

## Michael August Menze

Assistant Professor

Eastern Illinois University, Department of Biological Sciences

2070 Life Sciences Building, 600 Lincoln Ave, Charleston, IL, 61920

217-581-6386 (phone), 217-581-7141(fax), mmenze@eiu.edu, <http://ux1.eiu.edu/~mmenze/>

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### Education

- 2001 Dr. rer. nat. Heinrich-Heine-University, Düsseldorf, Germany, and Johannes-Gutenberg-University Mainz, Germany.  
Dissertation title: Allosteric regulation in hemocyanin of the European lobster *Homarus vulgaris* (Advisors: Dr. M.K. Grieshaber and Dr. H. Decker). Degree from Heinrich-Heine-University, Düsseldorf.
- 1997 Dipl. Biol. Heinrich-Heine-University, Düsseldorf, Germany  
Major: Zoology (Physiology).  
Minors: Biochemistry, Organic Chemistry.

### Professional Experience

- 2010 - present Assistant Professor, Department of Biological Sciences, Eastern Illinois University, Charleston, IL.
- 2010 - present Gratis Appointment Assistant Professor - Research, Department of Biological Sciences, Louisiana State University, Baton Rouge, LA.
- 2006 - present Visiting Scientist Appointment, Center for Engineering in Medicine, Shriners Burns Hospital and Massachusetts General Hospital, Harvard Medical School, Boston, MA.
- 2006 – 2013 Associate Member of the Graduate Faculty, Louisiana State University, Baton Rouge, LA.
- 2006 - 2010 Assistant Professor - Research, Department of Biological Sciences, Louisiana State University, Baton Rouge, LA.
- 2001 - 2006 Postdoctoral Researcher, Department of Biological Sciences, Louisiana State University, Baton Rouge, LA.
- 1997 - 2001 Scientific Assistant, Heinrich Heine University, Düsseldorf, Germany.

### Grants and Awards

#### A. Extramural Grants

- NSF-MRI grant proposal "Acquiring a Confocal Microscope" (Gary Bulla PI, Michael Menze, Co-PI, Mary Konkle, Co-PI, Gopal Periyannan, Co-PI, Britto Nathan, Co-PI). Total amount: \$478,002, *pending*.
- NSF-RUI grant proposal "A Mechanistic Investigation on How the Redox Chemistry of MitoNEET Regulates Energy Homeostasis on Cellular and Molecular Levels" (Mary Konkle PI, Michael Menze, Co-PI, Nilay Chakraborty, Co-PI ). Total amount: \$307,042, *pending*.
- NSF grant "Collaborative Research: Mechanisms of Tolerance to Severe Water Stress in Animals" (05/2015 - 04/2019; Michael Menze, PI; *IOS-1456809*). Total amount awarded: \$173,373.
- BioCision, LLC. Improving Cell Monolayer Freezing (2014). Amount awarded: \$2000.
- EIU subcontract for NSF grant "Mechanisms of Animal Desiccation Tolerance" (09/2011 - 09/2014; Steven Hand, PI, Michael Menze, Co-PI; *IOS-0920254*). Total amount awarded: \$17,610.
- NSF grant "Mechanisms of Animal Desiccation Tolerance" (09/2009 - 09/2012; Steven Hand, PI, Michael Menze, Co-PI; *IOS-0920254*). Total amount awarded: \$600,000. To investigate

the increase in dehydration tolerance of transgenic *Drosophila* cell lines that is conferred by late embryogenesis abundant proteins (LEA) from the brine shrimp *Artemia franciscana*. Antarctic Expedition "Collaborative Research: Possible Climate Induced Changes in the Distribution of *Pleurogramma antarcticum* on the Western Antarctic Peninsula Shelf" (03/10-05/10; Jose Torres, PI, Michael Menze, Participating Faculty, B-258-N). To investigate the impact of temperature on mitochondrial function in *P. antarcticum*.  
Keystone Symposium Travel Scholarship "Metabolomics: From Bioenergetics to Apoptosis", Symposium supported by National Institute of Aging (NIA) 1R13 AG027645-01 (04/2006). Amount awarded: \$1500.

### **B. Eastern Illinois University – Intramural Research Grants**

Council on Faculty Research Grant (CFR) Award, Eastern Illinois University, "The Brain on Aging – Role of CISD1" (10/2014-7/2015; Michael Menze, PI). To investigate the role CISD1 in aging. Amount awarded: \$5,000.  
Council on Faculty Research Grant (CFR) Award, Eastern Illinois University, "Lessons for a World in Heat" (7/2014-8/2014; Michael Menze, PI). To investigate the role of seed maturation proteins in biostabilization. Amount awarded: \$4,500.  
Early Research Support Grant Award (2013), Eastern Illinois University (Michael Menze, PI). Amount awarded: \$400.  
Council on Faculty Research Grant (CFR) Award, Eastern Illinois University, "Trehalose - the Sweet Way to Preserve Cells and Tissues" (10/2013-7/2014; Michael Menze, PI). To investigate the role of trehalose on cryopreservation of hepatocyte monolayers. Amount awarded: \$4,705.  
President's Fund for Research and Creative Activity (PFRCA) Award, Eastern Illinois University, "Mitochondrial Dysfunction and Type-2 Diabetes: Role of MitoNEET" (8/2013 – 07/2014; Mary Konkle, PI, Michael Menze, co-PI). Amount awarded: \$19,850.  
Council on Faculty Research Grant (CFR) Award, Eastern Illinois University, "Mitochondrial Dysfunctions in Type 2 Diabetes" (7/2013-8/2013; Michael Menze, PI). To investigate the role of mitochondrial bioenergetics in the development of insulin insensitivity. Amount awarded: \$4,500.  
Interdisciplinary Research in the Sciences Grant (IRIS), Eastern Illinois University, "Mitochondrial Dysfunction and Type-2 Diabetes: Role of MitoNEET" (12/2012 – 12/2013; Mary Konkle, PI, Michael Menze, PI). Amount awarded: \$5,000.  
Council on Faculty Research Grant (CFR) Award, Eastern Illinois University, "Life in hot waters: live fast die young" (7/2012-8/2012; Michael Menze, PI, Robert Colombo, PI). To investigate the role of the thermal impact on bluegill. Amount awarded: \$4,500.  
President's Research Fund (PRF) Award, Eastern Illinois University "Role of Estrogen in Alzheimer's Disease" (2012 - 2013; Michael Menze, PI, Britto Nathan, Co-PI). To investigate the role of the female sex hormone estrogen on mitochondrial bioenergetics. Amount awarded: \$16,780.  
Interdisciplinary Research in the Sciences Grant (IRIS), Eastern Illinois University, "Untangling Alzheimer's Disease: Identifying Mitochondrial Protein Targets of Oxidative Stress" (12/2011 – 12/2012; Mary Konkle, PI, Michael Menze, PI, Britto Nathan, PI). Amount awarded: \$4,000.  
Council on Faculty Research Grant (CFR) Award, Eastern Illinois University, "Sex and Power – the Role of Estrogen in Alzheimer's Disease" (7/2011-8/2011; Michael Menze, PI, Britto Nathan, PI). To investigate the role of the female sex hormone estrogen on mitochondrial bioenergetics. Amount awarded: \$4,500.  
Early Research Support Grant Award (2010), Eastern Illinois University (Michael Menze, PI). Amount awarded: \$378.

Council on Faculty Research grant (CFR), Eastern Illinois University, "Life without Water" (10/2010-10/2011; Michael Menze, PI). Amount awarded: \$4,000. To investigate the role of trehalose transporters in stabilization of insect cells.

### **C. Eastern Illinois University – Intramural Teaching Enhancement Grants**

Redden Fund Grant Award (2014), (Michael Menze, PI). Amount awarded: \$1250.

Redden Fund Grant Award (2013), (Michael Menze, PI). Amount awarded: \$1050.

Redden Fund Grant Award (2012), (Michael Menze, PI). Amount awarded: \$750.

Proposal Initiative Fund (PIF) Award, Eastern Illinois University, "Using Inquiry-based Learning Modules to Vertically Integrate Core Biological Concepts in the Biology Majors Curriculum" (08/2011-08/2012; Michael Menze, PI, Gary Bulla, PI, Robert Colombo, PI, Karen Gaines, PI, Kai Hung, PI, James Novak, PI). Amount awarded: \$7,500.

Redden Fund Grant Award (2011), (Michael Menze, PI). Amount awarded: \$1,500.

### **D. Awards in Teaching**

Student Government Distinguished Faculty Award, Eastern Illinois University, 2015.

Provost's Undergraduate Research Mentor Award, Eastern Illinois University, 2014.

College of Sciences Lida G. Wall Faculty Research Mentor and Teacher Award, Eastern Illinois University, 2013.

College of Sciences Student Advisory Board Outstanding Faculty Teaching Award, Eastern Illinois University, 2012.

### **E. Awards in Research**

Achievement and Contribution Award, Eastern Illinois University, 2013.

Achievement and Contribution Award, Eastern Illinois University, 2011.

Deans Award of Excellence in Research and Creative Activity, Eastern Illinois University, 2011.

Deans Award of Excellence in Research and Creative Activity, Eastern Illinois University, 2010.

### **Teaching Experience**

Advanced Cell Physiology (BIO5400), four semester credit hours (Spring 2015).

Cell and Molecular Biology (BIO3120), four semester credit hours (Fall 2013, Spring 2013, Fall 2012, Fall 2011, Spring 2011, Fall 2010).

Animal Physiology (BIO3520), four semester credit hours (Spring 2014, Fall 2014, Spring 2012, Spring 2011).

Advanced Cellular and Molecular Biology (BIO4751), three semester credit hours (Fall 2012).

Graduate Seminar (BIO4666), one semester credit hour (Spring 2011).

Honors Seminar (BIO4555), one semester credit hour (Spring 2011).

Cell Death (BIO7800), three semester credit hours (Fall, 2007).

Comparative Animal Physiology (BIO4800), guest lectures (Fall 2005, Spring 2009).

Mitochondrial Physiology (BIO7800), guest lectures (Spring 2006, 2008).

### **Publications**

#### **A. Peer-Reviewed Manuscripts**

Martinez E., **Menze M.A.**, Hendricks\* E. and Torres J.J. Thermal Resilience of Mitochondrial Energy Production in Tropical and Subtropical Teleosts. *Comp. Biochem. Physiol. A*, *accepted*.

Martinez<sup>#</sup> E., Porreca\* A.P., Colombo R.E. and **Menze<sup>#</sup> M.A.** Tradeoffs of warm adaptation in aquatic ectotherms: live fast, die young? *Comp. Biochem. Physiol. A*, *accepted*.

Hand S.C. and **Menze M.A.** (2015). Molecular approaches for improving desiccation tolerance: insights from the brine shrimp *Artemia franciscana*. *Planta*, *in press*.

Stokich B., Osgood Q., Grimm D., Moorthy S., Chakraborty N., and **Menze M.A.** (2014). Cryopreservation of hepatocyte (HepG2) cell monolayers: impact of trehalose. *Cryobiology*. 69(2):281-90.

- Boswell L., **Menze M.A.**, and Hand S.C. (2014). Group 3 LEA proteins from embryos of *Artemia franciscana*: structural properties and protective abilities during desiccation. *Physiol. Biochem. Zool.* 87(5):640-51
- Paudel\* S., and **Menze M.A.** (2014). Genetic engineering for sustainable biofuel production: a review. *Int. J. Env.* 3(2):324-344.
- Roberts M.E., Crail J.P., Laffoon M.M., Fernandez W., **Menze M.A.**, and Konkle M.E. (2013). Identification of disulfide bond formation between mitoNEET and glutamate dehydrogenase 1. *Biochemistry* 52 (50): 8969-8971.
- Martinez<sup>#</sup> E., **Menze<sup>#</sup> M.A.**, and Torres J.J. (2013). Mitochondrial energetics of benthic and pelagic Antarctic teleosts. *Mar. Biol.* 160: 2813-2823.
- Hand S.C., Patil Y., Li S., Chakraborty N., Borcar A., **Menze M.A.**, Boswell L.C., Moore D., and Toner M. (2013). Diapause and anhydrobiosis in embryos of *Artemia franciscana*: metabolic depression, LEA proteins, and water stress. *Cryobiol. Cryotech.* 59 (1): 41-46.
- Marunde M.A., Samarajeewa\* D.A., Anderson\* J., Li S., Hand S.C., and **Menze M.A.** (2013). Improved tolerance to salt and water stress in *Drosophila melanogaster* cells conferred by late embryogenesis abundant protein. *J. Insect. Physiol.* 59: 377-386.
- Borcar A., **Menze M.A.**, Toner M., and Hand S.C. (2013). Cobalt chloride does not mimic the effect of hypoxia on phosphorylation of pyruvate dehydrogenase in mammalian cells. *Cell. Tissue Res.* 351(1):99-106.
- Li S., Chakraborty N., Borcar A., **Menze M.A.**, Toner M., Hand S.C. (2012). Late embryogenesis abundant proteins protect human hepatoma cells during acute desiccation. *Proc. Natl. Acad. Sci. U. S. A.* 109 (51): 20859-64.
- Podrabsky J.E., **Menze M.A.**, and Hand S.C. (2012). Long-term survival of anoxia despite rapid ATP decline in embryos of the annual killifish *Austrofundulus limnaeus*. *J. Exp. Zool.* 317 (8):524-32.
- Chakraborty N., **Menze M.A.**, Heidi Elmoazzen H., Vu H., Yarmush M.L., Hand S.C., and Toner M. (2012). Trehalose transporter from African chironomid improves desiccation tolerance of Chinese hamster ovary cells. *Cryobiology* 64(2):91-6.
- Chakraborty N., **Menze M.A.**, Malsam J., Aksan A., Hand S.C., and Toner M. (2011). Cryopreservation of Spin-Dried Mammalian Cells. *PLOS* 6 (9):e24916.
- Hand S.C., **Menze M.A.**, Borcar A., Patil Y., Covi J.A., Reynolds J. A., and Toner M. (2011). Metabolic restructuring during energy-limited states: insights from *Artemia franciscana* embryos and other animals. *J. Insect. Physiol.* 57(5):584-94.
- Chang A., Chakraborty N., Elmoazzen H., **Menze M.A.**, Hand S.C., and Toner M. (2011). Spin-Drying Technique for Lyopreservation of Mammalian Cells, *Ann. Biomed. Eng.* 39(5):1582-91.
- Hand S.C., **Menze M.A.**, Toner M, Boswell L., and Moore D. (2011). Expression of LEA proteins during water stress: not just for plants anymore. *Annu. Rev. Physiol.* 17 (73):115-34.
- Menze M.A.**, Banerjee M., Clavenna\* M., Liu X.H., Toner M. and Hand S.C. (2010). Metabolic preconditioning of cells with AICAR-riboside: improved cryopreservation and cell-type specific impacts on energetics and proliferation. *Cryobiology* (61): 79-88.
- Menze M.A.**, Fortner\* G., Nag\* S., and Hand S.C. (2010). Mechanisms of apoptosis in Crustacea: what conditions induce versus suppress cell death? *Apoptosis* 15 (3): 293-313.
- Menze M.A.**, and Hand S.C. (2009). How do animal mitochondria tolerate water stress? *Commun. Integr. Biol.* 2 (5): 428-430.
- Menze M.A.**, Boswell L., Toner M. and Hand S.C. (2009). Occurrence of mitochondrial-targeted late embryogenesis abundant (LEA) gene in animals increases organelle resistance to water stress. *J. Biol. Chem.* 284 (16): 10714-10719.
- Bauer A., **Menze M.A.**, and Grieshaber M.K. (2009). Thermodynamics of effector binding to hemocyanin: influence of temperature. *Arch. Biochem. Biophys.* 483 (1): 37-44.

- He X., Fowler A., **Menze M.A.**, Hand S.C. and Toner M. (2008). Desiccation kinetics and bi-thermodynamics of glass forming trehalose solutions in thin films. *Ann. Biomed. Eng.* 36: 1428-39.
- Hand S.C and **Menze M.A.** (2008). Mitochondria under energy-limited states: mechanism that blunt the signaling of cell death. *J. Exp. Biol.* 211: 1829-1840.
- Menze M.A.** and Hand S.C. (2007). Caspase activity during cell stasis: avoidance of apoptosis in an invertebrate extremophile, *Artemia franciscana*. *Am. J. Physiol. Regul. Integr. Comp. Physiol.* 292: R2039-R2047.
- Hand S.C, Jones D., **Menze M.A.** and Witt T.L. (2007). Life without water: expression of plant LEA genes by an anhydrobiotic arthropod. *J. Exp. Zool.* 307 (A): 62–66.
- Elliott G., Cusick J., Liu X.H., **Menze M.A.**, Vincent J., Witt T., Hand S. and Toner M. (2006). Trehalose uptake through P2X<sub>7</sub> purinergic channels provides desiccation protection. *Cryobiology* 52 (1): 114-127.
- Buchanan S.S., **Menze M.A.**, Hand S.C., Pyatt D.W. and Carpenter J. (2005). Cryopreservation of human hematopoietic stem and progenitor cells loaded with trehalose: transient permeabilization via the adenosine triphosphate-dependent P<sub>2</sub>Z receptor channel. *Cell Preserv. Tech.* 3 (4): 212-222.
- Liu X.H., Akasan A., **Menze M.A.**, Hand S.C. and Toner M. (2005). Trehalose loading through the mitochondrial permeability transition pore enhances desiccation tolerance in rat liver mitochondria. *Biochim. Biophys. Acta.* 1717 (1): 21–26.
- Menze M.A.**, Hellmann N., Decker H. and Grieshaber M.K. (2005). Allosteric models for multimeric proteins: Oxygen-linked effector binding in hemocyanin. *Biochemistry* 44 (30): 10328-10338.
- Menze M.A.**, Hutchinson K., Laborde S.M. and Hand S.C. (2005). Mitochondrial permeability transition in the crustacean *Artemia franciscana*: Absence of a Ca<sup>2+</sup>-regulated pore in the face of profound calcium storage. *Am. J. Physiol. Regul. Integr. Comp. Physiol.* 289 (1): R68-R76.
- Menze M.A.**, Clavenna M. and Hand S.C. (2005). Depression of cell metabolism and proliferation by membrane permeable and impermeable modulators: Role for AMP:ATP ratio. *Am. J. Physiol. Regul. Integr. Comp. Physiol.* 288 (2): R501-R510.
- Menze M.A.**, Hellmann N., Decker H. and Grieshaber M.K. (2001). Binding of urate and caffeine to hemocyanin analyzed by isothermal titration calorimetry. *J. Exp. Biol.* 204: 1033-1038.
- Menze M.A.**, Hellmann N., Decker H. and Grieshaber M.K. (2000). Binding of urate and caffeine to hemocyanin of the lobster *Homarus vulgaris* as studied by isothermal titration calorimetry. *Biochemistry* 39 (35): 10806-10811.

\*EIU graduate student researcher, undergraduate student researcher underlined.

#Authors contributed equally

### **B. Book Chapters and Patents**

- Hand S.C. and **Menze M.A.** (2008). Preservation of cells using reversible pore formation. United States Patent 7314755.
- Hand S.C. and **Menze M.A.** Desiccation stress. In: Encyclopedia of tide pools and rocky shores, edited by Denny M.W. and Gaines S.D., University of California Press, Berkeley, 2007, pp. 173-177.
- Menze M.A.** Perspectives in Zoophysiology. In: Höhepunkte der Zoologischen Forschung, edited by Waegele J.W., Basiliken-Press, Marburg, 2007, pp. 243-249.
- Menze M.A.** Analyse der Regulation von Haemocyanin durch Urat beim europäischen Hummer (*Homarus vulgaris*), Berichte aus der Biologie, Shaker Verlag, Aachen, 2001.

## Presentations

### A. Posters Presented

- Grimm\* D.F., Altamirano\* L, Paudel\* S., Welker\* L., Herrera\* J., Konkle M., and **Menze M.A.** Effects of pioglitazone on liver cell bioenergetics. Presented at the annual meeting of the American Society for Cell Biology (ASCB), Philadelphia, PA, 2014.
- Paudel S., Welker L., Nathan B.P., Konkle M. and **Menze MA.** D-galactose decreases mitoNEET (CISD1) levels in HepG2 cells. Presented at the annual meeting of the American Society for Cell Biology (ASCB), Philadelphia, PA, 2014.
- Laffoon\* M. **Menze M.A.** and Konkle M. Chemical modification of mitoNEET. Presented at the annual meeting of the Protein Society, San Diego, CA, 2014.
- Banister\* S., Woodruff\* M., Paige\* B., **Menze M.A.** and Konkle M. Determining the effects of mitoNEET on cellular dehydrogenase activity. Presented at the annual meeting of the Protein Society, San Diego, CA, 2014.
- Hendricks E., Nathan B., and **Menze M.A.** Estrogen treatment dramatically increases respiration in Alzheimer's disease model. Presented at the annual meeting of the American Society for the Advancement in Sciences (AAAS), Chicago, IL, 2014.
- Stokich\* B. and **Menze M.A.** Biomimetic approaches in cryopreservation. Presented at the annual meeting of the American Society for the Advancement in Sciences (AAAS), Chicago, IL, 2014.
- Ferry\* N., Laffoon\* M.M., Konkle M., and **Menze M.A.** MitoNEET: reduction in insulin resistance through ameliorated oxidative stress? Presented at the annual meeting of the American Society for Cell Biology (ASCB), New Orleans, LA, 2013.
- Hendricks E., Nathan B., and **Menze M.A.** Bioenergetics of permeabilized and intact nerve cell terminals in ApoE deficient and wild-type mice. Presented at the annual Mitochondrial Physiology (MIP) meeting, Obergurgl, Austria, 2013.
- Crail\* J.P., Roberts M.E., Fernandez\* W., **Menze M.A.**, and Konkle M.E. Characterizing protein binding partners of mitoNEET. Presented at the annual meeting of the American Chemical Society (ACS), Indianapolis, IN, 2013.
- Osgood\* Q., Chakraborty N., Stokich\* B., and **Menze M.A.** Novel protein acts as cryoprotectant for embryonic kidney cell monolayers. Presented at the annual meeting of the Biomedical Engineering Society (BMES), Seattle, WA, 2013.
- Stokich\* B., Schreyer B., Osgood\* Q., Chakraborty N., Thompson M., and **Menze M.A.** Trehalose incubation improves cryopreservation of hepatoma cell monolayers. Presented at the annual meeting of the Biomedical Engineering Society (BMES), Seattle, WA, 2013.
- Fernandez\* W., Erbacher\* L., Konkle M., and **Menze M.A.** Examining the role of estrogen and oxidative damage in Alzheimer's Disease. Council on Undergraduate Research (CUR) *Poster on the Hill* event: to highlight undergraduate research to U.S. Senators and Representatives on Capitol Hill. Washington, DC, 2013.
- Martinez E., **Menze M.A.**, and Torres J.J. Mitochondrial energetics of benthic and pelagic Antarctic teleosts. Presented at the annual meeting of the American Society of Limnology and Oceanography, New Orleans, LA, 2013.
- Ferry\* N., Roland\* F., Konkle M., and **Menze M.A.** Type-2 Diabetes: Does mitoNEET impact mitochondrial functions by multiple mechanisms? Presented at the annual meeting of the Illinois State Academy of Science. Jacksonville, IL, 2013.
- Tofte\* A., Nathan B., and **Menze M.A.** Mitochondrial bioenergetics in response to estrogen therapy. Presented at the annual meeting of the Illinois State Academy of Science. Jacksonville, IL, 2013.
- Ferry\* N., Roland\* F., Konkle M., and **Menze M.A.** Type-2 Diabetes: Does mitoNEET impact mitochondrial functions by multiple mechanisms? Presented at the annual National Conferences on Undergraduate Research (NCUR). La Crosse, WI, 2013.

- Fernandez W.\*., Nathan B., and **Menze M.A.** Decline in mitochondrial respiration in post-ovariectomy mice is ameliorated by beta-estradiol treatment. Presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB). San Francisco, CA, 2013.
- Samarajeewa D., Harder\* A., Toner M., Chakraborty N., and **Menze M.A.** Intracellular ice nucleation protein reduces cryogenic injury in eukaryotic cells. Presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB). San Francisco, CA, 2013.
- Camp\* N., Martinez E., Phillips\* C., Procerra A., Torres J., Colombo R., and **Menze M.A.** Life in hot waters: live fast and die young. Presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB). San Francisco, CA, 2013.
- Marunde M.\*, Nguyen M.A., Hand S.C., and **Menze M.A.** Late Embryogenesis Abundant protein improves mitochondrial function under salt and water stress. Presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB). San Francisco, CA, 2013.
- Erbacher\* L, Fernandez\* W, **Menze M.A.**, and Konkle M. Targeting Alzheimer's: discovering mitochondrial protein targets of oxidative stress. Presented at the annual meeting of Protein Society. San Diego, CA, 2012.
- Harder\* A., Samarajeewa D., Toner M., Chakraborty N., and **Menze M.A.** Intracellular ice nucleation protein reduces cryogenic injury in eukaryotic cells. Presented at the Annual Meeting of the Biomedical Engineering Society (BMES). Atlanta, GA, 2012.
- Harder\* A., Toner M., Chakraborty N., and **Menze M.A.** Intracellular ice nucleation protein reduces cryogenic injury in eukaryotic cells. Presented at the Annual Meeting of the Illinois State Academy of Science. Galesburg, IL, 2012.
- Fernandez W\*., Nathan B., Konkle M., and **Menze M.A.** Effects of estrogen on mitochondrial function in ApoE-deficient mice. Presented at the annual meeting of the Society for Integrative and Comparative Biology (SICB). Charleston, SC, 2012.
- Martinez-Rivera E., **Menze M.A.**, Hand S.C., and Torres J.J. Life in constant cold: mitochondrial bioenergetics in Teleostei species from the Southern Ocean. Presented at the annual meeting of the American Society for Oceanography and Limnology. San Juan, Puerto Rico, 2011.
- Chakraborty N., **Menze M.A.**, Elmoazzen H., Hand S.C. and Toner M. Choline chloride improves the desiccation tolerance of Chinese hamster ovary cells. Presented at the Summer Bioengineering Conference (SBC). Naples, FL, 2010.
- Chakraborty N., **Menze M.A.**, Hand S.C., and Toner M. A spin drying technique for dry preservation of mammalian cells. Presented at the annual Biomedical Engineering Society (BMES) meeting. Austin, TX, 2010.
- Moorthy S., **Menze M.A.** and Hand S.C. Engineering freeze tolerance in human hepatoma cells: role of trehalose and LEA proteins. Poster session at the Summer Undergraduate Research Forum (SURF) in corporation with the Howard Hughes Medical Institute (HHMI). Baton Rouge, LA, USA, 2009.
- Patil Y.N., **Menze M.A.** and Hand S.C. Arrest of aerobic metabolism in *Artemia franciscana* embryos during diapause. Presented at the annual Society for Comparative and Integrative Biology (SICB) meeting. Boston, MA, USA, 2009.
- Boswell L.C., **Menze M.A.** and Hand S.C. Isolation and characterization of AMP-activated protein kinase from embryos of *Artemia franciscana*. Presented at the annual SICB meeting. Boston, MA, USA, 2009.
- Menze M.A.** and Hand S.C. Lessons in Apoptosis from the extremophile *Artemia franciscana*. Poster session at the 64th Harden Conference. Ambleside, UK, 2007.

- Witt T.L., **Menze M.A.** and Hand S.C. Isolation and characterization of AMP-activated protein kinase from embryos of *Artemia franciscana*. Presented at the annual SICB meeting. Orlando, FL, USA, 2006.
- Menze M.A.** and Hand S.C. Lessons in apoptosis from a non-model invertebrate species: Caspase-9 of *Artemia franciscana* is refractory to cyt-c, inhibited by GTP and activated by  $Ca^{2+}$ . Keystone Symposia, Metabolomics: From bioenergetics to apoptosis, Snowbird, UT, 2006.
- Menze M.A.**, Hutchinson K., Laborde S. and Hand S.C. Mitochondrial permeability transition in an invertebrate: Absence of a calcium-regulated pore in the face of profound calcium storage. Presented at the 4<sup>th</sup> conference on Mitochondrial Physiology-MIP. Schröcken, Austria, 2005.
- Menze M.A.**, Hutchinson K. and Hand S.C. Lack of calcium induced mitochondrial permeability transition in *Artemia franciscana* during early development. Presented at the annual SICB meeting. San Diego, CA, USA, 2005.
- Menze M.A.**, Hellmann N., Decker H., Grieshaber M.K. Effector binding of oxygenated and deoxygenated hemocyanin of the lobster *Homarus vulgaris*. Presented at the 48th annual meeting of the Biophysical Society, Baltimore, MD, USA, 2004.
- Menze M.A.** and Hand S.C. Modification of AMP/ATP ratios in mammalian cells to modify metabolic activity. Presented at the annual SICB meeting. New Orleans, LA, USA, 2003.
- Menze, M.A.**, Hellmann N., Decker H. and Grieshaber M.K. Direct investigation of effector binding to the respiratory pigment hemocyanin. Presented at the 52nd. Mosbacher Kolloquium, Mosbach, Germany, 2001.
- Menze M.A.**, Hellmann N., Decker H. and Grieshaber M.K. ITC-Analysis of urate and caffeine binding to hemocyanin of the lobster *Homarus vulgaris*: Influence of pH. Presented at the 44th annual meeting of the Biophysical Society, New Orleans, LA, USA, 2000.
- Menze M.A.**, Hellmann N., Decker H. and Grieshaber M.K. Comparison of ligand binding behaviors in hemocyanin of *Homarus vulgaris* as determined by ITC or UC. Presented at the 43rd annual meeting of the Biophysical Society, Baltimore, MA, 1999.
- Menze M.A.**, Hellmann N., Decker H. and Grieshaber M.K. Comparison of ligand binding behaviors in hemocyanin. Presented at the 2nd International Conference on Applications of Biocalorimetry (ICAB), Halle, Germany, 1999.

\*EIU student researcher.

### **B. Oral Papers and Invited Seminars**

- Menze M.A.** Group I LEA protein ameliorates inhibition of mitochondrial respiration in *Drosophila* Kc167 cells. Presented at the annual Mitochondrial Physiology (MIP) meeting, Obergurgl, Austria, 2013.
- Fernandez\* W., Nathan B., and **Menze M.A.** Decline in mitochondrial respiration in post-ovariectomy mice is ameliorated by beta-estradiol treatment. Presented at the annual National Conferences on Undergraduate Research (NCUR). La Crosse, WI, 2013.
- Marunde\* M., and **Menze M.A.** Late Embryogenesis Abundant Protein Improves Mitochondrial Function under Salt and Water Stress. Presented at the annual National Conferences on Undergraduate Research (NCUR). La Crosse, WI, 2013.
- Hendricks E., Nathan B., and **Menze M.A.** Improving mitochondrial bioenergetics in an Alzheimer's mouse model via estrogen therapy. Presented at the annual meeting of the Illinois State Academy of Science. Jacksonville, IL, 2013.
- Samarajeewa D.A., Thiruni A.\*, Hand S.C., and **Menze M.A.** Life without water: intracellular expression of Late Embryogenesis Abundant (LEA) protein increases dehydration tolerance of eukaryotic cells. Presented at the annual meeting of the Illinois State Academy of Science. Galesburg, IL, 2012.



- Marunde M.\*, Shumin S., Hand S.C., and **Menze M.A.** Life without water: do Late Embryogenesis Abundant (LEA) proteins preserve mitochondrial functions? Presented at the annual Honors Council of the Illinois Region (HCIR) Student Conference. Joliet, IL 2012.
- Fernandez W\*., Elmuti L.\*, and **Menze MA.** Mechanism of in vitro  $\beta$ -estradiol bioenergetic effects in synaptic and non-synaptic mitochondria using an apoE deficient mouse model. Presented at the annual National Conferences on Undergraduate Research (NCUR). Ogden, UT 2012.
- Marunde M\*., Shumin S., Hand S.C., and **Menze M.A.** Late embryogenesis abundant protein ameliorates inhibition of mitochondrial respiration. Presented at the annual SICB meeting. Charleston, SC 2012.
- Anderson, J.M., Harder\* A., Hand S.C., Chakraborty N., and **Menze M.A.** "Protective mechanisms against water stress evaluated in insect cells". Presented at the annual SICB meeting. Charleston, SC 2012.
- Anderson, J.M., Hand S.C., and **Menze M.A.** Water stress in insect cells. Presented at the annual meeting of the Illinois State Academy of Science. Charleston, IL, 2011.
- Menze M.A.** "Mitochondrial calcium import, signaling, and ER cross-talk". Presented at the Mitochondrial Physiology Society MIP Summer School. Baton Rouge, LA, 2009.
- Menze M.A.** and Hellmann N. "Allosteric models for multimeric proteins: oxygen-linked effector binding in hemocyanin". Presented at the International Congress of Respiratory Biology. Bonn, Germany, 2006.
- Menze M.A.** and Hand S.C. "Lessons in apoptosis from an invertebrate extremophile: Embryos of *Artemia franciscana*". Presented at the annual SICB meeting. Orlando, FL, USA, 2006.
- Menze M.A.** , Hellmann N., Decker H. and Grieshaber M.K. "Direct investigation of effector binding to the respiratory pigment hemocyanin". Presented at the DZG annual main meeting. Osnabrück, Germany 2001.
- Menze M.A.** , Hellmann N., Decker H. and Grieshaber M.K. "ITC analysis of urate and caffeine binding to hemocyanin of the lobster *Homarus vulgaris*: influence of pH". Presented at the SEB annual main meeting. Exeter, UK, 2000.

\*EIU student researcher.

### **Student Awards and Grants Mentored**

#### **A. Undergraduate Research, Scholarship, and Creative Activities (URSCA) Awards – EIU Honors College**

- Robert Skolik and Daniel Webster (Summer 2015). Anhydrobiosis (\$3000).
- Robert Skolik and David Constantinescu (Spring 2015). Protein involvement in water-stress tolerance (\$500).
- David Constantinescu (Summer 2014). Understanding water crystallization at low temperature (\$3000).
- Clinton Belott (Spring, 2013). Synergistic cancer treatment (\$500).
- Ben Poznic (Fall, 2013). Taking the heat: the possible role of LEA proteins in preventing cell suicide in genetically-engineered human kidney cells (\$500).
- Nicolas Ferry (Summer, 2013). Type-2 diabetes: does mitoNEET impact mitochondria and catalase functions by multiple mechanisms? (\$3000).
- Blake Stokich (Summer, 2013). Improving long-term storage of mammalian cells. (\$3000).
- William Fernandez (Fall, 2012). Role of apolipoprotein E in Alzheimer's disease (\$500).
- Nathan Camp (Fall, 2012). Life in hot waters: live fast die young (\$500).
- Matthew Marunde (Summer, 2012). Lessons learned from nature: can we engineer life without water? (\$3000).
- Matthew Marunde (Spring 2011). Life without water: do late embryogenesis abundant (LEA) proteins preserve mitochondrial functions? (\$500).

William Fernandez and Lena Elmuti (Summer, 2011). Sex and power: does estrogen control energy production in Alzheimer's disease? (\$3000).

**B. Biological Sciences Undergraduate Research Grants – EIU Biology Department**

Clinton Belott (Fall, 2013). Synergistic cancer treatment.

David Grimm (Fall, 2013). The effects of pioglitazone on mitochondrial bioenergetics.

Blake Stokich (Fall, 2013). Cryopreservation of hepatocyte monolayers.

Kevin Stanley (Spring, 2013). Role of succinate dehydrogenase in Alzheimer's disease.

Blake Stokich (Spring, 2013). Improving long-term storage of mammalian cells.

Austin Tofte (Fall, 2012). Impact of estrogen on mitochondrial bioenergetics.

Nicolas Ferry (Fall, 2012). Type-2 diabetes: functions of mitoNEET.

Christopher Phillips (Fall, 2012). Impact of thermal effluent on blue gill in Lake Coffeen.

Mathew Marunde (Spring, 2012). Impact of group one LEA proteins on desiccation tolerance and bioenergetics of Kc167 cells.

Minh Ha Nguyen (Spring, 2012). Heat shock promoter controlled expression of a group 5 LEA protein.

Avril Harder (Spring, 2012). Does Intracellular Ice Nucleation Protein reduces cryogenic injury in insect cells?

Jenna Slaughter (Spring, 2011). Impact of heat shock on *Artemia franciscana* embryos.

Mathew Marunde (Spring, 2011). Oxygen consumption of transgenic *Drosophila melanogaster* cell lines.

Thiruni Adikari (Spring, 2011). Impact of transgenic LEA protein expression on desiccation tolerance of Kc167 cells.

Mitchell Cronk (Spring, 2011). Assessing insect cell proliferation via alamarBlue reduction.

**C. Scholars in Undergraduate Research (SURE) Award - EIU College of Sciences**

Clinton Belott (2015), David Grimm (2015), Blake Stokich (2015), Ben Poznic (2014), Nicolas Ferry (2014), Blake Stokich (2014), Matthew Marunde (2013), William Fernandez (2013), Matthew Marunde (2012), William Fernandez (2012).

**D. Graduate Student Investigator (GSI) Award - EIU College of Sciences**

Sudip Paudel (2015), Trisha Bailey (2015), Erick Hendricks (2014), Sudip Paudel (2014), Erick Hendricks (2013), Dilini Samarajeewa (2013), Dilini Samarajeewa (2012), John Anderson (2011).

**E. Graduate School Research and Creative Activity Grant**

Sudip Paudel (2015), Trisha Bailey (2015), Sudip Paudel (2014), Dilini Samarajeewa (2013), Erick Hendricks (2013), Dilini Samarajeewa (2012), John Anderson (2012), John Anderson (2011).

**F. Williams Travel Award**

Sudip Paudel (2014), Eric Hendricks (2013), Dilini Samarajeewa (2013), Jon Anderson (2012).

**G. College of Sciences Travel Grant**

David Grimm (2014), Sudip Paudel (2014), Blake Stokich (2013), William Fernandez (2013), Matthew Marunde (2013).

**H. Other Student Awards and Honors**

Outstanding International Student Award (2014) - Sudip Paudel.

Award of Honorable Mention at the 2014 AAAS Student Poster Competition (Brain and Behavior), Chicago 2014 - Erick Hendricks and Austin Tofte.

Distinguished Senior Award (2013) - William Fernandez.

Provost Research Assistantship (2013) - Erick Hendricks (\$9,000).

Outstanding International Student Award (2013) - Dilini Samarajeewa.

Illinois State Academy of Sciences Cell, Molecular, and Developmental Biology Division  
 Outstanding Presentation Award (2013) - Erick Hendricks (\$125).  
 Annie Weller Scholarship (2013) - Alyssa Walser (\$400).  
 Distinguished Graduate Student Award for the MSNS program (2013) - Alyssa Walser.  
 EIU Graduate School Distinguished Master Thesis Award (2013) - John Anderson (\$500).  
 Illinois State Academy of Sciences Cell, Molecular, and Developmental Biology Division  
 Outstanding Presentation Award (2011) - John Anderson (\$250).

### ***I. Graduate Students Mentored***

Brett Janis (2015 – present), Clinton Belott (2015 – present), Kazi Islam (2014 – present),  
 Trisha Bailey (2013 – 2015), Sudip Paudel (2013 – 2015), Alyssa Walser (2011 – 2013), Eric  
 Hendricks (2012 – 2014), Dilini Samarajeewa (2011 – 2013), John Anderson (2010 – 2012).

### ***J. Undergraduate Students Mentored***

Daniel Webster (2014 – present), Austin Wigand (2014 – present), David Constantinescu (2013  
 – present), Robert Skolik (2013 – present), Leah Welker (2014 – 2015), Amechi Alozie (2013 –  
 2015), , Clinton Belott (2013 – 2015), Jocelyn Herrera (2013 – present), Leonardo Altamirano  
 (2013 – 2015), David Grimm (2013 – present), Blake Stokich (2012 – 2015), Nicolas Ferry  
 (2012 – 2015), Ben Poznic (2012 – 2015), Willow Spencer (2012 – 2013), Austin Tofte (2012 –  
 2013), Kevin Stanley (2012 – 2013), Christopher Phillips (2012), Nathan Camp (2012), Haisma  
 Tiffany (2011 – 2012), Minh Nguyen (2011 – 2013), Avril Harder (2011 – 2012), Mitchell Cronk  
 (2010 – 2012), William Fernandez (2010 – 2013), Thiruni Adikari (2010 – 2012), Matthew  
 Marunde (2010 – 2013), Jena Slaughter (2010 – 2012), Ujwal Jain (2010 – 2011), Kiara Mack  
 (2010 – 2011), Suman Nag (2008 – 2010), Michael Bujol (2009 – 2010), Aryanna Amini (2009 –  
 2010), Grady Fortner (2008 – 2010), Shhyam Moorthy (2008 – 2010), Kaitlin Wolkers (2008 –  
 2009), Joy Norris (2006 – 2008), Phillip Gilmore, (2005 – 2008), Alex Combe (2005 – 2006), Jill  
 Vincent (2003 – 2005).

## **Service and Outreach**

### ***A. EIU - University Level***

Undergraduate Research Task Force (2014 – present).  
 Open Access Task Force (2014 – 2015).  
 Council of Graduate Studies (CGS) Committee member (2012 – 2015). Chair, (2014-2015)  
 Hamand Scholar Selection Committee member (2013 – 2014).  
 Textbook Advisory Board member (2012 – 2014).  
 Electronic Learning Materials Task Force - Chair of subgroup 'supporters' (2012 - 2013).  
 Secretary for the local SigmaXi chapter (2011 – present).  
 Faculty Fellow (2011 – present).  
 Facilitator for the EIUreads! program (2011 - present).  
 Faculty Mentor for the Jumpstart 2 G.I.V.E. program (2011 - present).

### ***B. EIU - College Level***

First Choice College of Arts & Humanities Review Board member (2012).  
 First Choice College of Business & Applied Sciences Review Board member (2013 – present).

### ***C. EIU - Departmental Level***

Pre-health Science Building Committee (2013).  
 Professional Science Masters (Biomedical) committee member (2013).  
 Department Application of Criteria (DAC) Committee member (2012). Chair (2013).  
 Grants Committee chair (2011 – present).  
 Graduate Committee member (2011 – present).  
 Facilities Committee member (2010).

**D. Professional Level**

Mentoring of high school student Joe Robles enrolled at Oak Park River Forest high school in the O.P.R.F.H.S. Mentoring Program (2013 – 2014).  
Science Fair Project Judge for regional competition at Lake Land College (2012 - present).  
Review Editor for *Frontiers in Aquatic Physiology* (2010 - present).  
Best Student Paper Judge at the Annual Meeting of the Society for Integrative and Comparative Biology (2009, 2011, 2012).  
Scientific Advisor for the Mitochondrial Physiology Society, MIP *board* member (2009 -present).  
Member of Ph.D. Dissertation Committees: Eloy Martinez, College of Marine Sciences, University of South Florida, St. Petersburg, FL (2010 - 2013); Erica Hudson, College of Marine Sciences, University of South Florida, St. Petersburg, FL (2010 - 2012); Leaf Boswell, Department of Biological Sciences, Louisiana State University, Baton Rouge, LA (2006 - 2013).  
Louisiana Junior Science and Humanities Symposium Judge (2009, 2010) and Louisiana State Science and Engineering Fair Judge. Baton Rouge, LA (2008, 2009).  
Best student paper judge for the Center for BioModular Multi-Scale Systems (CBM<sup>2</sup>) colloquium. Louisiana State University, Baton Rouge, LA (2006).  
Dean's Representative for Doctoral General Examination in the Department of Chemistry, Louisiana State University, Baton Rouge, LA (2009).  
Local Organizer and Instructor for the Mitochondrial Physiology Society MIP *Summer* School (2009), Baton Rouge, LA.

**E. Reviewer for Proposals**

National Science Foundation (NSF). *Ad hoc* reviewer for the Physiological and Structural Systems Cluster (Integrative Organismal Systems) (2007, 2009, 2010).  
U.S. Civilian Research and Development Foundation (CRDF). *Ad hoc* reviewer for the Cooperative Grants Program (CGP) Section Bioengineering (2007).

**F. Reviewer for Manuscripts**

BBA Proteins and Proteomics (2006, 2008), Biochemistry (2009, 2010), Biochemistry and Cell Biology (2007, 2009), Biotechnology Progress (2005, 2008), BMC Developmental Biology (2005, 2008), Canadian Journal of Zoology (2013), Comparative Physiology and Biochemistry (2003, 2006, 2007, 2010), Cryobiology (2006, 2007, 2009, 2010), Genomics (2013), Journal of Aquatic Physiology (2011, 2012), Journal of Biological Chemistry (2011, 2012), Journal of Experimental Zoology (2009), NCUR Proceedings (2013), Thermochimica Acta (2005), The Plant Cell (2007).

**Professional Societies**

Biophysical Society, Mitochondrial Physiology Society (MIP), Society of Experimental Biology (SEB), Society of Integrative and Comparative Biology (SICB), SigmaXi, Illinois State Academy of Sciences (ISAS)

**References****Professor Steven C. Hand**

Louisiana State University  
Dept. of Biological Sciences  
Baton Rouge, LA, 70803  
Phone: 1-225-578-5144  
Email: shand@lsu.edu

**Professor Manfred K. Grieshaber**

Institut für Zoophysologie  
Heinrich Heine Universität  
40225 Düsseldorf, Germany  
Phone: +49-211-811-2314  
Email: griesha@uni-duesseldorf.de

**Professor Mehmet Toner**

Shriners Burns Hospital  
Harvard Medical School/MIT  
51 Blossom Street  
Boston, MA, 02114  
Phone: 1-617-371-4883  
Email: mehmet\_toner@hms.harvard.edu

**Professor Christopher Bridges**

Institut für Zoophysologie  
Heinrich Heine Universität  
40225 Düsseldorf, Germany  
Phone: +49 211 811 4991  
Email: bridges@uni-duesseldorf.de

**Professor Heinz Decker**

Institut für Molekulare Biophysik  
Johannes Gutenberg Universität  
Jakob-Welder Weg 26  
55128 Mainz, Germany  
Phone: +49-6131-392-3570  
Email: hdecker@uni-mainz.de