

CURRICULUM VITAE
Aaron Star Schwartz-Duval, Ph.D.

PRESENT TITLE AND AFFILIATION

Primary Appointment

Postdoctoral Fellow, Department of Imaging Physics, Division of Diagnostic Imaging, The University of Texas MD Anderson Cancer Center, Houston, TX

CITIZENSHIP

United States

OFFICE LOCATION

The University of Texas MD Anderson Cancer Center
Houston, TX 77054
Email: Aaron.SchwartzDuval@MDAnderson.org

EDUCATION

Degree-Granting Education

Michigan State University, East Lansing, Michigan, United States, BS, 2012, Biochemistry & Molecular Biology
University of Illinois, Urbana-Champaign, Illinois, United States, MS, 2017, Bioengineering
University of Illinois, Urbana-Champaign, Illinois, United States, PhD, 2019, Bioengineering

Postgraduate Training

Postgraduate Training, Biomedical Optics & NanoDiagnostics Laboratory, University of Texas MD Anderson Cancer Center, Houston, Texas, 2019-Present

EXPERIENCE/SERVICE

Academic Appointments

1. Laboratory Technologist, Cellular and Molecular Imaging Laboratory, Michigan State University, East Lansing, Michigan, United States, 2012-2014.
2. Teaching Assistant, Bioengineering Department, University of Illinois, Urbana-Champaign, 2014-2015
3. Graduate Researcher, Bioengineering Department, University of Illinois, Urbana-Champaign, 2014-2019
4. Research Team Leader, Summer Research Opportunities Program, Emergent Behavior of Cellular Systems, University of Illinois, Urbana-Champaign, Summer 2016
5. Postdoctoral Fellow, Imaging Physics Department, University of Texas at MD Anderson Cancer Center, Houston, 2019-Present

Consultantships

1. Materials Analysis Expert, Timely and Trustworthy Curating and Coordinating Data Building Blocks, Urbana-Champaign, Illinois, United States, 2016-2018, NSF-ACI1443013 (<https://t2c2.csl.illinois.edu/>)

HONORS AND AWARDS

1. Kalamazoo Promise Scholarship, Kalamazoo Promise, Kalamazoo, Michigan, United States, 2008-2012, \$80,000
2. French American Doctoral Exchange: Nanoparticles for Medicine Grant Awardee, Reims, France 2016, ~\$2,000
3. 2nd place graduate speaker competition Materials Research Lab Bioconference, University of Illinois, Urbana-Champaign, United States, 2016, \$250
4. Avery Brundage Scholarship, University of Illinois, Urbana-Champaign, United States, 2016-2017, \$2,500
5. American Heart Association Predoctoral Research Fellowship, Hyperbranched gold nano-polyvilli for early detection and post-op analysis of atherosclerotic plaques, 16PRE30150004, 7/1/2016-6/30/2018, \$52,000
6. Student Travel Award Stipend, World Molecular Imaging Congress, Philadelphia, Pennsylvania, USA, \$650
7. NIH/NCI Cancer Nanotechnology Postdoctoral Training Fellowship, T32CA196561, 3/1/2019-2/28/2021, \$112,000
8. Anne Eastland Spears Fellowship in Pancreatic Cancer Research, 5/21/2021, \$2,000
9. Ben Love Fellowship in Innovative Cancer Therapy Pilot Grant, 4/21/2022, \$10,000

RESEARCH

Grants and Contracts

Funded

1. Key Contributor, In situ cancer cell specific synthesis of gold nanoclusters for radiosensitization of pancreatic cancer, 1R21CA252156-01, NIH/NCI, 7/1/2020-6/30/2022, \$275,000 (\$150,000/year)
2. Key Contributor, In situ cancer cell specific synthesis of gold nanoclusters for enhanced radiotherapy of head and neck cancer, IRG, MDACC, 9/1/2020-8/31/2022, \$75,000

3. Key Contributor, Radiosensitization of thyroid cancer by cancer cell specific reduction of gold ions, 1R21CA259839-01A1, NIH/NCI, 4/1/2021-3/31/2023, \$275,000 (\$150,000/year)

Pending

1. Key Contributor, In situ cancer cell specific biomineralization to overcome nanoparticle delivery barriers and sensitize pancreatic cancer to radiotherapy, 1R01CA274415-01, NIH/NCI

Patents and Technology Licenses

Patents

1. Cancer radiosensitization by in situ formation of gold nanoparticles and/or gold nanoclusters, International Publication Number WO 2022/072095 A2, 4/7/2022

PUBLICATIONS

Peer-Reviewed Original Research Articles (7 first author or co-first author)

1. ER Swy⁺, **AS Schwartz-Duval**⁺, DD Shuboni, MT Latourette, CL Mallet, M Parys, DP Cormode, and EM Shapiro. Dual-modality, fluorescent, PLGA encapsulated bismuth nanoparticles for molecular and cellular fluorescence imaging and computed tomography. *Nanoscale*. 6:13104–13112, 2014. (***equal authorship**).
2. **AS Schwartz-Duval** and EM Shapiro, Physico-Chemical and Financial Comparisons of One-Step Iron Oxide Nanocrystal Syntheses for Nanoparticle Fabrication. *Nanoscience and Nanotechnology Letters*. 6:618–623. 2014.
3. SK Misra, P Mukherjee, A Ohoka, **AS Schwartz-Duval**, S Tiwari, R Bhargava, and D Pan. Vibrational spectroscopy and imaging for concurrent cellular trafficking of co-localized doxorubicin and deuterated phospholipid vesicles. *Nanoscale*. 8:2826–2831. 2016.
4. MR Gartia, SK Misra, M Ye, **A Schwartz-Duval**, L Plucinski, X Zhou, D Kellner, LT Labriola, and D Pan. Point-of-service, Quantitative Analysis of Ascorbic Acid in Aqueous Humor for Evaluating Anterior Globe Integrity. *Scientific Reports*. 6:160101. 2016.
5. G Vulugundam, SK Misra, F Ostadhossein, **AS Schwartz-Duval**, EA Daza, and D Pan. (-)/(+)-Sparteine induced chirally-active carbon nanoparticles for enantioselective separation of racemic mixtures. *Chemical Communications*. 52:7513–7516. 2016.
6. **AS Schwartz-Duval**, SK Misra, P Mukherjee, E Johnson, AS Acerbo, and D Pan. An Anisotropic Propagation Technique for Synthesizing Hyperbranched Polyvillic Gold Nanoparticles. *Nano Research*. 9:2889–2903. 2016. (**journal cover**).
7. EA Daza, SK Misra, **AS Schwartz-Duval**, A Ohoka, C Miller, and D Pan. Nano-Cesium for Anti-Cancer Properties: An Investigation into Cesium Induced Metabolic Interference. *ACS Applied Materials and Interfaces*, vol. 8, no. 40, pp. 26600–26612, Oct. 2016.
8. MS Khan, SK Misra, Z Wang, E Daza, **AS Schwartz-Duval**, JM Kus, and D Pan. Paper-Based Analytical Biosensor Chip Designed from Graphene-Nanoplatelet-Amphiphilic-di-block-co-Polymer Composite for Cortisol Detection in Human Saliva. *Analytical Chemistry*. 89:2107-2115. 2017.
9. MS Khan, SK Misra, **AS Schwartz-Duval**, EA Daza, F Ostadhossein, M Bowman, A Jain, G Taylor, D McDonagh, LT Labriola, and D Pan. Real-Time Monitoring of Post-Surgical and Post-Traumatic Eye Injuries using Multi-Layered Electrical Biosensor Chip. *ACS Applied Materials and Interfaces*. 9:8609-8622. 2017.
10. F Ostadhossein, SK Misra, **A Schwartz-Duval**, BK Sharma, D Pan. Nanosalina: A tale of Saline-loving Algae from the Lake's Agony to Cancer Therapy. *ACS Applied Materials and Interfaces*. 9:11528-11536. 2017.
11. SK Misra, **AS Schwartz-Duval**, D Pan. Genomic DNA Interactions Mechanize Peptidotoxin-mediated Anticancer Nanotherapy. *Molecular Pharmaceutics*, 14:2254-2261. 2017.
12. SK Misra, **AS Schwartz-Duval**, F Ostadhossein, EA Daza, ZM Saldivar, BK Sharma, D Pan. α -Amino Acid Rich Photophytanic Nanoparticles of Algal Origin Serendipitously Reveal Antimigratory Property against Cancer. *ACS Applied Materials and Interfaces*. 9:21147-21154. 2017.
13. MS Khan, K Dighe, Z Wang, I Srivastava E Daza, **AS Schwartz-Duval**, J Ghannam, SK Misra, D Pan. Detection of Prostate Specific Antigen (PSA) in Human Saliva Using an Ultra-Sensitive Nanocomposite of Graphene Nanoplatelet with Diblock-co-Polymer and Au Electrodes. *Analyst*, 144:1448-1457. 2018.
14. I Srivastava, SK Misra, I Tripathi, **A Schwartz-Duval**, D Pan. In Situ Time-Dependent and Progressive Oxidation of Reduced State Functionalities at the Nanoscale of Carbon Nanoparticles for Polarity-Driven Multiscale Near-Infrared Imaging. *Advanced Biosystems*. 2:1800009. 2018.
15. EA Daza, **AS Schwartz-Duval**, K Volkman, D Pan. Facile Chemical Strategy to Hydrophobically Modify Solid Nanoparticles Using Inverted Micelle-Based Multicapsule for Efficient Intracellular Delivery. *ACS Biomaterials Science & Engineering*, 4:1357-1367. 2018.
16. M Khan, SK Misra, K Dighe, Z Wang, **A Schwartz-Duval**, D Pan. Electrically-receptive and thermally-responsive paper-based sensor chip for rapid detection of bacterial cells. *Biosensors and Bioelectronics*, 110:132-140. 2018.

17. CJ Konopka, A Ploska, J Hedhli, M Wozniak, **AS Schwartz-Duval**, A Siekierzycka, D Pan, IT Dobrucki, L Kalinowski, LW Dobrucki. Multimodal Imaging of the Receptor for Advanced Glycation End-products with Molecularly Targeted Nanoparticles. *Theranostics*, 8:5012-5024. 2018. (journal cover).
18. SK Misra, I Srivastava, JS Khamo, VV Krishnamurthy, D Sar, **AS Schwartz-Duval**, JANT Soares, K Zhang, D Pan. Carbon Dots with Induced Surface Oxidation Permits Imaging at Single-Particle Level for Intracellular Studies. *Nanoscale*, 10:18510-18519. 2018.
19. S Misra⁺, K Dighe⁺, **AS Schwartz-Duval**⁺, Z Shang, L Labriola, D Pan. In situ plasmonic generation in functional ionic-gold-nanogel scaffold for rapid quantitative bio-sensing. *Biosensors and Bioelectronics*. 120:77-84. 2018. (*equal authorship).
20. MS Khan, K Dighe, Z Wang, I Srivastava, E Daza, **AS Schwartz-Duval**, J Ghannam, SK Misra, D Pan. Detection of Prostate Specific Antigen (PSA) in Human Saliva Using an Ultra-sensitive Nanocomposite of Graphene Nanoplatelets with Diblock-co-polymers and Au Electrodes. *Analyst*. 143:1094-1103. 2018
21. MS Khan, K Dighe, Z Wang, I Srivastava, **AS Schwartz-Duval**, SK Misra, D Pan. Electrochemical-digital immunosensor with enhanced sensitivity for detecting human salivary glucocorticoid hormone. *Analyst*. 144:1448-1457. 2019.
22. I Srivastava, D Sar, P Mukherjee, **AS Schwartz-Duval**, Z Huang, C Jaramillo, A Civantos, I Tripathi, JP Allain, R Bhargava, D Pan. Enzyme-Catalysed Biodegradation of Carbon Dots follow Sequential Oxidation in a Time Dependent Manner. *Nanoscale*. 11:8226-8236. 2019.
23. I Srivastava, S Misra, S Bangru, K Boateng, J Soares, **A Schwartz-Duval**, A Kalsotra, D Pan. Complementary Oligonucleotide Conjugated Multi-Color Carbon Dots for Complementary Oligonucleotide Conjugated Multi-Color Carbon Dots for Intracellular Recognition of Biological Events. *ACS Applied Materials and Interfaces*. 12:16137-16149. 2020.
24. **AS Schwartz-Duval**, CJ Konopka, P Moitra, EA Daza, I Srivastava, EV Johnson, TL Kampert, S Fayn, A Haran, LW Dobrucki, D Pan. Intratumoral Generation of Photothermal Gold Nanoparticles through a Vectorized Biomineralization of Ionic Gold. *Nature Communications*. 11:1-18. 2020.
25. **AS Schwartz-Duval**, R Wen, I Srivastava, P Moitra, and D Pan. A Simplistic Single-Step Method for Preparing Biomimetic Nanoparticles from Endogenous Biomaterials. *ACS Applied Materials and Interfaces*. 13(39):46464-77. 2021.
26. **Aaron S. Schwartz-Duval**, Konstantin Sokolov. Prospecting cellular gold nanoparticle biomineralization as a viable alternative to prefabricated gold nanoparticles. *Advanced Science*. 2105957. 2022

Published Abstracts & Technical Reports

1. P Nguyen, S Konstsantny, T Nicholson, T O'Brien, **A Schwartz-Duval**, T Spila, RH Campbell, I Gupta, M Chan, K McHenry, Paquin, K Nahrstedt. 4Ceed: Real-Time Data Acquisition and Analysis Framework for Material-Related Cyber-Physical Environments. Cluster Computing and the Grid (CCGRID), *IEEE/ACM International Symposium*. 11-20. 2017.
2. MS Khan, K Dighe, Z Wang, E Daza, **AS Schwartz-Duval**, CP Rowley, IA Calvillo, SK Misra, LT Labriola, D Pan. Label-free detection of lactoferrin and beta-2-microglobulin in contrived tear film using a low-cost electrical biosensor chip. *IEEE Healthcare Innovations and Point of Care Technologies (HI-POCT)*. 72-75. 2017.
3. Muhammad S Khan, Ketan Dighe, Zhen Wang, **Aaron S Schwartz-Duval**, Santosh K Misra, Dipanjan Pan. Ultra-sensitive paper-based biosensor for cortisol sensing in human saliva with electrical impedance analyzer. *IEEE Healthcare Innovations and Point of Care Technologies (HI-POCT)*. 184-187. 2017.
4. **AS Schwartz-Duval**, N Mistry, I Srivastava, J Singh, K Golk, D Pan. Facile Size-Controlled Synthesis of Fluorescent Carbon Nanoparticles with Size-Independent Optical Properties. <http://hdl.handle.net/2142/100875>. 2018.
5. I Srivastava, S Misra, J Khamo, V Krishnamurthy, D Sar, **A Schwartz-Duval**, K Zhang, D Pan. N-methylmorpholine-N-oxide acts as a 'sacrificial catalyst' to permit imaging of carbon nanodots at the single-particle level. *The American Chemical Society*. 255. 2018.
6. S Misra, M Khan, Z Wang, K Dighe, **A Schwartz-Duval**, D Pan. Highly Sensitive electrically-receptive thermally-responsive analytical biosensor chip for rapid detection of Bacterial cells. *The American Chemical Society*. 255. 2018.
7. I Srivastava, S Misra, K Boateng, J Soares, **A Schwartz-Duval**, D Pan. Intracellular cytotoxic peptide release triggered by in situ hybridization of complementary, DNA-conjugated, multicolor carbon dots. *The American Chemical Society*. 257. 2019.
8. I Srivastava, D Sar, P Mukherjee, **A Schwartz-Duval**, Z Huang, R Bhargava, D Pan. Lipase-catalyzed enzymatic biodegradation of carbon dots follow sequential oxidation pathway. *American Chemical Society*. 257. 2019.
9. T Mitcham, D Nevozhay, **A Schwartz-Duval**, S Lai, K Sokolov, R Bouchard. High-frequency ultrasound imaging of targeted, acoustically activated high-contrast Perfluorocarbon Nanodroplets. *Medical Imaging: Ultrasonic Imaging and Tomography*. 11319:0Q. 2020.

Book Chapters

1. Fatemeh D. Ostadhossein, Enrique Daza, Daniel Frankowski,; Drew Goatz, Molly Imgruet, Joseph Kus, Ryan Lake, Mallika Modak, Nick Olsen, **Aaron Schwartz-Duval**, Alyssa Zimmer, Nicholas Kolmodin, and Dipanjan Pan, "Nano-Enabled Delivery of Intracellular Therapeutics," *Top. Med. Chem.*, pp. 1–15, 2015.

EDITORIAL AND REVIEW ACTIVITIES

Journal Reviewer

1. ACS Applied Materials and Interfaces, 2019-present
2. ACS Sensors, 2020-present
3. Advanced Science, 2020-present
4. Journal of Composites Science, 2021-present
5. WIREs: Nanomedicine and Nanobiotechnology, 2021-present
6. Polymers, 2021-present
7. Materials, 2022-present

TEACHING

Teaching Within Current Institution – MD Anderson Cancer Center

Formal Teaching

Training Programs

1. Mentor, MD Anderson Summer Research Experience, 2019

Direct Supervision

Undergraduate and Allied Health Students

1. Research Mentor, Rice University, Rian Philip, 8/2021- 12/2021
2. Research Mentor, Rice University, Brian Lee, 8/2021- Present

Other Supervisory Teaching

1. Research Mentor, High School Student, Luis Amaro, Summer 2019

Teaching Outside Current Institution

Formal Teaching

Courses Taught

1. Teaching Assistant, Cell and Tissue Engineering Lab, University of Illinois, Urbana-Champaign, Course Number: BIOE 202, Credit Hours: 2, Sections taught: 2 Fall, 2014
2. Teaching Assistant, Cell and Tissue Engineering Lab, University of Illinois, Urbana-Champaign, Course Number: BIOE 202, Credit Hours: 2, Sections taught: 2 Spring, 2015

Training Programs

1. Research Team Leader, Summer Research Opportunities Program, Emergent Behavior of Cellular Systems, University of Illinois, Urbana-Champaign, Summer 2016
2. Mentor, IPromise, University of Illinois, Urbana-Champaign, 2016-2018
3. Mentor, Mentoring Undergraduates in Science & Engineering, University of Illinois, Urbana-Champaign, 2016-2019
4. Mentor, Summer Undergraduate Research Fellowship, University of Illinois, Urbana-Champaign, 2016-2018

Direct Supervision

Undergraduate and Allied Health Students

1. Research Mentor, Michigan State University, Jason Unold, 5/2014-9/2014
2. Research Team Leader, University of Illinois, Urbana-Champaign, Roy AJ Brooks Rivera, 5/2016-8/2016
3. Research Team Leader, University of Illinois, Urbana-Champaign, Tremaan Robbins, 5/2016-8/2016
4. Research Team Leader, University of Illinois, Urbana-Champaign, Olaoluwa Akinsola, 5/2016-8/2016
5. Research Team Leader, University of Illinois, Urbana-Champaign, Christopher Brenden, 5/2016-8/2016
6. Research Team Leader, University of Illinois, Urbana-Champaign, Sekinat Mumuney, 5/2016-8/2016
7. Research Mentor, University of Illinois, Urbana-Champaign, Jasleena Singh, 8/2015-5/2017
8. Research Mentor, University of Illinois, Urbana-Champaign, Kelsey Golk, 8/2016-6/2017
9. Research Mentor, University of Illinois, Urbana-Champaign, Neal Mistry, 10/2015-5/2018
10. Research Mentor, University of Illinois, Urbana-Champaign, Rachele Wen, 2/2016-1/2019

Medical Students

1. Research Rotation Mentor, University of Illinois, Urbana-Champaign, Emily Kerby, 5/2017-8/2017
- Graduate Students**
2. Research Mentor, University of Illinois, Urbana-Champaign, Indrajit Srivastava, 7/2015-1/2019
 3. Research Mentor, University of Illinois, Urbana-Champaign, Parinaz Fathi, 7/2016-1/2019
 4. Research Mentor, University of Illinois, Urbana-Champaign, Maha Alafeef, 5/2018-1/2019

CONFERENCES AND SYMPOSIA

Presentations at National or International Conferences

Invited

1. French American Doctoral Exchange Program: Nanoparticles in Medicine, Oral, Grenoble, France, 2016

Other, Including Scientific Exhibitions

2. World Molecular Imaging Congress, Poster, Savannah, GA, 2013
3. 1st Annual Cell Tracking Symposium, Poster, London, ON, Canada, 2013
4. Nanoengineering for Medicine and Biology Conference, Poster, Houston, TX, United States, 2016
5. BioMedical Engineering Society Meeting, Poster, Minneapolis, MN, United States, 2016
6. International Nanomedicine & Drug Delivery Symposium, Poster, Ann Arbor, MI, United States, 2019
7. World Molecular Imaging Congress, Oral, Philadelphia, PA, United States, 2017
8. NCI Alliance for Nanotechnology in Cancer, Poster, Bethesda, MD, United States, 2019

Other Presentations at State and Local Conferences

9. 5th Annual Postdoctoral Research Symposium, Poster, University of Illinois, Urbana-Champaign, 2015
10. 13th Center for Nanoscale Science and Technology Workshop, Poster, University of Illinois, Urbana-Champaign, 2015
11. UIC Cancer Research Forum, Poster, Chicago, IL, 2015
12. UIUC Graduate Student Seminar, Oral, University of Illinois, Urbana-Champaign, 2015
13. 6th Annual Postdoctoral Research Symposium, Poster, University of Illinois, Urbana-Champaign, 2016
14. 14th Center for Nanoscale Science and Technology Workshop, Poster, University of Illinois, Urbana-Champaign, 2016
15. Materials Research Lab BioConference, Oral, University of Illinois, Urbana-Champaign, 2016
16. AVS Prairie Symposium, Oral, Chicago, IL, United States, 2016
17. Omics Nanotechnology for Cancer Precision Medicine, Oral, University of Illinois, Urbana-Champaign, 2016

PROFESSIONAL MEMBERSHIPS/ACTIVITIES

Professional Society Activities, with Offices Held

National and International

- World Molecular Imaging Society
Member, 2013-Present
- Biomedical Engineering Society
Social Chair, UIUC chapter, 2014-2015
Member, 2014-2019
- American Society of Mechanical Engineers
Member, 2015-2017
- American Heart Association
Member, 2015-2018
- National Postdoctoral Association
Member, 2019-Present

Local/State

- Science Theatre, Michigan State University
Assistant Head Director, 2010-2011
Chemistry Director, 2011-2012
Member, 2009-2012
- Bioengineering Advisory Council, University of Illinois, Urbana-Champaign
Vice President, 2015-2017
- UIUC Engineering Graduate Student Advisory Committee, University of Illinois, Urbana-Champaign
Bioengineering Diversity Advocate, 2016-2017

UNIQUE ACTIVITIES

Musical Performance

Bass - Upright, 1999-Present

- >20 formal orchestra and ensemble performances with 6 competitions

Participant, International Society of Bassists Convention, 50 bass orchestra and all bass quartet,
Kalamazoo, MI, 2005

Music lessons received from notable bassists: Rufus Reid and Thomas Knific

Bass - Electric, 2002-Present

>60 formal jazz, ensemble, or other performances with ~ 10 paid shows

Rock Climbing, 2002 - Present

4 tournaments attended; 1 tournament organized; >50 outdoor excursions

Climbing Instructor and Route Setter, Climb Kalamazoo, 2006-2008

Member, Silver St. Member, University of Illinois Climbing Club, 2014-2018

Member, Urbana Boulders, 2016-2018

Member, Momentum Climbing Gym, 2019-Present

Underwater Hockey, 2008-Present

>70 tournaments attended; 8 tournaments organized

Member, Underwater Society of America, 2008-Present

Member, Michigan State University Underwater Hockey Club, 2008-2014

SCUBA Certification, 2010-Present

Coach, Michigan State Underwater Hockey Club, 2013-2014

Vice President, Michigan State Underwater Hockey Club, 2012-2013

Social Chair, Michigan State Underwater Hockey Club, 2011-2012

SwitchaRoo, Personalized Stick Design from Canam Underwater Hockey Gear

<https://www.canamuwhgear.com/CanAm-SwitchaRoo-p/stick-roo.htm>

Member, University of Illinois Underwater Hockey Club, 2014-2018

President, University of Illinois Underwater Hockey Club, 2018-2019

4th Place, A Division, 2016 US Nationals Tournament

Member, Houston Underwater Hockey, 2019-Present

DATE OF LAST CV UPDATE

5/13/2022