

# CURRICULUM VITAE of NATASHA E. ZACHARA PH.D.

## DEMOGRAPHIC AND PERSONAL INFORMATION

### Current Appointments

Department of Biological Chemistry (January 2007)

### Personal Data

The Department of Biological Chemistry  
WBSB 408  
The Johns Hopkins University School of Medicine  
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### Education and Training (in chronological order):

Year	Degree/Certificate	Institution	Discipline
1991-1993*	Bachelor of Technology	Macquarie University (Sydney, Australia)	Biotechnology
1993-1994	Honors Degree (1 <sup>st</sup> Class)	Macquarie University (Sydney, Australia)	Biotechnology
1995-1998	Ph.D.	Macquarie University (Sydney, Australia)	Biology/Glycobiology
1998-2005	Post-Doctoral studies	Dept. Biological Chemistry, Johns Hopkins University School of Medicine	Glycobiology

- My studies were completed in Australia, where the academic year starts in January

### Professional Experience (in chronological order, earliest first)

Dates	Positions	Institutions
1990 (Spring)	High School Student Research Intern	CSIRO, Division of Entomology (Canberra, Australia).
1992 (Summer)	Summer Student Research Internship	CSIRO Division of Plant Industry, Molecular Biology (Canberra, Australia).
1993 (Summer)	Summer Student Research Internship	BIOCLONE (West Lindfield, Australia).
1993 (Fall)	Student Research Internship	SCHOOL OF Chemistry, Macquarie University (Sydney, Australia).
1994 (Summer)	Summer Student Research Internship	CSIRO Division of Plant Industry, Molecular Biology (Canberra, Australia).
1995 (March 1 <sup>st</sup> ) -1998 (October 15 <sup>th</sup> )	Graduate Student	Department of Biology, Macquarie University (Sydney, Australia)
1998 (November 1 <sup>st</sup> )- August 31 <sup>st</sup> 2005	Trainee/ Post-Doctoral Fellow	Dept. Biological Chemistry, Johns Hopkins University School of Medicine
September 1 <sup>st</sup> 2005 – December 31 <sup>st</sup> 2007	Assistant Professor	Division of Biomedical Sciences, Johns Hopkins Singapore.
January 1 <sup>st</sup> 2007 - Current	Assistant Professor	Dept. Biological Chemistry, Johns Hopkins University School of Medicine

## RESEARCH ACTIVITIES

### Peer-Reviewed Research Articles:

1. **Zachara N.E.**, Packer N. H., Temple M. D., Slade M. B., Jardine D. R., Karuso P., Moss C. J., Mabbutt B. C., Curmi P. M. G., Williams K. L., and Gooley A. A. (1996) Recombinant Prespore-specific Antigen from *Dictyostelium Discoideum* is a  $\beta$ -Sheet glycoprotein with a spacer peptide modified by O-linked N-acetylglucosamine. *Eur. J. Biochem.*, 238 511-518.
2. Harrison M. J., Nouwens A. S., Jardine D., **Zachara N. E.**, Nevalainen H., Gooley A. A., and Packer N. H. (1998) Identification of unusual post-translational modifications of cellobiohydrolase I from *Trichoderma Reesei*. *Eur. J. Biochem.*, 256, 119-217.
3. Muller S., Alving K., Peter-Katalinic J., **Zachara N. E.**, Gooley A. A., and Hanisch F. G. (1999) High density O-Glycosylation on tandem repeat peptide from secretory MUC1 of T47D breast cancer cells. *J. Biol. Chem.*, 274, 18165-18172.
4. Hanisch F. G., Muller S., Hassan H., Clausen H., **Zachara N. E.**, Gooley A. A., Paulsen H., Alfing K., and Peter-Katalinic J.. (1999) Dynamic epigenetic regulation of initial O-glycosylation by UDP-N-Acetylgalactosamine:peptide N-acetylgalactosaminyl transferases. Site-specific glycosylation of MUC1 repeat peptide influences the substrate qualities at adjacent or distant Ser/Thr positions. *J. Biol. Chem.*, 274, 9946-9954.
5. Wugeditsch T., **Zachara N. E.**, Puchberger M., Kosma P., Gooley A. A., and Messner P. (1999) Structural heterogeneity in the core oligosaccharide of the S-layer glycoprotein from *Aneurinibacillus thermoaerophilus* DSM 10155. *Glycobiology*, 9, 787-795.
6. Gewinner C., Hart G. W., **Zachara N. E.**, Cole R. N., Beisenherz-Huss C., and Groner B. (2004) The coactivator of transcription CREB binding protein interacts preferentially with the glycosylated form of Stat5. *J. Biol. Chem.*, 279, 3563-3572.
7. O'Donnell N., **Zachara N.**, Hart G. W., and Marth J. D. (2004) OGT-dependent X-chromosome-linked intracellular protein glycosylation is essential for mammalian viability and cellular metabolism. *Mol. Cell. Biol.*, 24, 1680-1690.
8. **Zachara N. E.**, O'Donnell N., Mercer J. J., Marth J. D., and Hart G. W. (2004) Dynamic O-GlcNAc modification of nucleocytoplasmic proteins in response to stress. A survival response of mammalian cells. *J. Biol. Chem.*, 279, 30133-30142.
9. Slawson C., **Zachara N. E.**, Vosseller K., Cheung W., Lane M. D., and Hart G. W. (2005) Perturbations in O-GlcNAc protein modification cause severe defects in mitotic progression and cytokinesis. *J. Biol. Chem.*, 280, 32944-32956.
10. Jones S. P., **Zachara N. E.**, Teshima Y., Hart G. W., and Marban E. (2008) Endogenously-recruitable cardioprotection by N-acetylglucosamine linkage to cellular proteins. *Circulation*, 117, 1172-1182.
11. Ngoh G. A., Facundo H. T., Hamid T., Dillmann W., **Zachara N. E.**, Jones S. P. (2009). Unique Hexosaminidase Reduces Metabolic Survival Signal and Sensitizes Cardiac Myocytes to Hypoxia-Reoxygenation Injury. *Circ. Res.*, 104, 41-49.
12. Kazemi Z., Chang H., Haserodt S. K., McKen C., **Zachara N.E.** (2010) O-GlcNAc Regulates Stress-Induced Heat Shock Protein Expression in a GSK-3 $\beta$  Dependent Manner. *J. Biol. Chem.*, 285, 39096-39107.
13. **Zachara N.E.**, Molina H., Wong K., Pandey A., Hart G.W. (2011) The dynamic stress-induced O-GlcNAcome highlights functions for O-GlcNAc in DNA Repair

- and other cellular pathways. *Amino Acids* 40: 793-808.
14. Tarrant M.K., Rho H., Xie Z., Blackshaw Jiang Y., Gross C., Qian J., Ichikawa Y., **Zachara N.**, Etzkorn F., Hart G. W., Jeong J., S., Zhu H., Cole P. A.: (2012) Multi-faceted Regulation of Protein Kinase CK2 by Phosphorylation and Glycosylation Revealed through Semisynthesis. *Nature Chemical Biology*, 2012, 8:262-269.
  15. Jensen R.V., **Zachara N.E.**, Nielsen P.H., Kimose H.H., Kristiansen S.B., and Botker H.E. (2013) **Impact of O-GlcNAc on cardioprotection by remote ischemic preconditioning in non-diabetic and diabetic patients.** *Cardiovascular Research*, 97(2): 369-378.
  16. Jensen R.V., Johnsen J., Kristiansen S.B., **Zachara N.E.** and Botker H.E. (2013) **Ischemic Preconditioning Increases Myocardial O-GlcNAc Glycosylation.** *Scandinavian Cardiovascular Journal*, 47(3):168-74
  17. Tardio L\*, Andrés-Bergós J\*, **Zachara NE**, Larrañaga-Vera A, Rodriguez-Villar C, Herrero-Beaumont G, Largo R. O-linked N-Acetylglucosamine (O-GlcNAc) protein modification is increased in the cartilage of patients with knee osteoarthritis. *Osteoarthritis Cartilage*. *In Press*. \* Denotes co-first authors
  18. Reeves R., Lee A., and **Zachara N.E.** **Characterization of the Specificity of O-GlcNAc Reactive Antibodies Under Conditions of Starvation and Stress.** *Accepted at Analytical Biochemistry, pending revisions.*
  19. Lee A., Henry R., Miller D., Paruchuri V.D.P., O'Meally R., Boronina T., Cole R.N., **Zachara N.E.** **Combined Antibody/Lectin-Enrichment Identifies Extensive Changes in the O-GlcNAc Subproteome Upon Oxidative Stress,** *Submitted.*

#### Peer-Reviewed Method Articles:

20. **Zachara N. E.** and Gooley A. A. (2000) Identification of glycosylation sites in mucin peptides. In *Mucin Methods and Protocols, Methods in Molecular Biology*, T. Corfield (ed) Humana Press, Totowa, USA. 125, 121-128.
21. **Zachara N. E.**, Cheung W. D., and Hart G. W. (2004) The detection and analysis of nucleocytoplasmic protein glycosylation, O-GlcNAc. In *Signal Transduction Protocols, Methods in Molecular Biology*, R. Dickson and M. Mendenhall (eds), Humana Press, Totowa, USA. Volume 284, p.175-194.
22. **Zachara N. E.** (2009) Detection and Analysis of Nucleocytoplasmic Glycoproteins. In *The Nucleus: Principles and Protocols, Meth Mol Biol*. Hancock R (ed) Humana Press (Totowa, USA). Volume 464, 227-254.
23. **Zachara N. E.** (2009) Detecting the "O-GlcNAc-ome"; Detection, Purification, and Analysis of O-GlcNAc Modified Proteins. In *Glycomics, Meth Mol Biol*. Packer N, Karlsson GN (eds) Humana Press (Totowa, USA). Volume 534, 251-279.

#### Peer-Reviewed Review Articles:

24. **Zachara N. E.** and Hart G. W. (2002) The functional significance of O-GlcNAc in cellular processes. *Chemical Reviews*, 102, 431-438.
25. **Zachara N. E.**, Cheung W. D., and Hart G. W. (2004). O-GlcNAc, an essential post-translational modification of nucleocytoplasmic proteins. *Current Organic Chemistry*, 8, 369-383.

26. **Zachara N. E.** and Hart G. W. (2004) O-GlcNAc a sensor of cellular state: The role of nucleocytoplasmic glycosylation in modulating cellular function in response to nutrition and stress. *Biochim. Biophys. Acta.*, 1673, 13-28.
27. **Zachara N. E.** and Hart G. W. (2006) Cell Signaling, the Essential Role of O-GlcNAc! *Biochim. Biophys. Acta*, 1761, 599-617.
28. Paruchuri V.D.P. and **Zachara N. E.** (2011) "Defining the Cardiac O-GlcNAcome, A Review of Approaches and Methodologies", Special series: Integrating proteomics into cardiovascular disease in *Circulation: Cardiovascular Genetics*, 4, 710-718.
29. **Zachara N.E.** (2012) The Roles of O-Linked  $\beta$ -N-Acetylglucosamine (O-GlcNAc) in Cardiac Physiology and Disease. *American J Physiol Heart Circ Physiol.*, 302, H1905-H1918.
30. Groves J., Lee A., Yildirim G., and **Zachara N.E.** (2013) Dynamic O-GlcNAcylation and its roles in the cellular stress response and homeostasis. *Cell Stress and Chaperones*, Sep;18(5):535-58.

### Editorials

1. **Zachara N. E.** and Hart G. W. (2004) O-GlcNAc, a nutritional effector molecule, modulates proteasome function. *Trends in Cell Biology*, 14, 218-221.
2. **Zachara N.E.** (2007) The sweet nature of cardioprotection. *Amer J Phys (Heart and Circulatory Physiology)*; 293: H1324-H1326.

### Book Chapters

3. Nevalainen H., Harrison M., Jardine D., **Zachara N. E.**, Paloheimo M., Suominen P., Gooley A. A., and Packer N. P. (1997) Glycosylation of cellobiohydrolases from *Trichoderma reesei*. carbohydrates from *Trichoderma reesei* and other microorganisms: structure, biochemistry, genetics and applications. The Royal Society of Chemistry, Thomas Graham House, Cambridge, UK. p 335-344.
4. **Zachara N. E.**, Cole R. N., Hart G. W., and Gao Y.. (2001) Detection and analysis of proteins modified by O-Linked N-acetylglucosamine. In *Current Protocols in Protein Science*, Johns Wiley and Sons Inc., New York, USA. Chapter 12, p12.8.1-12.8.28.
5. **Zachara N. E.**, Cole R. N., Hart G. W., and Gao Y.. (2002) Detection and analysis of proteins modified by O-Linked N-acetylglucosamine. In *Current Protocols in Molecular Biology*, Johns Wiley and Sons Inc., New York, USA. Chapter 17, p17.6.1-17.6.22.
6. **Zachara N. E.** and Hart G. W.. (2004) Protein glycosylation. In *The Encyclopedia of Biochemistry*, W. Lennarz and M. D. Lane (eds), Academic Press/Elsevier Science, New York, USA. Volume 3: 504-509.
7. **Zachara N. E.**, Vosseller K. L., and Hart G. W. (2011) Detection and analysis of proteins modified by O-Linked N-acetylglucosamine. In *Current Protocols in Protein Science*, Johns Wiley and Sons Inc., New York, USA. Chapter 12: Unit 12.8.
8. **Zachara N. E.**, Vosseller K. L., and Hart G. W. (2011) Detection and analysis of proteins modified by O-Linked N-acetylglucosamine. In *Curr Protoc Mol Biol* Johns Wiley and Sons Inc., New York, USA. Chapter 17: Unit 17.6.

### Inventions, Patents, Copyrights (pending, awarded)

N/A

## Extramural Funding (current, pending, previous)

### Past:

#### **1995-1998: Australian Post Graduate Award (Australian Federal Government)**

**Total Direct Costs:** \$45,900 (AUS)

This is a competitive Scholarship awarded to directly to students

Mentors: Professor Keith L. Williams and Dr Andrew A. Gooley

#### **1997: Macquarie University Post Graduate Award 1997 (Macquarie University)**

**Total Direct Costs:** \$1500, (AUS)

This is a competitive Scholarship awarded to directly to students.

Mentors: Professor Keith L. Williams and Dr Andrew A. Gooley

#### **Scientist Development Grant : 0930162N**

1/2009-12/2012

American Heart Association (National Affiliate)

**Title:** O-GlcNAc, a New Paradigm in Regulating Cellular Response to Injury

**The overall goal of this project is to:** determine the molecular mechanism(s) by which O-GlcNAc regulates the expression of heat shock proteins; and to systematically identify proteins glycosylated in response to oxidative stress.

Role: PI

**Total Direct Costs:** \$280,000

#### **1 R21HL108003**

6/1/11-3/31/13

NIH/NHLBI:

**Title:** Defining the Molecular Mechanisms by Which O-GlcNAc Mediates Cardioprotection

**The overall goal of this project is to:** develop two new tools with which to study the O-GlcNAc modification. To demonstrate the utility of these tools we will map the spatial and temporal dynamics of O-GlcNAc modification and identify proteins that are dynamically O-GlcNAc modified from heart in response to ischemic preconditioning.

Role: PI

**Total Direct Costs:** \$275,000

### Current:

#### **1 P01HL107153-01**

4/1/11-3/31/17

NIH/NHLBI:

**Title:** Glycoconjugates and Cardiovascular Disease

**This is a program project grant the PI of which is Gerald Hart. I am a PI or Co-PI on three projects described below:**

**2011-2118:** Glycoconjugates and Cardiovascular Disease\*

**Project 2:** O-GlcNAc and Cardioprotection

**Role:** Principal Investigator

**Total Direct Costs:** \$1, 204, 596.

**The goals of the project are as follows:** A) to identify proteins that are dynamically O-GlcNAc modified in vivo in a model of ischemia reperfusion injury and to define the molecular mechanisms by which O-GlcNAc regulates a subset of these proteins; B) to determine if any of these target proteins are mis-O-GlcNAcylated in models of heart failure; C) To determine if this response is modulated by preconditioning agents; D) To study the biology of the enzymes that add and remove O-GlcNAc in ischemic reperfusion injury; E) To elucidate the mechanisms by which O-GlcNAc regulates autophagy, leading to cardioprotection.

**Core B: Glycosciences Skills Development**

**Role: PI**

**Direct Costs:** \$114,047

**The goals of this project are as follows:** To design and implement a didactic and hand-on glycobiology course at the Johns Hopkins University Medical school, in order to train the next generation of glycoscientist.

**SubCore C4: O-GlcNAc Resources**

**Role:** Co-Principal Investigator

**Direct Costs:** \$646,368.

**The goals of the project are as follows:** To maintain existing reagents for the detection and study of the O-GlcNAc modification, develop new reagents, and to support the study of the O-GlcNAc modification within the PEG and in the greater scientific community.

**GCF Fellowship**

1/1/13-12/31/15

**Role:** Mentor

**Direct Costs:** \$50,000

**The goals of the project are as follows:** To study the role of O-GlcNAc regulated arginine methylation in models of oxidative stress.

**AHA Post-doctoral Fellowship (13POST17100083)**

7/1/13-6/30/15

**Role:** Mentor

**Direct Costs:** \$43,000

**The goals of the project are as follows:** To study the role of O-GlcNAc in mediating the induction of Autophagy.

**Pending:**

**Mizutani Foundation for the Glycosciences**

4/1/14-3/31/15

**Role:** PI

**Direct Costs:** \$70,000

**Title:** Identification and Characterization of an O-GlcNAc Binding Protein

**Mizutani Foundation for the Glycosciences**

4/1/14-3/31/15

**Role:** Co-PI

**Direct Costs (to my lab):** \$25,375; **Total:** \$70,000

**Title:** Regulation of Nod2 by O-GlcNAc glycosylation in Crohn's disease

**Defense Threat Reduction Agency**

4/1/14-3/31/15

**Role:** Co-PI

**Direct Costs (to my lab):** \$186,964; **Total:** \$2,012,472

**Title:** By-passing Resistance: Characterization of Capsule Biosynthetic and Capsule Degrading Enzymes

## EDUCATIONAL ACTIVITIES

### Educational Publications

#### Other Media

- 1. Website:** Program of Excellence in Glycosciences  
[https://jshare.johnshopkins.edu/GlycoCardioPEG/public\\_html/index.html](https://jshare.johnshopkins.edu/GlycoCardioPEG/public_html/index.html)  
<http://cardiopeg.bs.jhmi.edu/Pages/Home.aspx>  
The notes, slides and lectures for Fundamentals of Glycobiology are available  
The notes for Introductory Glycobiology are available
- 2. Notes:** Introductory Glycobiology (my lectures only)  
N-linked Glycosylation  
O-linked Glycosylation  
Proteoglycans and Glycosaminoglycans  
[https://jshare.johnshopkins.edu/GlycoCardioPEG/public\\_html/index.html](https://jshare.johnshopkins.edu/GlycoCardioPEG/public_html/index.html)  
<http://cardiopeg.bs.jhmi.edu/Pages/Home.aspx>
- 3. Slides sets & Notes:** Fundamentals of Glycobiology  
O-linked glycans  
The O-GlcNAc modification  
The Glycobiology of Infectious Disease  
[https://jshare.johnshopkins.edu/GlycoCardioPEG/public\\_html/index.html](https://jshare.johnshopkins.edu/GlycoCardioPEG/public_html/index.html)  
<http://cardiopeg.bs.jhmi.edu/Pages/Home.aspx>
- 4. Video Lectures:** Fundamentals of Glycobiology  
O-linked glycans  
The O-GlcNAc modification  
The Glycobiology of Infectious Disease  
[https://jshare.johnshopkins.edu/GlycoCardioPEG/public\\_html/index.html](https://jshare.johnshopkins.edu/GlycoCardioPEG/public_html/index.html)  
<http://cardiopeg.bs.jhmi.edu/Pages/Home.aspx>

### Teaching

#### Classroom

- 1995: School of Biological Sciences, Macquarie University (Sydney, Australia). Biology Tutor and Demonstrator for Introductory Biology (100 level).
- 1995-1997: School of Biology Sciences, Macquarie University (Sydney, Australia). Biology Tutor and Demonstrator, for Molecular Biology and Biochemistry (200 level).
- 1996-1997: School of Chemistry, Macquarie University (Sydney, Australia). Chemistry Tutor and Demonstrator for Separation and Analysis (300 level).
- 2007-Current: Group Leader for Current Topics in Biological Chemistry, The Johns Hopkins University School of Medicine.
- 2009-2011: Small Group leader: Metabolism Section (Medical School Curriculum)
- 2012-Current: Lecturer and Co-organizer:  
Introduction to Glycobiology (330.712; BCMB Elective)
- 2012-Current: Organizer and Lecturer:  
Fundamentals in Glycobiology (340.709; 2 credits)
- 2013-Current: Organizer and Lecturer:  
Techniques in Glycobiology (340.710; 4 credits)
- 2013-Current: Lecturer  
Molecular Biology of Cellular Stress and Quality Control (SOPH)

#### Seminars

- 2012** (April 17<sup>th</sup>): Presented two seminars to a group of young women at the Baltimore Polytechnic Institute - focusing on the many roles of Glycan's in Biology.
- 2013:** Lecture for Henry Stewart Talks in the Glycobiology Theme
- 2013: Seminar,** Tribeta Biological Honors Society, Stevenson College

**Mentoring** (pre- and post-doctoral)

**Advisees:**

**Undergraduates**

- 2006: Wong Keryi (Undergraduate student, Division of Biomedical Sciences, Johns Hopkins Singapore). *Currently studying medicine at Duke Medical School (Singapore)*
- 2007: Sarah Haserodt (The Johns Hopkins University School of Medicine Minority Summer Internship Program). *Currently studying medicine at the University of Ohio.*
- 2008: Cathrine McKen (Sr Alma McNicholas Women Scientists Program, the College of Notre Dame, Maryland). *Graduated from Notre Dame, and currently employed in a research lab.*
- 2008-2011: Bahawa Nimaga (The Johns Hopkins University School of Medicine Minority Summer Internship Program). *Graduated from UCSD, currently employed in a research lab.*
- 2010: *Dekarman Fellowship*
- 2012: *ASBMB competitive travel award*
- 2008-2009: Shivang Doshi (Masters Student at the Johns Hopkins University). *Currently completing a Ph.D. in Public Health at Harvard.*
- 2009-Current: Srona Sengupta (Johns Hopkins University Undergraduate Student - Research for Credit program). *Currently completing a MD/Ph.D. at Johns Hopkins University School of Medicine.*
- 2010: *PURA Award (\$2500) to support research.*
- 2011: *ASBMB UAN (Undergraduate Affiliates Network) Undergraduate Research Award (\$1000) support research.*
- 2012: *ASBMB Competitive Travel Award.*
- 2012: *Best Poster (Undergraduate Poster Session: Cell Signaling Division) at Experimental Biology 2012.*
- 2012: *Best poster (Role of Glycoconjugates in Signaling and Development theme) was awarded to Srona Sengupta for her work "O-GlcNAc, A Novel Paradigm for Regulating Stress-Induced Signal Transduction Pathways" (ASBMB Section at Experimental Biology 2012).*
- 2012: *The William D. McElroy Award (JHU Department of Biology).*
- 2010-2011: Rubi Luna (Johns Hopkins University Undergraduate Student - Research for Credit program). *Graduated from JHU, taking a gap year.*
- 2010-2011: Russell Reeves (Johns Hopkins University Undergraduate Student - Research for Credit program). *Completing an M.D. at Dartmouth Medical School.*
- 2010: Juan Ramirez (The Johns Hopkins University School of Medicine Minority Summer Internship Program). *Completing his studies at UMBC.*
- 2010-Current: Roger Henry (Johns Hopkins University Undergraduate Student - Research for Credit program). *Completing his studies at JHU.*
- 2012: *Pura Award (\$2500) to support research*
- 2011: Lumena Louis (The Johns Hopkins University School of Medicine Basic Sciences Summer Internship Program). *Completing a Ph.D. in Pharmacology at the University of Pennsylvania.*
- 2012: Taylor Heck (The Johns Hopkins University School of Medicine Basic Sciences Summer Internship Program). *Graduated from the University of North Dakota. Taking a gap year.*



2012-2013: Aleesha Shaik, (Johns Hopkins University Undergraduate Student - Research for Credit program). *Graduated, Taking a gap year.*

2013-Current: Jeremy Sanchez, (Grinnell College, Summer Internship Program). *Completing his studies.*

2014-Current: Cloe Ferris, (Johns Hopkins University Undergraduate Student - Research for Credit program). *Completing her studies.*

### **Medical School Students**

Devin Miller, B.S. (2011, 2012): *Completing his studies at JHU*

### **Graduate Students**

Cassandra Patenaude (2010, BCMB Rotation Student)

Lidia Tardio Mora – Visiting Graduate Student, 2010 (Joint and Bone Research Unit, Fundación Jiménez Díaz, Madrid Spain). *Graduated in 2013.*

Rebekka Jensen M.D. - Visiting Graduate Student 2011, Department of Cardiology, B Århus University Hospital, Skejby, Denmark. *Graduated, 2013.*

Jennifer Groves, B.S. (2011 – Current, BC graduate program)

Honorable mention: NSF pre-doctoral fellowship

NSRA: 1<sup>st</sup> submission, Score 30

Elizabeth Calzada (2012, BCMB Rotation Student)

Terri Clister (2012, BCMB Rotation Student)

Selam Woldemeskel (2013, BC Rotation Student)

### **Post-doctoral Fellows**

Albert Lee, Ph.D. (2011 – Current, post-doctoral fellow)

2012: Travel Award – Society for Glycobiology

2013: GlycoCardio Fellow (Salary support for 3 years)

*Currently: Macquarie University, Post-doctoral fellow*

Kamau Fahie, PhD. (2011 –Current, post-doctoral fellow)

2013: AHA Post-doctoral fellowship (Salary support for 2 years)

2013: Travel Award – Society for Glycobiology

Marissa Martinez Ph.D. (2013-Current)

### **Thesis committees (provide: dates, name, title, your role)**

**Ping Hu** (Advisor: Gerald W. Hart)

Program: BC

Role: Member

Title: Regulation of IRS-1 and Insulin Signaling by O-GlcNAc

Dates: 2012-Current

**Michael Multhaup** (Advisor: Andrew Feinberg):

Program: BCMB

Role: Member

Title: Epigenetics of Diabetes

Dates: 2011-Current

**Korin Bullen (Formerly Cynthia Shrum; Advisor: Robert Silicano):**

Program: BCMB

Role: Member

Title: Mechanisms of latent HIV-1 reactivation by novel small molecule compounds

Dates: 2009-Current

**Jason Berk (Advisor: Kathy Wilson):**

Program: BCMB

Role: Member, Reader

Title: THE POSTTRANSLATIONAL REGULATION OF EMERIN FUNCTION

Dates: 2010-2012 (Graduated)

**Shino Shimoji (Advisor: Jerry Hart):**

Program: BCMB

Role: Member

Title: Sugar Coating T Cell Activation

Dates: 2009-2011 (Graduated)

**Chutikarn Butkinaree (Advisor: Jerry Hart):**

Program: BCMB

Role: Member

Title: The roles of  $\beta$ -N-acetylglucosamine modification during apoptosis and insulin signaling.

Dates: 2009-2011 (Graduated)

**Michael Housley (Advisor: Jerry Hart):**

Program: BCMB

Role: Member

Title: A PGC-1 $\alpha$ : O-GlcNAc transferase complex regulates the transcription factor foxo in response to glucose.

Dates: 2008 (Graduated)

**Training grant participation:**

2007-Current: BCMB

**Educational Program Building / Leadership**

2010, 2012: Summer Internship selection committee

2011-Current: BCMB Graduate Student Admissions Committee

2011-Current: BC Graduate Student Admissions Committee

2012-Current: Co-Director - BC Graduate Program

**CLINICAL ACTIVITIES**

Not Applicable

**SYSTEM INNOVATION AND QUALITY IMPROVEMENT ACTIVITIES**

Not Applicable

**ORGANIZATIONAL ACTIVITIES**

**Institutional Administrative Appointments**

August 2011-Current: Faculty Senate (previously the Medical School Council)

**Departmental Administrative Appointments**

2008: 100<sup>th</sup> Anniversary Committee, Department of Biological Chemistry

2009, 2011, 2012: Biological Chemistry, Faculty Search Committee

2010: Hellerman Lecture Selection committee

**Editorial Activities (dates, role)**

• **Editorial Board appointments:**

Journal of Biological Chemistry (July 1<sup>st</sup> 2013, 5 year appointment)

• **Journal peer review activities:**

2003-Current: Biochemistry and Biophysics Acta

2007-Current: Glycobiology Journal  
2007-Current: Proteomics Journal  
2008-Current: FASEB Journal  
2008-Current: Critical Care Medicine  
2008-Current: American Journal of Physiology  
2008-Current: Life Sciences  
2010-Current: PLOS1  
2010-Current: Molecular and Cellular Proteomics.  
2010-Current: The Journal of Biological Chemistry  
2010-Current: Chemistry and Biology  
2011-Current: Cell Stress and Chaperones  
2013-Current: Nature Medicine  
2013-Current: Neuroscience Letters  
2013-Current: Cell Death and Disease  
2013-Current: Molecular Medicine  
2013-Current: Current Biology

**Advisory Committees, Review Groups/Study Sections**

2008-Current: Peer Review, Wellcome Trust  
2008: NIH Special Emphasis Panel, declined due to visa status  
(Scientific Review Officer: Peter Zelazowski, PhD.)  
2012: NHLBI Program Project Grant Peer Review, declined conflict of interest  
(Scientific Review Officer: Kristin Goltry)  
2013: Hungarian Scientific Research Fund, declined  
(Assistant of International Affairs : Dr. Elod Nemerkenyi)  
2013: The Wellcome Trust/ DBT India Alliance  
(Dr Vandana Gambhir; Grants Adviser)

**Professional Societies:**

2005-Current: The Society for Glycobiology (Member)  
2005-Current: The American Society of Biochemists and Molecular Biologists  
(Member)  
2010-Current: Cell Stress Society International (Member)

**Conference Organizer, Session Chair** (date, sponsor, role)

2010: *Protein O-GlcNAcylation: A New Signaling Paradigm for the Cardiovascular System* chaired by Lance Wells and Natasha E. Zachara. Experimental Biology 2010, Anaheim, CA.  
2010-Current: Organizer Glycobiology Interest Group  
2012: Organizer: Glycobiology Interest Group “Annual Poster Session”  
2014: Glycobiology Theme Organizer ASBMB 2014

## RECOGNITION

### **Awards & Honors:**

- 1993: AMRAD Molecular Biology Award, Macquarie University (Sydney, Australia).
- 1995-1998: Lorne Protein Society Student Travel Award(s) (Lorne, Australia).
- 1994-1998: HECS Scholarship (Covered Tuition, Australian Federal Government) Macquarie University (Sydney, Australia).
- 1997: Young Scientist Award (International Glycoconjugate Organization), Glyco XIV (Zurich, Switzerland).
- 2000: Travel Award, Society for Glycobiology (Boston, MA).
- 2001: ASBMB Travel Award, Experimental Biology (Orlando, FL).
- 2004: ASBMB Travel Award, Experimental Biology (San Diego, CA).
- 2005: Albert Lehninger Young Scientist Award (JHU, Baltimore, MD).
- 2006: Lorne Protein Structure and Function Young Scientist Award (Lorne, Australia).
- 2006: O-GlcNAc a sensor of cellular state: the role of nucleocytoplasmic glycosylation in modulating cellular response to nutrition and stress (Vol 1673, 13-28, 2004), top 3 downloaded papers of BBA general subjects in 2005.
- 2011: Cell signaling, the essential role of O-GlcNAc (BBA Molecular and Cell Biology of Lipids. Vol 1761 (5): 599-617 2006). Most Cited Articles 2006-2010.

### **Invited Talks & Panels:**

#### *Conference talks from abstracts:*

- 1997: Characterization of Glycopeptide Linkers. Glyco XIV, Zurich, Switzerland.
- 2001: A tale of two post-translational modifications: The essential splicing protein ASF/SF2 is modified by O-GlcNAc. Experimental Biology, Orlando, FL.
- 2001: Identification of an O-GlcNAc binding motif in nucleo/cytoplasmic proteins. Glyco XVI, The Hague, Holland.
- 2003: Nucleocytoplasmic glycosylation, O-linked  $\beta$ -N-acetylglucosamine, a sensor of cellular stress. ASBMB, San Diego, CA.
- 2003: O-GlcNAc: A new Paradigm for modulating cellular responses to stress. Glycobiology Society, San Diego, CA.
- 2004: O-GlcNAc a mediator of cellular function: characterizing a family of O-GlcNAc binding proteins. Glycobiology Society, Honolulu, Hawaii.
- 2013: O-GlcNAc regulated arginine methylation, a novel paradigm in survival signaling. Glycobiology Society Meeting, St Petersburg, Florida.

#### *Institutional:*

- 2003: O-GlcNAc is a mediator of Cellular Stress Response. Glycobiology Interest Group, The Johns Hopkins University Medical School, Baltimore, MD.
- 2003: Stress, Nucleocytoplasmic O-Glycosylation and Heat Shock Proteins. The Department of Physiology, The Johns Hopkins University Medical School, Baltimore, MD.
- 2006: O-GlcNAc, A New Paradigm for Regulating Stress-Signaling Networks. The Division of Johns Hopkins University Singapore.
- 2007: The Sweet Nature of the Cellular Stress Response, December, Glycobiology Interest Group, Johns Hopkins University.

- 2009: Signaling Survival: Stress-Induced GlcNAcylation Regulates Heat Shock Proteins in a GSK3 $\beta$  Dependent Manner. Johns Hopkins University, Hopkins NHLBI Proteomics Center, Baltimore, MD.)
- 2009: O-GlcNAc, a Novel Regulator of the Cellular Stress Response and Cell Survival. Glycobiology Interest Group, Johns Hopkins University, Baltimore, Maryland.
- 2013: O-GlcNAc regulated arginine methylation, a novel paradigm in survival signaling. Glycobiology Interest Group, JHU, MD.

*Local:*

- 2002: Nucleocytoplasmic glycosylation, O-linked  $\beta$ -N-acetylglucosamine, a sensor of cellular stress. The National Heart Lung and Blood Institute, Bethesda, MD.
- 2006: O-GlcNAc, A New Paradigm for Regulating Stress-Signaling Networks. OLS Neurobiology Group Seminar, The National University of Singapore.
- 2008: An introduction to Glycoproteins and Glycoprotein Analysis. Amplimmune, Baltimore MD.
- 2009: The Sweet Nature of the Cellular Stress Response. University of Maryland Cancer Center, Baltimore, MD.
- 2009: Signaling Survival, O-GlcNAc a Novel Mediator of Heat Shock Protein Expression, Center for Marine Biotechnology. The University of Maryland, Baltimore, MD.

*National:*

- 2005: Dynamic Nucleocytoplasmic Glycosylation in Response to Stress; A New Paradigm for the Regulation of Stress-Signaling Networks. The University of Minnesota Duluth, Department of Chemistry and Biochemistry.
- 2005: Dynamic Nucleocytoplasmic Glycosylation, A mediator of the Cellular Stress Response. The Medical College of Wisconsin, Department of Biochemistry.
- 2005: Dynamic Glycosylation of Nucleocytoplasmic Proteins in Response to Stress: A New Paradigm for the Modulation of Stress Signaling Networks. The University of Texas Southwestern Medical Center, Department of Biochemistry.
- 2005: Dynamic Glycosylation of Nucleocytoplasmic Proteins in Response to Stress: A New Paradigm for the Modulation of Stress Signaling Networks. The Nebraska Medical Center Department of Biochemistry and Molecular Biology.
- 2007: The role of O-GlcNAc in Cellular Regulation, Experimental Biology 07, Washington DC.
- 2007: Dynamic Glycosylation of Nucleocytoplasmic Proteins in Response to Stress: A New Paradigm for the Modulation of Stress Signaling Networks. Department of Biological Sciences, Clemson University.
- 2008: The Sweet Nature of the Cellular Stress Response. Biochemistry Department, Drexel University College of Medicine, Philadelphia.
- 2008: The Sweet Nature of the Cellular Stress Response. 19<sup>th</sup> Annual UAB Vascular Biology and Hypertension Symposium, Birmingham, Alabama.
- 2009: The Sweet Nature of the Cellular Stress Response. Gordon Conference for Glycobiology, Ventura, California.

- 2010: O-GlcNAc, A Novel Regulator of the Cellular Stress Response and Cell Survival. Experimental Biology 2010, Anaheim, CA.
- 2012: Stressing the Role of Intracellular Glycosylation, O-GlcNAc, in Cell Survival Signaling. 6<sup>th</sup> International Symposium on Heat Shock Proteins in Biology and Medicine. Alexandria, VA.
- 2013: Decoding the O-GlcNAc Enigma in Survival Signaling. NIH and FDA Glycosciences Research Day, Bethesda, Maryland.
- 2014: O-GlcNAc regulated arginine methylation, a novel paradigm in survival signaling. Glycobiology Society Meeting. ASBMB 2014, San Diego, CA.

*International:*

- 2004: Dynamic Nucleocytoplasmic Glycosylation, a Mediator of Cellular Stress Response. Plant Industry, The CSIRO, Canberra, Australia.
- 2005: Dynamic Nucleocytoplasmic Glycosylation in Response to Stress; A New Paradigm for the Regulation of Stress-Signaling Networks. The Division of Johns Hopkins University Singapore.
- 2006: O-GlcNAc, A New Paradigm for Regulating Stress-Signaling Networks. The Baker Heart Research Institute. Melbourne, Australia.
- 2006: O-GlcNAc, A New Paradigm for Regulating Stress-Signaling Networks. 30<sup>th</sup> Lorne Conference on Protein Structure and Function. Lorne, Australia.
- 2011: O-GlcNAc, A Novel Regulator of the Cellular Stress Response and Cell Survival. Joint and Bone Research Unit, Fundación Jiménez Díaz, Madrid, Spain.