LUTZ BIRNBAUMER
Curriculum Vitae

Born: February 6, 1939 in Vienna, Austria
1948 - 1967: Lived in Argentina
1967: Migrated to USA
Citizenships: Argentina-United States
Status: Married to Mariel Birnbaumer (neé Despuy), Ph.D.; no children

Education

Up to 1958: Primary and secondary education in Buenos Aires, Argentina
1958-1962: Study of Pharmacy, University of Buenos Aires. ***Degree*** - Pharmacist.
1958-1964: Study of Biochemistry, University of Buenos Aires. ***Degree*** - Biochemist.
1964-1967: Predoctoral Fellow, Department of Biological Chemistry, Faculty of Sciences, University of Buenos Aires, Argentina. ***Degree*** - Ph.D. in Biochemistry: Regulation of Glycogen Biosynthesis. Thesis advisors: Dr. Luis F. Leloir and Héctor N. Torres.
1967-1971: Postdoctoral Fellow, Section on Endocrinology, National Institute of Arthritis and Metabolic Diseases, Bethesda, Maryland, USA. ***Major*** - Molecular Endocrinology: Regulation of Adenyl Cyclase by Hormones. Preceptor: Dr. Martin Rodbell.

Professional Experience

1960-1961: Teaching Assistant, Department of Inorganic and Analytical Chemistry
1962-1964: Teaching Assistant, Pharmacology, Faculty of Pharmacy and Biochemistry
1964-1966: Teaching Assistant, Department of Biological Chemistry, Faculty of Sciences

1971-1974: at Northwestern University

1971-1974 Associate Professor, Department of Physiology, Northwestern University Medical School.
1974-1975 Visiting Scientist, Department of Molecular Medicine, Mayo Clinic, Rochester, Minnesota,

1975-1994: at Baylor College of Medicine, Houston, Texas

1975-1994 Professor, Department of Cell Biology,
10/81-6/82 Visiting Scientist, Institute National de la Sante, Hopital Henri Mondor, Creteil, France (sabbatical leave).
1986-1994 Professor, Department of Physiology and Molecular Biophysics,
1990-1994 Professor, Division of Neurosciences
1992-1994 Director, Diabetes Research Center, Department of Medicine
1993-1994 Professor, Department of Medicine (Endocrinology)

1994-2001: at UCLA, Los Angeles, California

1994-2001 Professor, Department of Anesthesiology, School of Medicine
1994-2001 Professor, Department of Biological Chemistry, School of Medicine.
1994-2001 Full Member, Molecular Biology Institute
1995-2001 Member, Brain Research Institute
1996-2000 Director, Embryonic Stem Cell and Transgenic Mouse Facility, UCLA Jonsson Comprehensive Cancer Center.
1997-2001 Professor and Chair, Department of Molecular, Cell and Developmental Biology, College of Letters and Science, UCLA

2001-2014: at NIEHS (NIH, DHHS), Research Triangle Park, North Carolina.

2001-2007 Sr. Investigator (Full Professor equivalent)
2001-2006 Scientific Director, Division of Intramural Research, National Institute of Environmental Health Sciences (NIEHS), National Institutes of Health (NIH), Department of Health and Human Services (DHHS)
2001-2007 Head, Transmembrane Signalling Group, Laboratory of Signal Transduction, DIR, NIEHS.

2007-2014 Head, Transmembrane Signalling Group, Laboratory of Neurobiology, NIEHS
2014- NIH Scientitst Emeritus – NIEHS Special Volunteer

2015-present: at Catholic University of Argentina (UCA)

2015- Professor of Biomedical Sciences, Institute of Biomedical Research (BIOMED), School of Biomedical Sciences, UCA
2015- Head, Laboratory of Ion Channel Structure and Function in Health and Disease

Languages

English, German and Spanish: fully. French: understanding and reading. Italian:reading only.

Scientific Standing

1982 -Ranked at position 542 among 1,000 most cited scientists during period of 1965-1978 (c.f. Current Contents, Oct., 1982).

2002 -Ranked among most cited authors by the ISI Web of Science. Total times cited from 1980 through 2002: 14,676 times.

2012 -Total times cited from 1966 through 2012: 35,220 (peer reviewed: 28,018; reviews/book chapters: 7,202). Average citations per peer reviewed publication: 88.5. Average citations per invited publication (notes, reviews, book chapters): 97.4 Number of peer reviewed articles quoted more than 100 times: 85. *h Factor*: 96 (96 papers quoted more than 96 times).

Honors and Awards

1962-1966: Predoctoral Fellowship, National Research Council, Argentina.
1967: Prize "Faculty of Pharmacy and Biochemistry" (1966 best thesis) University of Buenos Aires.
1967-1968: U. S. Public Health Service Visiting Fellowship.
1968-1969: National Institutes of Health Postdoctoral Fellowship.
1981-1982: Macy Foundation Faculty Scholar Award.
1985: Society for the Study of Reproduction Research Award.
1986: C. C. Bell Research Professorship of Cell Biology, Baylor College of Medicine.
1986: MERIT Award, National Institute of Diabetes, Digestive and Kidney Diseases.
1989: Honorary Professor, Faculty of Sciences, University of Buenos Aires, Argentina.
1992: Wellcome Visiting Professor in the Basic Medical Sciences.
1995: Doctor *Honoris Causa* (Honorary Doctorate), School of Medicine, Universidad Complutense, Alcalá de Henares/Madrid, Spain.
1995: Member, U.S. National Academy of Sciences.
1997: The 1997 "H.W. Magoun Lecture" UCLA Brain Research Institute.
2002: The "Mavis P. Kelsey Lecture" Texas A&M Inst.of Biosciences and Technology, Houston, TX
2003: 2003 Memorial Lecture "Conferencia Orias", Society of Biology of Córdoba, Argentina.
2004: Foreign Associate Member, Argentine National Academy of Sciences.
2006: Foreign Associate Member, National Academy of Medicine, Argentina.
2007: NIH Distinguished Investigator.
2009: NIH Director's Challenge Award "DNA Methylation in Health and Disease" (Award: $450,000).
2011: Prize "Lius Federico Leloir for International Cooperation in Science, Technology and Innovation" conferred by the Ministry of Science, Technology and Innovation, Republic of Argentina.

Publications Peer Reviewed
2018 to present (total: 451)

450..Gao X, Cao Q, Cheng Y, Zhao D, Wang Z, Yang H, Wu Q, You L, Wang Y, Lin Y, Li X, Wang Y, Bian JS, Sun D, Kong L, **Birnbaumer L**, Yang Y. (2018) " Chronic stress promotes colitis by disturbing the gut microbiota and triggering immune system response " Proc Natl Acad Sci U S A. 2018 Mar 27;115(13):E2960-E2969. doi: 10.1073/pnas.1720696115.

428. Gao, X., Cao, Q., Cheng, Y., Zhao, D., Yang, H., Wu, Q., You, L., Wang, Y., Lin, Y., Li, X., Wang, Y., Bian, J.-S., **Birnbaumer, L.** and Yang, Y. (2018) "Chronic stress promotes colitis by disturbing the gut microbiota and triggering immune system response." Proc. Natl. Acad, Sci. USA *115*, E2960-E2969.

429. Nobles, M., Montaigne, D., Sebastian, S., **Birnbaumer, L**. and Tinker, A. (2018) "Differential effects of inhibitory G-protein isoforms on G-protein gated inwardly rectifying K+ currents in adult murine atria." Am. J. Physiol. Cell. Physiol. *314*, C616-C626.

430. Sachdeva, A., Schlotterer, A., Schumacher, D., Matka, C., Mathar, I., Dietrich, N., Medert, R., Kriebs, U., Lin, J., **Birnbaumer, L.,** Fleming, T., Hammes, H.-P. and Freichel, M. (2018) "TRPC proteins contribute to development of diabetic retinopathy and regulate glyoxalase 1 activity and methylglyoxal accumulation." Mol. Metabolism *9*, 156-167.

431. Cheng, Y., Gao, X-H., Li, X-J., Cao, Q.H., Zhao, D-D., Zhou, J-R., Wu, H-X., Wang, Y., You, L-J., Yang, H-B., He, Y-L., Li, Y-B., Bian, J-S., Zhu, Q-Y., **Birnbaumer, L**. and Yang, Y. (2018) "Depression promotes prostate cancer invasion and metastasis via a sympathetic-cAMP-FAK signaling pathway." Oncogene *37*, 2953-2966.

432. Marshall, J., Zhou, X., Chen, G., Yang, S., Li, Y., Wang, Y., Zhang, Z., Jiang, Q., **Birnbaumer, L**. and Cao, C. (2018) "Anti-depression action of BDNF requires, and is mimicked by G?i1/3 expression in the hippocampus." Proc. Natl. Acad. Sci. USA *115*, E3549-E3558.

433. Wu, J., Ryskamp, D., **Birnbaumer, L**. and Bezprozvanny, I. (2018) "Inhibition of TRPC1-Dependent Store-Operated Calcium Entry Improves Synaptic Stability and Motor Performance in a Mouse Model of Huntington's Disease. J Huntingtons Dis. *7*,35-50.

434. Marcott, P.F., Gong, S., Donthamsetti, P., Newman, A.H., **Birnbaumer, L**., Martemyanov, K.A., Javitch,J.A. and Ford, C.P. (2018) "Regional heterogeneity of D2-receptor signaling in the dorsal striatum and nucleus accumbens." Neuron *98*,575-587.

435. Baron, J., Bilbao, A., Hörtnagl, H., **Birnbaumer, L**., Leixner, S., Spanagel, R., Ahnert-Hilger, G. and Brunk, I. (2018) "Balance of Go1α and Go2α expression regulates motor function via the striatal dopaminergic system. J. Neurochem. *146*,374-3389.

436. Beer-Hammer, S., Lee, S.C., Mauriac, S.A., Leiss, V., Groh, I.A.M., Novakovic, A., Piekorz, R.P., Bucher, K., Chen, C., Ni, K., Rohbock, K., Harasztosi, C., Schimmang, T., Zimmermann, U., Pfeffer, K., **Birnbaumer, L**., Forge, A., Montcouquiol, M., Knipper, M., Nürnberg, B. and Rüttiger, L. (2018) "Galpha-i proteins are indispensable for hearing." Cell. Pysiol. Biochem. *47*, 1509-1532.

437. Ilatovskaya, D.V., Blass, G., Palygin, O., Levchenko, V., Pavlov, T.S., Grzybowski, M.N., Winsor, K., Shuyskiy, L.S., Geurts, A., Cowley Jr., A.W., **Birnbaumer, L.** and Staruschenko, A., (2018) "Critical role of NOX4/TRPC6 pathway in podocyte calcium regulation and kidney damage in diabetic nephropathy" J. Amer. Soc. Nephrol. *29*, 1917-1927.

438. Sonoda, T., Lee, S.K., **Birnbaumer, L**. and Schmidt, T.M. (2018) "Melanopsin phototransduction is repurposed by ipRGC subtypes to shape the function of distinct visual circuits." Neuron *99*, 1-14.

439. Chauhan, A., Sun, Y., Sukumaran, P., Zangbede, F.Q., Jondle, C., Sharma, A., Evans, E., Szlabick, R., Aaland, M., **Birnbaumer, L**., Sharma, J., Singh, B. and Mishra, B. (2018) "M1 macrophage polarization is dependent on TRPC1-medited calcium entry." iScience *8*, 85-102.

440. Cao, H., Qadri, S.M., Lang, E., Pelzl, L., Umbach, A.T., Leiss, V., **Birnbaumer, L.,** Nürnberg, B., Pieske, B., Voelkl, J., Gawaz, G., Bissinger, R. and Lang, F. (2018) "Heterotrimeric G-protein subunit Gαi2 contributes to agonist-sensitive apoptosis and degranulation in murine platelets." Physiological Reports *6*, e13841.

441. Hou, X., Xiao, H., Zhang, Y., Zeng, X., Huang, M., Chen. X., and **Birnbaumer. L**. and Liao, Y. (2018) "Transient Receptor Potential Channel 6 knockdown prevents apoptosis of renal tubular epithelial cells upon oxidative stress via autophagy activation" Cell Death and Disease *9*, 1015.

442. Saliba, Y., Jebara, V., Hajal, J., Maroun, R., Chacar, S., Smayra, V., Abramowitz, J., **Birnbaumer, L**. and Farès, N. (2018) "TRPC3/NFATc3 signaling pathway critically regulates myocardial fibrosis." Antiox. Redox. Signal.
(in press)

443. Trouillet, A.C., Keller, M., Weiss, J., Leinders-Zufall, T., **Birnbaumer, L**., Zufall, F., Chamero, P (2019) "Central role of G protein Gαi2- and Gαi2+ vomeronasal neurons in balancing territorial and infant-directed aggression of male mice." Proc. Netl. Acad. Sci. USA *116*, 5135-5143.

444. Li, Z.-W., Sun, B., Gong, T., Guo, S., Zhang, J., Wang, J., Sugawara, A., Jiang, M., Yan, J., Gurary, A., Zhen, X., Gao, B., Xiao, S.-Y., Chen, W., Ma, C., Zhu, C., Farrar, C., Chan, O.T.M., Xin, C., Winnicki, A.,, Winnicki, J., Tang, M., Park, R., Winnicki, M., Diener, K., Wang, Z., Liu, Q., Chu, C.H., Yue, P., Alpert, L., Hui, G.S., Fei, P., Turkson, J., Yang, W., Wu, G., Tao, A., Ramos, J.W., Moisyadi, S., Holcombe, R.F.,Jia, W., **Birnbaumer, L**., Zhou, X. and Chu, W.-M. (2019) "GNAI1 and GNAI3 Reduce Colitis-Associated Tumorigenesis in Mice by Blocking IL6 Signaling and Downregulating Expression of GNAI2." Gastroenterology *156*, 2297-2312.

445. Ibeh, C.L., Yiu, A.L., Kanaras, Y.L., Paal, E., **Birnbaumer,** L., Jose, P.J.A. and Bandyopadhyay, B.C. (2019) "Evidence for a regulated Ca^{2+} entry in proximal tubular cells and its implication in calcium stone formation." J. Cell Science *132*, jcs225268.

448. Wang Y, Quan F, Cao Q, Lin Y, Yue C, Bi R, Cui X, Yang H, Yang Y, **Birnbaumer L,** Li X, Gao X. (2020) "Quercetin alleviates acute kidney injury by inhibiting ferroptosis" J Adv Res. 2020 Jul 22;28:231-243. doi: 10.1016/j.jare.2020.07.007. eCollection 2021 Feb.

446. Tian JB, Yang J, Joslin WC, Flockerzi V, Prescott SA, **Birnbaumer L**, Zhu MX (2022) "TRPC4 and GIRK channels underlie neuronal coding of firing patterns that reflect Gq/11-Gi/o coincidence signals of variable strengths." Proc Natl Acad Sci U S A. 2022 May 17;119(20):e2120870119. doi: 10.1073/pnas.2120870119. Epub 2022

447. Caval-Holme FS, Aranda ML, Chen AQ, Tiriac A, Zhang Y, Smith B, **Birnbaumer L**, Schmidt TM, Feller MB. (2022) "The Retinal Basis of Light Aversion in Neonatal Mice" J Neurosci. 2022 May 18;42(20):4101-4115. doi: 10.1523/JNEUROSCI.0151-22.2022. Epub 2022 Apr 8.

449. Wu H, Li Y, Shi G, Du S, Wang X, Ye W, Zhang Z, Chu Y, Ma S, Wang D, Li Y, Chen Z, Birnbaumer L, Wang Z, Yang Y. (2022) "Hepatic interferon regulatory factor 8 expression suppresses hepatocellular carcinoma progression and enhances the response to anti-programmed cell death protein-1 therapy." Hepatology. 2022 Jan 6:10.1002/hep.32316. doi: 10.1002/hep.32316. Online ahead of print.

451. Hu W, Zheng S, Guo H, Dai B, Ni J, Shi Y, Bian H, Li L, Shen Y, Wu M, Tian Z, Liu G, Hossain MA, Yang H, Wang D, Zhang Q, Yu J, Birnbaumer L, Feng J, Yu D, Yang Y. (2021) "PLAGL2-EGFR-HIF-1/2α Signaling Loop Promotes HCC Progression and Erlotinib Insensitivity" Hepatology. 2021 Feb;73(2):674-691. doi: 10.1002/hep.31293. Epub 2021

Invited (total: 155)

155. Hossain MA, Liu G, Dai B, Si Y, Yang Q, Wazir J, **Birnbaumer L,** Yang Y. (2021) "Reinvigorating exhausted CD8+ cytotoxic T lymphocytes in the tumor microenvironment and current strategies in cancer immunotherapy." Med Res Rev. 2021 Jan;41(1):156-201. doi: 10.1002/med.21727. Epub 2020 Aug 25