Guma M. Can Metabolic Pathways Be Therapeutic Targets in Rheumatoid Arthritis? *J Clin Med*. 2019 May 27;8(5). pii: E753.
7. **Sanchez-Lopez E**, Zhong Z, Stubelius A, Sweeney SR, Booshehri L, Antonucci L, Liu-Bryan R, Lodi A, Terkeltaub R, Lacal JC, Tiziani S, Murphy AN, Hoffman HM, Guma M, Karin M. Choline uptake and metabolism modulate macrophage IL-1 β and IL-18 production. *Cell Metabolism*. 2019 Jun 4;29(6):1350-1362.e7
8. Zhong Z*, Liang S*, **Sanchez-Lopez E**, He F, Shalapour S, Lin XJ, Wong J, Ding S, Seki E, Schnabl B, Hevener AL, Greenberg HB, Kisseleva T, Karin M. New mitochondrial DNA synthesis enables NLRP3 inflammasome activation. *Nature*. 2018; 560(7717):198-203. * These authors have contributed equally.
9. Bustamante MF, Oliveira PG, Garcia-Carbonell R, Croft AP, Smith JM, Serrano RL, **Sanchez-Lopez E**, Liu X, Kisseleva T, Hay N, Buckley CD, Firestein GS, Murphy AN, Miyamoto S, Guma M. Hexokinase 2 as a novel selective metabolic target for rheumatoid arthritis. *Annals of the rheumatic diseases*. 2018.
10. Sanchez-Gonzalez PD, Lopez-Hernandez FJ, Dueñas M, Prieto M, **Sanchez-Lopez E**, Thomale J, Ruiz-Ortega M, Lopez-Novoa JM, Morales AI. Differential effect of quercetin on cisplatin-induced toxicity in kidney and tumor tissues. *Food Chem Toxicol*. 2017 Sep;107(Pt A):226-236. doi: 10.1016/j.fct.2017.06.047. Epub 2017 Jun 30. PubMed PMID: 28669851.
11. Xing W, Xiao Y, Lu X, Zhu H, He X, Huang W, **Lopez ES**, Wong J, Ju H, Tian L, Zhang F, Xu H, Wang SD, Li X, Karin M, Ren H. GFI1 downregulation promotes inflammation-linked metastasis of colorectal cancer. *Cell death and differentiation*. 2017; 24(5):929-943.
12. Zhong Z*, **Sanchez-Lopez E***, Karin M. Autophagy, NLRP3 inflammasome and auto-inflammatory/immune diseases. *Clinical and experimental rheumatology*. 2016; 34(4 Suppl 98):12-6. * These authors have contributed equally.
13. Zhong Z*, **Sanchez-Lopez E***, Karin M. Autophagy, Inflammation, and Immunity: A Troika Governing Cancer and Its Treatment. *Cell*. 2016; 166(2):288-298. * These authors have contributed equally.
14. **Sanchez-Lopez E**, Flashner-Abramson E, Shalapour S, Zhong Z, Taniguchi K, Levitzki A, Karin M. Targeting colorectal cancer via its microenvironment by inhibiting IGF-1 receptor-insulin receptor substrate and STAT3 signaling. *Oncogene*. 2016; 35(20):2634-44.

15. Zhong Z*, Umemura A*, **Sanchez-Lopez E**, Liang S, Shalapour S, Wong J, He F, Boassa D, Perkins G, Ali SR, McGeouh MD, Ellisman MH, Seki E, Gustafsson AB, Hoffman HM, Diaz-Meco MT, Moscat J, Karin M. NF- κ B Restricts Inflammasome Activation via Elimination of Damaged Mitochondria. *Cell*. 2016; 164(5):896-910. * These authors have contributed equally.
16. Guma M, **Sanchez-Lopez E**, Lodi A, Garcia-Carbonell R, Tiziani S, Karin M, Lacial JC, Firestein GS. Choline kinase inhibition in rheumatoid arthritis. *Annals of the rheumatic diseases*. 2015; 74(7):1399-407.
17. Shalapour S, Font-Burgada J, Di Caro G, Zhong Z, **Sanchez-Lopez E**, Dhar D, Willimsky G, Ammirante M, Strasner A, Hansel DE, Jamieson C, Kane CJ, Klatte T, Birner P, Kenner L, Karin M. Immunosuppressive plasma cells impede T-cell-dependent immunogenic chemotherapy. *Nature*. 2015; 521(7550):94-8.
18. Alique M, **Sanchez-Lopez E**, Rayego-Mateos S, Egido J, Ortiz A, Ruiz-Ortega M. Angiotensin II, via angiotensin receptor type 1/nuclear factor- κ B activation, causes a synergistic effect on interleukin-1- β -induced inflammatory responses in cultured mesangial cells. *J Renin Angiotensin Aldosterone Syst*. 2015 Mar;16(1):23-32. doi: 10.1177/1470320314551564. Epub 2014 Oct 29. PubMed PMID: 25354522.
19. Wang K, Kim MK, Di Caro G, Wong J, Shalapour S, Wan J, Zhang W, Zhong Z, **Sanchez-Lopez E**, Wu LW, Taniguchi K, Feng Y, Fearon E, Grivennikov SI, Karin M. Interleukin-17 receptor a signaling in transformed enterocytes promotes early colorectal tumorigenesis. *Immunity*. 2014; 41(6):1052-63.
20. Alique M, Civantos E, **Sanchez-Lopez E**, Lavoz C, Rayego-Mateos S, Rodrigues-Díez R, García-Redondo AB, Egido J, Ortiz A, Rodríguez-Puyol D, Rodríguez-Puyol M, Ruiz-Ortega M. Integrin-linked kinase plays a key role in the regulation of angiotensin II-induced renal inflammation. *Clinical science (London, England : 1979)*. 2014; 127(1):19-31.
21. **Sanchez-Lopez E**, Zimmerman T, Gomez del Pulgar T, Moyer MP, Lacial Sanjuan JC, Cebrian A. Choline kinase inhibition induces exacerbated endoplasmic reticulum stress and triggers apoptosis via CHOP in cancer cells. *Cell death & disease*. 2013; 4:e933.

A complete publication record can be found at:

<https://www.ncbi.nlm.nih.gov/myncbi/1pMIiOjYoCiQb/bibliography/public/>

ABSTRACT PRESENTATIONS (selected)

1. Tanya Major, Ruth Topless, **Elsa Sanchez-Lopez**, Jennie Harre Hindmarsh, Lisa Stamp, Nicola Dalbeth, Monica Guma, Robert Terkeltaub and Tony Merriman. Nutrient content of gout flare trigger foods. Abstract accepted #0653. ACR Convergence 2020 (November 5-9 2020). Poster.
2. Alyssa Torres, Brian Pedersen, Gary Firestein, **Elsa Sanchez-Lopez**, Monica Guma. Role of glutamine metabolism in rheumatoid arthritis fibroblast-like synoviocyte aggressive phenotype. Abstract accepted #0783. ACR Convergence 2020 (November 5-9 2020). Poster.
3. **Elsa Sanchez-Lopez**, Zhenyu Zhong, Alex Stubelius, Shannon R Sweeney, et al. Choline uptake and metabolism modulate macrophage immunity. Immunology 2019, American Association of Immunologist (AAI), San Diego, CA, USA. 2019. Poster and Oral.

4. **Elsa Sanchez-Lopez**, Zhenyu Zhong, Alex Stubelius, Shannon R Sweeney, et al. Role of Choline in Gouty Inflammation. 2018 ACR/ARHP Annual Meeting, Chicago, IL, USA. 2018. Oral.
5. **Elsa Sanchez-Lopez**, Emanuela M. Ghia, Laura Antonucci, Laura Z. Rassenti, et al. Activation of NF-Kappa B-p62-NRF2 signaling supports the survival of CLL cells that express high levels of ROR1. 2018 American Society of Hematology (ASH) Annual Meeting, San Diego, CA, USA. 2018. Poster.
6. Roxana Coras, Liang-Yu Chen, **Elsa Sanchez-Lopez**, Martin Lotz, Ru Liu-Bryan, and Monica Guma. The potential role of choline kinase alpha in osteoarthritis. ACR/ARHP Annual Meeting 2018, Chicago, IL, USA. Poster
7. Patricia Oliveira, Marta Fernandez Bustamante, Ricard Garcia Carbonell, **Elsa Sanchez-Lopez**, TeresinaLaragione, Percio S. Gulko, Gary S. Firestein, Anne N Murphy, Shigeki Miyamoto and Monica Guma. Role of Mitochondria-bound HK2 in Rheumatoid Arthritis fibroblast like synoviocytes. ACR/ARHP Annual Meeting 2018, Chicago, IL, USA. Poster
8. **Elsa Sanchez-Lopez**, Zhenyu Zhong, Michael Karin. Mitochondrial metabolism as a Positive and Negative Regulator of the NLRP3 Inflammasome. FASEB_Immunological aspects of Metabolic Syndrome 2018, Aspen, CO, USA. Oral (Invited Speaker).
9. Zhenyu Zhong, Atsushi Umemura, **Elsa Sanchez-Lopez**, Shuang Liang, Shabnam Shalpour, Jerry Wong, Feng He, Daniela Boassa, Guy Perkins, Syed Raza Ali, Matthew G McGeough, Mark H Ellisman, Ekihiro Seki, Asa B Gustafsson, Hal M Hoffman, Maria T Diaz-Meco, Jorge Moscat and Michael Karin. NF- κ B restricts NLRP3 inflammasome activation via p62-dependent mitophagy which eliminates mitochondrial signals. American Association of Immunologist (AAI) Annual Meeting 2016. Seattle, WA, USS. Oral.
10. Monica Guma, **Elsa Sanchez-Lopez**, Alessia Lodi, Stefano Tiziani, Juan Carlos Lacal, Michael Karin, Gary S. Firestein. Choline Kinase: a novel target for Rheumatoid arthritis. American College of Rheumatology (ACR) Annual Meeting 2013. San Diego, CA, USA. *Session Info*: Rheumatoid Arthritis - Animal Models I. Poster
11. **Elsa Sanchez-Lopez**, Laura Menchen, Esther Seco, Teresa Gomez del Pulgar, et al. Inhibition of choline kinase increases endoplasmic reticulum stress proteins. American Association of Cancer Research (AACR) 102nd Annual Meeting. Orlando, FL, USA. 2011. Poster.
12. **Elsa Sanchez-Lopez**, Sandra Rayego, Javier Sanchez-Rodriguez, Raquel Rodrigues-Diez, Raul Rodrigues-Diez, Louis Stark, Alberto Ortiz and Marta Ruiz-Ortega. New function of connective tissue growth factor CTGF: modulation of NF-kappa B and inflammation. Congreso Nacional de la Sociedad Espanola de Nefrologia (SEN), 2008. San Sebastian, Spain. Poster
13. **Elsa Sanchez-Lopez**, Juan Rodriguez -Vita, Monica Ruperez, Cecile Cartier, Vanesa Esteban, Gisselle Carvajal, Raquel Rodrigues-Diaz, Jesus Egido and Marta Ruiz-Ortega. Interleukin-1 beta modulates angiotensin II-mediated fibrotic and inflammatory responses. Role of MAPK and NF-

kB pathways. American Society of Nephrology (ASN) Renal Week, 2006. San Diego, CA, USA.
Session Info: Tubulo-interstitial damage and mediators of disease. Oral

14. **Elsa Sanchez-Lopez**, Andres Lopez, Vanesa Esteban, Susana Yague, Jesus Egido, Maria Victoria Alvarez Arrollo and Marta Ruiz-Ortega. Angiotensin II increases vascular endothelium growth factor (VEGF) in the kidney through hypoxia inducible factor (HIF1) and REDOX mechanism. Congreso de la Sociedad española de Nefrología (SEN), 2005. Malaga, Spain. Poster

RESEARCH SUPPORT

Role of Choline metabolism in activated macrophage phenotype. K01 Award. May 2020-April 2025.
Principal Investigator: Elsa Sanchez-Lopez. Funding Entity: NIAMS/NIH. Total Amount: \$579,600.00.

Choline metabolism as a potential therapy for Osteoarthritis. Pilot project. September 2019- November 2021.

Principal Investigator: Elsa Sanchez Lopez. Funding Entity: Microenvironment in Arthritis Resource Center at Division of Rheumatology, Allergy and Immunology at University of California San Diego. P30/NIAMS/NIH. Total amount: \$50,000.00.