

## **CURRICULUM VITAE**

Name **GREG ERWIN LEMKE**  
Date of Birth December 31, 1955  
Place of Birth Delphos, Ohio  
Citizenship United States



### **EDUCATION**

1974-1978 Massachusetts Institute of Technology (MIT; Undergraduate)  
1978-1983 California Institute of Technology (Caltech; Graduate)  
Graduate advisor: Jeremy Brockes  
1983-1985 College of Physicians and Surgeons, Columbia University (Postdoctoral)  
Postdoctoral advisor: Richard Axel

### **SCHOLASTIC HONORS**

1974-1978 National Merit Scholarship  
1978 S.B. in Life Sciences, MIT  
1983 Ph.D. in Biology, Caltech

### **PROFESSIONAL APPOINTMENTS**

1985 - 1991 Assistant Professor,  
1991 - 1995 Associate Professor,  
1995 - Professor and Director, Molecular Neurobiology Laboratory,  
2012 - Françoise Gilot-Salk Professor, Salk Institute for Biological Studies, La Jolla, California  
2014 - Director, Immunobiology and Microbial Pathogenesis Laboratory  
2002 - 2003 Chair of the Faculty, Salk Institute  
2009 - 2010  
2014 - 2015  
1986 - 1991 Adjunct Assistant Professor,  
1991 - 1995 Adjunct Associate Professor,  
1996 - Adjunct Professor, Department of Neuroscience, School of Medicine, University of California, San Diego, La Jolla, California

### **AWARDS**

1979 - 1981 Kroc Foundation Graduate Fellowship  
1983 - 1985 Muscular Dystrophy Association Postdoctoral Fellowship  
1986 - 1990 Pew Scholars Award, Pew Memorial Trust  
1987 - 1989 Basil O'Connor Starter Scholar Award, March of Dimes

- 1990 - 1995 Rita Allen Scholars Award, Rita Allen Foundation  
 1994 - 2001 Javits Neuroscience Investigator (Merit) Award, NIH  
 2007 - Fellow, American Association for the Advancement of Science

## PROFESSIONAL SERVICE

- 1989 - 95 Associate Editor, *Neuron*,  
*Journal of Neuroscience*,  
*Glia*
- 1995 - 2005 Editor-in-Chief, *Molecular and Cellular Neuroscience*  
 2005 - 2010 Associate Editor, *Molecular and Cellular Neuroscience*  
 1989 - 2014 Ad Hoc Member, Multiple NIH Study Sections  
 1992 - 1996 Regular Member, NIH Neurology C Study Section  
 1991 - 1996 Member, Research Advisory Board, Natl. Neurofibromatosis Foundation  
 1994 - 2006 Member, Scientific Advisory Board, Hereditary Disease Foundation  
 1999 - 2000 Chair, Brain Molecular Anatomy Project Advisory Panel, NIH  
 2000 - 2006 Member, Scientific Advisory Board, deCODE Genetics  
 2003 - 2008 Advisor, Helmholtz Gemeinschaft  
 2007 - 2013 Member, National Advisory Committee, Pew Scholars Program  
 2007 - 2017 Chair, Science Advisory Board, Dept. of Biomedicine, University of Basel  
 2015 - 2017 Member, Scientific Advisory Board, Kolltan Pharmaceuticals  
 2016 - 2020 Regular Member, NIH Cell & Molecular Biology of Glia Study Section  
 2017 - Member, Pew Innovation Advisory Committee, Pew Charitable Trusts

## PROFESSIONAL MEMBERSHIPS

- 1980 - Society for Neuroscience  
 1986 - American Association for the Advancement of Science  
 2011 - American Association of Immunologists

## TEACHING EXPERIENCE

- 1987 - Lectures in Molecular and Cellular Neurobiology, and Neuroanatomy  
 UCSD Neuroscience graduate series
- 1989 - Course director (with B. Ranscht and D. O'Leary)  
 Developmental Neurobiology, UCSD Neuroscience core course
- 1993 - 1995 Course director (with D. O'Leary)  
 Developmental Neurobiology, Cold Spring Harbor summer course

**PUBLICATIONS**

- Brockes, J.P., Lemke, G.E., and Balzer, D.R., Jr. (1980) Purification and preliminary characterization of a glial growth factor from the bovine pituitary. *J. Biol. Chem.* 255:8374-8377.
- Lemke, G. and Brockes, J.P. (1981) An immunochemical approach to the purification and characterization of glial growth factor. In *Monoclonal Antibodies to Neural Antigens* (Cold Spring Harbor Reports in the Neurosciences, V.2, eds. R. McKay, M.C. Raff, and L. Reichardt), pp. 133-140.
- Brockes, J.P. and Lemke, G.E. (1981) The neuron as a source of mitogen. In *Development in the Nervous System* (eds. D.R. Garrod and J.D. Feldman) Cambridge University Press, pp. 309-327.
- Brockes, J.P., Fryxell, K., and Lemke, G.E. (1981) Studies on cultured Schwann cells. *J. Exp. Biol.* 95: 215-230.
- Lemke, G.E. and Brockes, J.P. (1983) Glial growth factor: a mitogenic polypeptide of the brain and pituitary. *Fed. Proc.* 42: 2627-2630.
- Lemke, G.E. and Brockes, J.P. (1984) Identification and purification of glial growth factor. *J. Neurosci.* 4: 75-83.
- Kintner, C.R., Lemke, G.E. and Brockes, J.P. (1984) Glial growth factor and the neuronal control of cell division in amphibian limb regeneration. In *Molecular Bases of Neural Development*. pp. 119-138.
- Lemke, G. and Axel, R. (1985) Isolation and sequence of a cDNA encoding the major structural protein of peripheral myelin. *Cell* 40: 501-508.
- Lemke, G. (1986) Molecular biology of the major myelin genes. *Trends in Neurosciences* 9:266-270.
- Lemke, G. (1987) Molecular biology of the genes encoding the major myelin proteins. In *Molecular Neurobiology*, (eds. S. Heinemann and J. Patrick), pp. 21-43.
- Webster, H.deF., Lamperth, L., Favilla, J.T., Lemke, G., Tesin, D. and Manuelidis, L. (1987) Use of a biotinylated probe and *in situ* hybridization for light and electron microscopic localization of P<sub>0</sub> mRNA in myelin-forming Schwann cells. *Histochemistry* 86: 441-444.
- Lemke, G. and Chao, M. (1988) Axons regulate Schwann cell expression of the major myelin and NGF receptor genes. *Development* 102: 499-504.

- Lemke, G., Lamar, E. and Patterson, J. (1988) Isolation and analysis of the gene encoding peripheral myelin protein zero. *Neuron* 1: 73-83.
- Trapp, B.D., Hauer, P. and Lemke, G. (1988) Axonal regulation of myelin protein mRNA levels in actively myelinating Schwann cells. *J. Neurosci.* 8: 3515-3521.
- Lemke, G. (1988) Unwrapping the genes of myelin. *Neuron* 1: 535-543.
- Monuki, E.S., Weinmaster, G., Kuhn, R. and Lemke, G. (1989) SCIP: a glial POU domain gene regulated by cAMP. *Neuron* 3:783-793.
- Kuhn, R., Pravtcheva, D., Ruddle, F. and Lemke, G. (1990) The gene encoding peripheral myelin protein zero is located on mouse chromosome 1. *J. Neurosci.* 10:205-209.
- Lemke, G., Weinmaster, G. and Monuki, E.S. (1990) The myelination cascade. In *Cellular and Molecular Biology of Myelination* (G. Jeserich, H.H. Althaus, T.V. Waehneltd, eds.) NATO ASI series, Springer-Verlag, Berlin, pp. 533-541.
- Weinmaster, G. and Lemke, G. (1990) Cell-specific cyclic AMP-mediated induction of the PDGF receptor. *EMBO J.* 9: 915-920.
- Lemke, G., Kuhn, R., Monuki, E.S. and Weinmaster, G. (1990) Transcriptional controls underlying Schwann cell differentiation and myelination. *Proc. N.Y. Acad. Sci.* 605: 248-253.
- Lemke, G. (1990) Glial growth factors. *Seminars in Neuroscience* 2: 437-443.
- Monuki, E.S., Kuhn, R., Weinmaster, G., Trapp, B.D. and Lemke, G. (1990) Expression and activity of the POU transcription factor SCIP. *Science* 249: 1300-1303.
- Lemke, G. (1990) Mitogen signal. *Nature* 348: 201.
- Lemke, G. Kuhn, R., Monuki, E.S., and Weinmaster, G. (1991) Expression and activity of the transcription factor SCIP during glial differentiation and myelination. *Proc. N.Y. Acad. Sci.* 633: 189-195.
- Lai, C. and Lemke, G. (1991) An extended family of protein-tyrosine kinase genes differentially expressed in the vertebrate nervous system. *Neuron* 6: 691-704.
- Weinmaster, G., Roberts, V.J., and Lemke, G. (1991) A homolog of *Drosophila Notch* expressed during mammalian development. *Development* 113: 199-206.
- Kuhn, R., Monuki, E.S., and Lemke, G. (1991) The gene encoding the transcription factor SCIP has features of an expressed retroposon. *Molec. Cell. Biol.* 11: 4642-4650.

- Nave, K.-A. and Lemke, G. (1991) Induction of the myelin proteolipid protein (PLP) gene in C6 glioblastoma cells: Functional analysis of the PLP promoter. *J. Neurosci.* 11: 3060-3069.
- Spreyer, P., Kuhn, G., Hanemann, C.O., Gillen, C., Schaal, H., Kuhn, R., Lemke, G., and Müller, H.W. (1991) Axon-regulated expression of a Schwann cell transcript that is homologous to a "growth-arrest-specific" gene. *EMBO J.* 10: 3661-3668 .
- Messing, A., Behringer, R.R., Hammang, J.P., Palmiter, R.D., Brinster, R.L., and Lemke, G. (1992) P<sub>0</sub> promoter directs expression of reporter and toxin genes to Schwann cells of transgenic mice. *Neuron* 8: 507-520.
- Collarini, E., Pringle, N., Mudhar, H., Stevens, G., Kuhn, R., Monuki, E., Lemke, G., and Richardson, W.D. (1991) Growth factors and transcription factors in oligodendrocyte development. *J. Cell Sci. (suppl.)*15: 117-123.
- Hall, Z., Anderson, D., Banker, G., Breakefield, X., Kennedy, M., Lemke, G., Patterson, P., Ross, E., Sargent, P., Scheller, R., Vale, R. (1992) Chap. 9: Myelin and myelination, and Chap. 10: Gene regulation in the nervous system. In: *An Introduction to Molecular Neurobiology*, Sinauer Associates, Sunderland, MA.
- Collarini, E.J., Kuhn, R., Marshall, C.J., Monuki, E.S., Lemke, G., and Richardson, W.D. (1992) Down-regulation of the POU transcription factor SCIP is an early event in oligodendrocyte differentiation *in vitro*. *Development* 116: 193-200.
- Giese, K.P., Martini, R., Lemke, G., Sorianno, P., and Schachner, M. (1992) Mouse P<sub>0</sub> gene disruption leads to hypomyelination, abnormal expression of recognition molecules, and degeneration of myelin and axons. *Cell* 71: 565-576.
- Weinmaster, G., Roberts, V.J., and Lemke, G. (1992) *Notch 2*: A second mammalian Notch gene. *Development* 116: 931-941.
- Lemke, G. (1993) The molecular genetics of myelination: An update. *Glia* 7: 263-271.
- Lemke, G. (1993) Recitative and aria (News and Views). *Nature* 362: 291-292.
- Monuki, E.S., Kuhn, R., and Lemke, G. (1993) Repression of the myelin P<sub>0</sub> gene by the POU transcription factor SCIP. *Mechanisms of Development* 42: 15-32.
- Bögler, O., Entwistle, A., Kuhn, R., Monuki, E., Lemke, G. and Noble, M. (1993) Single cell analysis of the expression of a nuclear protein, SCIP, by fluorescent immunohistochemistry visualized with confocal microscopy. *Histochemical J.* 25: 746-761.
- Lemke, G. (1993) Transcriptional control in the development of neurons and glia. *Curr. Opin. Neurobiol.* 3: 703-708.

- Monuki, E.S., Kuhn, R., and Lemke, G. (1993) Cell-specific action and mutable structure of a transcription factor effector domain. *Proc. Natl. Acad. Sci. USA* 90: 9978-9982.
- Polvi, A., Armstrong, E., Lai, C., Lemke, G., Huebner, K., Spritz, R.A., Guida, L.C., Nicholls, R.D. and Alitalo, K. (1993) The human Tyro 3 gene and pseudogene are located in chromosome 15q14-q25. *Gene* 134: 289-293.
- Lai, C. and Lemke, G. (1994) Structure and expression of the Tyro 10 receptor tyrosine kinase. *Oncogene* 9: 877-883.
- Scherer, S.S., Wang, D.-y., Kuhn, R., Lemke, G., Wrabetz, L., and Kamholz, J. (1994) Axons regulate Schwann cell expression of the POU transcription factor SCIP. *J. Neurosci.* 14: 1930-1942.
- Messing, A., Behringer, R.R., Wrabetz, L., Hammang, J.P., Lemke, G., Palmiter, R.D., and Brinster, R.L. (1994) Hypomyelinating peripheral neuropathies and Schwannomas in transgenic mice expressing SV40 T-antigen. *J. Neurosci.* 14: 3533-3539.
- Lai, C., Gore, M. and Lemke, G. (1994) Structure, expression, and activity of Tyro 3, a neural adhesion-related receptor tyrosine kinase. *Oncogene* 9: 2567-2578.
- Plantinga, L.-C., Schrama, L.H., Eggen, B.J.L., Gispen, W.H., Verhaagen, J., and Lemke, G. (1994) B-50/GAP-43 mRNA expression in cultured primary Schwann cells is regulated by cyclic AMP. *NeuroReport* 5: 2465-2468.
- Monuki, E. S. and Lemke, G. (1995) Molecular Biology of Myelination. In: *The Axon* (S. Waxman, ed.), Oxford University Press, New York, pp. 144-163.
- Stitt, T.N., Conn, G., Gore, M., Lai, C., Bruno, J., Radziejewski, C., Mattsson, K., Fisher, J., Geis, D., Jones, P.F., Masiakowski, P., Ryan, T.E., Tobkes, N.J., Chen, D.H., DiStefano, P.S., Long, G.L., Basilico, C., Goldfarb, M., Lemke, G., Glass, D. and Yancopoulos, G.D. (1995) The Anticoagulation factor Protein S and its relative, Gas6, are ligands for the Tyro 3/Axl family of receptor tyrosine kinases. *Cell* 80: 661-670.
- Weinstein, D.E., Burrola, P.G. and Lemke, G. (1995) Premature Schwann cell differentiation and hypermyelination in mice expressing a targeted antagonist of the POU transcription factor SCIP. *Mol. Cell. Neurosci* 6: 212-229.
- Gassmann, M., Casagrande, F., Orioli, D., Simon, H., Lai, C., Klein, R. and Lemke, G. (1995) Aberrant neural and cardiac development in mice lacking the ErbB4 neuregulin receptor. *Nature* 378: 390-394

- Lemke, G. and Matus, A. (1995) Neuronal and glial cell biology (Editorial Overview), *Curr. Opin. Neurobiol.* 5: 547-550.
- Kilpatrick, T. J., Brown, A., Lai, C., Gassmann, M., Goulding, M. and Lemke, G. (1996) Expression of the Tyro4/Mek4/Cek4 gene specifically marks a subset of embryonic motor neurons and their muscle targets. *Mol. Cell. Neurosci.* 7: 62-74.
- Lemke, G. (1996) Neuregulins in development. *Mol. Cell. Neurosci.* 7: 247-262.
- Syroid, D.E., Maycox, P.R., Burrola, P.G., Liu, N., Wen, D., Lee-K.-F., Lemke, G. and Kilpatrick, T.J. (1996) Cell death in the Schwann cell lineage and its regulation by neuregulin. *Proc. Natl. Acad. Sci. USA* 93: 9229-9234.
- Lemke, G. (1996) Unwrapping myelination (News and Views). *Nature* 383: 395-396.
- Zorick, T.S., Syroid, D.E., Arroyo, E., Scherer, S.S. and Lemke, G. (1996) The transcription factors SCIP and Krox-20 mark distinct stages and cell fates in Schwann cell differentiation. *Mol. Cell. Neurosci.* 8: 129-145.
- Zorick, T.S. and Lemke, G. (1996) Schwann cell differentiation. *Curr. Opin. Cell Biology* 8: 870-876.
- Orioli, D., Henkemeyer, M., Lemke, G., Klein, R. and Pawson, T. (1996) Sek4 and Nuk receptors cooperate in guidance of commissural axons and in palate formation. *EMBO J.* 15: 6035-6049.
- Lemke, G. (1997) Chapter 11. Genes and development of myelin-forming cells. In: *Multiple Sclerosis: Clinical and pathogenetic basis.* (C.S. Raine, H.F. McFarland, W.W. Tourtellotte, eds.) Chapman and Hall, London: pp.187-196.
- Gassmann, M. and Lemke, G. (1997) Neuregulins and neuregulin receptors in neural development. *Curr. Opin. Neurobiology* 7: 87-92 .
- Maycox, P. R., Ortuño, D., Burrola, P., Kuhn, R., Bieri, P.L., Arrezzo, J.C. and Lemke, G. (1997) A transgenic mouse model for human hereditary neuropathy with liability to pressure palsies. *Mol. Cell. Neurosci.* 8: 405-416.
- Brown, A. M. and Lemke, G. (1997) Multiple regulatory elements control transcription of the peripheral myelin protein zero gene. *J. Biol. Chem.*, 272: 28939-28947.
- Shrivastava, A., Radziejewski, C., Campbell, E., Kovac, L., McGlynn, M., Ryan, T.E., Davis, S., Goldfarb, M.P., Glass, D.J., Lemke, G. and Yancopoulos, G. D. (1997) An orphan receptor tyrosine kinase family whose members serve as nonintegrin collagen receptors. *Molecular Cell* 1: 25-34.
- Zhao, J. J. and Lemke, G. (1998) Rules for ribozymes. *Mol. Cell. Neurosci.* 11: 92-97 .

- Zhao, J.J. and Lemke, G. (1998) Selective disruption of neuregulin-1 function in vertebrate embryos using ribozyme-tRNA transgenes. *Development* 125: 1899-1907.
- Désarnaud, F., Thi, A.N.D., Brown, A.M., Lemke, G., Suter, U., Baulieu, E.-E. and Schumacher, M. (1998) Progesterone stimulates the activity of the promoters of peripheral myelin protein-22 and P<sub>0</sub> genes in Schwann cells. *J. Neurochem.* 71: 1765-1768.
- Lemke, G. (1998) Eph receptors and ligands in axon pathway choice, target recognition, and synaptogenesis. *Progress in Brain Research* 117:171-176.
- Lemke, G. (1999) A potential supramolecular assembly in myelin. In *Neural Development*. Keio University Symposia for Life Science and Medicine, Vol. 2. (K. Uyemura, K. Kawamura, T. Yazaki, eds.) Springer-Verlag Tokyo, pp. 315-319.
- Syroid, D.E., Zorick, T.Z., Arbet-Engels, C., Kilpatrick, T.J., Eckhart, W., and Lemke, G. (1999) Role of insulin-like growth factor-I in the regulation of Schwann cell survival. *J. Neurosci.* 19: 2059-2068.
- Zorick, T. S., Syroid, D.E., Brown, A., Gridley, T. and Lemke, G. (1999) Krox-20 controls SCIP expression, cell cycle exit, and susceptibility to apoptosis in developing myelinating Schwann cells. *Development* 126: 1397-1406.
- Krappa, R., Nguyen, A., Burrola, P., Deretic, D., and Lemke, G. (1999) Ectodins: Vesicular proteins that carry a pleckstrin homology domain and localize to post-Golgi membranes. *Proc. Natl. Acad. Sci.*96: 4633-4638.
- Lu, Q., Gore, M., Zhang, Q., Camenisch, T., Boast, S., Casagrande, F., Lai, C., Skinner, M., Klein, R., Matsushima, G.K., Earp, H.S., Goff, S. P. and Lemke, G. (1999) Tyro-3 family receptors are essential regulators of mammalian spermatogenesis. *Nature* 398: 723-728.
- Bertuzzi, S., Hindges, R., Mui, S.H., O'Leary, D.D.M., and Lemke, G. (1999) The homeodomain protein Vax1 is required for axon guidance and major tract formation in the developing forebrain. *Genes and Development* 13: 3092-3105.
- Kilpatrick, T.J., Ortuño, D., Bucci, T., Lai, C., and Lemke, G. (2000) Rat oligodendroglia express c-met and focal adhesion kinase, protein tyrosine kinases implicated in regulating epithelial cell motility. *Neurosci. Lett.* 279: 5-8.
- Brown, A., Yates, P.A., Burrola, P., Ortuño, D., Vaidya, A., Jessell, T.M., Pfaff, S.L., O'Leary, D.D.M., and Lemke, G. (2000) Topographic mapping from the retina to the midbrain is controlled by relative but not absolute levels of EphA receptor signaling. *Cell* 102: 77-88.



- Syroid, D.E., Maycox, P.J., Soilu-Hanninen, M., Petratos, S., Bucci, T., Burrola, P., Murray, S., Cheema, S., Lee, K.-F., Lemke, G., and Kilpatrick, T.J. (2000) Induction of postnatal Schwann cell death by the low-affinity neurotrophin receptor in vitro and after axotomy. *J. Neurosci.* 20: 5741-5747.
- Lemke, G. (2001) Glial control of neuronal development. *Annu. Rev. Neurosci.* 24: 87-105.
- Labrador, J.P., Azcoitia, V., Tuckermann, J., Lin, C., Olaso, E., Mañes, S., Brückner, K., Goergen, J.-L., Lemke, G., Yancopoulos, G., Angel, P., Martinez-A, C., and Klein, R. (2001) The collagen receptor DDR2 regulates proliferation and its elimination leads to dwarfism. *EMBO Reports*: 2: 446-452.
- Lu, Q. and Lemke, G. (2001) Homeostatic regulation of the immune system by receptor tyrosine kinases of the Tyro 3 family. *Science* 293: 306-311.
- Mui, S.H., Hindges, R., O'Leary, D.D.M., Lemke, G., and Bertuzzi, S. (2002) The homeodomain protein Vax2 patterns the dorsoventral and nasotemporal axes of the eye. *Development* 129: 797-804.
- Stefansson, H., Sigurdsson, E., Steinhorsdottir, V., Bjornsdottir, S., Sigmundsson, T., Ghosh, S., Brynjolfsson, J., Gunnarsdottir, S., Ivarsson, O., Chou, T.T., Hjaltasson, O., Birgisdottir, B., Jonsson, H., Gudnadottir, V.G., Gudmundsdottir, E., Bjornsson, A., Ingvarsson, B., Ingason, A., Sigfusson, S., Hardardottir, H., Harvey R.P., Lai, D., Zhou, M., Brunner, D., Mutel, V., Gonzalo, A., Lemke, G., Sainz, J., Johannesson, G., Andresson, T., Gudbjartsson, D., Manolescu, A., Frigge, M.L., Gurney, M.E., Kong, A., Gulcher, J. R., Petrusson, H., and Stefansson, K. (2002) Neuregulin 1 and Susceptibility to Schizophrenia. *Amer. J. Human Genetics*: 71: 877-892.
- Henderson, C. and Lemke, G. (2002) Neuronal and glial cell biology. Editorial overview. *Curr. Opin. Neurobiol.* 12: 473-475.
- Lemke, G. and Lu, Q. (2003) Macrophage regulation by Tyro 3 family receptors. *Curr. Opin. Immunol.* 15: 31-36.
- Zhu, D., Kennerson, M., Merory, J., Chrast, R., Verheijen, M., Lemke, G., and Nicholson, G. (2003) Refined localization of dominant intermediate Charcot-Marie-Tooth neuropathy and exclusion of seven known candidate genes in the region. *Neurogenetics* 4: 179-183.
- Verheijen, M. H. G., Chrast, R., Burrola, P., and Lemke, G. (2003) Local regulation of fat metabolism in peripheral nerves. *Genes and Dev.* 17: 2450-2464 .
- Senderek J., Bergmann, C., Stendel, C., Kirfel, J, Verpoorten, N., De Jonghe, P., Timmerman, V., Chrast, R., Verheijen M.H.G., Lemke, G., Battaloglu, E., Parman, Y., Erdem, S., Tan, E., Topaloglu, H., Hahn, A., Muller-Felber, W., Rizzuto, N.,

- Fabrizi, G.M., Stuhmann, M., Rudnik-Schoneborn, S., Zuchner, S., Michael Schroder, J., Buchheim, E., Straub, V., Klepper, J., Huehne, K., Rautenstrauss, B., Buttner, R., Nelis, E. and Zerres, K. (2003) Mutations in a Gene Encoding a Novel SH3/TPR Domain Protein Cause Autosomal Recessive Charcot-Marie-Tooth Type 4C Neuropathy. *Am. J. Hum. Genet.* 73: 1106-1119.
- Vaidya A., Pniak A., Lemke G., and Brown A. (2003) EphA3 null mutants do not demonstrate motor axon guidance defects. *Mol. Cell. Biol.* 23: 8092-8098.
- Chrast, R., Verheijen, M.H., and Lemke, G. (2004) Complement factors in adult peripheral nerve: a potential role in energy metabolism. *Neurochem. Int.* 45: 353-359.
- Reber, M., Burrola, P. and Lemke, G. (2004) A relative signaling model for the formation of a topographic neural map. *Nature* 431: 847-853.
- Angelillo-Scherrer, A., Burnier, L., Flores, N. Savi, P., Schaeffer, P., Herbert, J.-M., Lemke, G., Goff, S., Matsushima, G.K., Earp, H.S., Hoylaerts, M.F., Plaisance, S., Conway, E.M., Collen, D., Wehrle-Haller, B. and Carmeliet, P. (2005) Role of the Gas6 receptors Tyro 3, Axl, and Mer in outside-in signaling during thrombus stabilization: implications for antithrombotic therapy. *J. Clin. Invest.* 115: 237-246.
- Mui, S., Kim, J. W., Lemke, G., and Bertuzzi, S. (2005) Vax genes ventralize the embryonic eye. *Genes and Development*: 19: 1249-1259.
- Lemke G, Reber M. (2005) Retinotectal Mapping: New insights from molecular genetics. *Annu. Rev. Cell Dev. Biol.* 21: 551-580.
- Budagian V, Bulanova E, Orinska Z, Duitman E, Brandt K, Ludwig A, Hartmann D, Lemke G, Saftig P, Bulfone-Paus S. (2005) Soluble Axl is generated by ADAM10-dependent cleavage and associates with Gas6 in mouse serum. *Mol Cell Biol.* 25: 9324-9339
- Radic, M.Z., Shah, K., Zhang, W., Lu, Q., Lemke, G. and Hilliard. G.M. (2006) Heterogeneous Nuclear Ribonucleoprotein (hnRNP) P2 is an autoantibody target in mice deficient for Mer, Axl, and Tyro 3 receptor tyrosine kinases. *J. Immunol.* 176: 68-74.
- Lemke, G. (2006) Neuregulin-1 and myelination. *Sci STKE.* Mar 7; (325):pe11.
- Caraux, A., Lu, Q., Fernandez, N., Di Santo, J.P., Raulet, D.H., Lemke, G., and Roth, C. (2006) Receptor tyrosine kinases of the Tyro 3 Family play a critical role in Natural Killer cell differentiation. *Nature Immunology* 7: 747-754.
- Sharif, M.N., Sosic, D., Rothlin, C.V., Kelly, E., Lemke, G., Olson, E.N., and Ivashkiv,

- L.B. (2006) Related Articles, Twist mediates suppression of inflammation by type I IFNs and Axl. *J. Exp. Med.* 203: 1891-901
- Shankar, S.L., O'Guin, K., Kim, M., Varnum, B., Lemke, G., Brosnan, C.F., and Shafit-Zagardo B. (2006) Gas6/Axl signaling activates the phosphatidylinositol 3-kinase/Akt1 survival pathway to protect oligodendrocytes from tumor necrosis factor alpha-induced apoptosis. *J. Neurosci.* 26: 5638-5648.
- Prasad, D., Rothlin, C. V., Burrola, P., Burstyn-Cohen, T., Lu, Q., Garcia de Frutos, P., and Lemke, G. (2006) TAM receptor function in the retinal pigment epithelium. *Mol. Cell. Neurosci.* 33: 96-108.
- Kim, J. W. and Lemke, G. (2006) Hedgehog-regulated localization of Vax2 control eye development. *Genes and Development* 20: 2833-2847.
- Stephen, L.J., Fawkes, A.L., Verhoeve, A., Lemke, G., and Brown, A. (2007) A critical role for the EphA3 receptor tyrosine kinase in heart development. *Dev. Biol.*: 302: 66-79.
- Seitz, H.M., Camenisch, T.D., Lemke, G., Earp, H.S. and Matsushima, G.K. (2007) Macrophages and dendritic cells use different axl/mertk/tyro3 receptors in clearance of apoptotic cells. *J. Immunol.* 178: 5635-5642.
- de Preux, A.S., Goosen, K., Zhang, W., Sima, A.A., Shimano, H., Ouwens, D.M., Diamant, M., Hillebrands, J.L., Rozing, J., Lemke, G., Beckmann, J.S., Smit, A.B., Verheijen, M.H. and Chrast, R. (2007) SREBP-1c expression in Schwann cells is affected by diabetes and nutritional status. *Mol. Cell. Neurosci.* 35: 525-534.
- Roth, C., Rothlin, C., Riou, S., Raulet, D.H. and Lemke, G. (2007) Stromal-cell regulation of natural killer cell differentiation. *J. Mol. Med.* 85: 1047-1056.
- Rothlin, C.V., Ghosh, S., Zuniga, E., Oldstone, M.B.A., and Lemke, G. (2007) TAM receptors are pleiotropic inhibitors of the innate immune response. *Cell* 131: 1124-1136.
- Angelillo-Scherrer, A, Burnier, L., Lambrechts, D., Fish, R. J., Tjwa, M., Plaisance, S., Sugamele, R., DeMol, M., Martinez-Soria, E., Maxwell, P., Lemke, G., Goff, S.P., Matsushima, G.P., Earp, H.S., Collen, D., Izui, S., Schapira, M., Conway, E.M., and Carmeliet, P. (2008) Role of Gas6 in erythropoiesis and anemia. *J. Clin. Invest.* 118: 583-596.
- Gallarda, B.W., Bonanomi, D., Müller, D., Brown, A., Alaynick, W. A., Andrews, S.E., Lemke, G., Pfaff, S.L., and Marquardt, T. (2008) Segregation of sensory and motor pathways via heterotypic trans-axonal signaling. *Science* 320: 233-236.

- Pierce, A., Bliesner, B., Xu, M., Nielsen-Preiss, S., Lemke, G., Tobet, S. and Wierman, M.E. (2008) Axl and Tyro3 modulate female reproduction by influencing gonadotropin-releasing hormone neuron survival and migration. *Mol. Endocrinol.* 22: 2481-95.
- Lemke, G. and Rothlin, C.V. (2008) Immunobiology of the TAM receptors. *Nature Reviews Immunology* 8: 327-336.
- Kim, J.W., Kang, K.H., Burrola, P., Mak, T.W., and Lemke, G. (2008) Retinal degeneration triggered by inactivation of PTEN in the retinal pigment epithelium. *Genes & Development* 22: 3147-3157.
- Kang, K.H., Lemke, G., and Kim, J.W. (2009) The PI3K-PTEN tug-of-war, oxidative stress and retinal degeneration. *Trends Mol. Med.* 15: 191-198.
- Triplett, J.W., Owens, M.T., Yamada, J., Lemke, G., Cang, J., Stryker, M.P., and Feldheim, D.A. (2009) Retinal input instructs alignment of visual topographic maps. *Cell* 139: 175-185.
- Burstyn-Cohen, T., Heeb, M. J., and Lemke, G. (2009) Lack of Protein S in mice causes embryonic lethal coagulopathy and vascular dysgenesis. *J. Clin. Invest.* 119: 2942-2953.
- Rothlin C.V. and Lemke, G. (2010) TAM receptor signaling and autoimmune disease. *Curr. Opin. Immunol.* 22: 740-746.
- Lemke, G. and Burstyn-Cohen, T. (2010) TAM receptors and the clearance of apoptotic cells. *Ann. N. Y. Acad. Sci.* 1209: 23-29.
- Bevins, N., Lemke, G., and Reber, R. (2011) Genetic dissection of EphA receptor signaling dynamics during retinotopic mapping. *J. Neurosci.* 31: 10302-10310.
- Wang, J., Zhang, H., Young, A.G., Qiu, R., Argalian, S., Li, X., Wu, X., Lemke, G. and Lu, Q (2011) Transcriptome analysis of neural progenitor cells by a genetic dual reporter strategy. *Stem Cells* 29: 1589-1600.
- Vacik, T., Stubbs, J. L., and Lemke, G. (2011) A novel mechanism for the transcriptional regulation of Wnt signaling in development. *Genes and Development* 25:1783-1795.
- Vacik, T. and Lemke, G. (2011) Dominant-negative isoforms of Tcf/Lef proteins in development and disease. *Cell Cycle* 10(24): 419-200.
- Slavotinek, A.M., Chao, R., Vacik, T., Yahyavi, M., Abouzeid, H., Bardakjian, T., Schneider, A., Shaw, G., Sherr, E.H., Lemke, G., Youssef, M., and Schorderet, D.F.

- (2012) VAX1 mutation associated with microphthalmia, corpus callosum agenesis, and orofacial clefting: The first description of a VAX1 phenotype in humans. *Hum. Mutat.* 33: 364-368.
- Bauer, T., Zagórska, A., Jurkin, J., Jasmin, N., Köffel, R., Richter, R., Gesslbauer, B., Lemke, G., and Strobl, H. (2012) Identification of the receptor tyrosine kinase Axl as a downstream effector of TGF- $\beta$ 1 during Langerhans cell differentiation and epidermal homeostasis: *J. Exp. Med.* 209: 2033-2047.
- Meertens, L., Carnec, X., Perera Lecoin, M., Ramdasi, R., Guivel-Benhassine, F., Lew, E., Lemke, G., Schwartz, O., and Amara, A. (2012) TIM and TAM receptors mediate dengue virus infection. *Cell Host & Microbe* 12: 544-557.
- Burstyn-Cohen, T., Lew, E.D., Través, P. G., Burrola, P. G., Hash, J. C., and Lemke, G. (2012) Genetic dissection of TAM receptor-ligand interaction in retinal pigment epithelial cell phagocytosis: *Neuron* 76: 1123-1132.
- Sullivan, B.M., Welch, M.J., Lemke, G., and Oldstone, M.B. (2013) Is the TAM receptor Axl a receptor for lymphocytic choriomeningitis virus? *J. Virol.* 87:4071-4074.
- Carrera Silva, E. A., Chan, P. Y., Joannas, L., Jabbour, M., Perry, A., Smith-Chakmakova, F., Burstyn-Cohen, T., Lemke, G., Ghosh, S., and Rothlin, C. V. (2013) T cell-derived Protein S engages TAM signaling in Dendritic Cells to control the magnitude of the immune response. *Immunity* 39: 160-170.
- Bhattacharyya, S., Zagórska, A., Lew E. D., Shrestha, B., Rothlin, C. V., Diamond, M. S., Lemke, G. and Young, J. A. T. (2013) Viruses disable innate immune responses via direct activation of TAM receptors: *Cell Host & Microbe* 14: 136-147.
- Lemke, G. (2013) Biology of the TAM Receptors. In: *Signaling by Receptor Tyrosine Kinases*, J. Schlessinger and M. Lemmon, eds., *Cold Spring Harb Perspect Biol.* 5(11): a009076. doi: 10.1101/cshperspect.a009076.
- Zagórska, A., Través, P.G., Lew, E.D., Dransfield, I., and Lemke, G. (2014) Diversification of TAM receptor tyrosine kinase function. *Nature Immunology* 15: 920-928.
- Lew, E.D., Oh, J., Burrola, P.G., Lax, I., Zagórska, A., Schlessinger, J., and Lemke, G. (2014) Differential TAM receptor-ligand-phospholipid interactions delimit differential TAM bioactivities. *eLife* Sep 29;3. doi: 10.7554/eLife.03385.
- Lemke, G. and Julius, D. (2014) Stephen F. Heinemann: A true original. *Proc. Natl. Acad. Sci. USA* 111: 14314-14315.

- Dransfield, I., Zagórska, A., Lew, E.D., and Lemke, G. (2015) Mer receptor tyrosine kinase mediates both tethering and phagocytosis of apoptotic cells. *Cell Death and Disease*: 6:e1646. doi: 10.1038/cddis.2015.18.
- Lemke, G. and Lew, E.D. (2015) A ligand for ALK. *Science Signaling*: 8(360):fs2. doi: 10.1126/scisignal.aaa5566.
- Fuhs, S.R., Meisenhelder, J., Aslanian, A., Ma, L., Zagórska, A., Stankova, M., Binnie, A., Al-Obeidi, F., Mauger, J., Lemke, G., Yates, J.R., and Hunter, T. (2015) Monoclonal 1- and 3-Phosphohistidine Antibodies: New Tools to Study Histidine Phosphorylation. *Cell* 162: 198-210.
- Miner, J.J., Daniels, B.P., Shrestha, B., Proenca-Modena, J.L., Lew, E.D., Lazear, H.M., Gorman, M.J., Lemke, G., Klein, R.S., and Diamond, M.S. (2015) The TAM receptor tyrosine kinase Mertk protects against neuroinvasive viral infection by maintaining blood-brain barrier integrity. *Nature Medicine* 21: 1464-1472.
- Lemke, G. (2015) Adopting ALK and LTK. *Proc. Natl. Acad. Sci. USA* 112: 15783-15784.
- Fourgeaud, L., Través, P. G., Tufail, Y., Leal-Bailey, H., Lew, E. D., Burrola, P. G., Callaway, P., Zagórska, A., Rothlin, C. V., Nimmerjahn, A., and Lemke, G. (2016) TAM receptors regulate multiple features of microglial physiology. *Nature* 532: 240-244.
- Tufail, Y., Cook, D., Fourgeaud, L., Powers, C. J., Merten, K., Clark, C. L., Hoffman, E., Ngo, A., Sekiguchi, K. J., O'Shea, C. C., Lemke, G., and Nimmerjahn, A., (2017) Phosphatidylserine exposure controls viral innate immune responses by microglia. *Neuron* 93: 574-586.
- Savier, E., Eglen, S.J., Bathélémy, A., Perraut, M., Pfrieger, F.W., Lemke, G., Reber, M. (2017) A molecular mechanism for the topographic alignment of convergent neural maps. *Elife* Mar 14;6. pii: e20470. doi: 10.7554/eLife.20470.

**CONTACT**

Email [lemke@salk.edu](mailto:lemke@salk.edu)  
Tel (office) 858-453-4100 ext 1542  
Tel (Admin) 858-453-4100 ext 1149  
Website <http://www.lemkelab.org>  
IMDb site <http://www.imdb.com/name/nm6608562/>

