Chad Coarsey, M.S.

Biomedical Engineer and Advocate

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One-handed and far reaching

Education

2015–2017

M.S. Florida Atlantic University, Boca Raton, FL
GPA: 3.61 Core GPA: 3.82 Bioengineering
TA Courses: MCB 3020L: General Microbiology Lab
EGN 1935: Intro. to Bioengineering

2009–2014

B.S. Florida Atlantic University, Boca Raton, FL
Molecular Biology & Microbiology

Master thesis

title *Development of Smart Phone-Based Automated Microfluidic-ELISA For Human Immunodeficiency Virus 1*

supervisor Waseem Asghar, PhD.

description The majority of HIV prevalence found in Sub-Saharan Africa with 36.9 million living with HIV/AIDS. The cultural implications such as patient non-compliance or denial of available routine medical care can potentially cause limitations on the eectiveness of detecting such virulent pathogens or manage chronic disease. The lack of access to healthcare hinder the ability to adequately diagnose and treat infection in resource-limited settings. Intervention through diagnosis and interventional treatment helps prevent the spread of transmission, where pre-exposure prophylaxis or active disease prevention measures are not readily available. Serological detection can be advantageous for surveillance and screening, Enzyme-Linked Immunosorbent Assay (ELISA) can detect a viral protein (antigen) or antibodies. The ELISA can require at least 12 hours of assay preparation and takes a diagnostic laboratory many resources to run. There is need to develop Point-of-Care (POC) testing that can potentially be used for decentralized testing that can leverage existing technologies such as smart phone capability. A novel smart phone-enabled automated magnetic bead-based platform was developed for a microuidic ELISA for HIV1 detection at the POC to meet this demand.

Experience

Vocational

2015–Current **Co-founder & Chief of Bioengineering**, *The Bionic Glove Project, 501(c)3.*
Use 3-D printing and scanning technologies to develop and provide custom prosthetics for upper limb amputees for no cost.

- Development and Patient Contact
  - Delivered 10+ 3-D printed devices to over three different patients
  - One patient received the Team Unlimbited arm for a transhumeral amputee
  - Two patients received modifed Raptor Reploaded II devices for transradial amputees
  - Work directly with e-NABLE Foundation for troubleshooting and development
  - Guide patients through the custom process and organize appointments for our specialists
- Regulatory Affairs and Compliance
  - Prepare IRB and FDA IDE paperwork for research studies
  - Standardize all Documentation, Forms, and Records

2014–2017 **Research Assistant**, *The Asghar Lab*, Boca Raton, FL.
Developed disease diagnostic platforms for emerging pathogens including rapid automated antigen-capture detection microfluidic platforms.

- Microfluidic ELISA (M-ELISA) for Viral Pathogen Detection
  - Achieved validation and troubleshooting steps to achieve a bead-based POC ELISA;
  - Integrated bead-based ELISA system for rapid HIV1 p24 detection with high sensitivity
  - Implemented and test a smart phone-based colorimetric detection system for HIV-p24 M-ELISA
- Loop-mediated Isothermal Amplification (LAMP)
  - Designed and tested over eight optimized sets of LAMP primers for HIV-1 DNA model
  - Troubleshooted overcome primer-dimer challenges with specific reagent and protocol optimization

Internships and Consulting

2016–Current **3-D Printing Education Consultant**, *Teach Geek*, Boca Raton, FL.
Teaching 3-D printing and CAD to middle and high school children. Help troubleshoot and print student designs.

- Taught CAD and 3-D printing
  - Developed lesson plans and projects for students to create and print
  - Gave lessons on use and troubleshooting for 3-D printers
- Troubleshooting and Printing support
  - Provide overflow printing services to ensure students get their objects
  - Fixed printers and provide instruction on printer troubleshooting

June - Sept. 2015 **Quality Control Microbiology Internship**, *Applied Consumer Services*, Hialeah Gardens, FL.
Running antimicrobial effectiveness experiments and product claim testing in a Quality Control chemistry and microbiology testing Lab

- Custom Microbial Applications
  - Development of experimental research protocols for client claim validation;
  - Ordering surrogate microorganisms for testing in suitable and Biosafety compliant conditions.
- Developed standardized forms for USP 51, 61 and 62 protocols for microbial testing

Publications

C. Coarsey, N. Esiobu, R. Narayanan, M. Pavlovic, H. Shafiee & W. Asghar *Strategies in Ebola virus disease (EVD) diagnostics at the point of care*, Critical Reviews in Microbiology 43(6):779–798, 2017.

M. Safavieh, C. Coarsey, N. Esiobu, A. Memic, JM. Vyas, H. Shafiee & W. Asghar *Advances in Candida detection platforms for clinical and point-of-care applications*. Critical Reviews in Biotechnology, 37(4):441-458, 2017.

C. Coarsey, B. Coleman, M. Sher, W. Asghar *Development of Point-of-Care ELISA and Automated Platform for Cell Phone-based HIV Detection* 6th Annual Out in Science, Technology, Engineering,. and Math Conference, November 11-13th, 2016.

C. Coarsey, B. Coleman, M. Sher, W. Asghar *Development Of Platform For Automated HIV P24 Antigen Capture Magnetic Enzyme-Linked Immunosorbent Assay With Phone Application Detection*. 3rd International Conference On Surfaces, Coatings And Nanostructured Materials, May 18-20th, 2016

C. Coarsey, A. Berger, C. Medina, M. Pavlovic, & C. Weinthal *Open-Source Device For Variable Ulnar Prominence*. 42nd Annual Meeting & Scientific Symposium, American Academy of Orthotists and Prosthetists. March 9-12, 2015.

Volunteer Experience

2017-Current **Director of (Dis)Ability Diversity**, *Out in Science, Technology, Engineering and Math*.
Strengthen diversity and inclusion of GLBTQ+ intersectional identities in STEM

Computer Software Skills

Type	Skill Level	Software Used
Finite Analysis	Intermediate	MATLAB and Simulink
CAD	Intermediate	SolidWorks, Fusion360, AutoCAD
Multiphysics	Beginner	COMSOL Multiphysics

Selected Press Coverage

- Asghar Lab: https://youtu.be/FMI_a5NDjME
- Bionic Glove Project: http://bit.ly/2B1xdWL
- TEDx Talk: https://youtu.be/Jg36WFnv_ZI

References

- Waseem Asghar, Ph.D. wasghar@fau.edu
- Charles "Perry" Weinthal weinthalp@bionicglove.org
- Patty Anastasio, M.D. panastasiomd@gmail.com
- Falon Valez falon@teachgeek.co

More available upon request