

**BIOGRAPHICAL SKETCH**

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NAME: Santos-Argumedo, Leopoldo

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

POSITION TITLE: Professor

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
National Polytechnic Institute	BSc	1980	Bacteriology and Parasitology Chemist
National Polytechnic Institute	MSc	1985	Immunology
National Polytechnic Institute	PhD	1989	Immunology
National Institute for Medical Research, Mill Hill, London, U.K.	Postdoctoral	1991	Immunology
DNAX Research Institute, Palo Alto, California, USA	Postdoctoral	1993	Immunology

**A. Personal Statement**

I have contributed to the understanding of the B-cell Biology through the use of monoclonal antibodies. Specifically, I characterized three monoclonal antibodies, one of them helped to define a new co-stimulatory molecule on the surface of B and T lymphocytes (CD38). A second monoclonal was used to identify and clone a B cell marker (CD22), and the third of this group is currently in use to analyze B cell motility and cytoskeleton changes. For more than 12 years, my laboratory has contributed to identify and characterize patients suffering primary immunodeficiencies (IDP). Before we started this group, the study of these diseases in Mexico was incipient so we have contributed to a better diagnosis of the patients which has resulted in a timely and better oriented treatments. In academia, I was one of the founders of the Molecular Biomedicine Department at the Center of Research and Advances Studies (CINVESTAV) in Mexico City. The main aim of this graduate program is to improve biomedical research through a multidisciplinary approach, using the methods available to each specialty. The department includes professionals in Immunology, Molecular Biology, Cell Biology, Parasitology, Epidemiology, Neurodegenerative Diseases and Clinical Research. I have mentored 27 Ph.D. students, 42 M.Sc. students and 13 B.Sc. students. I have more than 122 publications in peer review journals. I served as president of the Mexican Society of Immunology.

**Santos-Argumedo L**, Teixeira C, Preece G, Kirkham PA, Parkhouse RM. *A B lymphocyte surface molecule mediating activation and protection from apoptosis via calcium channels.* **J Immunol.** 1993 151(6):3119-30.

Howard M, Grimaldi JC, Bazan JF, Lund FE, **Santos-Argumedo L**, Parkhouse RM, Walseth TF, Lee HC. *Formation and hydrolysis of cyclic ADP-ribose catalyzed by lymphocyte antigen CD38.* **Science.** 1993 262(5136):1056-9.

**Santos-Argumedo L**, Kincade PW, Partida-Sánchez S, Parkhouse RM. *CD44-stimulated dendrite formation ('spreading') in activated B cells.* **Immunology.** 1997 90(1):147-53

Moreno-García M. E., López-Bojórques L. N., Zentella A., Humphries L. A., Rawlings D. J. and **Santos-Argumedo L**. *CD38 Signaling regulates B lymphocyte activation via a phospholipase C (PLC)- $\gamma$ 2-independent, protein kinase C, phosphatidylcholine-PLC, and phospholipase D-dependent signaling cascade.* **J. Immunol.** 2005 174(5): 2687–2695.

## B. Positions and Honors

### Positions and Employment

1980-1993 Department of Immunology, National School of Biological Sciences, IPN.  
1982-1983 National School of Professional Studies campus Iztacala, UNAM.  
1983-1986 Department of Infectious Diseases, National Institute of Pediatrics, SSA.  
1993-1999 Department of Cell Biology, CINVESTAV-IPN.  
2005-2007 Visiting Scientist, Laboratory of Immunogenetics, NIAID-NIH, MD, USA.  
1999 Department of Molecular Biomedicine, CINVESTAV-IPN.

### Other Experience and Professional Memberships

1983 Mexican Association of Immunology.  
1990 British Society for Immunology.  
1990 The Biochemical Society.  
1992 American Association for the Advancement of Science.  
1994 Mexican Academy of Sciences.  
1999 American Association of Immunologists.

### Honors

**1984** "Lázaro Cárdenas" medal for best GPA during M.Sc. studies, National Polytechnic Institute, Mexico City.  
**1986** "High honors", MSc thesis defense, National Polytechnic Institute, Mexico City.  
**1990** Award for best GPA during PhD studies, National Polytechnic Institute, Mexico City.  
**1997** Travel research award from the Royal Society of London.  
**1998** Award and medal for Excellence in Biomedical Research "Miguel Aleman Foundation"  
**1999** Award for Excellence in Research from the National Polytechnic Institute, Mexico City.  
**2002-2004** President, Mexican Society of Immunology.  
**2007** Medical Research Award "Dr. Jorge Rosenkranz."  
**2010** Biomedical Research Award in human genetics. ("Premio GEN").  
**2011-2012** Member of Foro Consultivo Científico y Tecnológico (FCCyT).  
**2012** Medical Research Award "Dr. Jorge Rosenkranz."  
**2013-2016** Council Member of the International Union of Immunological Societies (**IUIS**).  
**2015-2018** President of Latin-American Association of Immunology (**ALAI**).

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## C. Contribution to Science

Primary immunodeficiencies (IDP) are a diverse group of more than 300 genetic disorders that primarily affect the development and/or the functionality of the immune system. Most of them are monogenic disorders, but the spectrum of the IDP is constantly expanding with the identification of new immunodeficiency syndromes through the generation of technologies of sequencing and clinical understanding. Patients typically present with increased susceptibility to infections or infections by unusual organisms and can also develop autoimmunity or antoinflammatory diseases and neoplasms. Although the supportive treatments are effective for many of these conditions, the most severe hematopoietic progenitor requires definitive treatment early through a transplant of cells in order to prevent chronic morbidity and early mortality. The study of these diseases, in Mexico, is incipient so our group (mainly consisting of researchers from the National Institute of Pediatrics and our laboratory) is given the task of identify and characterize both clinic as molecularly to such patients. We hope these studies contribute to a better diagnosis of the patients which can result in a timely and better oriented treatment. In addition, we hope to learn from these patients the molecular determinants that control various functions of the immune system in a natural environment.

López-Herrera G, Berron-Ruiz L, Mogica-Martínez D, Espinosa-Rosales F, Santos-Argumedo L. *Characterization of Bruton's tyrosine kinase mutations in Mexican patients with X-linked agammaglobulinemia*. **Mol. Immunol.** 2008. 45:1094-1098.

Vargas-Hernández A, López-Herrera G, Maravillas-Montero JL, Vences-Catalán F, Mogica-Martínez D, Rojo-Domínguez A, Espinosa-Rosales F, **Santos-Argumedo L.** *Consequences of Two Naturally Occurring Missense Mutations in the Structure and Function of Bruton Agammaglobulinemia Tyrosine Kinase*, **IUBMB LIFE**, 2012, 64(4): 346-353.

Vargas-Hernández A, Berrón-Ruiz L, Staines-Boone T, Zarate-Hernández M, Córdova-Calderón W, Espinosa-Rosales F, **Santos-Argumedo L.** *Clinical and genetic analysis of patients with X-linked hyper-IgM syndrome.*, **Clin Genet.** **2012**, 64(4):346-53

Ramirez-Alejo N, Blancas-Galicia L, Yamazaki-Nakashimada M, García-Rodríguez SE, Rivas-Larrauri F, Paolo-Cienfuegos DP, Alcantara-Salinas A, Espinosa-Rosales F, **Santos-Argumedo L.** *Molecular analysis for patients with IL-12 receptor  $\beta$ 1 deficiency.* **Clin Genet.** **2013** 86(2):161-6.

Ramírez-Alejo N, Alcántara-Montiel JC, Yamazaki-Nakashimada M, Duran-McKinster C, Valenzuela-León P, Rivas-Larrauri F, Cedillo-Barrón L, Hernández-Rivas R, **Santos-Argumedo L.** *L. Novel hypomorphic mutation in IKBKG impairs NEMO-ubiquitylation causing ectodermal dysplasia, immunodeficiency, incontinentia pigmenti, and immune thrombocytopenic purpura.* **Clinical Immunology**, **2015**, 160: 2163–171.

Alcántara-Montiel JC, Staines-Boone T, López-Herrera G, Espinosa-Rosales F, Espinosa-Padilla SE, Hernández-Rivas R, **Santos-Argumedo L.** *Functional Characterization of two New STAT3 Mutations Associated with hyper-ig e syndrome in a Mexican Cohort.* **Clin Genet.** **2016**, 89(2):217-21.

Myosins comprise a family of motor proteins whose role in muscle contraction and motility in a large range of eukaryotic cells has been widely studied. Although these proteins have been characterized extensively and much is known about their function in different cellular compartments, little is known about these molecules in hematopoietic cells. Myosins expressed by cells from the immune response are involved in maintaining plasma membrane tension, moving and secreting vesicles, endo- and exocytotic processes, and promoting the adhesion and motility of cells. We interested in increase our current understanding of class I myosins in lymphocytes, with an emphasis on the emerging roles of these molecular motors in immune functions.

Maravillas-Montero JL., Gillespie PG., Patiño-López G., Shaw S., **Santos-Argumedo L.** *Myosin 1c Participates in B Cell Cytoskeleton Rearrangements, Is Recruited to the Immunologic Synapse, and Contributes to Antigen Presentation.* **J Immunol.** **2011**, Sep 15;187(6):3053-3063.

Maravillas-Montero JL., **Santos Argumedo L.** *The myosin family: unconventional roles of actin-dependent molecular motors in immune cells.* **J. Leukoc Biol.** **2012** Jan; 91(1):35-46.

**Santos-Argumedo L.**, Maravillas-Montero JL, López-Ortega O. *Class I myosins in B-cell physiology: functions in spreading, immune synapses, motility, and vesicular traffic.* **Immunol Rev.** **2013**, 256(1):190-202.

López-Ortega O, Ovalle-García E, Ortega-Blake I, Antillón A, Chávez-Munguía B, Patiño-López G, Fragoso-Soriano R, **Santos-Argumedo L.** *Myo1g is an active player in maintaining cell stiffness in B-lymphocytes.* **Cytoskeleton** (Hoboken). **2016** May;73(5):258-68.

Piedra-Quintero ZL, Serrano C, Villegas-Sepúlveda N, Maravillas-Montero JL, Romero-Ramírez S, Shibayama M, Medina-Contreras O, Nava P, **Santos-Argumedo L.** *Myosin 1F Regulates M1-Polarization by Stimulating Intercellular Adhesion in Macrophages.* **Front Immunol.** **2019** Jan 10;9:3118. doi: 10.3389/fimmu.2018.03118. eCollection.

**Complete List of Published Work in MyBibliography:** <https://www.ncbi.nlm.nih.gov/pubmed/?term=Santos-Argumedo+L>

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

##### Ongoing Research Support

**2016-2019 CB-2015-01-255053** "Classical non-conventional myosins regulate membrane tension and contribute to vesicular transit in lymphocytes and macrophages." National Council of Science and Technology (CONACYT), Mexico.

**2017-2019 PN-2015-01-900** "Detection of immunoglobulin A2 in human colostrum as a screening for selective deficiency of IgA2 in mothers and its correlation with infections (respiratory and gastrointestinal tract) in the newborn during the first trimester of life." National Council of Science and Technology (CONACYT), Mexico.

##### Completed Research Support

- **1993-1995** National Council of Science and Technology (CONACYT), Mexico.
- **1996-1999** National Council of Science and Technology (CONACYT), Mexico.
- **1997-2000** Third World Academy of Sciences, Trieste, Italy.

- **1998-2001** "Miguel Aleman Foundation". Mexico.
- **2000-2002** National Council of Science and Technology (CONACYT), Mexico.
- **2001-2003** CONACYT-CSIC (National Council of Scientific Research, Spain, Consejo Superior de Investigaciones Científicas -Spain)
- **2003-2006** CONACYT-CSIC (National Council of Scientific Research, Spain, Consejo Superior de Investigaciones Científicas-Spain)
- **2003-2006** National Council of Science and Technology (CONACYT), Mexico.