

KENETTA L. NUNN, Ph.D.

Associate Manager of Bioinformatics, Translational Genomics
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EDUCATION

- 2014 – 2020 **Ph.D., Bioinformatics & Computational Biology**
Thesis topic: Ecological drivers of human vaginal bacterial community composition
University of Idaho, Moscow, ID | Major Professor: Dr. Larry J. Fomey
- 2012 – 2014 **M.S., Biomedical Engineering**
Thesis: Influence of vaginal lactobacilli on the barrier properties of human cervicovaginal mucus against HIV
University of North Carolina at Chapel Hill | Major Professor: Dr. Samuel K. Lai
- 2003 – 2007 **B.S., Biology, Chemistry Minor**
Duke University, Durham, NC

PROFESSIONAL & RESEARCH EXPERIENCE

- 08.2021 – Present **Associate Manager of Bioinformatics,**
Q² Solutions, Durham, North Carolina
- 02.2020 – 07.2021 **Postdoctoral Research Fellow,**
University of Michigan, Ann Arbor, Michigan
- 08.2014 – 01.2020 **Graduate Research Assistant,**
University of Idaho, Moscow, Idaho
- 08.2012 – 07.2014 **Graduate Research Assistant/ Clinical Study Coordinator**
University of North Carolina at Chapel Hill, Chapel Hill, NC
- 08.2011 – 08.2012 **Clinical Study Coordinator**
University of North Carolina at Chapel Hill, Chapel Hill, NC
- 07.2008 – 08.2011 **Research Associate**
Affinergy Inc., Research Triangle Park, NC
- 01.2008 – 07.2008 **Histology Laboratory Assistant**
Biotechnics, Hillsborough, NC
- 01.2004 – 09.2007 **Laboratory Assistant**
Department of Dermatology, Duke University, Durham, NC

RESEARCH INTERESTS

Human health, cancer therapeutics, infectious diseases, sexually transmitted infections, temporal dynamics of the human microbiome, bacterial composition of the human microbiome, the influence of steroid hormones on the microbiome, and ecological interactions within microbial communities.

TECHNICAL SKILLS

- Management** People & resource management, hiring & onboarding, employee performance reviews & goal setting, clinical study design & management, project scoping and management, scientific writing & editing & reviewing, mentoring & supervising students & laboratory technicians, shipping & receiving of category B laboratory substances, experimental design, public speaking

Bioinformatics	Analytical assay validations, gene expression data analysis, data science, bash, R, Python, SQLAlchemy, PostgreSQL, microbiome data processing, Next Generation Sequencing (NGS), multivariate statistics, research reproducibility, data visualization
Tools/Applications	SmartSolve document management, Smartsheet & Resource Management by Smartsheet, Enterprise Library and Vaulting Information System, Workday, Microsoft operating systems, Keynote, Adobe Illustrator
Regulatory	Human subjects research (HIPAA & PHI), preparation of IRB and Biosafety applications and protocols, BSL-2 practices, GLP, GMP, GCP
Laboratory	Cloning techniques, gel electrophoresis (PAGE & agarose), western blotting, nucleic acid extraction & purification (DNA & RNA), PCR, qPCR, 16S rRNA amplicon sequencing, nanopore library prep & sequencing, virus propagation, viral titer assays, polyclonal antibody purification, mammalian cell culture (stem cells, epithelial cells), histology, fluorescence microscopy, culturing of fastidious bacterial organisms, synthesis/coupling/purification of peptides, modification of peptides and proteins, HPLC, HPLC-MS, immunohistochemistry, ELISA

AWARDS, GRANTS, & SCHOLARSHIPS

2020	Diane Haynes Memorial Award
2020	College of Science Dean's Graduate Award
2018 – 2019	Alumni Award for Excellence, University of Idaho
2018 – 2019	Glen E. Nielsen & Jean K. Science Scholarship, University of Idaho (\$9,352)
2018 – 2019	Bioinformatics & Computational Biology Graduate Fellowship (\$25,000 stipend & travel)
2017	BEACON travel award (University of Idaho), Gordon Research Conference for Microbial Population Biology GRC (\$2,116)
2014 – 2018	President's Doctoral Scholars Award, University of Idaho (\$50,000 awarded annually)
2013	President's Scholar Award, International Congress of Mucosal Immunology (\$1,000)
Summer 2002	Howard Hughes Summer Research Fellow – Duke University (\$1,000)

PATENTS

1. Lai SK, Wang YY, Kannan A, **Nunn KL**, Subramani B, Cone R. (2012) Compositions and Methods for Inhibiting Pathogen Infections. UNC – Chapel Hill. WO2014070786A1: US 10,100,102 B2 (Issued); EP2912060B1 (Issued); US 2019/0023769A1 (Issued); EP3666285A3 (Pending).

PUBLICATIONS

1. **Nunn KL**, Witkin SW, Schneider GM, Boester A, Nasioudis D, Minis E, Gliniewicz K, Forney LJ. Changes in the vaginal microbiome during the pregnancy to postpartum transition. *Reprod Sci*, 2021; DOI: 10.1007/s43032-020-00438-6.
2. **Nunn KL**, Clair GC, Adkins J, Engbrecht K, Fillmore T, Forney LJ. Amylases in the human vagina. *mSphere*, 2020; 5:e00943-20.
3. **Nunn, KL.**, Ridenhour, BJ., Chester, EM., Vitzthum, VJ., Fortenberry, JD., and Forney, LJ. Vaginal glycogen, not salivary estradiol, is associated with vaginal bacterial community composition in black adolescent women. *J Adolesc Health*. 2019; 65(1):130-138.
4. Schroeder HA, **Nunn KL**, Schaefer A, Henry CE, Lam F, Pauly MH, Whaley KJ, Zeitlin L, Humphrys MS, Ravel J, Lai SK. Herpes simplex virus-binding IgG traps HSV in human cervicovaginal mucus across the menstrual cycle and diverse vaginal microbial composition. *Mucosal Immunol*. 2018;11(5):1477-1486.
5. Henry CE, Wang YY, Yang Qi, Hoang T, Hoen T, Ensign LM, **Nunn KL**, Schroeder H, McCallen J, Moench T, Cone R, Roffler S, Lai SK. Anti-PEG antibodies alter the mobility and biodistribution of densely PEGylated nanoparticles in mucus. *Acta Biomater*. 2016; 43:61-70.
6. **Nunn KL**, Forney LJ. Unraveling the Dynamics of the Human Vaginal Microbiome. *Yale J Biol Med*. 2016; 89(3):331-337.

7. Wang YY, Schroeder HA, **Nunn KL**, Woods K, Anderson DJ, Lai SK, Cone RA. Diffusion of Immunoglobulin G in Shed Vaginal Epithelial Cells and in Cell-Free Regions of Human Cervicovaginal Mucus. *PLoS One*. 2016; 11(6): e0158338.
8. Wang YY, **Nunn KL**, Harit D, McKinley SA, Lai SK. Minimizing biases associated with tracking analysis of submicron particles in heterogeneous biological fluids. *J Control Release*. 2015; 220(Pt A):37-43.
9. **Nunn KL**, Wang YY, Harit D, Humphrys MS, Ma B, Cone R, Ravel J, Lai SK. Enhanced trapping of HIV-1 by human cervicovaginal mucus is associated with *Lactobacillus crispatus*-Dominant microbiota. *mBio*. 2015; 6(5): e01084-15.
10. Wang YY*, Kannan A*, **Nunn KL**, Murphy M, Subramani DB, Moench TM, Cone RA, Lai SK. IgG in cervicovaginal mucus traps HSV and prevents vaginal herpes infections. *Mucosal Immunol*. 2014; 7(5):1036-44.

SOCIETY & PROFESSIONAL MEMBERSHIPS

American Society for Microbiology
 American Association for the Advancement of Science
 The Honor Society of Phi Kappa Phi
 Institute for Bioinformatics and Evolutionary Studies – The University of Idaho
 The Initiative for Maximizing Student Diversity, UNC-Chapel Hill, 2012-2014

TEACHING

- Spring 2023 Guest lecturer, North Carolina DNA Day
 Lectured on DNA and forensics to a 10th grade Biology class at Douglas Byrd High School, Fayetteville, NC.
- Fall 2018 Guest Lecturer, Bio 250: General Microbiology, University of Idaho
 Professors: Larry J. Forney, Ph.D. & Eva M. Top, Ph.D.
 Lecture title: The Human Microbiome
- Lectured on the history of the human microbiome, research methods used to study the human microbiome, therapies to target the human microbiome, and important topics on the human vaginal microbiome.
- Spring 2018 Teaching assistant. English 318: Science Writing, University of Idaho
 Professor: Jodie Nicotra, Ph.D.
- Lectured on the basics of scientific writing, diagramming the important aspects of abstracts, introductions, and discussions. Lectured on science literacy and how it might be influenced by culture, trust, and common knowledge. Paired students with professors to interview for the purpose of writing up a scientific communication piece for the general public about the professors' research. Led a panel discussion with biology professors regarding their experience with their research in the media. Provided feedback and grading on scientific communication reports, scientific infographics, and other class projects.
- Summer 2013 Student lecturer, North Carolina DNA Day
 Taught Immunology modules to 10th graders at Western Alamance High School, Elon, NC.

RESEARCH MENTORSHIP & SUPERVISION

University of Idaho, Laboratory of Dr. Larry J. Forney

- 2018 – 2019 Graduate mentor to Kristen Frafjord, UI undergraduate student
 Project: Exploring the relationship between glycogen and α -amylase in the human vagina. Kristen was a recipient of the Brian & Gayle Hill Undergraduate Research Fellowship from the College of Science (\$1,500).
- 2017 – 2018 Graduate mentor to Shilah Loosle, UI undergraduate student
 Project: Carbon resource utilization by vaginal *Lactobacillus* species. Shilah was the recipient of an Undergraduate Research Grant from the department of Biological Sciences (\$1,500).

- Summer 2017 Graduate mentor to Zoila I. Álvarez Aponte, summer REU student
Project: Elucidating ecological interactions between vaginal lactobacilli.
- Summer 2016 Graduate mentor to Génesis Sánchez Lopez, summer REU student
Project: Resource phenotyping of vaginal *Lactobacillus* species.
- Summer 2015 Graduate mentor to Ana Beatriz Freire, undergraduate exchange student
Project: Determining key resource requirements for vaginal *Lactobacillus* species.

University of North Carolina at Chapel Hill, Laboratory of Dr. Sam K. Lai

- 2013 – 2014 Graduate mentor to Felix Lam, UNC-CH undergraduate researcher
Project: Biochemical characterization of human cervicovaginal mucus
- 2013 – 2014 Graduate mentor to Christine Henry, UNC-CH undergraduate researcher
Project: Characterizing the effect of anti-PEG antibodies on densely PEGylated nanoparticles in mucus.

SERVICE AND OUTREACH

- Spring 2019 Planned, organized, and secured funding (\$3,300) for the first writing retreat for BCB graduate students.
- Since 2017 Graduate representative, Institute for Bioinformatics and Evolutionary Studies (IBEST) Steering Committee
- 2018 Graduate Student Panel – ICUR, Boise, ID, served on a panel of graduate students for the Idaho Conference of Undergraduate Research to discuss graduate school with undergraduate students.

PRESENTATIONS & ABSTRACTS

- **Nunn, KL.** 2021. What's driving changes in the vaginal microbiome (skype). Bio 385-001, Gustavus Adolphus College. St. Peter Minnesota.
- **Nunn, KL.** 2019. The vaginal ecosystem and human health. Invited lecture (skype). Bio 101, Gustavus Adolphus College. St. Peter Minnesota.
- **Nunn, KL.** 2019. Ecological drivers of *Lactobacillus* abundance in human vaginal microbial communities. Poster presented at the Gordon Research Conference for Microbial Population Biology, Andover, NH.
- **Nunn, KL.** 2018. Ecological drivers of human vaginal community composition. Invited talk presented at the 2018 INBRE Research Conference –Moscow, ID.
- **Nunn, KL.** 2018. What are the factors driving changes in the abundances of *Lactobacillus* in human vaginal communities? Invited talk presented at the Thunder Thursday series with the Institute for Bioinformatics and Evolutionary Studies, University of Idaho, Moscow, ID.
- **Nunn, KL.,** Ridenhour, BJ., Fortenberry, JD., Chester, EM., Vitzthum, VJ., Forney, LJ. 2018. Vaginal glycogen, not salivary estradiol nor stress, is associated with vaginal community composition in healthy, black adolescent women. Poster presented at 4th Annual Translational Microbiome Conference, Boston, MA.
- **Nunn, KL.,** Ridenhour, BJ., Fortenberry, JD., Forney, LJ. 2017. Ecological drivers of vaginal community composition. Poster presented at the Gordon Research Seminar and Conference for Microbial Population Biology, Andover, NH.
- **Nunn, KL.,** Ridenhour, BJ., Fortenberry, JD., Forney, LJ. 2017. Ecological drivers of vaginal community composition. Poster presented at the Annual College of Science Research Exposition, Moscow, ID. 2017.
- **Nunn, KL.** 2017. Linking the vaginal microbiome to health and disease. Talk presented at the Palouse Clearwater Environmental Institute (PCEI) Science after hours colloquium – A Multitude of Microbes, Moscow, ID.
- **Nunn, KL.** and Forney, LJ. 2016. Resource utilization by vaginal lactobacilli. Poster presented at the annual IBEST science expo, Moscow, ID.
- **Nunn KL.** and Forney LJ. Resource competition in the human vagina. Poster presented at the annual IBEST science expo 2015, Moscow, Idaho.

- **Nunn, KL.**, Wang, YY., Kannan, A., Harit, D., Cone, R., Lai, S. 2012. Influence of vaginal lactobacilli on mobility of HIV virions in fresh human cervicovaginal mucus. Poster presented at the Annual Biomedical Research Conference for Minority Students (ABRCMS), San Jose, CA.
- **Nunn, KL.**, Wang, YY., Kannan, A., Harit, D., Cone, R., Lai, S. 2013. Influence of vaginal lactobacilli on mobility of HIV virions in fresh human cervicovaginal mucus. Poster presented at the International Congress of Mucosal Immunology (ICMI), Vancouver, Canada. Received the President's Scholar award for this conference.
- **Nunn, KL.**, Wang, YY., Kannan, A., Harit, D., Cone, R., Lai, S. 2013. Influence of vaginal lactobacilli on mobility of HIV virions in fresh human cervicovaginal mucus. Poster presented at The Joint Department of Biomedical Engineering Research Retreat, NC Biotechnology Center. RTP, NC.
- **Nunn, KL.** 2013. The Influence of commensal lactobacilli on the barrier properties of cervicovaginal mucus against HIV. Talk presented at the Virology in Progress (VIP) spring seminar series, Chapel Hill, NC.
- **Nunn, KL.** 2013. The Influence of commensal lactobacilli on the barrier properties of cervicovaginal mucus against HIV. Talk presented at the Mid-Atlantic PREP & IMSD symposium, Virginia Tech, Blacksburg, VA.
- Nair, SA; Darby, MK; Orgambide, G; Sanford, I; Hamilton, PT; Gron, H; Anwer, M; Chen, Y; Benson, RE; Doligalski, ML; White, JM; Krajewska, M; **Nunn, K.** 2011. Self-Assembling high affinity peptides for point of care drug-device combinations. Gordon Research Conferences, Biomaterials & Tissue Engineering, Holderness, NH.
- Hamilton, P.T., Darby, M., Orgambide, G., Sanford, I.G., **Nunn, K.**, Nair, S., Gile, J., Gron, H. 2008. Using bifunctional peptides capable of delivering antibiotics to biomaterials as medical device coatings. Biointerfaces, Minneapolis, MN.