BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Campbell, Kevin P.	Investigator, Howard Hughes Medical Institute Director, Wellstone Muscular Dystrophy Research Center Chair, Dept of Molecular Physiology and Biophysics
eRA COMMONS USER NAME (credential, e.g., agency login) kcampbell	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Manhattan College, Bronx, NY	B.S.	1973	Physics
University of Rochester, Rochester, NY	M.S.	1976	Biophysics
University of Rochester, Rochester, NY	Ph.D.	1979	Biophysics
University of Toronto, Toronto, Canada	Postdoc	1979-81	Membrane Biochemistry

A. Personal Statement

Our research focuses on understanding the molecular, cellular and physiological basis of various forms of muscular dystrophy, and on developing therapeutic strategies to treat these diseases. Our laboratory's early studies at the University of Iowa focused on elucidating the structure and function of calcium channels in skeletal muscle. For the past twenty years, however, we have actively investigated the molecular pathogenesis of muscular dystrophy. Our laboratory has used biochemical, cell biological, genetic and physiological techniques to identify and define disease mechanisms that cause various forms of muscular dystrophy. In doing so, we cloned and characterized dystroglycan, and demonstrated that it links the cytoskeleton to the extracellular matrix in skeletal muscle. Our studies on dystroglycan have since led to significant insights into its basic function as an extracellular matrix receptor in skeletal muscle, its role in the maintenance of muscle-cell membrane integrity and its role in the molecular pathogenesis of glycosylation-deficient muscular dystrophy.

B. Positions and Honors

Positions and Employment

1973-1977 Graduate Student, Department of Radiation Biology and Biophysics, University of Rochester
1977, 1978 Teaching Assistant, Graduate Biochemistry, University of Rochester
1979-1981 Postdoctoral Fellow with Dr. David MacLennan, University of Toronto
1981-1985 Assistant Professor, Dept. of Molecular Physiology and Biophysics, University of Iowa
1985-1988 Associate Professor, Dept. of Molecular Physiology and Biophysics, University of Iowa
1988- Professor, Dept. of Molecular Physiology and Biophysics, University of Iowa
1989- Investigator, Howard Hughes Medical Institute
1997- Professor, Dept. of Neurology, University of Iowa
1999- Roy J. Carver Biomedical Research Chair in Molecular Physiology and Biophysics
2002-2005 Interim Head, Department of Molecular Physiology and Biophysics, University of Iowa
2005- Professor, Department of Internal Medicine
2005- Chair, Department of Molecular Physiology and Biophysics, University of Iowa
2005- Director, Wellstone Muscular Dystrophy Cooperative Research Center

Other Experience and Professional Memberships

1988-2001 Editorial Board: Journal of Biological Chemistry
1989-1995 Muscular Dystrophy Association Fellowship Review Committee
1991-1995 Physiology Study Section Member, National Institutes of Health
1996-2009 Muscular Dystrophy Association Scientific Advisory Committee

2000-2004 Editorial Board: Journal of Cell Biology
2001-2005 Skeletal Muscle Biology and Exercise Physiology Study Section, National Institutes of Health
2005-2009 Council Member, National Arthritis and Musculoskeletal and Skin Disease Advisory Council
2006- Board Member, Duke NUS-Graduate Medical School Singapore, Scientific Advisory Board
2008-2009 University of Iowa Animal Care Facilities Planning Taskforce
2010- Member, Biomedical Science Advisory Board, Vanderbilt University
2010- Co-Editor-in-Chief: Skeletal Muscle
2011- Reviewer Board: PLoS Currents: Muscular Dystrophy

Honors

1973 Phi Beta Kappa, Manhattan College
1977-1978 Elon Huntington Hooker Fellow, University of Rochester
1978-1981 Medical Research Council Postdoctoral Fellowship, University of Toronto
1984-1989 Established Investigator of the American Heart Association
1989 University of Iowa Foundation Distinguished Professor of Physiology and Biophysics
1990 Regents Award for Faculty Excellence
1992 Emilio Trabucchi Foundation Medal
1993 Muscular Dystrophy Association Service Merchandise Leadership Award
1994 ASBMB-Amgen Award
1994 International Albrecht Fleckenstein Award
1995 INSERM/Académie des Sciences Prix
1996 American Academy of Neurology Decade of the Brain Award
1997 Duchenne-Erb-Preis Award (German Muscular Dystrophy Association)
1999 Fellow of the Biophysical Society
1999 Roy J. Carver Biomedical Research Chair in Molecular Physiology and Biophysics
1999 Elected to the Institute of Medicine, National Academy of Sciences
2000 G. Conte Prize for Basic Research, Mediterranean Society of Myology
2001 S. Mouchly Small, MDA Scientific Achievement Award
2001 Elsevier Science Award at the World Muscle Society Meeting
2003 University of Manitoba Samuel Weiner Distinguished Visitor Award
2004 Rochester Distinguished Scholar Medal
2004 American Academy of Neurology Lecturer Award
2004 Elected to the National Academy of Sciences
2005 Carver College of Medicine Distinguished Mentor Award
2006 American Academy of Arts and Sciences
2009 March of Dimes Prize in Developmental Biology
2010 A. Ross McIntyre Award

C. Selected peer-reviewed publications

1. **Campbell, K.P.** and Kahl, S.D. Association of Dystrophin and an Integral Membrane Glycoprotein. *Nature 338*:259-262, 1989. PMID: 2493582.
2. Ervasti, J.M., Ohlendieck, K., Kahl, S.D., Gaver, M.G., and **Campbell, K.P.** Deficiency of a Glycoprotein Component of the Dystrophin Complex in Dystrophic Muscle. *Nature 345*:315-319, 1990. PMID: 2188135.
3. Ervasti, J.M. and **Campbell, K.P.** Membrane Organization of the Dystrophin-Glycoprotein Complex. *Cell 66*:1121-1131, 1991. PMID: 1913804.
4. Ibraghimov-Beskrovnaya, O., Ervasti, J.M., Leveille, C.J., Slaughter, C.A., Sernett, S.W., and **Campbell, K.P.** Primary Structure of Dystrophin-Associated Glycoproteins Linking Dystrophin to the Extracellular Matrix. *Nature 355*:696-702, 1992. PMID: 1741056.
5. Roberds, S.L., Leturcq, F., Allamand, V., Piccolo, F., Jeanpierre, M., Anderson, R.D., Lim, L.E., Lee, J.C., Tomé, F.M.S., Romero, N.B., Fardeau, M., Beckmann, J.S., Kaplan, J.-C., and **Campbell, K.P.** Missense Mutations in the Adhalin Gene Linked to Autosomal Recessive Muscular Dystrophy. *Cell 78*:625-633, 1994. PMID: 8069911.
6. Michele, D.E., Barresi, R., Kanagawa, M., Saito, F., Cohn, R.D., Satz, J.S., Dollar, H., Nishino, I., Kelley, R.I., Somer, H., Straub, V., Mathews, K.D., Moore, S.A. and **Campbell, K.P.** Posttranslational Disruption of Dystroglycan-Ligand Interactions in Congenital Muscular Dystrophies. *Nature 418*:417-422, 2002. PMID: 12140558.

7. Cohn, R.D., Henry, M.D., Michele, D.E., Barresi, R., Saito, F., Moore, S.A., Flanagan, J.D., Skwarchuk, M.W., Robbins, M.E., Mendell, J.R., Williamson, R., **Campbell, K.P.** Disruption of Dag1 in Differentiated Skeletal Muscle Reveals a Role for Dystroglycan in Muscle Regeneration. *Cell 110*:639-48, 2002. PMID: 12230980.
8. Bansal, D., Miyake, K., Vogel, S.S.,Williamson, R., McNeil, P.L., **Campbell, K.P.** Defective Membrane Repair in Dysferlin-Deficient Muscular Dystrophy. *Nature 423*:168-172, 2003. PMID: 12736685.
9. Saito, F., Moore, S.A., Barresi, R., Henry, M.D., Messing, A., Ross-Barta, S.E., Cohn, R.D., Williamson, R.A., Sluka, K.A., Sherman, D.L., Brophy, P.J., Schmelzer, J.D., Low, P.A., Wrabetz, L., Feltri, M.L., and **Campbell, K.P.** Unique Role of Dystroglycan in Peripheral Nerve Myelination, Nodal Structure and Sodium Channel Stabilization. *Neuron 38*:747-58, 2003. PMID: 12494959.
10. Barresi, R., Michele, D.E., Kanagawa, M., Harper, H.A., Dovico, S.A., Satz, J.S., Moore, S.A., Zhang, W., Schachter, H., Dumanski, J.P., Cohn, R.D., Nishino, I. and **Campbell, K.P.** LARGE Can Functionally Bypass α-Dystroglycan Glycosylation Defects in Distinct Congenital Muscular Dystrophies. *Nat. Med. 10*:696-703, 2004.PMID: 15184894.
11. Kanagawa, M., Saito, F., Kunz, S., Yoshida-Moriguchi, T., Barresi, R., Kobayashi, Y.M., Muschler, J., Dumanski, J.P., Michele, D.E, Oldstone, M.B. and **Campbell, K.P.** Molecular Recognition by LARGE is Essential for Expression of Functional Dystroglycan. *Cell 117*:953-64, 2004. PMID: 15210115.
12. Kobayashi, Y.M., Rader, E.P., Crawford, R.W., Iyengar, N.K., Thedens, D.R., Faulkner, J.A., Parikh, S.V., Weiss, R.M., Chamberlain, J.S., Moore, S.A., **Campbell, K.P.** Sarcolemma-Localized nNOS is Required to Maintain Activity After Mild Exercise. *Nature* 456:511-5, 2008. PMID: 15953332; PMCID: PMC2588643.
13. Han, R., Kanagawa, M., Yoshida-Moriguchi, T., Rader, E., Ng., R.A., Michele, D.E., Muirhead, D.E., Kunz, S., Moore, S.A., Iannaccone, S.T., Miyake, K., McNeil, P.L., Mayer, U., Oldstone, M.B.A., Faulkner, J.A., **Campbell, K.P.** Basal Lamina Strengthens Cell Membrane Integrity via the Laminin G Domain Binding of α-Dystroglycan. *Proc Natl Acad Sci USA*. *31*:12573-79, 2009. PMID: 19633189; PMCID: PMC2715328.
14. Yoshida-Moriguchi, T., Yu, L., Stalnaker, S.H., Davis, S., Kunz, S., Oldstone, M.B.A., Schachter, H., Wells, L., **Campbell, K.P.** *O*-Mannosyl Phosphorylation of Alpha-Dystroglycan is Required for Laminin Binding. *Science. 327*:88-92, 2010. PMID: 20044576.
15. Hara, Y., Balci, B., Kanagawa, M., Beltran-Valero de Bernabe, D., Gundesli, H., Yoshida-Moriguchi, T., Willer, T., Satz, J.S., Burden, S.J., Oldstone, M.B.A., Accardi, A., Talim, B., Muntoni, F., Topaloglu, H., Dincer, P. and **Campbell, K.P.** A Dystroglycan Mutation Associated with Limb-Girdle Muscular Dystrophy. *N. Eng. J. Med. 364:* 939-46, 2011.
16. Hara, Y., Kanagawa, M., Kunz, S., Yoshida-Moriguchi, T., Satz, J.S., Kobayashi, Y.M., Zhu, Z., Burden, S.J., Oldstone, M.B.A. and **Campbell, K.P.** LARGE-dependent modification of dystroglycan at Thr-317-319 is required for laminin binding and areanavirus infection. *Proc Natl Acad Sci USA*. *108:* 17426-31, 2011.
17. Inamori, K., Yoshida-Moriguchi, T., Hara, Y., Anderson, M.E., Yu, L. and **Campbell, K.P.** Dystroglycan Function Requires Xylosyl- and Glucuronyltransferase Activities of LARGE. *Science 335:* 93-96, 2012.

D. Research Support

Ongoing Research Support

Investigator Campbell (PI)
Howard Hughes Medical Institute
Cell Biological Studies of Muscular Dystrophy
The overall goal of this project is to understand the molecular pathogenesis of muscular dystrophy.

5 U54 NS053672-06 (Campbell) 06/08/2010-06/31/2015
NIH/NINDS
Senator Paul D. Wellstone Muscular Dystrophy Cooperative Research Center
Therapeutic Strategies for Congenital and Limb-Girdle Muscular Dystrophies
The overall goal of this proposal is to create a Muscular Dystrophy Cooperative Research Center which will use translational research and advance diagnostic services to explore therapeutic strategies for the treatment of various forms of muscular dystrophy.

1 RC2 NS069521-01 (Campbell) 09/30/2009-08/31/2011
NIH/NINDS

ARRA: High-Throughput Genetic & Small-Molecule Screening for Therapeutic Modifiers
This proposal is designed to identify new gene mutations that can cause these types of muscular dystrophy, discover small molecules that can improve dystroglycan function, develop needed mouse models of the disease and to validate newly identified small molecules in treatment strategies.

Muscular Dystrophy Association (Campbell) 01/01/2010-12/31/2012
This proposal focuses on exploring the mechanisms required for dystroglycan posttranslational processing. The overall results of these experiments will lead to identification of both positive effectors and negative regulators of dystroglycan post-translational modification.

Completed Research Support

W81XWH-05-1-0079 (Campbell) 11/05/2004-11/04/2009
US Department of Defense
Muscle Cell Membrane Maintenance and Repair
The overall goal of this proposal is to understand better the physiology of muscle cell membrane repair.

5 R01 AR051199 (Campbell) 4/01/2004-03/31/2010
NIH/NINDS
Therapeutic Potential of ε-sarcoglycan in the Treatment of LGMD Type 2D
The overall goal of this project is to design a therapy for autosomal recessive limb-girdle muscular dystrophy type 2D by exploring the therapeutic potential of upregulating ε-sarcoglycan in skeletal muscle.

3 R01 AR051199-05S1 (Campbell) 09/23/2009-09/22/2010
NIH/NIAMS
Therapeutic potential of α-sarcoglycan in the treatment of limb-girdle muscular dystrophy type 2D (LGMD-2D)
This Competitive Revision focuses on exploring pharmacological treatment strategies encompassing pathways involved in exercise to prevent this form of fatigue as well as prevent exercise-induced muscle edema in mdx and sarcoglycan mouse models.