

Principal Investigator/Program Director (Last, first, middle):

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed for Form Page 2.
Follow the sample format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Cáceres, Alfredo Oscar		POSITION TITLE Investigator ("Superior") Argentine Research Council (CONICET). Professor and Director Instituto Investigación Médica Mercedes y Martín Ferreyra (INIMEC-CONICET-UNC)	
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Colegio Gabriel Taborin, Córdoba	Bachelor	1968	Science/Humanities
University of Córdoba Medical School	MD	1975	Medicine
University of Córdoba Medical School	PhD	1979	Medicine & Physiology
University of Virginia Medical School	Post-doc	1980-82	Neuroscience
University of Albany Medical School	Post-doc	1982	Neuroscience

NOTE: The Biographical Sketch may not exceed five pages. Items A and B (together) may not exceed two of the four-page limit. Follow the formats and instructions on the attached sample.

A. Personal Statement

My lab works on the role of the cytoskeleton in the establishment of neuronal polarity, a term introduced for the first time in a paper I published in 1986, when working as a postdoc at the laboratory of Dr. Gary A. Banker. Our initial experiments showed that the recently discovered Microtubule-Associated Protein 2 (MAP2) selectively labeled dendrites in cultured neurons (Cáceres et al., 1986), and that its segregation occurred in isolated cells, independent of cell-to-cell interactions. As stated recently (Banker, 2017), these observations changed how we thought about neurons, from cells that were a composite of different cellular regions (presynaptic and postsynaptic specializations, nodes and internodes), to cells whose most basic property was their polarization into axonal and dendritic domains. We were the first to show a causal relationship between MAP2 and Tau expression and axon/dendrite development (Cáceres & Kosik, 1990; Cáceres et al., 1992). My contributions to the field have been published in outstanding journals such as: Nature, Neuron, Nature Neuroscience, J Cell Biology, Developmental Cell, PNAS, Current Biology, Cell Reports, J Neurosci, etc. I have also published state of the art review articles in Nature Review Neurosci, Curr Op Cell Biology, Cytoskeleton, etc.

B. Positions and Honors. List in chronological order previous positions, concluding with your present position. List any honors. Include present membership on any Federal Government public advisory committee.

Positions and Employment

1975-79 Research Fellow, Argentine Research Council. Neuroendocrinology
1980-82 International Fogarty Post-doctoral Fellow, Department of Neuroscience, University of Virginia Medical School (Charlottesville). Neuronal Plasticity. Cytoskeleton and Neuronal Polarity. Mentor: Dr. Oswald Steward
1982 International Fogarty Post-doctoral Fellow, Department of Anatomy. University of Albany Medical College (Albany). Cytoskeleton and Neuronal Polarity. Mentor: Dr. Gary Banker.
1982-87 Adjunct Investigator, Argentine Research Council. Head and Founder Laboratory of Neurobiology at INIMEC
1983-84 Adjunct Professor Center of Electron Microscopy, University of Córdoba
1987-99 Independent Investigator, Argentine Research Council. Head Laboratory of Neurobiology at INIMEC
1989-91 Visiting Scientist, Center for Neurological Diseases, Department of Neurology, Harvard Medical School
1999-07 Professor and Principal Investigator, Argentine Research Council. Head Laboratory of Neurobiology at INIMEC
2002-03 Visiting Professor, Dyson Vision Institute, Cornell Medical College (New York)
2004 Vice-Director, Instituto Investigación Médica Mercedes y Martín Ferreyra (INIMEC-CONICET)
2005-09 Director, Instituto Investigación Médica Mercedes y Martín Ferreyra (INIMEC-CONICET)
2007-present Superior Investigator, Argentine Research Council. Head Laboratory of Neurobiology at INIMEC
2007-2020 Director Advanced Microscope Core Facility, INIMEC and CIQUIBIC-CONICET, University of Córdoba
2013-present Full Professor Institute for Biomedical Education Córdoba (IUCBC)
2013-present Vice-Chancellor Institute for Biomedical Education Córdoba (IUCBC)

2014-15 Visiting Professor, Max Planck Institute Biophysical Chemistry, Gottingen, Germany
2016-2020 Director, Instituto Investigación Médica Mercedes y Martín Ferreyra (INIMEC-CONICET-UNC)
2020-present. Head laboratory of Stem Cell Research, CIMETSA-Instituto Universitario Ciencias Biomédicas de Córdoba

Awards

1975 MD with Honors, University of Córdoba
1979 PhD with honors University of Córdoba
1975-1979 Fellowship of the National Research Council (CONICET), Argentina
1980 External Fellowship of the National Research Council (CONICET), Argentina
1980 International NIH Fogarty Fellowship
1987 Bernardo Houssay Prize for Excellence in Science. Argentine Research Council (CONICET)
1989 External Fellowship, National Research Council (CONICET), Argentina
1997-2006 International Research Scholar, Howard Hughes Medical Institute, USA
2001 John Simon Guggenheim Memorial Fellowship, USA
2003 Ranwell Caputto Lecture, Argentine Society of Neuroscience
2004 Oscar Orías Lecture, Society of Biology, Córdoba
2004 Member of the National Academy of Sciences, Argentina
2009 Member of the Academy of Medical Sciences, Córdoba, Argentina
2013 Konex Prize (100 personalities in science of the last decade, 2003-2012) Argentina
2013 Alexander von Humboldt Research Award, Germany
2018 Foreign Member, European Molecular Biology Organization (EMBO)
2023 Konex Prize (100 personalities in science of the last decade, 2013-2022) Argentina

PhD Thesis Supervised

- Jorge Busciglio (1989)
- Fabián Feiguin (1994)
- María Clara DiTella (1996)
- Gerardo Morfini (1997)
- Gustavo Pigino (1998)
- Leticia Peris (2002)
- Patricia Kunda (2002)
- Diego Peretti (2003)
- Flavia Bollati (2006)
- Mariano Bisbal (2009)
- Soledad de Olmos (2009)
- Ignacio Jausoro (2010)
- Laura Gastaldi (2011)
- José Wojnacki (2014)
- Gonzalo Quassollo (2016)

Present Position of Former Lab Members (partial list)

- Carlos Dotti Professor and Group Leader Centro Biología Molecular Severo Ochoa, Madrid (Spain)
- Jorge Busciglio Associate Professor, Center for the Neurobiology of Learning and Memory, University California, Irvine (USA)
- Adriana Ferreira Associate Professor Department of Anatomy and Cell Biology, North Western University, Chicago (USA)
- Gerardo Morfini Associate Professor Department of Anatomy and Cell Biology, University of Chicago (USA)
- Leticia Peris Neurobiology Researcher Grenoble Institute of Neuroscience, Grenoble (France)
- Diego Peretti Career Development Fellow at MRC Toxicology Unit, Cambridge University (United Kingdom)
- Gabriela Paglini Independent Researcher CONICET INIMEC-CONICET-UNC (Argentina)
- Cecilia Conde Independent Researcher CONICET INIMEC-CONICET-UNC (Argentina)
- Silvana Rosso Independent Researcher CONICET School of Biochemistry Universidad de Rosario (Argentina)
- Patricia Kunda Adjunct Researcher CONICET CIMETSA-CONICET Instituto Universitario Ciencias Biomédicas (Argentina)
- Flavia Bollati Adjunct Researcher CONICET School of Biochemistry Universidad Nacional Córdoba (Argentina)
- Mariano Bisbal Adjunct Researcher CONICET INIMEC-CONICET-UNC (Argentina)
- José Wojnacki Post Doctoral Fellow Centre for Genomic Regulation (Malhotra Lab), Barcelona (Spain)

Professional Memberships, Study Section Service, Advisory Boards, Ad-hoc reviewer

Member Argentine Society of Neurochemistry

Vice-President Argentine Society of Neuroscience (2004-06),

Foreign Member American Society of Neuroscience

Foreign Member American Society of Cell Biology

Study Section Medical Sciences Argentine Research Council (1988), Study Section Medical and Biological Sciences Argentine Research Council (1996), Cell Biology Study Section, National Agency for Promotion of Science & Technology, Argentine Ministry of Science (1998).

Chairman, Advisory Committee for the Career of Scientific Investigator Argentine Research Council (2000), Co-Chairman, Study Section Medical Sciences Argentine Research Council (2007), Chairman, Study Section Medical Sciences Argentine Research Council (2008). Member and Chairman, Advisory Board for the promotion of career scientists of CONICET to the highest rank (Investigador Superior (2020-present)).

Member Advisory Committee Argentine Research Council-Max Planck Institute (MPI-Buenos Aires-Germany).

Ad Hoc reviewer Argentine Research Council, National Agency for Promotion of Science & Technology (Argentina), CONyCIT (Chile), FONDAF (Chile), CNPq (Brazil), National Research Council (Uruguay), National Science Foundation (USA), NIH (USA), Alzheimer Association (USA), Wellcome Trust (UK), Human Science Frontier, Austrian Science Fund (Austria), Agence Nationale Recherche (France), Council for the Earth and Life Sciences (The Netherlands), U.S.-Israel Binational Science Foundation (BSF).

Member of the Advisory Board Argentine-EMBO membership

Member Management Board Global Bioimaging Initiative (GBI)

Selected peer-reviewed publications

Total: 102. Citations: 12000 (Google Scholar), H-Index= 59 (Google Scholar). Citations: 8024 (Scopus excluding self citations), H-Index: 54 (Scopus, excluding self-citations)

Key laboratory articles on cytoskeleton, neuronal polarity, signaling and bioimaging

- 1. Cáceres, A.**, Payne, M., Binder, L., and Steward, O. (1983) Immunocytochemical localization of actin and MAP-2 in dendritic spines. **PNAS USA** 80:1738-1742.
- 2. Cáceres, A.**, Bender, P., Binder, L., Payne, M., Rebhun, L., & Steward, O. (1984) Differential subcellular localization of tubulin and the microtubule-associated protein MAP-2 in brain tissue as revealed by immunocytochemistry with hybridoma monoclonal antibodies. **J. Neuroscience** 4: 394-410.
- 3. Cáceres, A.**, Banker, G., and Binder, L. (1986). Immunocytochemical localization of tubulin and microtubule-associated protein 2 during the development of hippocampal neurons in culture. **J. Neuroscience** 6: 774-722.
- 4. Ferreira, A.**, Busciglio, J., Landa, C., and **Cáceres, A.** (1990) Ganglioside-enhanced neurite growth: Evidence for a selective induction of high molecular weight MAP2. **J. Neuroscience** 10: 293-302.
- 5. Cáceres, A.**, and Kosik, K. (1990) Inhibition of neurite polarity by tau antisense oligonucleotides in primary cerebellar neurons. **Nature** 343: 461-463.
- 6. Ferreira, A.**, **Cáceres, A.** (1991) Estrogen-enhanced neurite growth: Evidence for a selective induction of Tau and stable microtubules. **J. Neuroscience** 11:392-400.
- 7. Cáceres, A.**, Potrebic, S., and Kosik, K. (1991) The effect of Tau antisense oligonucleotides on neurite formation of cultured cerebellar macroneurons. **J. Neuroscience** 11: 1515-1523.
- 8. Cáceres, A.**, Mautino, J., and Kosik, K. (1992) Suppression of MAP-2 in cultured cerebellar macroneurons inhibits minor neurite formation. **Neuron** 9: 607-618.
- 9. Feiguin, F.**, Ferreira, A., Kosik, K., and **Cáceres, A.** (1994) Kinesin-mediated organelle translocations revealed by specific cellular manipulations. **J. Cell Biology** 127: 1021-1039.
- 10. DiTella, M.**, Feiguin, F., Carri, N., and **Cáceres, A.** (1996) MAP-1b/Tau functional redundancy during laminin-enhanced axonal growth. **J. Cell Science** 109: 467-477.
- 11. Morfini, G.**, Rosa, A., Quiroga, S., Kosik, K., and **Cáceres, A.** (1997) Suppression of KIF2 alters the distribution of a growth cone non-synaptic membrane receptor and inhibits neurite outgrowth. **J. Cell Biology** 138: 657-669.
- 12. Paglini G.**, Kunda K., Quiroga S, Kosik K, and **Cáceres, A.** (1998) Suppression of radixin and moesin alters growth cone morphology, motility and process formation in primary cultured neurons. **J. Cell Biology** 143: 443-455.
- 13. Paglini, G.**, Pigino, G., Morfini, G., Kunda, P., Maccioni, R., Quiroga, S., Ferreira, A., and **Cáceres, A.** (1998) Evidence for the participation of the neuron-specific activator p35 during laminin-enhanced axonal growth. **J. Neuroscience** 18: 9858-9869.
- 14. Peretti, D.**, Peris, L., Rosso, S., Quiroga, S., and **Cáceres, A.** (2000) Evidence for the involvement of KIF4 in the anterograde transport of L1-containing vesicles. **J. Cell Biology** 149: 141-152.

- 15.** Paglini, G., Peris, L., Diez-Guerra, J., Quiroga, S., and **Cáceres, A.** (2001) The Cdk5-p35 kinase associates with the Golgi apparatus and regulates membrane traffic. **EMBO Report** 2: 1139-1144.
- 16.** Kunda, P., Paglini, G., Kosik, K., Quiroga, S., and **Cáceres, A.** (2001) Evidence for the involvement of Tiam-1 in axon formation. **J. Neuroscience** 21: 2361-2372.
- 17.** Gonzalez-Billault, C., Avila, J., and **Cáceres, A.** (2001) Evidence for the role of MAP1B in axon formation. **Molecular Biology Cell** 12:2087-2098.
- 18.** Rosso, S., Bollati, F., Bisbal, M., Peretti, D., Sumi, T., Nakamura, T., Quiroga, S., Ferreira, A., and **Cáceres, A.** (2004) LIMK1 regulates Golgi dynamics, traffic of Golgi-derived vesicles, and process extension in primary cultured neurons. **Molecular Biology Cell** 15: 3433-3449.
- 19.** Chuang, J., Yen, T., Bollati, F., Conde, C., Canavosio, F., **Cáceres, A.**, Sung, C-H. (2005) The dynein light chain Tctex-1 has a dynein-independent role in actin remodeling during neurite outgrowth. **Developmental Cell** 9:75-86. **(Cover Faculty of 1000 selection).**
- 20.** Szebenyi, G., Bollati, F., Bisbal, M., Sheridan, S., Fass, L., Wray, R., Haferkamp, S., Saprill, M., **Cáceres, A.**, and Brady, S.T. (2005) MAP1A is required for activity induced dendritic growth and branching. **Current Biology** 15: 1820–1826.
- 21.** Sosa, L., Dupraz, S., Laurino, L., Bollati, F., Bisbal, M., **Cáceres, A.**, Pfenninger, K., Quiroga, S. (2006) IGF-1 receptor is essential for the establishment of hippocampal neuronal polarity. **Nature Neuroscience** 9: 993-995.
- 22.** Bisbal, M., Wojnaki, J., Peretti, D., Roppolo, A., Sesma, J., Jausoro, I., **Cáceres, A.** (2009) KIF4 mediated anterograde translocation and positioning of ribosomal constituents to developing axons. **J. Biological Chemistry** 284: 9489-9497.
- 23.** Dupraz, S., Grassi, D., Sosa, L., Bisbal, M., Gastaldi, L., **Cáceres, A.**, Pfenninger, K., Quiroga, S. (2009) The TC10-exo70 complex is essential for membrane expansion and axonal specification in developing neurons. **J. Neuroscience** 29: 13292-13301.
- 24.** Bisbal, M., Conde, C., Donoso, M., Bollati, F., Sesma, J., Díaz Añel, A., Quiroga, S., Malhotra, V., Marzolo, M., **Cáceres, A.** (2009). Protein kinase D regulates trafficking of dendritic membrane proteins in developing neurons. **J. Neuroscience** 28: 9297-9308.
- 25.** Salvarezza, S., Campagne, F., Schreiner, R, Kessels, M., Qualmann, B., **Cáceres, A.**, Kreitzer, G., Rodriguez-Boulan, E. (2009) LIM Kinase 1 and cofilin regulate actin filament population required for dynamic-dependent apical fission from the TGN. **Molecular Biology Cell** 20: 438-451.
- 26.** Conde, C., Chuang, J., Arias, C., Nairn, A., Sung, C-H., **Cáceres, A.** (2010) Evidence for the involvement of Lfc and Tctex-1 in axon formation. **J. Neuroscience** 30: 6793-6800 **(TWIJ Article).**
- 27.** Montenegro, C., Tortosa, E., Rosso, S., Peretti, D., Bollati, F., Bisbal, M., Jausoro, I., Avila, J., **Cáceres, A.**, Gonzalez-Billault, C. (2010). MAP1B regulates axonal development by modulating Rho-GTPase Rac1 activity. **Molecular Biology Cell** 21: 3518-3528.
- 28.** Li, A., Ye, C., Chuang J-Z., **Cáceres, A.**, and Sung, C-H. (2013) IGF-1 activates a cilium-localized non-canonical Gβγ signaling pathway that regulates cell cycle progression. **Developmental Cell** 26:358-68 **(Cover).**
- 29.** Quassollo, G., Wojnacki, J., Salas, D., Gastaldi, L., Marzolo, M.P., Conde C., Bisbal, M., Couve, A. **Caceres, A.** (2015) A RhoA signaling pathway regulates dendritic Golgi outpost formation. **Current Biology** 25: 971-982.
- 30.** Unsain, N., Bordenave, M.D. Sami, J., Martínez, G., von Binderling, C., Barabas, F., Masullo, L., Johnstone, A., Barker, P.A., Bisbal, M., Stefani, F., **Cáceres A.** (2018) Remodeling of the Actin/Spectrin Membrane-associated Periodic Skeleton, Growth Cone Collapse and Decreased Filamentous Actin during Axonal Degeneration. **Scientific Reports** 8: 3007. doi: 10.1038/s41598-018-21232-0.
- 31.** Wilson, C., Giono, L., Rozés, V., Fizsbein A, Kornblhitt A, **Cáceres, A.** (2020) The histone methyltransferase G9a controls axon growth by targeting the RhoA signaling pathway. **Cell Reports** 31:1076.
- 32.** Szalai, A.N., Siarry, B., Lukin, J., Williamson, D.J, Unsain, N., Becerra, N., **Cáceres, A.**, Pilo-Pais, M., Acuna, G., Refojo, D., Owen, D., Simoncelli, S., Stefani, F. (2021) Three-dimensional total internal reflection fluorescence nanoscopy with sub-10 nm resolution. **Nature Communications** 12: 517. doi: 10.1038/s41467-020-20863-0.

Key Review Articles

- 33.** Conde, C., **Cáceres, A.** (2009) Microtubule dynamics in axons, dendrites and at the synapse. **Nature Review Neuroscience** 10: 319-332.
- 34.** González-Billault, C., Muñoz-Llancao, P., Henriquez, D., Wojnacki, J., Conde, C., and **Cáceres, A.** (2012) The role of small GTPases in neuronal morphogenesis and polarization. **Cytoskeleton** Special Issue “Emerging concepts on neuronal cytoskeleton”. (**Hoboken**) 69: 464-485.
- 35.** **Cáceres, A.**, Bing, Y. and Dotti, C. G. (2012) Neuronal Polarity: Demarcation, growth, commitment. In “Membranes and organelles” **Current Opinion Cell Biology** 24: 547-553.
- 36.** Unsain, N., Stefani, F., **Cáceres, A.** (2018) The actin-spectrin membrane-associated periodic skeleton in neuronal axons. **Frontiers in Synaptic Neuroscience** 10:10. doi: 10.3389/fnsyn.2018.00010.