

# Ayana Makeda Hinton

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## EDUCATION

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- Ph.D.** Wayne State University School of Medicine, Detroit, MI **1999 – 2004**  
Concentration: **Biochemistry and Molecular Biology**  
Dissertation: *In vitro Studies with Atp11p and Atp12p*  
Research Advisor: Dr. Sharon Ackerman
- B.S.E.** University of Michigan, Ann Arbor, MI **1991 – 1996**  
Concentration: **Chemical Engineering**

## TEACHING EXPERIENCE

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**ASSOCIATE PROFESSOR OF BIOLOGY** – Denison University Granville, OH **Fall 2019-present**  
**ASSISTANT PROFESSOR OF BIOLOGY** – Denison University Granville, OH **Fall 2010-Spring 2018**

### **BIOL345 – Eukaryotic Cell Biology and Lab**

- Upper level majors class that focuses on cell biology from the standpoint of eukaryotic cells in the context of normal function and disease states. Lab sessions emphasize cell biology and molecular biology techniques and experimental design

### **BIOL315 – General Microbiology and Lab**

- Upper level majors class that focuses on the biology of microorganisms, particularly bacteria. Special emphasis in lab to teach skills and methods that are commonly used to work with microorganisms and identify bacteria.

### **BIOL210 – Molecular Biology and Unicellular Life and Lab**

- Core course that explores the origins of cellular life, features of prokaryotes (cell structure, genetics, bioenergetics, etc...), the origin of eukaryotic cells and features of unicellular eukaryotes (cell structure, genetics, cell cycle regulation, etc...)

### **BIOL201 – Cellular and Molecular Biology and Lab**

- Core course that explores the basic cellular and molecular functions that contribute to the day to day functioning of the cell

### **BIOL150 – Introduction to the Science of Biology and Lab**

- Core course that introduces students to basic concepts in biology such as Evolution, Structure/Function relationships, Bioenergetics, Response to Stimuli and Reproduction. Also focuses on principles and practice of the scientific method

**ADJUNCT FACULTY** – Bunker Hill Community College Boston, MA **Spring 2009**

### **BIO195 - General Biology I Lecture and Lab**

- Taught a class of twenty science majors general cell biology including cellular respiration, mitosis, meiosis, basics of macromolecular structure & function, and other introductory topics.

**FACILITATOR** – Tufts University School of Medicine Boston, MA **Fall 2008 & 2009**  
**PBL1 - Problem Based Learning for first year medical students**

- Used case study instruction to facilitate a discussion group of five medical students through the patient diagnosis process.

**INSTRUCTOR** – Wayne State University Detroit, MI

**Summer 2000 & 2001**

**Summer Undergraduate Research Experience for Minority Students**

- Taught a class of fifteen incoming freshmen the metric system and other principles important for making basic scientific measurements.

**RESEARCH EXPERIENCE**

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**PROFESSIONAL RESEARCH** – Denison University Granville, OH

**2010-present**

- Study the role Vacuolar H<sup>+</sup>-ATPases play in breast cancer metastasis by investigating their function in activation of cathepsins secreted from a human breast cancer cell line.
- Understand the mechanisms that underlie assembly of the V-ATPase by studying the properties and function of Vma12p and Vma22p, proteins that act as assembly factors for the V-ATPase.

**POSTDOCTORAL RESEARCH** - Tufts University School of Medicine Boston, MA

**2004 – 2009**

Department of Physiology

Research Adviser – Dr. Michael Forgac

- Investigated the role of Vacuolar H<sup>+</sup>-ATPases in breast cancer invasion
  - Determined the “a” subunit isoform of the V-ATPase responsible for cell surface localization
  - Identified the “a” subunit isoforms important for *in vitro* invasion of highly metastatic breast cancer cells
- I am developing a high-throughput yeast screen that will be used to identify inhibitors that are specific for each subunit “a” isoform. These inhibitors could be used as lead compounds in the development of therapeutic agents for treatment of metastasis and other diseases.

**DOCTORAL RESEARCH** - Wayne State University School of Medicine Detroit, MI

**1999 – 2004**

Department of Biochemistry and Molecular Biology

Research Advisor – Dr. Sharon Ackerman

- Re-engineered the gene for recombinant yeast Atp11p to allow for the preparation of a truncated protein amenable for structure determination by x-ray crystallography or NMR
- Expressed and purified soluble wild type and mutated human Atp12p to study its molecular chaperone activity and to prepare for its structure determination.

**HONORS AND AWARDS**

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**Training in Education and Critical Research Skills Fellowship**

**2007 – 2010**

**National Research Service Award Minority Fellowship  
Initiative for Minority Student Development Fellowship**

**2001 – 2004  
1999 – 2001**

## **PUBLICATIONS**

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Andrew Uhlman, Kelly Folkers, Jared Liston, Harshida Pancholi, and Ayana Hinton “Effects of Vacuolar H<sup>+</sup>-ATPase Inhibition on Activation of Cathepsin B and Cathepsin L Secreted from MDA-MB231 Breast Cancer Cells.” **2017** *Cancer Microenvironment* 10(1); 49-56

Ayana Hinton, Souad R. Sennoune, Sarah Bond, Min Fang, Moshe Reuveni, G. Gary Sahagian, Daniel Jay, Raul Martinez-Zaguilan, and Michael Forgac “Function of a Subunit Isoforms of the V-ATPase in pH Homeostasis and Invasion of MDA-MB231 Breast Cancer Cells” **2009** *J. Biol. Chem.*, 284: 16400-16408

Ayana Hinton, Sarah Bond, and Michael Forgac “V-ATPase Function in Normal Disease Processes” **2009** *Pflugers Arch.* 457: 589-598

Takao Inoue, Yanru Wang, Kevin Jefferies, Jie Qi, Ayana Hinton, and Michael Forgac “Structure and Regulation of the V-ATPases” **2005** *J. Bioenerg. Biomembr.*, 37(6); 393-398

Ayana Hinton, Domenico L. Gatti, and Sharon H. Ackerman “The Molecular Chaperone, Atp12p, from *Homo sapiens*: *In vitro* Studies with Purified Wild Type and Mutant E240K Proteins” **2004** *J. Biol. Chem.*, 279: 9016 – 9022

Ayana Hinton, Erik R.P. Zuiderweg, and Sharon H. Ackerman “A Purified Subfragment of Yeast Atp11p Retains Full Molecular Chaperone Activity” **2003** *J. Biol. Chem.*, 278: 34110 - 34113

Undergraduate research students

## **INVITED SEMINARS**

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“Role of V-ATPases in Tumor Cell Invasiveness” Colgate University, Hamilton, NY      **March, 2009**

## **POSTERS PRESENTED AT CONFERENCES**

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### **2018 Experimental Biology Conference - ASBMB Meeting**

“V-ATPase-mediated Activation of Intracellular and Secreted Cathepsins: Exploring Their Role in Breast Cancer Metastasis”

### **2016 American Society of Cancer Biology Annual meeting**

“V-ATPase-mediated Activation of Cellular and Secreted Cathepsins: Exploring Their Role in Breast Cancer Metastasis”

### **2015 Experimental Biology Conference - ASBMB Meeting**

“V-ATPase-mediated Activation of Cellular and Secreted Cathepsins in Breast Cancer Cells: Exploring Their role in Breast Cancer Metastasis”

### **2014 Experimental Biology Conference - ASBMB Meeting**

“V-ATPase-mediated Secretion and Activation of Cathepsins in Breast Cancer Cells:  
Investigating the role of Vacuolar H<sup>+</sup>-ATPases Subunit a Isoforms in Breast Cancer Metastasis”

**2012 Experimental Biology Conference - ASBMB Meeting**

“The Role of the V-ATPase Subunit a Isoforms in Secretion and Activation of Cathepsin L in Human Breast Cancer Cells”

**2010 Experimental Biology Conference - ASBMB Meeting**

“Role of V-ATPase “a” Subunit Isoforms in Invasion of Breast Cancer Cells and Development of an Isoform-Specific Inhibitor Screen”

**2009 Gordon Research Conference**

“Role of V-ATPase a Subunit Isoforms in pH Homeostasis and *In Vitro* Invasion of Human Breast Cancer Cells” presented at the session on Molecular and Cellular Bioenergetics

**2008 IRACDA Conference**

“Role of V-ATPase a Subunit Isoforms in *In Vitro* Invasion of Human Breast Cancer Cells”

**2003 Gordon Research Conference**

“*In vitro* studies with the molecular chaperones, Atp11p and Atp12p” presented at the session on Molecular and Cellular Bioenergetics

**FUNDING**

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Denison University Research Fund (DURF)

2013 and 2015

**STUDENT MENTORED RESEARCH**

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**Spring 2011-Spring 2012** Kelly Folkers (class of 2012): directed study, summer research and senior research for recognition

**Summer 2011** – Kaitlyn Fiore (class of 2012): summer research

**Summer 2011-Spring 2012** – Hallie Singer (class of 2012): summer research and senior research

**Fall 2011-Spring 2012** – Stuart Landstreet (class of 2012): senior research

**Fall 2011-Spring 2012; Fall 2012-Spring 2013** –Jared Liston (class of 2013): directed study and senior research

**Fall 2012-Spring 2013** – Yajun Liu (class of 2013): senior research

**Spring 2013** – Dave Abbott (class of 2013): directed study

**Summer 2013, Summer 2014, Spring 2015** – Angie Trovato (class of 2015): summer research and senior research

**Summer 2013-Fall 2013** – Andrew Uhlman (class of 2014): summer research and senior research

**Fall 2013** – Harshida Pancholi (class of 2015): directed study

**Fall 2017-Spring 2018** – Ellari Hodges ('18): senior research

**Fall 2017-Spring 2018** – Peter Malicky ('18): senior research

**LEADERSHIP AND SERVICE FOR THE COLLEGE**

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Faculty of Color and International Faculty (FOCIF) group

2010-present

- Member of the leadership team 2011-2014

<b>Academic Events Committee</b>	<b>2012-2014</b>
<b>Honorary Degree Committee</b>	<b>2015-present</b>
<b>Working Group on Student Ratings Forms</b>	<b>2013</b>
<b>Campus Affairs Council</b>	<b>2016-present</b>

## **PROFESSIONAL SERVICE**

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<b>Reviewer</b> for Oncotarget journal	<b>January 2018</b>
<b>Reviewer</b> for Biology Open journal	<b>September 2017</b>
<b>Workshop member</b> “Realizing Potential: Developing Strategies to Enhance Intellectual Engagement for Underrepresented Minorities in Liberal Arts Colleges” – Vassar College <u>Alliance to Advance Liberal Arts Colleges</u>	<b>June 2017</b>
<b>Judge</b> for Minority Affairs Committee Poster Competition <u>American Society for Cell Biology</u>	<b>Fall 2016</b>
<b>Judge</b> for Poster Session <u>Building Diversity in Biomedical Sciences Program</u> Tufts University School of Medicine	<b>Summer 2008 &amp; 2009</b>
<b>Panel Member</b> for <u>Careers in Science Panel Discussion Series</u> Held at Bunker Hill Community College and University of Massachusetts - Boston	<b>Fall 2008</b>

## **PROFESSIONAL DEVELOPMENT**

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<b>Great Lakes College Association Leadership Institute</b> <ul style="list-style-type: none"><li>• Held in Ann Arbor, MI</li></ul>	<b>Fall 2013</b>
<b>Conference in Case Study Teaching in Science</b> <ul style="list-style-type: none"><li>• Held at the University of Buffalo</li></ul>	<b>Fall 2009</b>
<b>Grant Writing Workshop</b> Facilitated by Dr. Daniel G. Jay	<b>Spring 2009</b>
<b>Clicker Workshop</b> “Using Audience Response Systems in the Classroom” Facilitated by Hannah Reeves and David Grogan	<b>Fall 2008</b>
<b>Graduate Institute for Teaching (GIFT)</b> Sessions taught by Tufts University Faculty <ul style="list-style-type: none"><li>• Three-week intensive training on pedagogical techniques</li><li>• Topics covered included:<ul style="list-style-type: none"><li>○ Triggers and Hooks to Engage Students</li><li>○ Course Design and Planning</li><li>○ Teaching Research Based Learning</li></ul></li></ul>	<b>Summer 2008</b>

**IRACDA (Institutional Research and Career Development Award) Conference** **Summer 2008**

- Held at the University of North Carolina – Chapel Hill
- Sessions focused on teaching, research, and career development

**Mentoring Workshop** **Spring 2008**

“Mentoring and Being Mentored: A Workshop Series for Tufts Postdocs”  
Facilitated by TEACRS Fellows

- Co-lead the session “Mentoring at the Next Level”

**Lab Management Workshop** **Fall 2007**

“Lab Dynamics: Managing Difficult People and Difficult Situations”  
Facilitated by Dr. Carl M. Cohen

## **OTHER PROFESSIONAL EXPERIENCE**

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**ENGINEER - International Paper, Co.** **1996 – 1999**

- Process Engineer, Lancaster, OH - Responsible for ensuring product quality and production efficiency through management of a team of manufacturing associates
- Technical Representative, Menasha, WI - Responsible for managing technical aspects of customer accounts in the hygiene market; resolved product quality issues, developed new products

## **PROFESSIONAL AFFILIATIONS**

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**American Society for Biochemistry and Molecular Biology** **2009-present**  
**American Society for Cell Biology** **2013-present**

## **REFERENCES**

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**Dr. Christine Weingart** – Associate Professor  
Department of Biology - Chair  
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**Dr. Michael Forgac** – Professor  
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**Dr. Sharon Ackerman** – Associate Professor  
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**Mr. Robert Steeper** – Professor, Chairperson  
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