

**BIOGRAPHICAL SKETCH**

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.  
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Walter, Glenn Adam	POSITION TITLE Assistant Professor of Physiology and Functional Genomics		
eRA COMMONS USER NAME			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Franklin and Marshall College, Lancaster, PA	B.A.	1989	Biology/Physics
University of Pennsylvania, Philadelphia, PA	Ph.D.	1997	Biophysics

**A. Positions and Honors.****Positions and Employment**

1989-1990 **Technician**, Department of Biochemistry and Biophysics, University of Pennsylvania, Philadelphia, PA  
 1990-1991 **Research Assistant**, Department of Biochemistry and Biophysics, University of Pennsylvania, Philadelphia, PA  
 1991-1997 **Predoctoral Student**, Department of Biochemistry and Biophysics, University of Pennsylvania, Philadelphia, PA, Metabolic Magnetic Resonance Research and Computing Center, University of Pennsylvania, Philadelphia, PA  
 1997-1999 **Postdoctoral Fellow**, Department of Physiology, University of Pennsylvania, Philadelphia, PA  
 1999-2001 **Instructor of Physiology** Department of Physiology, University of Pennsylvania, Phila., PA  
 2001- **Assistant Professor**, Department of Physiology and Functional Genomics, University of Florida, Gainesville, FL

**Other Experience and Professional Memberships**

American Society of Sports Medicine/American Physiological Society / Powell Gene Therapy Center, University of Florida/ University of Florida Cancer Center/ University of Florida Brain Institute/ National High Field Magnet Laboratory

**Honors**

1991-1993 Recipient of NIH training grant in biophysics / 1997-1999 Recipient of NIH training grants in cardiology and physiology/ 1998 Young Investigator Award, Institute for Human Gene Therapy/ 1999 Young Investigator Award, Institute for Human Gene Therapy

**B. Selected peer-reviewed publications**

Vandenborne, K., McCully, K., Kakihiro, H., Prammer, M., Bolinger, L., Detre, J., De Meirleir, K., Walter, G., Chance, B., Leigh, J.S.: Metabolic heterogeneity in human calf muscle during maximal exercise. *Proc Natl Acad Sci USA* 88: 5714-5718, 1991.  
 Goelman, G., Walter, G. and J.S. Leigh. "Hadamard spectroscopic imaging technique as applied to study human calf muscles." *Magn. Reson. Med.*, 25, 349-354, 1992.  
 Mancini, D.M., Walter, G., Reichel, N., Lenkinski, R., McCully, K., Mullen, J. and Wilson, J.R. "Contribution of skeletal muscle atrophy to exercise intolerance and altered muscle metabolism in heart failure." *Circulation*, 85, 1364-1373, 1992.  
 Vandenborne, K., Walter, G., Leigh, J.S., Goelman, G.: pH heterogeneity in localized spectra of single human muscles. *Am J Physiol* 265 (*Cell Physiol* 34): C1132-C1139, 1993.  
 Vandenborne, K., Walter, G., Ploutz-Snyder, L., Staron, R., Fry, A., De Meirleir, K., Dudley, G., Leigh, J.S.: Energy rich phosphates in slow and fast human skeletal muscle. *Am J Physiol* (268): C869-C876, 1995.  
 Walter, G., Vandenborne, K., McCully, K., Leigh, J.S.: Noninvasive measurement of phosphocreatine recovery kinetics in single muscles. *Am J Physiol* 272 (*Cell Physiol* 41): C525-534, 1997.  
 Elliott, M.A., Walter, G.A., Gulish, H., Sadi, A.S., Lawson, D.D., Jaffe, W., Insko, E.K., Leigh, J.S., Vandenborne, K.: Volumetric measurement of human calf muscle from MRI. *MAGMA* 5: 93-98, 1997.

- Vandenborne, K., Elliot, M.A., Walter, G.A., Sadi, A.S., Okereke, E., Shaffer, M., Tahernia, D., Esterhai, J.: Longitudinal study of skeletal muscle adaptations during immobilization and rehabilitation. *Muscle Nerve* 21: 1006-1012, 1998.
- Elliott, M.A., Walter, G.A., Swift, A., Vandenborne, K., Schotland, J.C., Leigh, J.S.: Spectral quantitation by principle-component analysis using complex singular value decomposition. *Mag.Res.Med.*,41:450-455, 1999.
- Walter, G., Vandenborne, K., Elliott, M., Leigh, J.S.: Non-invasive measurement of ATP synthesis rates in single human muscles. *J Physiol (London)*, 519:901-910, 1999.
- Walter, G., Barton, E. and H.L. Sweeney, "Noninvasive measurement of gene expression in muscle" *PNAS* 97:5151-5155, 2000.
- Vandenborne, K., Walter, G., Ploutz-Snyder, L., Dudley, G., Elliott, M.A., De Meirleir, K., Leigh, J.S.: Relationship between muscle T2 relaxation properties and metabolic state: a combined localized 31P-spectroscopy and 1H-imaging study. *Eur J Physiol*, 82:76-82,2000.
- Shaffer M, Okereke E, Esterhai J, Elliott M, Walter GA, Yim S, Vandenborne K. "The effects of immobilization on plantar flexion strength, endurance, and functional ability following an ankle fracture." *Physical Therapy*, 80(8), 769-181, 2000.
- Russ, D.W., Vandenborne, H.E., Walter, G.A., Elliott, M.E., and S. Binder-Macleod. Effects of Stimulation Frequency and Force on Fatigue and Metabolism in Human Skeletal. *J Appl Physiol* 92: 1978–1986, 2002.
- Russ, D.W., Vandenborne, H.E., Walter, G.A., Elliott, M.E., and S. Binder-Macleod. Metabolic costs of isometric force generation and maintenance of human skeletal muscle. *Am J Physiol Endocrinol Metab* 282: E448–E457, 2002.
- Fraites, T J. ,Schleissing, MR, Shanely, RA, Walter,GA, Cloutier, DA, Zolotukhin,I, Pauly, DF, Raben, N, Plotz, PH, Powers, SK, Kessler, PD and Barry J. Byrne. Correction of the enzymatic and functional deficit in a model of Pompe's disease using adeno-associated virus vectors. *Molecular Therapy* 5(2):571-578 , 2002.
- Walter, G., Cahill, KC, Feng, H., Douglas, T., Huard, J., Sweeney, H.L., J.W.M Bulte. Noninvasive Monitoring of Stem Cell Transfer for Muscle Disorders *Magn Reson Med*. 2004 Feb;51(2):273-7.
- White, L.J., McCoy, S.C., Castellano, V., Gutierrez, G., Stevens, J.E., GA Walter, and K Vandenborne. Resistance Training Improves Strength and Functional Capacity in Persons with Multiple Sclerosis. *Mult Scler* Dec;10(6):668-74, 2004.
- Stevens, J., Walter, G., Esterhai, J., Elliott, M., Shaffer, M., Yim, S., Vandenborne, K. Longitudinal Study of Skeletal Muscle Adaptations During Immobilization and Rehabilitation after Ankle Fracture. *Med. Sci. Sports Exer.*, 36(10): 1695-1701, 2004.
- Cahill, KS, Gaidosh, G., Silver, X., Huard, J., Byrne, B.J., and G. Walter. Noninvasive Monitoring and Tracking of Muscle Stem Cell Transplants. *Transplantation* 78(11), pp. 1626-1633, 2004.
- Falcón, BL, Bourassa E., Stewart J. ,Katovich M.J., Walter G., Speth, R.C. Sumners, C. and M.K. Raizada Angiotensin II type 2 receptor gene transfer elicits cardioprotective effects in an angiotensin II infusion rat model of hypertension. *Physiol Genomics*;19(3):255-61, 2004.
- Cahill, KS, Germain, S., Byrne, BB and G. A Walter. Non-invasive analysis of myoblast transplants in rodent cardiac muscle *International Journal of Cardiovascular Imaging*. 20(6):December 2004.
- Pathare NC, Walter, G.A., Stevens JE, Yang Z, Okereke E, Gibbs JD, Esterhai JL, Scarborough, JT, Gibbs, CP, Sweeney HL, and K Vandenborne. Changes in inorganic phosphate and force production in human skeletal muscle following cast immobilization. *J Appl Physiol* 98: 307–314, 2005.
- Frimel, T.N, Walter,G.A., Gibbs, J.D., Gaidosh, GS. and Krista Vandenborne. Noninvasive monitoring of muscle damage during reloading following limb disuse. *Muscle Nerve* 32(5):605-612, 2005
- Frimel, T.N, Kapadia, F., Gaidosh, GS. Li, Y., Walter, G.A., and Krista Vandenborne. A model of muscle atrophy using cast immobilization in mice. *Muscle Nerve* 32(5)672-674, 2005.
- Swadeshmukul Santra, Heesun Yang, Jessie T. Stanley, Paul H. Holloway, Brij M. Moudgil, Glenn Walter, and Robert A. Mericle, "Rapid and Effective Labeling of Brain Tissue Using TAT-Conjugated CdS:Mn/ZnS Quantum Dots", *Chemical Communications*, Jul:7(25):3144-3146, 2005.
- Swadeshmukul Santra, Rahul P. Bagwe, Debamitra Dutta, Jessie T. Stanley, Glenn A. Walter, Weihong Tan, Brij M. Moudgil, and Robert A. Mericle, "Synthesis and characterization of novel fluorescent, radio-opaque and paramagnetic silica nanoparticles for multimodal bioimaging applications", *Advanced Materials*, (17):2165-, 2005.
- Walter, G.,Bloy,D., Cordier, L, and H. Lee Sweeney. Noninvasive monitoring of gene correction in muscle *Magn Reson Med*. 2005 Dec;54(6):1369-76.
- Conlon TJ, Walter G, Owen R, Cossette T, Erger K, Gutierrez G, Goetzman E,Matern D, Vockley J, Flotte TR. Systemic correction of a fatty acid oxidation defect by intramuscular injection of a recombinant adeno-associated virus vector. *Hum Gene Ther*. 2006 Jan;17(1):71-80.

**C. Research Support**  
**Ongoing Research Support**

**U54 AR052646** Lee Sweeney (PI) 10/1/05-09/30/10  
 NIH

“Modulation of Muscle Growth for Muscular Dystrophies”.

The overall theme of this Center is to study mechanisms to modulate muscle growth and breakdown for treatment of a variety of muscular dystrophies.

**R01 HL78670-01** (PI G.A. Walter) 9/1/04-8/31/08  
 NIH

Noninvasive Monitoring and Tracking of Muscle Stem Cells

The overall objective of this proposal is to develop magnetic resonance method to noninvasively evaluate cell based therapies in skeletal- and cardiac myopathies. Current methods for the analysis of cell-based therapies are largely restricted to invasive measurements in animal models. In this proposal, emphasis is placed on the development of noninvasive magnetic resonance (MR) assays to monitor *in vivo* stem cell migration, viability, and engraftment following cell delivery to cardiac and skeletal muscle using a FDA approved superparamagnetic iron oxide.

**R01 HD40850-01** PI: Krista Vandeborne 12/1/01-6/30/06  
 NIH

“IGF-I gene transfer to accelerate recovery following disuse”

The objective of this study is to investigate the potential of virus-mediate gene transfer of IGF-1 to accelerate the recovery of muscle following immobilization.

Role: Co-I

**P01 HL59412 (N Muzyczka)** 9/01/02-8/31/07  
 NIH/NHLBI

**Subproject 2** (T. Flotte) "AAV vector delivery to skeletal muscle as a platform for therapeutic protein delivery"

Disorders of mitochondrial fatty acid oxidation (FAO) as a group represent a relatively common class of metabolic disorders, the most common of which typically present with either Sudden Infant Death Syndrome (SIDS) or with a combined cardiac and skeletal myopathy. We propose to utilize rAAV vectors expressing FAO enzymes in an attempt to unravel the pathobiology of FAO disorders and to better define endpoints for molecular therapies of these disorders.

Role: Co-I

**Subproject 4** (B. Byrne) "Correction of inherited cardiomyopathy using AAV vectors"

The proposed study is designed to examine the ability of AAV-GAA to direct the sustained cardiac expression of GAA in a murine model of cardiomyopathy. We now propose to evaluate this potential by assessing the effectiveness and biological impact following AAV-mediated reconstitution of acid a-glucosidase activity in an animal model of the inherited hypertrophic cardiomyopathy, infantile Pompe disease.

**NIH-RO1 (S. Zolotukin)** 9/1/03-8/31/08  
 “rAAV-Mediated Engineering *in vivo*”

The objective of this study is to show that the novel adipocyte hormone adiponectin, when administered peripherally via recombinant adeno-associated virus (rAAV), can control body weight (BW) gain and correct the attendant metabolic disorders for extended periods of time in obese rodents with specific genetic defects and in diet-induced obese (DIO) insulin-resistant rats.

Role: Co-I

**RO1-AR47292 (H.L. Sweeney)** 7/1/00-8/31/05  
 NIH

**Bioengineering Research Partnership aimed at Muscular Dystrophy**

Bioengineering Research Partnership aimed at the development of novel therapies and the noninvasive monitoring for the treatment of muscular Dystrophy. As part of our BRP we have assembled a multidisciplinary research team applying an integrative systems approach to develop methods to prevent, detect, diagnose and treat neuromuscular diseases. The overall goal of Core 3 is the development of noninvasive imaging modalities that can lead to the identification and progression/regression in muscular dystrophy and the testing of adeno-associated (AAV)-based gene therapy for Duchenne and Becker muscular dystrophies.

Role: Co-I

**Completed Projects:**

**2P41RR02305-16 PI:** Jack S. Leigh

9/30/99-8/31/04

NIH-P50

"A resource for magnetic resonance and optical research"

Core1.4: Noninvasive Measurement of Gene Expression in Skeletal Muscle

The major goals of this project are to develop specific marker genes that can be used to noninvasively monitor gene delivery. The specific aims are to develop novel NMR, MRI, and optical gene products that can be used to image gene transfer efficacy in vivo.

Role: Co-I

**R01 HD37645-01 PI:** Vandeborne, K.

7/1/99-6/30/04

NIH

"Mechanisms of muscle dysfunction and recovery after limb disuse."

The major goal of this study is to implement innovative, noninvasive imaging techniques to study the mechanisms involved in the loss and recovery of muscle strength and overall functional ability after limb disuse. For this purpose, Magnetic Resonance Imaging (MRI) and Magnetic Resonance Spectroscopy (MRS) measurements will be performed on skeletal muscle during the course of cast immobilization and the subsequent recovery, in both humans and an animal model. MRI and MRS determined measures will be related to in vitro measures for validation and to performance in daily ambulatory activities in order to determine their predictive outcome value.

Role: Co-I

**"MRI and MRS of murine dystrophy" (PI)**

7/1/00-3/31/02

Muscular Dystrophy Association

The major goals of this project are to determine whether proton MRI and MRS can be used to noninvasively monitor gene delivery and antibiotic treatments for muscular dystrophy. In addition, new MRI/MRS techniques are to be developed to monitor the efficacy of gene therapy and antibiotic treatment for the prevention of muscle damage in the muscular dystrophy.

**Shared Instrumentation Grant (Co-PI)**

09/1/01-08/31/02

USHHS

Magnetic Resonance Instrumentation for a National Center for Human Brain Functional Imaging Technology and Image Guided Surgery (CHBFIT) within the McKnight Brain Institute of the University of Florida (MBI-UF)"