



NAME: Dr. Madhu S. Dhar

TITLE: Research Associate Professor

AFFILIATION: Large Animal Clinical Sciences  
College of Veterinary Medicine

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#### SUMMARY OF EDUCATION AND EXPERIENCE

Univ. of Poona, India	B.S.	1981	Chemistry
Univ. of Poona, India	M.S.	1983	Biochemistry
Univ. of Poona, India	Ph.D.	1990	Chemistry
Univ. of Tennessee, Knoxville, USA	Postdoc	1990-1992	Biochemistry
Univ. of Tennessee, Knoxville, ORNL, USA	Postdoc	1992-1998	Biomedical Sciences

SPECIALIZATION: Molecular Genetics and Functional Genomics

#### A. Positions and Honors:

##### Positions and Employment

1990-1992 Postdoc Fellow, Biochemistry, University of Tennessee, Knoxville  
1992-1993 Postdoc Fellow, Biomedical Science, University of Tennessee, Knoxville  
1994-1995 Research Associate, Biomedical Science, University of Tennessee, Knoxville  
1995-1998 Postdoc Trainee, Biomedical Science, University of Tennessee, Knoxville  
1998-2003 Research Assistant Professor (Laboratory Manager), Genome Science and Technology, University of Tennessee, Knoxville  
2003-2004 Research Assistant Professor, Dept. of Nutrition, University of Tennessee, Knoxville  
2004-2006 Research Assistant Professor, Large Animal Clinical Sciences, College of Veterinary Medicine, University of Tennessee, Knoxville  
2006-present Research Associate Professor, Large Animal Clinical Sciences, College of Veterinary Medicine, University of Tennessee, Knoxville

##### Honors and Awards

2009 **Member**, Editorial Board, The Open Obesity Journal.  
2008 **Member**, Region 2 Study Section, American Heart Association, Basic Cell and Molecular Biology (Mid-Atlantic and Greater Southeast) Apr 2008-2011.  
2007 **Best Poster Award** for "Tobacco carcinogens stimulate G-protein inwardly rectifying potassium channel 1 (GIRK1) protein expression in a small cell lung cancer cell line." Authored by **Madhu S Dhar**, Michael

- W. Hance and Howard K. Plummer III. Presented at the Ion Channel Targets Conference, Boston, MA. September 10-11, 2007.
- 2007-2008 **Chair, Large Animal Clinical Sciences, Research Committee**
- 2006 **Nominated as the Honorary Member of UT Phi Zeta** (Tennessee Chapter at University of Tennessee College of Veterinary Medicine)
- 2006 **First author** of BMC Physiology paper which was cited as one of the 30 best publications by **Lead Discovery**, a company for pharmaceutical targeted research areas.
- 2006-2007 **Invited Member** of the Working Committee of Genome India International.
- 2006 **Hot Topic Abstract** “A type IV P-type ATPase affects insulin-mediated glucose uptake in adipose tissue and skeletal muscle in mice and may be involved in protein trafficking and sequestration” selected for presentation at the Keystone Symposia on Adipogenesis, Obesity and Inflammation, Vancouver, British Columbia, Jan 21-26, 2006.
- 2005 **Invited reviewer** for the Journal Nutrition and Metabolism
- 2004 **Invited reviewer** for the Journal Experimental Biology and Medicine
- 2003 **Outstanding Mentor Award** from United States Department of Energy in recognition of dedication as a Mentor to undergraduate research at Oakridge National Laboratory
- 2002 **Outstanding Research Poster Award** for “A Novel Polygenic Mouse Model of Obesity and Diabetes: Evaluation of Genetic and Nutritional Control of Obesity and Glucose Homeostasis “ in the category of Complex Genetics and Disease Modifiers, at the 16<sup>th</sup> International Mouse Genome Conference, San Antonio, Texas, Nov 17-21, 2002.
- 2001-2002 **Travel Award** from the International Mammalian Genome Society to attend the 15<sup>th</sup> and 16<sup>th</sup> International Mouse Genome Conferences, Edinburgh, Scotland, Oct. 21-24, 2001.
- 2001 **Interactive Poster Award** for “A murine aminophospholipid translocase on chromosome 7 is associated with an obesity phenotype” at FASEB Summer Research Conference on Transport ATPases (From Genomics to Mechanism) at Snowmass Village, Snowmass, Colorado. July 14-19, 2001.
- 2000 **Travel Award** from the Oak Ridge Associated Universities and the International Mammalian Genome Society to attend the 14<sup>th</sup> International Mouse Genome Conference, Narita, Japan, Nov. 6-9, 2000.

### Research Interests and Expertise

- Animal models of human disease with special relevance to obesity and diabetes
- Identification of novel targets of metabolic diseases - role of glucose transporters and amino phospholipid translocases in insulin resistance
- Immunofluorescence and TIRF microscopy to visualize redistribution of integral membrane proteins under insulin stimulation

- Regulation of gene and protein expression in mouse adipocytes and myocytes *in vivo and in vitro*
- Role of G-protein linked potassium channels in breast cancer cells

### **Clinical Interests**

- Link basic molecular and cellular research to clinical cases.
- Identify molecular and cellular targets for complex diseases for translational research.
- Regenerative medicine – adipose tissue as a source of adult stem cells.

**DESCRIPTION OF RESEARCH:** The main research focus of Dr. Madhu Dhar's laboratory is to study animal models of obesity and diabetes to identify novel targets of these complex diseases. The long term goal is to develop novel therapeutic agents to combat these morbid diseases. She uses the latest, state-of-the-art molecular techniques of DNA, RNA, and protein in her experiments. Dr. Dhar collaborated with Dr. Nicholas Frank (Large Animal Clinical Sciences), on mechanisms of insulin signaling and glucose homeostasis in lean and obese horses to generate preliminary data for grant applications. She also collaborated with Dr. Frank Andrews (Large Animal Clinical Sciences), to study the molecular regulation of Na<sup>+</sup>/K<sup>+</sup> ATPase gene in the study of gastric ulcers in horses (a model for Gastro-oesophageal Reflux Disease). She mentored students through the Center of Excellence program to carry out this research. Besides the above, Dr. Dhar is also collaborating with Dr. Joe Bartges (Small Animal Clinical Sciences), to investigate the mechanisms of phospholipid translocase activities regulating obesity and diabetes in dogs.

In the identification of novel animal models, Dr. Dhar's research focuses on a diet-induced polygenic mouse model of diabetes and obesity that she discovered at Oak Ridge National Laboratory. She positionally cloned a novel P-type ATPase, *Atp10c*, a strong candidate for the phenotype, which is suggested to play important roles in intracellular signaling and protein trafficking. She is using both animal models as well as cell-culture models to study the biological role of this protein in adipogenesis and glucose uptake. She is collaborating with Dr. Coen Paulusma from Netherlands in this project. His laboratory has successfully cloned and for the first time demonstrated that these ATPases are important to maintain the asymmetry of the lipid bilayer in plasma membranes and function in endocytic/exocytic processes. She is also collaborating with Dr. John Biggerstaff, UTK to optimize microscopic techniques to study the redistribution of integral membrane proteins when cells are stimulated with insulin.

Dr. Dhar has two students working towards their MS through the Comparative and Experimental Biology Program in the College of Veterinary Medicine.

## **RESEARCH FUNDING:**

### **Current**

(02/2009 – 01/2010) University of Tennessee Obesity Research Center: Pilot and Feasibility project grant (Role: PI) (\$13,000)

(05/2008 – 04/2009) American Kennel Club: **Characterization of a P-type ATPase in dog adipose tissue: a novel target for metabolic diseases in mammals** (Role: PI) (\$12,000)

(07/2005 – 07/2008) Center of Excellence, University of Tennessee: **Regulation of *Atp10c* in mouse fat and muscle cells** (Role: PI) (\$15,000/year)

(02/2004 - present) Large Animal Clinical Sciences, Univ. of Tennessee, College of Veterinary Medicine (Role: PI)

### **Previous**

(07/2004 - 06/2007) Philip Morris External Research Program: **GIRK channels, beta adrenergic signaling and breast cancer.** (Role: Co-investigator) (\$330, 000/year)

(07/2004 – 07/2006) Beginning Grant – in – Aid American Heart Association: **Glucose Metabolism in a novel mouse model of obesity associated with insulin resistance** (Role: PI) (\$55,000/year)

(07/2005 - 07/2006) Center of Excellence, University of Tennessee: **Molecular link between obesity and cancer: Expression profiling to identify cancer susceptibility genes in a Novel Mouse Model of Insulin resistance and Obesity** (Role: PI) (\$12,000)

(10/2005 – 01/2006) Small Animal Clinical Sciences, University of Tennessee: **Genetic basis of melanoma in dogs** (Role: Collaborator) (\$3000)

(04/1998-07/2004) National Institute of Health, funding the **Mapping and Cloning of an Obesity locus on Mouse chromosome 7** (Role: Postdoctoral)

(06/1995-08/1998) National Institute of Health, postdoctoral fellowship funding **Studies using mice as a model system for human diseases** (Role: Postdoctoral)

(07/1992-06/1995) National Science Foundation, postdoctoral fellowship funding the **Mechanisms of DNA replication in *Dictyostelium discoideum*** (Role: Postdoctoral)

(01/1990-07/1992) Council of Tobacco Research, postdoctoral fellowship funding the **Role of Aluminum and Iron in Brain Disorders** (Role: Postdoctoral)

### **Publications**

- Peretich, A.L., Cekanova, M., Hurst, S., Baek, S.J. and **Dhar, M.S.** PPARgamma agonists PPAR $\gamma$  agonists down-regulate the expression of *Atp10c* mRNA during adipogenesis. *The Open Obesity Journal (2009) (In Press)*
- Peretich, A.L., Abbott, L.L., Andrews, F.M. and **Dhar M.S.** Age-dependent regulation of sodium-potassium ATPase and sodium-hydrogen exchanger

- mRNAs in equine nonglandular mucosa. *American Journal of Veterinary Research* (2009) (In Press)
- Michael Hance, **Madhu Dhar** and H K Plummer Tobacco carcinogens stimulate different signaling pathways in breast cancer. *Breast Cancer: Basic and Clinical Research* 1, 25-34 (2008)
  - Abbott, L.L., Peretich, A.L., Andrews, F.M. and **Dhar M.S.** Role of sodium-potassium ATPase and sodium-hydrogen exchanger in mRNA in equine gastric ulcer syndrome. *Proceedings of the 9<sup>th</sup> International Equine Colic Research Symposium June 15, p28* (2008).
  - Peretich, A., Pineda, A'Drian, Neilsen, N., Graham, T. and **Dhar, M.**, Regulation of *Atp10c* mRNA expression in mouse 3T3-L1 adipocytes. *FASEB J.*, 21: p. 523.8 (2007).
  - **M.S. Dhar** and H.K. Plummer 3<sup>rd</sup> Protein expression of G-protein inwardly rectifying potassium channels (GIRK) in breast cancer cells. *BMC Physiol.* 6(8) (2006).
  - N. Frank, **M.Dhar**, S. Elliott and Joshua S. Yuan Effects of long-term levothyroxine administration on adipose and skeletal muscle tissue glucose transporter gene expression in mares. *Journal of Veterinary Internal Medicine* 20:743 (2006).
  - **Madhu S. Dhar**, Joshua S. Yuan, Sarah B. Elliott and Carla Sommardahl A type IV P-type ATPase affects insulin-mediated glucose uptake in adipose tissue and skeletal muscle in mice. *Journal of Nutritional Biochemistry* 17(12), 811-20 (2006) Epub 2006 Feb 3.
  - F. Ding , Y. Prints , **M. S. Dhar**, D.K. Johnson, C. Garnacho-Montero, R.D. Nicholls and U. Francke Lack of Pwcr1/MBII-85 snoRNA is critical for neonatal lethality in Prader-Willi syndrome mouse models. *Mammalian Genome.* 16(6), 424-31 (2005).
  - H.K. Plummer 3<sup>rd</sup>, **M.S. Dhar**, M. Cekanova and H.M. Schuller Expression of G-protein inwardly rectifying potassium channels (GIRKs) in lung cancer cell lines. *BMC Cancer.* 18(5), 104 (2005).
  - Howard Plummer 3<sup>rd</sup>, **Madhu Dhar** and Hildergarde Schuller Expression of the alpha 7 nicotinic acetylcholine receptor in human lung cells. *Respiratory Research* 6, 29-38 (2005).
  - **Madhu Dhar**, Loren Hauser, Robert Nicholls and Dabney Johnson Physical mapping of the *pink-eyed dilution* complex in mouse chromosome 7 shows that *Atp10c* is the only transcript between *Gabrb3* and *Ube3a*. *DNA Sequence* 15(4), 306-309 (2004).
  - Y. Wang, Brynn Voy Jones, Sumitra Urs, Suyeon Kim, Morvarid Soltani-Bejnood, Neal Quigley, Y.R. Heo, Melissa Standridge, Brett Andersen, **Madhu Dhar**, Rashika Joshi, Patrick Wortman, J.W. Taylor, J. Chun, M. Leuze, Kate Claycombe, Alan Saxton and Naima Moustaid-Moussa The human fatty acid synthase gene and de novo lipogenesis are coordinately regulated in human adipose tissue. *Journal of Nutrition* 134(5), 1032-8, (2004).
  - **Madhu Dhar**, Carla Sommardahl, Sarah Nelson, Tanisa Kirkland, Larry Castellani, Robert Donnell and Dabney Johnson Mice heterozygous for *Atp10c*, a

- putative amphipath, represent a novel mouse model of obesity and type 2 diabetes. *Journal of Nutrition* 134, 799-805 (2004).
- R.D. Nicholls, M. Stefan, H. Ji, Y. Qi, R.S. Frayo, R.H. Wharton, **M.S. Dhar**, D.E. Cummings, M.I. Friedman and R.S. Ahima Mouse models for Prader-Willi and Angelman syndromes offer insights into novel obesity mechanisms. *In: Progress in Obesity Research, 9, Medeiros-Neto, G., Halpern, A. and Bouchard, C. eds. John Libbey Eurotext Ltd. 313-319 (2003).*
  - **Madhu Dhar**, Loren Hauser, and Dabney Johnson An aminophospholipid translocase associated with body fat and type 2 diabetes phenotypes. *Obesity Research* 10(7), 695-702, (2002).
  - **Madhu S. Dhar** Ferritin: A novel human ferritin heavy chain mRNA is predominantly expressed in the adult brain. *In: Nutrition and Gene Expression, Berdanier, C.D. and Moussa, N.M. eds. CRC Press, Boca Raton, Florida. (Chapter 18, 449-459) (2001).*
  - Jennifer L. Aponte, Gary A. Segal, Loren Hauser, **Madhu S. Dhar**, Catherine M. Withrow, Donald A. Carpenter, Eugene M. Rinchik, Cymbeline T. Culiati, and Dabney Johnson Point Mutations in the Murine Fumarylacetoacetate gene: Animal Models for the Human Genetic Disorder Hereditary Tyrosinemia Type I. *PNAS, USA, 98(2), 641-645, (2001).*
  - **Madhu Dhar**, Lisa Webb, Laurel Smith, Loren Hauser, Dabney Johnson and David West A Novel ATPase on Mouse Chromosome 7 is a candidate gene for increased Body Fat. *Physiological Genomics* 4, 93-100, (2000).
  - Paulus, M. J., S. S. Gleason, H. Sari-Sarraf, D. K. Johnson, C. J. Foltz, D. W. Austin, M. E. Easterly, E. J. Michaud, **M. S. Dhar**, P. R. Hunsicker, J. W. Wall, M. Schell.. High-resolution X-ray CT screening of mutant mouse models. *Proc. SPIE* 3921:270-279, (2000).
  - M. Shuster, **M.S. Dhar**, A.L. Olins, D.E. Olins, C.Y. Howell, S.M. Gollin and J.R. Chaillet Parental alleles of an imprinted mouse transgene replicate synchronously. *Dev. Genet.* 23 (4), 275-284, (1998).
  - M.E. Percy, S. Wong, S. Bauer, N. Liaghati, M.D. Perry, V.M. Chauthaiwale, **M. Dhar** and J.G. Joshi Iron Metabolism and human ferritin heavy chain cDNA from adult brain with an elongated untranslated region : new findings and insights. *Analyst* 123, 41, (1998).
  - **M.S.Dhar** and D.K.Johnson A microsatellite map of the *pink-eyed dilution (p)* deletion complex in Mouse Chromosome 7. *Mammalian Genome* 8(2), 143-145, (1997).
  - M.E. Percy, S.J. Bauer, S. Rainey, D.R.C. McLachlan, **M. Dhar** and J.G. Joshi Localization of a new ferritin heavy chain sequence present in human brain mRNA to chromosome 11. *Genome* 38, 450-457, (1995).
  - L.J. Hauser, **M.S. Dhar** and D.E. Olins *Dictyostelium discoideum* contains a single-subtype of histone H1 present as a single-copy gene. *Gene* 154, 119-122, (1995).
  - **M.S. Dhar** and J.G. Joshi Detection and quantitation of the novel ferritin heavy chain message in human tissues. *Biofactors* 4, 147-149, (1994).

- J.G. Joshi, **M.S. Dhar**, M. Clauberg and V. Chauthaiwale Iron and aluminum homeostasis in neural disorders. *Environmental Health Perspectives Supplements 102, Supplement 4, (1994)*.
- A.L. Olins, L.H. Cacheiro, A.L. Herrmann, **M.S. Dhar** and D.E. Olins Inaccessibility of the *Euplotes* telomere binding protein. *Chromosoma 102, 700-711, (1994)*.
- **M. S. Dhar** and J. G. Joshi Differential processing of the ferritin heavy chain mRNA in human liver and adult human brain. *J. Neurochemistry 61, 2140-2146, (1993)*.
- K.D. Swanson, **M.S. Dhar** and J.G. Joshi The human and bovine 14-3-3n protein mRNAs are highly conserved in both their translated and untranslated regions. *Biochem. Biophys. Acta 1216, 145-148, (1993)*.
- J. C. Chen, P. A. Hardy, W. Kucharczyk, M. Clauberg, J. G. Joshi, A. Vourlas, **M. S. Dhar** and R. M. Henkelman. MR of human postmortem brain tissue: Correlative study between T2 and assays of iron and ferritin in Parkinson and Huntington disease. *American J. of Neuroradiology, 14, 275-281, (1993)*.
- **M. Dhar**, V. Chauthaiwale, and J. G. Joshi Sequence of a cDNA encoding the ferritin H-chain from an 11-week human fetal brain. *Gene, 126 (2), 275-278, (1993)*.
- J. G. Joshi, M. Clauberg and **M. S. Dhar** Role of Aluminum and Iron in brain disorders. *In: Advances in Behavioral Biology, 40, Treatment of Dementias, Ed. Edwin M. Meyer, J. W. Simkpins, J. Yamamoto and F. T. Crews, 387-396, Plenum press, NY, (1992)*.
- **M. S. Dhar**, V. V. Pethe, V. S. Gupta and P. K. Ranjekar Predominance and tissue specificity of adenine methylation in rice. *Theor. Appl. Genet., 80, 402-408, (1990)*.
- V.S. Gupta, **M.S. Dhar**, B.G. Patil, G.S. Narvekar, S.R. Rawat and P.K. Ranjekar Molecular cloning and restriction enzyme analysis of a long repetitive DNA sequence in rice. *J. Bioscience (India) 15, 145-149, (1990)*.
- **M. S. Dhar**, M. M. Dabak, V. S. Gupta and P. K. Ranjekar Organization and properties of repeated DNA sequences in rice genome. *Plant Science 66 (1), 43-52, (1988)*.
- S. A. Ranade, M. D. Lagu, S. M. Patankar, M. M. Dabak, **M. S. Dhar**, V. S. Gupta and P. K. Ranjekar Identification of a dispersed *Mbo I* repeat family in five higher plant genomes. *Bioscience Reports (U.K.), 8 (5), 435-442, (1988)*.
- M.M. Dabak, S.A. Ranade, **M.S. Dhar**, V.S. Gupta and P.K. Ranjekar Molecular characterization of *Pigeonpea* genome. *Indian Journal of Biochemistry and Biophysics 25 (3), 230-236, (1988)*.

### **Scientific Abstracts and Presentations (Last 3 years)**

#### **2009**

- Sarah Hurst, Amanda Peretich, Steven Minkin, John Dunlap, John Biggerstaff, **Madhu Dhar** In vitro silencing of a putative phospholipid translocase results in an increase in glucose uptake in 3T3 L1 adipocytes. *Experimental Biology, New Orleans, LA April 17-22, 2009. (Travel award to student)*

- Frank M. Andrews, Amanda L. Peretich, Lora L. Abbott, **Madhu S. Dhar** Age-dependent regulation of sodium-potassium adenosinetriphosphatase and sodium-hydrogen exchanger mRNAs in equine nonglandular mucosa. *Experimental Biology, New Orleans, LA April 17-22, 2009.*

## 2008

- **Madhu Dhar** P-type ATPases in obesity and diabetes. *1<sup>st</sup> Annual Retreat, UT Obesity Research Center, Fall Creek Falls, Oct 10, 2008.* (Invited Presentation)
- Amanda Peretich, Maria Cekanova, Seung J. Baek, **Madhu Dhar** PPAR $\gamma$  agonists down-regulate the expression of a phospholipid translocase during adipogenesis. *Keystone Symposia: Molecular Control of Adipogenesis and Obesity Banff, Alberta (Canada) February 19-24, 2008*(Travel award to student)
- **Madhu Dhar** RNAi technology reveals a novel target for obesity and diabetes. *9<sup>th</sup> Annual Beyond Genome (Cambridge Heathtech Institute), Tools to Therapies: RNA Interference (RNAi target validation), San Francisco, CA. June 8-10, 2008.* (Invited Presentation)
- **Madhu Dhar** P-type ATPases in obesity and diabetes. *Metabolex Inc., Hayward, CA. June 10, 2008.* (Invited Presentation)
- Abbott, L.L., Peretich, A.L., **Dhar M.S.**, and Andrews, F.M. Role of sodium-potassium ATPase and sodium-hydrogen exchanger in mRNA in equine gastric ulcer syndrome. *The 9<sup>th</sup> International Equine Colic Research Symposium, Liverpool, UK. June 15-18 2008.* (Invited Presentation)
- **Madhu Dhar** Role of a novel P-type ATPase in obesity and diabetes? *University of Tennessee, College of Veterinary Medicine, Research Roundtable, Knoxville, TN. March 27, 2008.* (Invited Presentation)

## 2007

- **Madhu Dhar**, Michael Hance and H K Plummer Tobacco carcinogens stimulate G-protein inwardly rectifying potassium channel 1 (GIRK1) protein expression in a small cell lung cancer cell line. *Ion Channel Targets Conference, Boston, MA. September 10-11, 2007.*
- **Madhu Dhar** NIH grants for risky projects: P-type ATPases in diseases. *University of Tennessee-ORNL NIH forum, Oak Ridge, TN. Nov 14, 2007.* (Invited Presentation)
- Amanda Peretich, Guozhang Mao, Nancy Neilsen, Xuemin Xu, Carla Sommardahl and **Madhu Dhar** Hormonal regulation of *Atp10c*, a type 4 P-type ATPase, in mouse adipocytes. *1<sup>st</sup> Annual Meeting of the Comparative and Experimental Medicine, College of Veterinary Medicine, Knoxville, TN. June 22, 2007.*
- Michael W. Hance, **Madhu S. Dhar**, and Howard K. Plummer III Effects of G-protein inwardly rectifying potassium channel 1 (GIRK1) knockdown in the MDA-MB453 breast cancer cell line. *8<sup>th</sup> Annual Beyond Genome (Cambridge Heathtech Institute), San Francisco, CA. June 21-22, 2007.*
- Amanda Peretich, A'Drian Pineda, Nancy Neilsen, Todd Graham and **Madhu Dhar**

Regulation of *Atp10c* mRNA expression in mouse 3T3-L1 adipocytes. *American Society of Biochemistry and Molecular Biology/Experimental Biology, Washington DC. April 28 - May 2, 2007.* (Travel award to student)

## 2006

- Helen E. Reaves, Carla S. Sommardahl, Deborah K. Haines, Joshua S. Yuan and **Madhu S. Dhar** Insulin signaling pathway in a novel mouse model of type 2 diabetes. *46<sup>th</sup> Annual Meeting of The American Society of Cell Biology, San Diego, CA, Dec 9-13, 2006.*
- **Madhu Dhar** Insulin signaling pathway in a novel mouse model of type 2 diabetes. *Center of Excellence, University of Tennessee College of Agriculture, Knoxville, TN. August 3, 2006.* (Invited Presentation)
- Michael Hance, Madhu Dhar and H K Plummer Tobacco carcinogens stimulate different signaling pathways in breast cancer. *46<sup>th</sup> Annual Meeting of The American Society of Cell Biology, San Diego, CA, Dec 9-13, 2006.*
- **Madhu S. Dhar**, Joshua S. Yuan, Sarah B. Elliott and Carla Sommardahl. A type IV P-type ATPase affects insulin-mediated glucose uptake in adipose tissue and skeletal muscle in mice. *Keystone Symposia on Adipogenesis, Obesity and Inflammation, Vancouver, British Columbia, Jan 21-26, 2006.* (Late breaking abstract)

## Students

- Tanisa Kirkland MS Oak Ridge National Laboratory/University of Tennessee, 2003-2005
- Jennifer Stafford DVM University of Tennessee, College of Veterinary Medicine 2005
- Lora Abbott DVM University of Tennessee, College of Veterinary Medicine 2006 - 2007
- Helen Reaves DVM University of Tennessee, College of Veterinary Medicine 2006
- Sara Roshwalb DVM University of Tennessee, College of Veterinary Medicine 2008
- Amanda Peretich MS Comparative and Experimental Medicine Program, University of Tennessee, College of Veterinary Medicine 2006-2008.
- Michael Hance PhD Comparative and Experimental Medicine Program, University of Tennessee, College of Veterinary Medicine 2006-present.
- Sarah Hurst MS Comparative and Experimental Medicine Program, University of Tennessee, College of Veterinary Medicine 2008-present.
- Sarah Grogerman DVM University of Tennessee, College of Veterinary Medicine 2009