

## DINARI A. HARRIS

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### EDUCATION

**University of Michigan** August, 2004  
Ann Arbor, Michigan  
Doctor of Philosophy, Chemistry

**University of Maryland Baltimore County** August, 1999  
Catonsville, Maryland  
Bachelor of Science, Biochemistry  
*Cum Laude*

### ACADEMIC EXPERIENCE

Research Assistant Professor of Chemistry August 2014-present  
Howard University, Washington DC

### PROFESSIONAL EXPERIENCE

Fellows Rotation in Extramural Research 2013-2014  
Center for Translation Research and Implementation Science, National Heart, Lung and Blood Institute (NHLBI), National Institutes of Health (NIH), Bethesda, MD  
Advisor: Dr. George Mensah

*Project: Conceptual framework for health inequities research in heart, lung, and blood diseases*

- Focus on the application of implementation and systems science approaches to address research translation gaps in order to maximize health impact in the prevention and treatment of heart, lung, and blood diseases and the elimination of health inequities.
- Learn about and contribute to the strategies and planning to address health disparities within NHLBI
- Participate in NHLBI steering committees and perform portfolio review of health disparities research being conducted throughout the institute.
- Participated in planning and organization of 7<sup>th</sup> Annual Dissemination and Implementation (D&I) Conference
- Organized Health Inequities think tank forum
- Wrote and developed Director's blog within CTRIS

### TEACHING EXPERIENCE

- Adjunct Lecturer, courses: (1) General Biology, BIOL 103 & BIOL104; (2) Gene Organization and Expression, BIOL 567; (3) Molecular Genetics and Recombinant DNA Methodology, BIOL 568 (Department of Biology, Catholic University of America, Washington DC, 2014-2015)
- Teacher, Foundation for Advanced Education in the Science (FAES), courses: (1) MCAT review course: areas include chemistry, organic chemistry, and biology; (2) Forensic Science: Incriminating DNA; (3) Personalized Medicine: Genome and You (NIH, Bethesda, 2014)
- Teaching Assistant, Introductory Chemistry Lab I & II (Department of Chemistry, University of Michigan, Ann Arbor, MI, 1999-2001)

- Teaching Assistant, Biochemistry Lab (Department of Chemistry, University of Maryland Baltimore County, 1999)

**MENTORING**

- Supervised summer undergraduate interns conducting research (NHLBI, NIH, 2012, 2013)
- Conducted hands-on Biology and Chemistry experiments in an elementary school classroom as a ReSET volunteer scientist (2012)
- Provided assistance with homework to children K-12 (Stepping Stones Homeless Shelter, Silver Spring, MD, 2011-2012)
- Private Chemistry tutor for high school students (Silver Spring, MD, 2011-2012)
- Provided patients with homework assistance and/or conducted age-appropriate educational activities (Children’s Memorial Hospital, Chicago, IL, 2009)
- Participated in summer research experience for undergraduates (REU) (Northwestern University, Evanston, IL, 2008-2010)
- Developed science fair projects for elementary school students (Northwestern University, Evanston, IL 2008-2009)
- Tutored undergraduates in Biochemistry, Cell Biology, and Molecular Biology (University of Michigan, Ann Arbor, MI, 2002-2003)

**LEADERSHIP**

Science writer, monthly review article contributor to “Science Beat”; a scientific newsletter published by  
 NHLBI, Division of Intramural Research (NIH, 2012-2013)  
 Health Disparities Research Interest Group, Member (NIH, 2013)  
 Science Policy Discussion Group, Member (NIH, 2012-2013)  
 NIH RNA Club, Member (NIH, 2011-2012)  
 Peer Advisor for first-year graduate students (University of Michigan, Ann Arbor, 2001-2004)

**FELLOWSHIPS AND AWARDS**

Visual Sciences Training Grant	2009-2010
Oncogenesis and Developmental Biology Training Grant	2008-2009
Damon Runyon Postdoctoral Research Fellowship	2005-2008
Wirt & Mary Cornwell Outstanding Graduate Student Research Award	2004
UNCF/Merck Science Initiative Fellowship	2003-2004
Rackham Merit Fellowship	2000-2004
Biophysics Training Grant	2002-2003
Dharmacon Research Presentation Award	2000
National Consortium in Engineering and Science for Graduate Degrees for Minorities (GEM) Fellowship	1999-2000
National Collegiate Minority Leadership Award	1999-2000
Robert and Jane Meyerhoff Scholarship	1995-1999
Minority Access to Research Careers (MARC U*) Scholarship	1997-1999

**RESEARCH EXPERIENCE**

**Research Fellow** 2011-2014  
 National Heart, Lung and Blood Institute (NHLBI), National Institutes of Health (NIH), Bethesda, MD  
 Advisor: Dr. Justin Taraska  
*Project #1: Visualizing exosomes: An extracellular organelle important in stimulating cancer cell migration*

*Project #2: Cellular trafficking and exocytosis of matrix-metalloproteinase 9 (MMP-9) in cancer progression and metastasis*

- Perform and develop several fluorescence biophysical experiments including steady-state fluorescent techniques, fluorescence resonance energy transfer (FRET), and total internal reflection microscopy (TIRF) to visualize exosome trafficking in metastatic breast cancer cells.
- Utilize cell culture techniques to express fluorescently tagged protein.
- Image vesicles fusion and recapture events from the cell surface in excitable cells.
- *In vitro* detection and quantification of exosomes using ELISA and western blot detection using exosome antibodies.
- Perform purification of recombinant proteins using FPLC (*eg*: Histidine-tag; GST-tag; monoclonal antibody; and cation exchange); DNA/RNA purification and isolation.
- Conduct siRNA-mediated gene knockdown experiments.

**Postdoctoral Research Associate**

2004-2011

Department of Biochemistry, Molecular Biology & Cell Biology, Northwestern University, Evanston, IL

Advisor: Dr. Richard Carthew

*Project: Identification and characterization of genes involved in RNA silencing (siRNA, miRNA, endo-siRNA, and piRNA) in Drosophila melanogaster*

- Performed standard molecular biology and genetics techniques, including immunoprecipitation; Western blots; UV crosslinking; confocal microscopy; gel filtration chromatography, single-nucleotide polymorphism (SNP) mapping, real-time PCR assays; RT-PCR (real-time and agarose).
- Performed purification of recombinant proteins; DNA/RNA purification and isolation.
- Performed DNA sequence analysis; site-directed mutagenesis; gene cloning; subcloning and expression.
- Conducted specialized biochemical and genetic assays, involving RNA interference (RNAi), including siRNA transfections; siRNA induced target mRNA cleavage assays; native protein gel electrophoresis; small RNA Northern blots; validation and characterization of synthetic siRNA's and small hairpin RNAs for *in vitro* cell-based assays.
- Expressed and purified recombinant proteins in mammalian, baculovirus, *E. coli*, and *Drosophila* S2 cells.

**Graduate Research Assistant**

2000-2004

Department of Chemistry, University of Michigan, Ann Arbor, MI

Advisor: Dr. Nils G. Walter

*Project: Folding kinetics, conformational changes, and metal binding properties in the hepatitis delta virus ribozyme*

- Conducted enzyme kinetics and thermodynamic assays, including steady-state and rapid quench-flow experiments, UV melting curves analysis, circular dichroism, hydroxyl radical and lanthanide metal mediated footprinting.
- Performed and developed several fluorescence biophysical experiments including steady-state, time-resolved, and single molecule fluorescence resonance energy transfer (FRET), 2-aminopurine dequenching, and sensitized-luminescence assays.

**Undergraduate Research Assistant**

1997-1999

Department of Chemistry & Biochemistry, University of Maryland, Catonsville, MD

Advisor: Dr. Michael F. Summers

*Project: NMR structure of the HIV-1 nucleocapsid protein bound to stem-loop of the  $\psi$ -RNA packaging signal*

- Performed standard molecular biology techniques, such as restriction digestion, ligations, subcloning and protein expression in bacteria.
- Conducted RNA synthesis, HPLC purification and gel electrophoresis purification.
- Conducted nuclear magnetic resonance (NMR) spectroscopy and subsequent data structural analysis.

#### **TRAINING/PROFESSIONAL ASSOCIATIONS**

- Completed “NIMHD Translational Health Disparities Course: Integrating Principles of Science, Practice and Policy in Health Disparities Research” course at NIH (2014)
- Completed/Certified in “Scientist Teaching Science” course at NIH (2012)
- Completed/Certified in “Summer Mentor Training” course at NIH (2012)
- Biophysical Society (since 2011)
- Society for Biochemistry and Molecular Biology, (2011)
- American Cancer Society Cancer Action Network (ACSCAN) (since 2006)
- American Chemical Society (since 2000)

#### **GRANTS/FUNDING**

- 2/1/2017: Startup funds from Howard University: \$210,000
- 5/25/2016-6/30/2016: Howard University Summer Faculty Research Fellowship Program (PI: Harris) \$10,000; *Systematic spatial mapping of proteins involved in metastasis by using high resolution imaging of cancer cells.*
- 5/25/2017-6/30/2017: Howard University Summer Faculty Research Fellowship Program (PI: Harris) \$10,000; *Imaging of the recruitment and loss of proteins and lipids at the single site of exocytosis in breast cancer cells*

#### **SERVICE**

##### *Departmental Committees*

Strategic Planning Committee	2017
Chemistry Seminar Coordinator	2017
Organic Chemistry Committee	2015 - 2017
Departmental Undergraduate Education Committee	2016 - 2017
Chemistry Search Committee	2017

##### *External Service*

Guest lecturer/faculty advisor for Bison STEM Scholar Program	2017
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#### **CONFERENCES/POSTERS/PRESENTATIONS/SEMINARS**

- NIH Research Festival; September 14-16, 2106, Bethesda, Maryland; Title: Imaging the recruitment and loss of proteins and lipids at single sites of PMA-triggered exocytosis ; presenter: Dr. Dinari Harris (Poster)
- Biophysical Society meeting – 61<sup>st</sup> Annual Meeting of the Biophysical Society. February 11-15, 2017, New Orleans, Louisiana; Title: Investigating protein dynamics at sites of exocytosis in live cells; presenter: Dr. Dinari Harris (Poster)
- Research Week 2017; Howard University, April 10-12, Washington DC; Title: Imaging the recruitment and loss of proteins and lipids at single sites of PMA-triggered exocytosis; presenter: Dr. Dinari Harris (Poster)

## RESEARCH GROUP

### *Current Graduate Students*

Dominique Stephens

from 9/1/2016 (Chemistry student)

### *Former Undergraduate Students*

Anaya Russell

9/3/2016 – 12/31/2016 (Biology student)

Nicole Osunsami

1/9/2016 - 12/31/2016 (Biology student)

Noah Nelson

9/3/2015 - 12/31/2015 (Biology student)

## TEACHING

CHEM151: Biochemistry I (for undergraduate students)

CHEM251: Biochemistry I (for graduate students)

CHEM151: Organic Chemistry Lab (for undergraduate students)

## PATENTS

U.S. patent application publication number (US2007/0249009 A1), Composition and methods for altering RNAi; filed December 2006.

## PUBLICATIONS

**Harris, D.A.**, Patel, S.H., Gucek, M., Hendrix, A, Westbroek, W. and Taraska, J.W. (2015) Exosomes released from breast cancer carcinomas stimulate cell movement. *PlosOne*, 10(3):e0117495.

**Harris, D.A.**, Kim, K., Nakahara, K., Vasquez-Doorman, C. and Carthew, R.W. (2011) Cargo sorting to lysosome-related organelles regulates siRNA-mediated gene silencing. *J. Cell Biol.* 194, 77-87.

Kim, K, Lee, Y.S., **Harris, D**, Nakahara, K, Carthew, R.W. (2006) The RNAi pathway initiated by Dicer-2 in Drosophila. *Cold Spring Harb Symp Quant Biol.* 71, 39-44.

**Harris, D.A.**, Tinsley, R.T. and Walter, N.G. (2004) Terbium-mediated footprinting probes a catalytic conformational switch in the antigenomic hepatitis delta virus ribozyme. *J. Mol Biol* 341, 389-403.

Tinsley, R.T., **Harris, D.A.**, and Walter, N.G. (2004) Magnesium dependence of the amplified conformational switch in the trans-acting hepatitis delta virus ribozyme. *Biochemistry* 43, 8935-8945.

**Harris, D.A.** and Walter, N.G. (2004) Terbium(III) footprinting as a probe of RNA structure and metal binding sites. In *Handbook of RNA Biochemistry*, (A. Bindereif, R. Hartmann, A. Schön, and E. Westhof, eds.), Wiley-VCH Verlag, Weinheim.

Tinsley, R.T., **Harris, D.A.**, and Walter, N.G. (2003) Significant kinetic solvent isotope effects in folding of the catalytic RNA from the hepatitis delta virus. *J. Am. Chem. Soc. USA* 125, 13972-13973.

**Harris, D.A.**, and Walter, N.G. (2003) Probing RNA structure and metal-binding sites using terbium(III) footprinting. *Curr. Protocols in Nucleic Acid Chem.* Chapter 6.8 6.8.1-6.8.8.

Walter, N.G., **Harris, D.A.**, Pereira, M.J.B., and Rueda, D. (2002) In the fluorescent spotlight: global and local conformational changes of small catalytic RNAs. *Biopolymers* 61, 224-241.

**Harris, D.A.**, Rueda, D., and Walter, N.G. (2002) Local conformational changes in the catalytic core of the trans-acting hepatitis delta virus ribozyme accompany catalysis. *Biochemistry* 41, 12051-12061.

Pereira, M.J.B., **Harris, D.A.**, Rueda, D. and Walter, N.G. (2002) The reaction pathway of the trans-acting hepatitis delta virus ribozyme: A conformational change accompanies catalysis. *Biochemistry* 41, 730-740.