COVER PAGE

Application Package for Black Trailblazers in Engineering Symposium

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Document Checklist:

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COVER LETTER

January 15, 2021
Black Trailblazers in Engineering (BTE) Committee

Dear Committee Members,

It is my great pleasure to apply to be a BTE fellow. As my CV attests, my multidisciplinary academic background, demonstrated research excellence in bioengineering, evidence-based teaching interests and experience, and proactive outreach and service activities place me on a trajectory to be a future faculty trailblazer in engineering.

Why I am interested in the BTE program: The BTE program represents an ideal opportunity for me to expand my network and meet other early career trailblazers in engineering, thought leaders, program managers at funding agencies, Purdue Engineering school heads, and renown scientists. I also look forward to participating in panel discussions and workshops focused on faculty development and success and that help to demystify the hidden curriculum in academia.

How the BTE program would benefit me: I have worked in primarily white institutions for all of my academic life. In the 17 years since I began my undergraduate studies, I have gained a first-hand appreciation of the challenges of being the "*only*" in academic environments. Even now, I remain the only Black academic in my interdisciplinary research building. The BTE program provides a unique opportunity to network with other Black Trailblazers in Engineering, to connect with peer and senior mentors, to be inspired by thought leaders, and to learn best practices for surviving and thriving in academia. I would also benefit from the opportunity to meet program managers from the NSF, AFOSR, NIH, and ONR to learn about how to obtain early career funding, and to gain insight into current priorities for different funding agencies.

My experiences, activities, and/or goals to promote, as a future engineering faculty, a climate that values diversity and inclusion through research, teaching and/or engagement:

My overarching goal is to pursue research topics, evidence-based teaching, and outreach activities that promote justice, equity, diversity, and inclusion (JEDI) in academia and society in both local and global contexts. My lived experience as a Black man navigating academia in Canada and the US and my formative years (in Nigeria and Canada) influence how I approach JEDI in science.

Informal and Formal Mentoring: As a master's student at the University of Alberta in Edmonton, Canada, I volunteered with the Edmonton Immigrant Services Association. I was a Math and English tutor for a young Black teenage immigrant with special needs and learned about his experiences in a predominantly white Canadian city where he was often viewed as an outsider. This volunteer experience promoted a desire to give back to my local community and to be a role model for young people from underrepresented backgrounds that don't often see people that look like them in academic environments.

I have served as a research mentor for 13 students so far in my academic career – 7 of whom were from historically underrepresented backgrounds in science and engineering. Two of my four current undergraduate trainees recently received Washington Research Foundation fellowships to pursue independent research – both of them are students from historically underrepresented backgrounds. I also recently mentored three students through the Graduate Student Mentorship Initiative for grad school applicants from historically underrepresented backgrounds: one queer student from Brazil, a Nigerian student in Cyprus, and an African American woman in Atlanta. I'm learning to tailor my mentorship and advice to their intersectional identities and needs.

As a faculty member, I will intentionally seek to improve representation and retention of students from historically underrepresented backgrounds, recognizing the importance of intersectional identities and the individual needs of students. My recruitment efforts will include scheduling informal meetings and career discussions with trainees when I give guest lectures at other institutions. I will also support and mentor local chapters of the National Society for Black Engineers (NSBE) and other student affinity groups.

Leadership and Service: Throughout my graduate career I served on committees that aimed to address power imbalances that often intersected with JEDI issues on campus. During my PhD, I served as the Member Support Commissioner for the Postgraduate Student's Society of McGill University. My responsibilities were to respond to graduate student concerns about supervision, finances, and legal cases. I was also a student advocate that helped to resolve conflicts that arose between students and supervisors and often intersected with power imbalances driven by racism, sexism, and immigration status. I educated students about their rights and the resources available to support them and learned strategies for tipping the scales to reduce the pressure felt by students including working with the Dean and Associate Deans of Graduate Studies.

When I moved to the University of Washington (UW) for my postdoc, I became a founding member of the Postdoc Diversity Alliance that provides community for postdocs from historically underrepresented backgrounds and their allies/accomplices. We organized events including workshops on "crafting effective diversity statements" to help attendees reflect on what diversity, equity, and inclusion look like in research and teaching environments.

As a faculty member, I will participate in conferences like the Annual Biomedical Research Conference for Minority Students (ABRCMS) and AfroBiotech that promote recruitment and retention of Black people in science and engineering. I will also serve on admissions and awards committees to support the recruitment and retention of Black students in academia.

Teaching: As a participant in the Science Teaching Experience Program (STEP) for postdocs at UW, I co-designed and taught a course called "Diseases, Diagnostics, and Treatments" with two postdoc colleagues. I incorporated diversity, equity, and inclusion into my teaching by highlighting the impacts of racism, gender inequality, and income inequality on HIV health disparities both in endemic regions like sub-Saharan Africa and here in the US. I also drew parallels to COVID-19 healthcare disparities fueled by systemic racism and income inequality.

As a faculty member, I will include discussions of health disparities in courses focused on global health and diagnostics for infectious and chronic diseases. I will provide data from primary sources and case studies that highlight healthcare disparities among those who are already marginalized in society. (Yancy, 2020, *JAMA*) I will also incorporate student-centered learning activities that not only help all students learn better but also reduce achievement gaps for students from historically underrepresented backgrounds. (Theobald et al, 2020, *PNAS*)

Summary: The BTE program is a unique training and networking opportunity for me to meet Black early career researchers and thought leaders, connect with program managers from key funding agencies, and receive training in strategies for success as a faculty member. The BTE program will add to my toolkit for success as a future faculty trailblazer in engineering whose research, teaching, and engagement helps to address inequities in health care in local and global contexts.

I look forward to hearing from you soon. Thank you.

Sincerely,

Ayokunle O. Olanrewaju, Ph.D.

RESEARCH AND EDUCATION PLAN AS A FUTURE FACULTY TRAILBLAZER IN ENGINEERING

My overarching goal is to pursue research topics, evidence-based teaching, and outreach activities that promote justice, equity, diversity, and inclusion (**JEDI**) in academia and society in both local and global contexts. I want to lead a multidisciplinary and collaborative team that develops point-of-care (**POC**) devices for therapeutic drug monitoring and precision medicine in infectious and chronic disease management. Integrating teaching and mentoring with my research helps me ask better research questions that lead to innovative & impactful research.

Research: Point-of-care assays for therapeutic drug monitoring and precision medicine

Rationale: Over 25 million people living with human immunodeficiency virus (**HIV**) take daily antiretroviral therapy (**ART**) to extend their length and quality of life. Millions more at risk of HIV receive oral pre-exposure prophylaxis (**PrEP**) to prevent infection.(*1*) However, inadequate medication adherence (<4 doses/week) can lead to treatment failure and drug resistance(*2*) while excessive drug concentrations can cause adverse reactions that lead to poor adherence.(*3*) Measuring antiretroviral drug metabolites can provide objective information about antiretroviral drug concentrations to support precision dosing and improve clinical outcomes.(*4*)

Previous work: I developed the REverSe TRanscrIptase Chain Termination (**RESTRICT**) enzymatic assay to measure antiretroviral drugs in blood (**Fig.1**).(*5*) I invented the assay, led the experimental validation, generated a theoretical model for rational assay design, and conducted preliminary validation with spiked blood samples and clinical samples.(*6*) Direct measurement of nucleotide analogs and their metabolites provides objective information about adherence and drug toxicity for antiretroviral therapy (**ART**) and pre-exposure prophylaxis (**PrEP**) for human immunodeficiency virus (HIV) treatment and prevention.

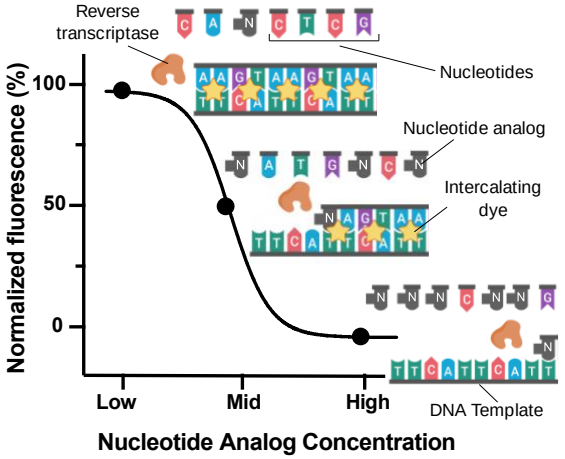

Fig 1. RESTRICT is a functional assay that measures nucleotide analog concentrations based on reverse transcriptase enzyme inhibition. Olanrewaju *et al*, *ACS Sensors*, DOI:10.1021/acssensors.9b02198

Future directions: I will develop point-of-care RESTRICT for measuring nucleotide analogs in clinical samples:

1. Develop self-regulated microfluidics with freeze-dried reagents for POC RESTRICT.
    - I will leverage my expertise in designing and 3D-printing capillary microfluidics (*7–9*) to automate the RESTRICT assay without external instruments. I will integrate freeze-dried reagents to eliminate the need for cold storage and compare chip-based and lab-based RESTRICT assays.
2. Design enzymatic assays to measure other classes of HIV drugs.
    - I will develop functional assays to measure new investigational drugs with long-acting injectable formulations, like cabotegravir (an integrase inhibitor), that alleviate medication adherence concerns associated with daily oral dosing but could benefit from therapeutic drug monitoring during their long pharmacokinetic tail when there is a risk of emergence of drug resistance. (*10*)
3. Measure polymerase inhibitors used to treat other infectious and chronic diseases.
    - Nucleotide analogs and polymerase inhibitors are used to treat other infectious diseases like hepatitis B(*11*) and tuberculosis(*12*) and a variety of cancer types including leukemia, non-Hodgkin's lymphoma, breast cancer, and ovarian cancer.(*13*) Therapeutic monitoring of polymerase inhibitors will support personalized and precision dosing in clinical and drug development trials.(*14*)

Significance: RESTRICT has immediate applications in clinical practice, clinical trials, and behavioral studies to assess the effectiveness of various counselling strategies for improving medication adherence. In future, functional assays can be integrated into wearable sensors for real-time measurement of long-acting injectable

drugs to support precision dosing and prevent emergence of drug resistant infections. I will position my lab at the forefront of efforts to develop functional assays for therapeutic monitoring of patient-to-patient variation in medication adherence and metabolism for infectious and chronic disease management.

Teaching and mentorship: Enthusiastic, Evidence-Based, and Student-Centered

Approach: I approach teaching in the classroom, laboratory, or informal settings in an enthusiastic and engaging manner that aims to spark curiosity and understanding in the learner whether they're a freshman undergraduate or a seasoned postdoc. I do not lean solely on my interest and passion for teaching; I use evidence-based teaching strategies to implement an equitable, inclusive, and student-centered learning environment that helps my students to meet their goals.

Teaching experience: My most pivotal teaching experience was as a participant in the Science Teaching Experience Program (**STEP**) at the University of Washington in Spring 2020. STEP provided instruction in best practices for student-centered teaching as well as structured feedback from a senior faculty mentor and two postdoc colleagues. Our teaching team developed a 10-week undergraduate seminar called "Diseases, Diagnostics, and Treatments". I taught the first three weeks of class in a quarter that was 100% online due to the ongoing COVID-19 pandemic. My co-instructors and I introduced each class with wellness checks – inviting students to share something positive that happened to them that week. We also acknowledged ongoing societal issues including the pandemic and, near the end of the course, protests against anti-black racism and police brutality. We adapted our in-class activities to facilitate interactive, student-centered instruction even in an online environment using tools like Padlet, Google docs, and Zoom breakout rooms to help students move beyond knowledge and comprehension to higher level learning tasks like analysis, synthesis, and evaluation. We submitted a paper describing "instructor talk" – non-course related language – that instructors used in STEP courses during the COVID-19 pandemic.(*15*) STEP helped me develop the skills and confidence to teach in a systematic, structured, and scientific way without letting go of my enthusiasm and charisma.

Mentoring experience: I have served as a research mentor for 13 students so far in my academic career – 7 of whom were from historically underrepresented backgrounds in biomedical engineering. Two of my four current undergraduate trainees recently received Washington Research Foundation fellowships to pursue independent research – both of them are students from historically underrepresented backgrounds. I encourage my students to apply for awards and support them by providing feedback, enthusiastic letters of support, and information to demystify the application process.

Teaching and Mentoring plans: As a faculty member I will continue to engage in evidence-based education by:

1. Participating in recruitment and retention efforts tailored towards Black students and other students from historically underrepresented groups in engineering including conferences like ABRCMS and AfroBiotech. Use active and student-centered learning approaches (like jigsaw and gallery walk) that improve student engagement and reduce achievement gaps for underrepresented students.(*16*)
2. Providing high-risk, high-reward research projects for undergraduate students to channel the fearless optimism that many undergrads have, understanding that the stakes can feel lower in undergrad projects compared with graduate students and postdocs who often feel pressure to find something that "works".
3. Prioritizing creativity and independence in graduate student and postdoc mentoring recognizing that the intrinsic motivation that comes from taking ownership of a project is a crucial part of their burgeoning independence. I will also provide practical time and funding constraints to guide this creative exercise to ensure that trainees meet external and personal milestones and timelines.

SUMMARY: My research, teaching, and service focus on developing innovative engineering solutions for infectious and chronic disease monitoring that help to address healthcare disparities in local and global contexts. As a faculty member I will lead a multidisciplinary team at the forefront of efforts to develop point-of-care diagnostics for precision medicine and engage in evidence-based teaching and mentoring that help to advance the field and address inequities in academia and in society at large.

REFERENCES

1. "UNAIDS Data 2019" (UNAIDS, 2019), pp. 1–476.
2. R. M. Grant, P. L. Anderson, V. McMahan, A. Liu, K. Rut s. Amico, M. Mehrotra, S. Hosek, C. Mosquera, M. Casapia, O. Montoya, S. Buchbinder, V. G. Veloso, K. Mayer, S. Chariyalertsak, L.-G. Bekker, E. G. Kallas, M. Schechter, J. Guanira, L. Bushman, D. N. Burns, J. F. Rooney, D. V. Glidden, Uptake of pre-exposure prophylaxis, sexual practices, and HIV incidence in men and transgender women who have sex with men: a cohort study. *The Lancet Infectious Diseases*. **14**, 820–829 (2014).
3. K. Brinkman, T. N. Kakuda, Mitochondrial toxicity of nucleoside analogue reverse transcriptase inhibitors: a looming obstacle for long-term antiretroviral therapy? *Current Opinion in Infectious Diseases*. **13**, 5 (2000).
4. P. K. Drain, A. R. Bardon, J. M. Simoni, T. R. Cressey, P. Anderson, D. Sevenler, **A. O. Olanrewaju**, M. Gandhi, C. Celum, Point-of-care and Near Real-time Testing for Antiretroviral Adherence Monitoring to HIV Treatment and Prevention. *Curr HIV/AIDS Rep*. **17**, 487–498 (2020).
5. **A. O. Olanrewaju**, B. P. Sullivan, J. Y. Zhang, A. T. Bender, D. Sevenler, T. J. Lo, M. Fernandez-Suarez, P. K. Drain, J. D. Posner, Enzymatic Assay for Rapid Measurement of Antiretroviral Drug Levels. *ACS Sens.* **5**, 952–959 (2020).
6. **Olanrewaju, Ayokunle O.**, Sullivan, Benjamin P, Bardon, Ashley R, Lo, Tiffany J, Cressey, Tim R, Posner, Jonathan D, Drain, Paul K, Pilot Evaluation of an Enzymatic Assay for Rapid Measurement of Antiretroviral Drug Concentrations. *In Review* (2020), doi:10.21203/rs.3.rs-104033/v1.
7. **A. O. Olanrewaju**, A. Robillard, M. Dagher, D. Juncker, Autonomous microfluidic capillaric circuits replicated from 3D-printed molds. *Lab Chip*. **16**, 3804–3814 (2016).
8. **A. O. Olanrewaju**, A. Ng, P. DeCorwin-Martin, A. Robillard, D. Juncker, Microfluidic Capillaric Circuit for Rapid and Facile Bacteria Detection. *Anal. Chem.* **89**, 6846–6853 (2017).
9. **A. Olanrewaju**, M. Beaugrand, M. Yafia, D. Juncker, Capillary microfluidics in microchannels: from microfluidic networks to capillaric circuits. *Lab Chip*. **18**, 2323–2347 (2018).
10. R. J. Landovitz, S. Li, J. J. Eron, B. Grinsztejn, H. Dawood, A. Y. Liu, M. Magnus, M. C. Hosseinipour, R. Panchia, L. Cottle, G. Chau, P. Richardson, M. A. Marzinke, S. H. Eshleman, R. Kofron, A. Adeyeye, D. Burns, A. R. Rinehart, D. Margolis, M. S. Cohen, M. McCauley, C. W. Hendrix, Tail-phase safety, tolerability, and pharmacokinetics of long-acting injectable cabotegravir in HIV-uninfected adults: a secondary analysis of the HPTN 077 trial. *The Lancet HIV*. **7**, e472–e481 (2020).
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12. S. Valencia, M. León, I. Losada, V. G. Sequera, M. Fernández Quevedo, A. L. García-Basteiro, How do we measure adherence to anti-tuberculosis treatment? *Expert Review of Anti-infective Therapy*. **15**, 157–165 (2017).
13. L. P. Jordheim, D. Durantel, F. Zoulim, C. Dumontet, Advances in the development of nucleoside and nucleotide analogues for cancer and viral diseases. *Nature Reviews Drug Discovery*. **12**, 447–464 (2013).
14. L. Alnaim, Therapeutic drug monitoring of cancer chemotherapy. *J Oncol Pharm Pract*. **13**, 207–221 (2007).
15. Yee Mey Seah, Ana M Chang, Smritee Dabee, Brittney Davidge, Jami R Erickson, **Ayokunle O Olanrewaju**, Rebecca M Price, Pandemic-Related Instructor Talk: How New Instructors Supported Students at the Onset of the COVID-19 Pandemic. *In Revision at Journal of Microbiology Education.* (2021).
16. E. J. Theobald, M. J. Hill, E. Tran, S. Agrawal, E. N. Arroyo, S. Behling, N. Chambwe, D. L. Cintrón, J. D. Cooper, G. Dunster, J. A. Grummer, K. Hennessey, J. Hsiao, N. Iranon, L. Jones, H. Jordt, M. Keller, M. E. Lacey, C. E. Littlefield, A. Lowe, S. Newman, V. Okolo, S. Olroyd, B. R. Peecook, S. B. Pickett, D. L. Slager, I. W. Caviedes-Solis, K. E. Stanchak, V. Sundaravardan, C. Valdebenito, C. R. Williams, K. Zinsli, S. Freeman, Active learning narrows achievement gaps for underrepresented students in undergraduate science, technology, engineering, and math. *PNAS*. **117**, 6476–6483 (2020).

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CURRICULUM VITAE

EDUCATION

2017 **McGill University**, Montreal, Quebec, Canada
Ph.D. Biological and Biomedical Engineering
Thesis: 3D-printed Capillaric Circuits for Autonomous Liquid Delivery
Advisor: David Juncker (Biomedical Engineering)

2011 **University of Alberta**, Edmonton, Alberta, Canada
MSc, Biomedical Engineering
Advisor: Chris Backhouse (Electrical Engineering)

2008 **University of Alberta,** Edmonton, Alberta, Canada
BSc (with Distinction), Electrical Engineering (Biomedical Option)

RESEARCH APPOINTMENTS

2020 - now **University of Washington**
Acting Assistant Professor, Mechanical Engineering
Member, Center for AIDS Research
Member, Institute for Translational Health Sciences

2018 – 20 **University of Washington**
Postdoctoral Fellow, Mechanical Engineering
Advisors: Jonathan Posner (Mechanical Engineering, Chemical Engineering, Family Medicine) and Paul Drain (Epidemiology, Global Health, and Medicine)

2017 – 18 **McGill University & Sensoreal Inc**
Industrial Postdoctoral Fellow, Biomedical Engineering

2012 – 17 **McGill University**
Graduate Research Assistant, Biomedical Engineering

2010 – 11 **University of Alberta**
Laboratory Technologist, Microfluidics Development Group

2008 – 10 **University of Alberta**
Master's Student, Electrical and Computer Engineering

2007 **University of Lübeck**, Germany
DAAD Research Internship in Science and Engineering (RISE) student
Institute for Robotics and Cognitive Systems

RESEARCH INTERESTS

Point-of-care Diagnostics, Microfluidics & Capillary-driven Flow, 3D-printing & Rapid Prototyping, Medication Adherence & Therapeutic Drug Monitoring, Precision Medicine, Personalized Medicine, Functional Assays

HONORS & AWARDS

2020 – 22	New Investigator Award, University of Washington/Fred Hutch Center for AIDS Research
2019 – 20	Mistletoe Research Fellowship
2019	1st Place, Elevator Speech Contest, American Society for Cell Biology Annual Meeting: https://youtu.be/r2USzdRwVSY
2017 – 18	MITACS Elevate Industrial Postdoctoral Fellowship
2017	Québec Étudiant-Chercheur étoiles (Star Student Researcher)
2017	1st Place, Shark Tank Competition, MicroTAS 2017 Conference: https://youtu.be/zqPDxmFFDW8
2017	Top 15, Canada-wide NSERC Science Action! Video Competition: https://youtu.be/PzED8k9HQNU
2016	McGill Biomedical Engineering Department, GREAT Travel Award
2015	CMBS Young Investigator Travel Award
2014	CIHR Systems Biology Training Program Travel Award
2014	Quebec International Merit Scholarship for Foreign Students
2012 – 15	CIHR Systems Biology Training Program PhD Fellowship
2012 – 14	NSERC CREATE Integrated Sensor Systems PhD Fellowship
2012	McGill University Biomedical Engineering Department Recruitment Award
2009 – 10	Alberta Innovates Graduate Scholarship in Nanotechnology
2007	DAAD RISE Internship in Science and Engineering
2007	Fluor Canada Ltd Scholarship
2006	Thirst for Knowledge Undergraduate Scholarship
2006	1st Place, University of Alberta Engineering Competition
2005	Talisman Energy Undergraduate Scholarship
2005	University of Alberta Undergraduate Scholarship
2004	Registrar's International Student Scholarship

FUNDING

Awarded funding

2020 – 25 **Title:** A novel REverSe TRanscrIptase Chain Termination (RESTRICT) assay for near-patient, objective monitoring of long-term pre-exposure prophylaxis (PrEP) adherence
Sponsor: National Institutes of Health – NIH/NIAID R01-AI157756
Project period: 09-November-2020 to 31-October-2025

Amount: $3,839,095
Role: Co-Investigator (Principal Investigators: Jonathan Posner, Paul Drain)
- co-wrote ~75% of the science.

2020 – 22 **Title:** A rapid enzymatic assay for measurement of adherence to pre-exposure prophylaxis
Sponsor: University of Washington/Fred Hutch Center for AIDS Research New Investigator Award
Project period: 01-July-2020 to 30-June-2022
Amount: $90,000
Role: Principal Investigator

2020 – 21 **Title:** Rapid test for measuring adherence to pre-exposure prophylaxis and antiretroviral therapy for HIV
Sponsor: CoMotion Innovation Gap Fund
Project period: 01-January-2020 to 31-December-2020
Amount: $50,000
Role: Co-Investigator (Principal investigator: Paul Drain) – co-wrote 100% of the science

2019 – 20 **Title:** Unfettered Research Grant
Sponsor: Mistletoe Research Fellowship (now Momental Foundation)
Project period: 01-September-2019 to 30-June-2020
Amount: $10,000
Role: Principal Investigator

2017 – 18 **Title:** Self-powered microfluidics for rapid diagnosis and severity determination of urinary tract infections
Sponsor: MITACS Elevate Industrial Postdoctoral Fellowship
Project period: 05-September-2017 to 04-September-2018
Amount: $45,000
Role: Principal Investigator

Pending proposals

2021 – 22 **Title:** Fast HIV drug level monitoring
Sponsor: Atlanta Center for Microsystems Engineered Point of Care Technologies
Project period: 01-June-2021 to 31-December-2022
Amount: up to $180,000
Role: Principal Investigator (Co-Investigators: Jonathan Posner, Paul Drain)
- Submitted letter of intent in March 2020 and was invited to submit full proposal in September 2020.

PUBLICATIONS

* Denotes students that I mentored

Preprints and Submitted Manuscripts

[3] Zhang J, Zhang Y, Sullivan B, **Olanrewaju A**, Bender A, Lillis L, Boyle D, Drain P, Posner J, (2020) HIV Pre-Exposure Prophylaxis Adherence Test Using Reverse Transcription Isothermal Amplification Inhibition Assay, In review. DOI: 10.21203/rs.3.rs-113196/v1

[2] Seah Y.M, Chang A.M, Dabee S, Davidge B, Erickson J.R, **Olanrewaju A.O**, Price R.M, (2020) Pandemic-related instructor talk: how new instructors supported students at the onset of the COVID-19 pandemic. In revision, *Journal of Microbiology Education.*

[1] **Olanrewaju A.O**, Sullivan B.P, Bardon A.R, Lo T.J*, Cressey T.R, Posner J.D, Drain P.K, (2020) Pilot Evaluation of a Rapid Enzymatic Assay for Measuring Antiretroviral Drug Concentrations. In revision, *Virology Journal*, DOI: 10.21203/rs.3.rs-104033/v1

Peer-reviewed Journal Articles

[5] Drain P.K, Bardon A.R, Simoni J.M, Cressey T.R, Anderson P, Sevenler D, **Olanrewaju A.O**, Gandhi M, Celum C. (2020) Point-of-Care and Near-Patient Antiretroviral Testing for Monitoring Adherence to HIV Treatment and Prevention, *Current HIV/AIDS Reports.* DOI:10.1007/s11904-020-00512-3

- ***Times cited: 1***

[4] **Olanrewaju A.O**, Sullivan B.P, Zhang J.Y, Bender A.T, Sevenler D, Lo T.J*, Fernandez-Suarez M, Drain P.K, and Posner J.D. (2020) Enzymatic Assay for Rapid Measurement of Antiretroviral Drug Levels. *ACS Sensors*, 5(4), 952 – 959. DOI:10.1021/acssensors.9b02198.

- ***Times cited: 2***
- ***Featured in** C & EN news*

[3] **Olanrewaju A.O**, Beaugrand M, Yafia M, and Juncker D. (2018) Capillary microfluidics in microchannels: from microfluidic networks to capillaric circuits, *Lab on a Chip*, 18 (16), 2323-2347. DOI:10.1039/C8LC00458G.

- ***Times cited: 75***
- ***Featured on the cover of Lab on a Chip***

[2] **Olanrewaju A.O,** Ng A, DeCorwin-Martin P, Robillard A*, and Juncker D. (2017) Microfluidic Capillaric Circuit for Rapid and Facile Bacteria Detection, *Analytical Chemistry,* 89, 6846 – 6853. DOI:10.1021/acs.analchem.7b01315

- ***Times cited: 25***

[1] **Olanrewaju A.O**, Robillard A*, Dagher M, and Juncker D. (2016) Autonomous Microfluidic Capillaric Circuits Replicated from 3D-Printed Molds", *Lab on a Chip,* 16 (19), 3804 – 3814. DOI:10.1039/C6LC00764C.

- ***Times cited: 25***

Oral Presentations

[5] **Olanrewaju A.O**, Yafia M, Beaugrand M, Possel F, and Juncker D (2017) Domino Capillaric Circuits: 3D-Printed Capillary Microfluidics for Scalable, Sequential, and Simultaneous Liquid Delivery, *The 21st International Conference on Miniaturized Systems for Chemistry and Life Sciences*, Savannah, USA.

- ***<10% acceptance rate among ~1,000 attendees.***

[4] **Olanrewaju A.O** and Juncker D, (2016) Design Rules for 3D-Printed Autonomous Capillaric Circuits, *The 20th International Conference on Miniaturized Systems for Chemistry and Life Sciences*, Dublin, Ireland.

- ***<10% acceptance rate among ~1,000 attendees.***

[3] **Olanrewaju A.O**, Ng A, Robillard A*, and Juncker D, (2015) 3D-Printed Capillaric Circuits for Ultrarapid Bacteria Detection Using Packed Bead Columns Assembled On-the-spot, *The 19th International Conference on Miniaturized Systems for Chemistry and Life Sciences*, Gyeongju, Korea.

- ***<10% acceptance rate among ~1,000 attendees***

[2] **Olanrewaju A.O**, Safavieh R, and Juncker D. Bacteria Capture in Capillary-Driven Microfluidic Device, (2014) *2nd Annual Symposium of the Systems Biology Training Program,* McGill University, Montreal, Canada.

[1] **Olanrewaju A.O**, Behnam M, , Martinez-Quijada J, Hejazi F, Banting G, Bidulock A, Groendahl S, Johnstone R.W, Glerum D.M, and Backhouse C.J. (2010) Towards a portable and inexpensive genetic analysis toolkit for point-of-care applications, *Engineering Graduate Research Symposium,* University of Alberta, Canada

Poster Presentations

[18] Gim. A.H***, Olanrewaju A.O**, Sullivan B.P, Drain K.P, Posner, J.D. (2020) "Calibrating a Theoretical Model for Rapid, Near-Patient Measurement of Antiretroviral Drug Concentrations", *Gulf Coast Undergraduate Research Symposium*, Virtual Event

[17] Gim. A.H***, Olanrewaju A.O**, Sullivan B.P, Drain K.P, Posner, J.D. (2020) "Calibrating a Theoretical Model for Rapid, Near-Patient Measurement of Antiretroviral Drug Concentrations", *University of Washington Summer Undergraduate Research Symposium*, Virtual Event

[16] **Olanrewaju A.O,** Sullivan B.P., Lo, T.J.*, Cressey T.R, Posner J.D., Drain P.K. (2020) Pilot evaluation of an enzymatic assay for rapid measurement of antiretroviral drug concentrations, *Cell Bio Virtual 2020*

[15] **Olanrewaju A.O,** Sullivan B, Zhang J.Y, Sevenler D, Bender A.T, Lo T.J*, Fernandez-Suarez M, Drain P.K, Posner J.D. (2019) A Rapid Enzymatic Assay for Near-Patient Measurement of Adherence to HIV Pre-Exposure Prophylaxis, *Annual Meeting of the American Society for Cell Biology*

[14] **Olanrewaju A.O,** Sullivan B, Zhang J.Y, Sevenler D, Bender A.T, Lo T.J*, Fernandez-Suarez M, Drain P.K, Posner J.D. (2019) A Rapid Enzymatic Assay for Near-Patient Measurement of Adherence to HIV Pre-Exposure Prophylaxis, *The 23rd International Conference on Miniaturized Systems for Chemistry and Life Sciences,* Basel, Switzerland.

[13] Zhang J.Y**, Olanrewaju A.O,** Bender A.T, Zhang Y, Drain P.K, Posner J.D. (2019) An ultrasensitive, semi-quantitative measurement of HIV nucleoside reverse transcriptase inhibitors (NRTI) with RT-recombinase polymerase amplification (RT-RPA) for rapid PrEP adherence testing. *The 23rd International Conference on Miniaturized Systems for Chemistry and Life Sciences,* Basel, Switzerland.

[12] Zhang J.Y**, Olanrewaju A.O,** Bender A.T, Zhang Y, Drain P.K, Posner J.D. (2019) An ultrasensitive, semi-quantitative measurement of HIV nucleoside reverse transcriptase inhibitors (NRTI) with RT-recombinase polymerase amplification (RT-RPA) for rapid ART and PrEP adherence testing, *Annual meeting of the Biomedical Engineering Society* (*BMES)*, Philadelphia, PA, USA.

[11] **Olanrewaju A.O,** Sullivan B, Zhang J.Y, Sevenler D, Bender A.T, Lo T.J*, Fernandez-Suarez M, Bardon A.R, Stekler JD, Drain P.K, Posner J.D. (2019) Enzymatic Assay for Near-Patient Measurement of Long-Term ART and PrEP Adherence*, The 14th International Conference on HIV Treatment and Prevention Adherence,* Miami, FL, USA.

[10] **Olanrewaju A.O,** Lenzen P*, Ymbern O, Yafia M, and Juncker D. (2018) 3D-Printed Domino Capillaric Circuits for Colorimetric Bacteria Detection in Urine, *The 22nd International Conference on Miniaturized Systems for Chemistry and Life Sciences,* Kaohsiung, Taiwan.

[9] Ymbern O, Lenzen P*, **Olanrewaju A.O**, Tavakoli A, Yafia M, and Juncker D. (2018) Microchannel-based capillary microfluidics: From simple networks to capillaric circuits, *The 16th IEEE International New Circuits and Systems Conference (NEWCAS)*, Montreal, Canada.

[8] **Olanrewaju A.O**, Safavieh R, and Juncker D. (2017) The Urine Chip: Rapid Urinary Tract Infection Diagnosis in 7 minutes, *MEDTEQ Forum,* Montreal, Canada

[7] **Olanrewaju A.O**, Ng A, and Juncker D. (2015) Rapid and inexpensive manufacture of 3D printed capillaric circuits for point-of-care diagnostics, *Gordon Research Conference on the Physics & Chemistry Microfluidics,* Vermont, USA.

[6] **Olanrewaju A.O**, Ng A, and Juncker D. (2014) Capillaric Circuits for Fast and Sensitive Bacteria Detection, *Annual Meeting of the Biomedical Engineering Society (BMES),* San Antonio, USA.

[5] Laforte V, **Olanrewaju A.O**, and Juncker D. (2013) Low-cost, high liquid volume silicon quill pins for robust and reproducible printing of antibody microarrays, *The 17th International Conference on Miniaturized Systems for Chemistry and Life Sciences*, Freiburg, Germany.

- ***Times cited: 3***

[4] Safavieh R, **Olanrewaju A.O**, and Juncker D. (2013) Autonomous capillary microfluidic systems for time-sensitive delivery of multiple liquids, *NSERC CREATE Integrated Sensor Systems Summer School*, Montreal, Canada.

- ***Received Best Poster Award.***

[3] Safavieh R, **Olanrewaju A.O**, and Juncker D. (2013) Autonomous capillary microfluidic systems for time-sensitive delivery of multiple liquids, *Systems Biology Training Program Symposium,* McGill University, Montreal, Canada

[2] Safavieh R, **Olanrewaju AO**, and Juncker D. (2012) Capillary-based microfluidic system for sequential delivery of multiple liquids, *Microfluidics 2.0: Workshop on Capillary-based Microfluidics for Bioanalysis*, Boston, USA.

[1] Behnam M, **Olanrewaju A.O**, Martinez-Quijada J, Hejazi F, Banting G, Bidulock A, Groendahl S, Johnstone R.W, Glerum D.M, Backhouse C.J. (2010) Inexpensive and portable sample-in-answer-out genetic analysis systems for point of care applications, *The 14th International Conference on Miniaturized Systems for Chemistry and Life Sciences*, Groningen, Netherlands.

PATENT APPLICATIONS

[3] **Olanrewaju A.O**, Sullivan B.P, Sevenler D, Bender A.T, Zhang J.Y, Sandlin R.D, Drain P.K, Posner J.D. (2019) An enzymatic assay to measure long-term adherence to pre-exposure prophylaxis and antiretroviral therapy, PCT/US2020/037609.

[2] Juncker D, **Olanrewaju A.O**, and Yafia M. (2017) Domino Capillaric Circuits: 3D-Printed Capillary Microfluidics for Scalable, Sequential, and Simultaneous Liquid Delivery, US Provisional Patent Application No. 62/575418.

[1] Juncker D, and **Olanrewaju A.O.** (2015) Fluidic Circuits and Methods for Bacterial Screening, PCT/CA2016/051232.

INVITED LECTURES AND SEMINARS

10/2020 Boston University, Biomedical Engineering Department, Emerging Scholars Symposium

- *Towards point-of-care detection of antiretroviral drug concentrations for improving human immunodeficiency virus (HIV) treatment and prevention.*

10/2020 University of Washington, Mechanical Engineering Department
- *Towards a rapid and accessible test for measuring antiviral drug levels to improve HIV treatment and prevention.*

07/2020 University of Washington, Undergraduate Research Program
- *My Research, Motivation, and Journey in Academia.*

06/2020 University of Washington, Diversity in UW STEM Research Seminar
- *Developing diagnostic tools to monitor the effectiveness of antiretroviral treatment and prevention*

06/2020 University of Washington, Molecular Engineering & Sciences Institute
- *An enzymatic assay for fast and accessible measurement of antiretroviral drug levels.*

02/2020 University of Washington, Bioengineering Department
- *Towards a fast and accessible test for measuring medication adherence to HIV treatment and prevention.*

TEACHING EXPERIENCE

2020 **Guest Lecturer,** BIOEN 457/557, Advanced Molecular Engineering, Bioengineering Department, University of Washington

2020 **Guest Lecturer,** GEN ST 297, Diversity in UW STEM Research Seminar, University of Washington

2020 **Guest lecturer,** BIOEN 485/585, Computational Bioengineering, Molecular Engineering & Sciences Institute, University of Washington

2020 **Co-Instructor,** Biology 285A: Diseases, Diagnostics, and Treatments, University of Washington
- Science Teaching Experience Program: Working in Science Education

2012 – 17 **Instructor**, Hands-on workshop in Micro- and Nano-bioengineering, McGill University

2012 **After-school Tutor,** Let's Talk Science Outreach Program, McGill University

2009 – 10 **In-class Presenter**, Let's Talk Science Outreach Program, University of Alberta
- Received Most Outstanding Health Workshop Volunteer Award

2009 **Teaching Assistant**, EE 457, Microfabrication and Devices, Electrical and Computer Engineering Department, University of Alberta

2005 **Instructor**, DiscoverE Science & Engineering Camps, University of Alberta

RESEARCH ADVISING

Graduate Students

2020 – now Ross Nelson, Master's student, Chemical Engineering, University of Washington (UW)
- Project: Integrase activity assays for measuring concentrations of dolutegravir and cabotegravir.

2019 – 20 Tiffany Lo, Master's student, Materials Science & Engineering, UW
- Master's thesis: RESTRICT assay with long DNA templates
- Undergraduate project: RESTRICT assays at room temperature

2018 Philippe Lenzen, Master's student, Biomedical Engineering, McGill University
- Project: Capillaric circuits for self-regulated detection of salivary biomarkers

- On exchange from École Polytechnique fédérale de Lausanne, Switzerland

2016 Florian Possel, Master's student, Biomedical Engineering, McGill University
- Project: domino microfluidics for scalable, sequential, and simultaneous liquid delivery.
- On exchange from University of Tubingen, Germany

Undergraduate Students

2020 – now Jason Chan, Biology, UW
- Project: RESTRICT assay with dried blood spots

2020 – now Alicia Gim, Chemical Engineering, UW
- Project: Automating and optimizing a mathematic model of the RESTRICT assay
- Received CoMotion Mary Gates Innovation Summer Internship
- Received Washington Research Foundation Fellowship

2020 – now Yonas Meshesha, Bioengineering, UW
- Project: Optimization of RESTRICT assay to operate with a low-cost reader
- Received Washington Research Foundation Fellowship

2020 – now Katherine Zhang, Bioengineering, UW
- Project: Multiplexed RESTRICT assays with rationally designed DNA templates and molecular beacons
- Received CoMotion Mary Gates Innovation Summer Internship

2014 – 15 Alessandra Robillard, Mechanical Engineering, McGill University
- Project: Rapid and inexpensive 3D-printing of capillaric circuits
- Received Integrated Sensor Systems Summer Training Fellowship

2014 – 15 Rivka Cohen, Mechanical Engineering, McGill University
- Project: Rapid and inexpensive 3D-printing of capillaric circuits

2014 – 15 Luigi Corrado, Mechanical Engineering, McGill University
- Project: Rapid and inexpensive 3D-printing of capillaric circuits

2014 – 15 Andrew Luongo, Mechanical Engineering, McGill University
- Project: Rapid and inexpensive 3D-printing of capillaric circuits

2012 Anupam Yadav, McGill University
- Project: Microfluidics powered by gas from a chemical reaction.
- on exchange from India on MITACS Summer Internship

DIVERSITY, EQUITY, AND INCLUSION EFFORTS

2020 – now Volunteer, Graduate Student Mentorship Initiative, Cientifico Latino

2020 – now Member, National Society of Black Engineers

2020 – now Member, UNITE, University of Washington
- Group devoted to advancing justice, equity, diversity, and inclusion in STEM.

2020 Panelist, University of Washington School of Medicine Anti-Racism Town Hall

2020 Guest Lecturer, University of Washington, Diversity in UW STEM Research Seminar

2019 – 20 Organizer, Crafting Effective Diversity Statements Workshops
- University of Washington Postdoc Diversity Alliance

2019 Panelist, Managing the Student to Postdoc Transition as an Underrepresented Minority

2018 – now Founding Member, Postdoc Diversity Alliance, University of Washington
- Organization that provides community and support for postdocs from historically underrepresented backgrounds and their allies/accomplices.

2015 – 16 Member, Equity and Diversity Committee, McGill Post Graduate Students' Society

PROFESSIONAL DEVELOPMENT & SERVICE

2020 – now Coordinator, K99/R00 Peer Mentoring Group, University of Washington & Beyond

2020 Panelist, Accomplishing Career Transitions (ACT) Program Networking Session, Cell Bio Virtual 2020

2020 Panelist, Science Teaching Experience Program, Future Faculty Fellows Workshop, University of Washington

2019 – 20 Science Teaching Experience for Postdocs, University of Washington

2019 – now American Society for Cell Biology Accomplishing Career Transitions Program
- Cohort training program for postdocs and junior faculty from historically underrepresented backgrounds in STEM.

2019 Startup Collaboration Program, Mistletoe Research Fellowship

2019 Future Faculty Fellows Workshop, University of Washington

2019 BIO 2019 I-Corps Bio-Entrepreneurship Workshop & Travel Award

2019 Art of Science Communication Course

2018 Judge, Washington Regional Junior Science and Humanities Symposia

2016 – 17 Steering Committee for Undergraduate Skills Development, McGill University

2016 Advisory Committee for the Selection of Dean of Students, McGill University

2015 – 16 Member Support Commissioner, Postgraduate Students' Society, McGill University

2012 – 15 Councilor, Postgraduate Students' Society, McGill University

2012 Learning to Teach Day, McGill University

PEER REVIEW

ACS Applied Materials & Interfaces, Analytical Chemistry, Angewandte Chemie Int. Ed., Biosensors, Lab on a Chip, Langmuir, Micromachines, Microsystems and Nanoengineering, MicroTAS Conference, New England Journal of Medicine, RSC Advances, Sensors, Technology

PROFESSIONAL SOCIETY MEMBERSHIPS

American Association for the Advancement of Science (AAAS), American Society for Biochemistry and Molecular Biology (ASBMB), American Society of Cell Biology (ASCB), American Society for Microbiology (ASM), Biomedical Engineering Society (BMES), National Society of Black Engineers (NSBE)

UNIVERSITY OF WASHINGTON
INTERNATIONAL CLINICAL RESEARCH CENTER

January 18, 2021

Dear Purdue University,

I am pleased to write my most enthusiastic letter in support of Dr. Ayokunle (Ayo) Olanrewaju's application for the Black Trailblazing in Engineering at Purdue University. Ayo is an acting assistant professor in the Mechanical Engineering Department, who has been a key scientist for my NIH R01 grant (NIAID R01 AI136648) focused on developing a point-of-care test to measure drugs to prevent or treat HIV/AIDS.

Ayo has been incredibly valuable for using his bioengineering expertise to initiate a new direction of research for developing a novel blood test to measure long-term adherence to pre-exposure prophylaxis (PrEP) and antiretroviral therapy (ART) for HIV. Together, we recently submitted a new NIH R01 grant to optimize and validate the prototype adherence test for metabolites of a common HIV drug. Our recent grant proposal scored in the 7th percentile and is pending funding. His research project is in contrast to my other project for developing a point-of-care drug test, which only measures short-term urine tenofovir. Ayo's assay will measure reverse transcriptase activity, which is the downstream target of the tenofovir and related drug compounds. Therefore, his research represents a new class of objective adherence testing that can measure long-term ART and/or PrEP adherence at the clinical point of care. From a clinical perspective, the preliminary data that will be gathered within Ayo's proposed project will enable us to monitor adherence in a variety of clinical and epidemiological studies. Future studies that could use this POC assay would be for studying the effectiveness of PrEP roll-out in low and middle income countries, investigating the influence of adherence on development of drug- resistant HIV in various populations, and measuring the effectiveness of various counselling strategies for improving medication adherence.

As a collaborator, Ayo has proven himself to be an exceptionally strong and dedicated scientist. He has been a regular contributor to my group's bi-weekly lab meetings with other trainees from global health, epidemiology, and medicine. He has also been critical for our working group of collaborators on ART/PrEP adherence, which includes students and faculty with expertise in pharmacokinetics and behavioral sciences. This training environment has helped to support Ayo's development into an independent HIV researcher with bioengineering and global health expertise. Ayo has also taken up a mentorship role, including his recent supervision of an undergraduate chemical engineering student this summer who gathered data in the lab that will be included in 2 figures in an upcoming manuscript submission.

Ayo's research has continued to be highly innovative and important for the field, and I very strongly support his application for the Black Trailblazing in Engineering at Purdue University. Please contact me if I can provide any additional information.

Sincerely,

Paul K. Drain, MD, MPH, FACP
Associate Professor
Departments of Global Health, *Medicine (Infectious Diseases), and Epidemiology*
Associate Director, Tuberculosis Research and Training Center
University of Washington
Office: (206) 520-3820; pkdrain@uw.edu

UNIVERSITY OF WASHINGTON
COLLEGE of ENGINEERING Mechanical Engineering
A Community of Innovators

CHEMICAL ENGINEERING
UNIVERSITY of WASHINGTON

January 18, 21

Re: Dr. Ayokunle (Ayo) Olanrewaju's Purdue Black Trailblazers Engineering Program

Dear Search Committee,

It is my pleasure to write this letter in support of Dr. Ayokunle (Ayo) Olanrewaju for Purdue's Black Trailblazers in Engineering Program. Ayo joined my lab in May 2018 as a postdoctoral fellow working on the development of a point-of-care test to determine adherence to antiretroviral drugs therapy for HIV-1. He spent roughly two years as a postdoctoral scholar in my lab. After these two years, he was appointed an acting assistant professor in the Department of Mechanical Engineering at the University of Washington. This 'acting' title is a grant-supported research position with elevated compensation and independence compared to a postdoc position. He has no formal teaching responsibilities; however, Ayo has sought some teaching opportunities. This letter describes my working relationship and observations of Ayo over the last 2.5 years.

I have worked closely with Ayo and feel confident to provide insightful assessment of his technical capabilities as well as his interpersonal and leadership skills. Ayo came to UW from Dr. Juncker's lab at McGill University in Alberta where he was working on surface tension driven automated microfluidic assays. His PhD research has been highly cited and it is evident that Ayo has received excellent training at McGill under the direction of Dr. Juncker. Ayo's publication record in both peer-reviewed journals and conference proceedings are very competitive in our field, as are his patents and industrial experience. Ayo has an exceptional gift for communicating his research as evidenced by several invited oral presentations at the International Conference on Miniaturized Systems for Chemistry and Life Sciences (uTAS) and an award for his participation in this conference's "shark tank" competition.

Ayo has taken independent leadership over the technical details and research direction over his current project. Dr. Olanrewaju is leading the development and validation of a near patient test to measure the level of HIV antiretroviral drugs in patient's body as a measure of adherence to the prescribed treatment regimen (called RESTRICT). Currently, the only way to measure the concentration of these drugs is using mass spectrometry, which is resource intensive and slow. In his first few weeks at UW he was up to speed with his new project and uncovered some significant technical challenges in the proposed approach using an immunological binding assay. Dr. Olanrewaju suggested a novel way to measure the presence of antiretroviral drugs using reverse transcriptase activity assay that could be used in nearly any lab using a simple fluorescence assay or integrated into a point of care test. In less than a month, he had proposed a new method and demonstrated its proof of concept with publishable quality data. Ayo has rapidly pushed out a journal paper on the RESTRICT method and is now testing clinical samples as well as preparing a journal manuscript on a theoretical model to predict the RESTRICT assay to various controlling parameters. He has several other publications outlined which he has students working on.

For the RESTRICT project, Ayo leads the collaboration with Paul Drain (infectious disease MD, epidemiologist, and global health researcher from UW), Tim Cressy (analytical chemist in Thailand), Alex Greninger (UW Lab Medicine and the first person to diagnose a US citizen with COVID in the US) and Pete Anderson (analytical pharmacologist from UC Denver). In this regard, he is recognized as the intellectual core and leader of this project.

Ayo's rapid advancement and leadership of the RESTRICT project drove me to seek advancement opportunities for him with the goal of retaining him. At UW, he has been hired as an acting assistant professor. This role is primarily research and student mentoring and is not tenure track. In this role, he has recruited a surprising number of high-quality, master-level (2 ChemE) and undergraduate students (4 mechanical engineering, chemistry, bioengineering) from different disciplines to work his various projects. Since his position, by definition, is temporary, he has resisted hiring PhD students. This group of students is also diverse (two women, one black). I think it is the compelling projects and Ayo's infectious personality that makes him successful in recruiting projects. I have directly observed him mentoring his students and found him to be responsive and supportive as well as always seeking excellence. Several of his students are now obtaining publishable data on projects that Ayo has independently conceived and leading. These student recruiting and mentoring examples make it clear that he will be successful at recruiting excellent graduate students and mentoring them towards completion of their desired degrees.

Ayo has demonstrated his ability to maintain a funded research group by conceiving, writing, and being awarded grants with interdisciplinary teams. Ayo led the composition and submission of a NIH R01 grant to support his work on the RESTRICT assay. This RO1 was awarded in November 2020 for 3.8M over 5 years. Ayo serves as the Co-I for this work and includes investigators from infectious diseases, psychology, pharmacology, epidemiology, lab

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medicine, and global health. This work focuses on the optimization of the RESTRICT assay to measure the level of anti-retroviral drugs in ART and PrEP patient's blood. Once the assay is optimized and validated, it will be translated to lab medicine and to meet CLIA requirements. The final aim of this work is to measure drug levels in PrEP patient's blood at the Madison Clinic in Seattle. Ayo also was awarded a two-year young investigator award from the Center for AIDS Research that is based at the Fred Hutch Institute in Seattle. This grant focuses on developing and validating a point-of-care version of the RESTRICT assay.

Ayo has a gift for communication. Although he has had no formal teaching responsibilities at UW, he has sought opportunities to teach and it is clear that he has natural ability and passion for pedagogy. At UW he has been a guest lecturer for the diversity in UW STEM Research Seminar and the Molecular Engineering & Sciences Institute. He also co-taught Biology 285A "Diseases, Diagnostics, and Treatments" as part of the Science Teaching Experience Program which focuses on giving postdoctoral scholars mentored opportunities to teach. I do not have information on his teaching evaluations; however, I have been an audience member to several of his seminars and journal club presentations and have always found him to be very well prepared, engaging, excited to be conveying information. I have also observed him mentoring junior researchers in the lab and found to be thorough and encouraging. My observations of and experiences with Dr. Olanrewaju gives me great confidence that he will excel at teaching a wide range of engineering subjects.

Ayo's gifts have not gone unnoticed by other UW faculty. Professionally and socially, Ayo has been a joy to work with. He conducts himself according to the highest standards in both his dealings with members of my lab and our clinical collaborators. Ayo's professionalism is evident in the way that he manages individual and group meetings. Ayo has demonstrated the ability to form and cultivate meaningful collaborations across a wide range of disciplines. He has forged new relationships with Barry Lutz (Bioengineering), Nina Kim (Infectious Diseases), and Catherine Beni (Surgery) to start several new projects, including one that is funded by a new investigator grant funded by the Center for AIDS Research. At the request of Dr. Paul Drain M.D., our primary collaborator for the antiviral drug adherence project, Ayo is now attending weekly meetings of clinicians to work on a broad range of infectious disease focused challenges. He has also been recruited by Catherine Beni (UW Surgical Resident and youngest woman to earn a PhD at Caltech) to develop hardware and assays for an open flow perfusion system used to predict shock in ICU patients. Ayo's affable personality, critical thinking skills, and reputation for action has resulted in a rapid growth in his professional connections at UW and engagement in research far beyond the project he was originally recruited for. The interest other UW faculty have shown in working with Ayo is a testament to the respect they have for intellect and demeanor and provide evidence for his promising future. He has demonstrated the ability to embed himself into the fabric of the institution.

Ayo is an exceptional researcher and mentor with the best professional and interpersonal skills of any postdoctoral scholar I have ever mentored. Ayo lifts everyone around him up and brings joy to his work environment. He is admired for his creativity, intelligence, and the respect that he shows to everyone, independent of their station. The manner in which Ayo has created and fostered collaborations shows that he has the demeanor and interpersonal skills to lead an independent research group and seek funding working on interdisciplinary research projects in health. Based on this evidence, I recommend that Dr. Olanrewaju for Purdue's Black Trailblazers in Engineering Program.

Respectfully,

Jonathan D. Posner, Ph.D.
Richard and Victoria Harrington Professor Engineering Innovation in Health
Mechanical Engineering
Chemical Engineering
Adjunct, Family Medicine