
BIOGRAPHICAL SKETCH

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NAME W. Marie Campana, Ph.D.	POSITION TITLE Associate Professor of Anesthesiology		
eRA COMMONS USER NAME wcampana			
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
University of California, Berkeley, Berkeley, CA	B.S.	1984-89	Nutrition and Biochemistry
The Pennsylvania State University, University Park, PA	Ph.D.	1991-94	Endocrinology/Cell Biology
University of California San Diego, La Jolla, CA	Fellow	1994-97	Neuroscience

A. Positions and Honors

Professional Experience

1989-1991	Head Prenatal Nutritionist, Vista Community Clinic, Vista, CA
1997-2000	Postgraduate Research Neuroscientist, Department of Neuroscience, University of California, San Diego, La Jolla, CA
2000-2003	Assistant Project Scientist, Department of Anesthesiology, University of California, San Diego, La Jolla, CA
2003-2007	Assistant Professor, Department of Anesthesiology, University of California, San Diego, La Jolla, CA
2007-present	Associate Professor, Department of Anesthesiology, University of California, San Diego, La Jolla, CA

Honors and Awards

1988-1989	American Heart Association Service Award
1991-1994	USDA Pre-doctoral Fellowship, The Pennsylvania State University
1994	Outstanding Graduate Research Award, School of Graduate Studies, The Pennsylvania State University
2003	Recipient, International Society for the Study of the Lumbar Spine (ISSLS) Prize for Best Basic Science in Back Pain Research, Vancouver, Canada
2003	Recipient, EuroSpine Prize for Best Basic Science Poster, Prague, CZ
2003	Cover Research Article, European Journal of Neuroscience
2006	Editorial Board Member, Journal of Peripheral Nervous System
2007	Cover Research Article, Brain Behavior and Immunity
2007	Graduate, National Leadership in Academic Medicine (NCLAM)
2008	Permanent (chartered) Member, NIH/NINDS NSD-2 Study Section
2008	Scientific Advisory Board Member, Peripheral Nerve Society
2009	Editorial Board Member, Current Drug Targets

B. Peer-Reviewed Publications (selected from 48 in print or in press):

1. Campana, W.M., Josephson, R.V., and Patton, S. (1992) PRESENCE AND GENETIC POLYMORPHISM OF AN EPI-THELIAL MUCIN IN MILK OF THE GOAT (CAPRA HIRCUS). **Comp. Biochem. Physiol.** 103B:261-266.
2. Baumrucker, C.R., Campana, W.M., Gibson, C.A., and Kerr, D.E. (1993) INSULIN-LIKE GROWTH FACTORS (IGFs) AND IGF BINDING PROTEINS IN MILK; SOURCES AND FUNCTIONS. **Endocr. Regul.** 27:157-172.

3. Campana, W.M., Skaar, T.C., Gibson, C.A., and Baumrucker, C.R. (1994) INSULIN-STIMULATED GROWTH THROUGH AUTOCRINE IGF-II SECRETION AND THE IGF-I RECEPTOR IN A MOUSE MAMMARY EPITHELIAL CELL LINE. **Endocr. J.** 2: 883-889.
4. Campana, W.M., Hiraiwa, M., Addison, K.C., and O'Brien J.S. (1996) INDUCTION OF MAPK PHOSPHORYLATION BY PROSAPOSIN AND PROSAPTIDE IN PC12 CELLS. **Biochem. Biophys. Res. Commun.** 229:706-712.
5. Hiraiwa, M., Taylor, E.M., Campana, W.M., Darin, S.J., and O'Brien, J.S. (1997) CELL DEATH PREVENTION AND MITOGEN-ACTIVATED PROTEIN KINASE STIMULATION IN SCHWANN CELLS AND OLIGODENDROCYTES BY PROSAPOSIN AND PROSAPTIDES. **Proc. Natl. Acad. Sci. USA** 94:4778-4781.
6. Hiraiwa, M., Campana, W.M., Martin, B., and O'Brien, J.S. (1997) PROSAPOSIN RECEPTOR: EVIDENCE FOR A G-PROTEIN ASSOCIATED RECEPTOR. **Biochem. Biophys. Res. Commun.** 240: 415-418.
7. Campana, W.M., Misasi, R., and O'Brien J.S. (1998) IDENTIFICATION OF A NEUROTROPHIC SEQUENCE IN ERYTHROPOIETIN. **Int. J. Mol. Med.** 1:235-241.
8. Campana, W.M., Eskeland, N., Calcutt, N.A., Misasi, R., Myers, R.R., and O'Brien J.S. (1998) PROSAPTIDE PREVENTS PACLITAXEL NEUROTOXICITY. **Neurotoxicol.** 19: 237-244.
9. Campana, W.M., Hiraiwa, M., and O'Brien J.S. (1998) PROSAPTIDE ACTIVATES THE MAPK PATHWAY BY A G-PROTEIN-DEPENDENT MECHANISM ESSENTIAL FOR ENHANCED SULFATIDE SYNTHESIS BY SCHWANN CELLS. **FASEB J.** 12:307-314.
10. Misasi, R., Sorice, M., Garofalo, T., Campana, W.M., Giammatteo, M., Pavan, A., Hiraiwa, M., Pontieri, G.M., and O'Brien J.S. (1998) COLOCALIZATION AND COMPLEX FORMATION BETWEEN PROSAPOSIN AND MONOSIALOGLANGLIOSIDE GM3 IN NEURAL CELLS. **J. Neurochem.** 71:2313-2321.
11. Campana, W.M., O'Brien, J.S., Hiraiwa, M., and Patton, S. (1999) SECRETION OF PROSAPOSIN, A MULTIFUNCTIONAL PROTEIN, BY BREAST CANCER CELLS. **Biochim. Biophys. Acta** 1427:392-400.
12. Calcutt, N.A., Campana, W.M., Eskelund, N., Mohiuddin, L., Dines, K.C., Mizisin, A.P., and O'Brien J.S. (1999) PROSAPOSIN GENE EXPRESSION AND THE EFFICACY OF A PROSAPOSIN DERIVED PEPTIDE IN PREVENTING STRUCTURAL AND FUNCTIONAL DISORDERS OF PERIPHERAL NERVE IN RATS. **J. Neuropath. Exp. Neurol.** 58:628-636.
13. Hiraiwa, M., Campana, W.M., Mizisin, A.P., Mohiuddin, L., and O'Brien, J.S. (1999) PROSAPOSIN: A MYELINOTROPHIC PROTEIN THAT PROMOTES EXPRESSION OF MYELIN CONSTITUENTS AND IS SECRETED AFTER NERVE INJURY. **Glia** 26:353-360.
14. Campana, W.M., Darin, S., and O'Brien J.S. (1999) PHOSPHATIDYLINOSITOL 3-KINASE AND AKT PROTEIN KINASE MEDIATE IGF-I AND PROSAPTIDE INDUCED SURVIVAL IN SCHWANN CELLS. **J. Neurosci. Res.** 57:332-341.
15. Cai, F., Campana, W.M., Tomlinson, D.R., and Fernyhough, P. (1999) TRANSFORMING GROWTH FACTOR AND GLIAL GROWTH FACTOR-2 REDUCE NEUROTROPHIN-3 MRNA EXPRESSION IN CULTURED SCHWANN CELLS VIA A CAMP-DEPENDENT PATHWAY. **Mol. Brain Res.** 71:256-264.
16. Campana, W.M., Mohiuddin, L., Misasi, R., O'Brien, J.S. and Calcutt, N.A. (2000) PROSAPOSIN-DERIVED PEPTIDES ENHANCE SPROUTING OF SENSORY NEURONS *IN VITRO* AND INDUCE SPROUTING OF MOTOR ENDPLATES *IN VIVO*. **J. Peripher. Nerv. Syst.** 5:126-130.
17. Misasi, R., Sorice, M., DiMarzio, L., Campana, W.M., Molinari, S., Cifone, M.G., Pavan, A., Pontieri, G.M., and O'Brien, J.S. (2001) PROSAPOSIN TREATMENT INDUCES PC12 ENTRY IN THE S PHASE OF THE CELL CYCLE AND PREVENTS APOPTOSIS: ACTIVATION OF ERKS AND SPHINGOSINE KINASE. **FASEB J.** 15:467-474.
18. Campana, W.M., and Myers, R.R. (2001) ERYTHROPOIETIN AND ERYTHROPOIETIN RECEPTORS IN THE PERIPHERAL NERVOUS SYSTEM: CHANGES AFTER NERVE INJURY. **FASEB J.** 15:804-806.
19. Rende, M., Brizi, E., Donato, R., Provenzano, C., Bruno, R., Mizisin, A.P., Garrett, R.S., Calcutt, N.A., Campana, W.M., and O'Brien, J.S. (2001) PROSAPOSIN IS IMMUNOLocalized TO MUSCLE AND PROSAPTIDES PROMOTE MYOBLAST FUSION AND ATTENUATE LOSS OF MUSCLE MASS AFTER NERVE INJURY. **Muscle Nerve** 24:799-808.

20. Campana, W.M., Myers, R.R., Rearden, A. (2003) IDENTIFICATION OF PINCH IN DRG NEURONS: SHUTTLING AND SIGNALING AFTER NERVE INJURY. *Glia* 41:213-223.
21. Myers, R.R., Sekiguchi, Y., Kikuchi, S., Scott, B., Medicherla, S., Protter, A., and Campana, W.M. (2003) INHIBITION OF P38 MAP KINASE ACTIVITY ENHANCES AXONAL REGENERATION. *Exp. Neurol.* 184:606-614.
22. Sekiguchi, Y., Kikuchi, S., Myers, R.R., and Campana, W.M. (2003) ISSLS PRIZE WINNER: ERYTHROPOIETIN INHIBITS SPINAL NEURONAL APOPTOSIS AND PAIN FOLLOWING NERVE ROOT CRUSH. *Spine* 28:2577-2584.
23. Svensson C.I., Marsala, M. Westerlund, A., Calcutt, N.A., Campana, W.M., Freshwater, J.D., Catalano, R., Fend, Y., Protter, A.A., Dugar S., Chakravarty, S., Scott, B. and Yaksh, T.L. (2003) ACTIVATION OF P38 MAP KINASE IN SPINAL MICROGLIA IS A CRITICAL LINK IN INFLAMMATION-INDUCED SPINAL PAIN PROCESSING. *J. Neurochem.* 86:1534-1544.
24. Campana, W.M., and Myers, R.R. (2003) EXOGENOUS ERYTHROPOIETIN PROTECTS AGAINST DORSAL ROOT GANGLION APOPTOSIS AND PAIN FOLLOWING PERIPHERAL NERVE INJURY. *Eur. J. Neurosci.* 18:1497-1506.
25. Li, X., Gonias, S.L., and Campana, W.M. (2005) SCHWANN CELLS EXPRESS ERYTHROPOIETIN RECEPTOR AND REPRESENT A MAJOR TARGET FOR EPO IN PERIPHERAL NERVE INJURY. *Glia* 51:254-265.
26. Bouaziz, H., Iohom, G., Estebe, J.P., Campana, W.M., and Myers, R.R. (2005) EFFECTS OF LEVOBUPIVACAINE AND ROPIVACAINE ON RAT SCIATIC NERVE BLOOD FLOW. *Br. J. Anaesth.* 95:696-700.
27. Lester, R.D., Jo, M., Campana, W.M., and Gonias, S.L. (2005) ERYTHROPOIETIN PROMOTES MCF-7 BREAST CANCER CELL MIGRATION BY AN ERK/MITOGEN-ACTIVATED PROTEIN KINASE-DEPENDENT PATHWAY AND IS PRIMARILY RESPONSIBLE FOR THE INCREASE IN MIGRATION OBSERVED IN HYPOXIA. *J. Biol. Chem.* 280:39273-39277.
28. Campana, W.M. (2006) ERYTHROPOIETIN AND NEUROPROTECTION IN THE PERIPHERAL NERVOUS SYSTEM: *IN VIVO* STUDIES. In **Erythropoietin and the Nervous System** (A. Hoke, eds.) Springer, New York, NY, pp 165-177.
29. Shubayev, V., Angert, M., Dolkas, J., Campana, W.M., Palenscar, K., and Myers R.R. (2006) TNF- α -INDUCED MMP-9 PROMOTES MACROPHAGE RECRUITMENT INTO INJURED PERIPHERAL NERVE. *Mol. Cell. Neurosci.* 31:407-15.
30. Takahashi, N., Kikuchi, S., Shubayev, V.I., Campana, W.M., and Myers, R.R. (2006) TNF- α AND PHOSPHORYLATION OF ERK IN DRG AND SPINAL CORD: INSIGHTS INTO MECHANISMS OF SCIATICA. *Spine* 31:523-9.
31. Campana, W.M., Li, X., Shubayev, V.I., Angert, M., Cai, K., and Myers, R.R. (2006) ERYTHROPOIETIN REDUCES SCHWANN CELL TNF- α , WALLERIAN DEGENERATION AND PAINFUL BEHAVIORS AFTER PERIPHERAL NERVE INJURY. *Eur. J. Neurosci.* 23:617-28.
32. Myers, R.R., Campana, W.M., and Shubayev, V.I. (2006) THE ROLE OF NEUROINFLAMMATION IN NEUROPATHIC PAIN: MECHANISMS AND THERAPEUTIC TARGETS. *Drug Discov. Today* 11:8-20.
33. Campana, W.M., Li, X., Dragojlovic, N., Janes, J., Gaultier, A., and Gonias, S.L. (2006) THE LOW DENSITY LIPOPROTEIN RECEPTOR-RELATED PROTEIN IS A PRO-SURVIVAL RECEPTOR IN SCHWANN CELLS: POSSIBLE IMPLICATIONS IN PERIPHERAL NERVE INJURY. *J. Neurosci.* 26:11197-207.
34. Campana, W.M. (2007) SCHWANN CELLS: ACTIVATED GLIA AND THEIR ROLE IN NEUROPATHIC PAIN. *Brain Behav. Immun.* 21:522-7.
35. Arandjelovic, S., Dragojlovic, N., Li, X., Myers, R. R., Campana, W.M., and Gonias, S.L. (2007) A DERIVATIVE OF THE PLASMA PROTEASE INHIBITOR α 2-MACROGLOBULIN REGULATES THE RESPONSE TO PERIPHERAL NERVE INJURY. *J. Neurochem.* 103:694-705.
36. Montel, V., Gaultier, A., Lester, R., Campana, W.M. and Gonias, S.L. (2007) THE LOW DENSITY LIPOPROTEIN RECEPTOR-RELATED PROTEIN PROMOTES CANCER CELL SURVIVAL AND METASTASIS DEVELOPMENT. *Cancer Research* 67:9817-24.

37. Gaultier, A., Arandjelovic, S., Li, X., Janes, J., Dragojlovic, N., Zhou, G.P., Dolkas, J., Myers, R.R., Gonias, S.L., Campana, W.M. (2008) A SHED FORM OF LDL RECEPTOR-RELATED PROTEIN-1 REGULATES PERIPHERAL NERVE INJURY AND NEUROPATHIC PAIN IN RODENTS. *J Clin Invest* 118:161-172.
38. Gaultier, A., Arandjelovic, S., Niessen, S., Overton, C., Fazio, S., Campana, W.M., Cravatt, B.F., Gonias, S.L. (2008) REGULATION OF THE IKK-NF- κ B PATHWAY BY LDL-RECEPTOR RELATED PROTEIN EXPLAINS THE INFLAMMATORY ACTIVITY OF THIS RECEPTOR. *Blood* 111:5316-25.
39. Mantuano, E., Mukadala, G., Li, X.Q., Campana, W.M., Gonias, S.L. (2008) Molecular dissection of the human α 2-Macroglobulin subunit reveals domains with antagonistic activities in cell signaling. *J Biol Chem* 283:19904-11.
40. Mantuano, E., Inoue, G., Li, X.Q., Takahashi, K., Gaultier, A., Gonias, S.L., Campana, W.M. (2008) The hemopexin domain of matrix metalloproteinase-9 activates cell signaling and promotes migration of Schwann cells by binding to low density lipoprotein receptor related protein. *J Neurosci* 28:11571-82.
41. Sorkin, L., Svensson, C.I., Jones-Cordero, T.L., Hefferan, M.P., Campana, W.M. (2009) Spinal p38 mitogen activated protein kinase mediates allodynia induced by first degree burn in the rat. *J Neurosci Res* 87:948-955.
42. Gaultier, A., Wu, X., Le Moan, N., Takimoto, S., Mukandala, G., Akassoglou, K., Campana, W.M., Gonias, S.L. (2009) Low density lipoprotein receptor related protein is an essential receptor for myelin phagocytosis. *J Cell Science* 122 (Pt 8):ra18.
43. Shi, Y., Mantuano, E., Inoue, G., Campana, W.M., Gonias, S.L. (2009) The low density lipoprotein receptor related protein transactivates TrkA. *Science Signaling* 2:ra18.
44. Inoue, G., Gaultier, A., Li, XQ, Mantuano, E., Richardson, G., Takahashi K., Campana, W. M. (2009) ERYTHROPOIETIN PROMOTES SCHWANN CELL MIGRATION AND ASSEMBLY OF THE PROVISIONAL EXTRACELLULAR MATRIX BY RECRUITING β 1 INTEGRIN TO THE CELL SURFACE. *GLIA* (in press).

C. Research Support

Ongoing:

- | | |
|--|---------------------|
| NIH-NINDS R01NS057456 – Campana (PI)
“LRP-1 is a multifunctional regulator during peripheral nerve injury and pain”
The goal of this project is to determine the role of LRP-1 in peripheral nerve after injury and its contribution to chronic pain. | 01/15/08 – 01/14/13 |
| NIH NINDS R01 NS054571 - Gonias (PI)
“Alpha-2-macroglobulin in peripheral nerve injury”
The goal of this project is to dissect the molecular domains of Alpha -2-macroglobulin and determine their functionality in peripheral nerve injury. | 07/01/07-06/30/12 |
| NIH-NINDS R21NS062446 – Calcutt (PI)
“Non pharmacologic treatments for diabetic neuropathy”
Our primary aim is to investigate the effect of low-intensity ultrasound to prevent and treat nerve damage in diabetic rats. Our secondary aim is to investigate whether the mechanism of action is related to induction of changes in blood flow local, without there being any general systemic effects. The goal is to determine whether this non-invasive, non-pharmaceutical, therapy has potential for rapid translation to use in patients suffering from diabetic neuropathy, for whom life-long treatment with systemic drugs designed to improve nerve blood flow may be costly and have harmful side-effects. | 02/01/09 – 01/31/11 |
| NIH-NINDS P30 NS047101 - Gleeson (PI)
UCSD Neuroscience Microscopy Imaging Core | 06/01/04 – 06/01/13 |

Completed:

NIH-NINDS R01 NS041983-01 – Campana (PI) 01/31/03 - 12/31/07
“Epo-dependent JAK2 Signaling in Painful Neuropathy”
This projects aims to identify the mechanism underlying the neuroprotective effects of Epo-mediated alleviation of neuropathic pain.

NIH-CHHD R24 HD050537 - Campana (PI) 03/01/06 – 02/28/07
“Glia activation in Muscle Pain”
The goal of this project was to determine differences in spinal glia after eccentric and isometric muscle activity.

UCSD Academic Senate Grant – Campana (PI) 01/01/07 – 12/31/07
“LRP-1 in peripheral nerve injury”

NIH-NINDS R01 NS018715-24 - Myers (PI) 03/01/03 - 12/01/07
“Pathogenesis and Treatment of Nerve Block Injuries”
This project aims to identify the role of TNF- α -mediated signaling and matrix metallo-proteinases after nerve injury leading to chronic pain.

NIH-NINDS R01 NS41580-05 – Sorkin (PI) 12/01/01 – 11/30/05
“Ca Permeable non-NMDAr: New Spinal Sensitization Pathway”
This project aims to identify the role of calcium permeable non-NMDA receptors in pain processing. Specific emphasis was to determine associated signaling pathways in the spinal dorsal horn and how that relates to pain states.