

Curriculum Vitae

Nicole E. Putnam, Ph.D., D(ABMM)

Assistant Professor, Department of Pathology, University of Maryland School of Medicine
Assistant Director, Clinical Microbiology Laboratory,
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Contact Information

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Education

2006-2010 B.S., Biochemistry, Psychology, University of Wisconsin – La Crosse (Magna Cum Laude)
2012-2014 Sc.M., Molecular Microbiology and Immunology, Johns Hopkins Bloomberg School of Public Health, Thesis Advisor – Diane Griffin, M.D., Ph.D., “The cellular immune response to wild-type measles virus infection in rhesus macaques”
2014-2019 Ph.D., Microbiology and Immunology, Vanderbilt University Medical Center, Thesis Advisor – Jim Cassat, M.D., Ph.D., “Innate immunity and bone remodeling during *Staphylococcus aureus* osteomyelitis”

Post Graduate Education and Training

2019-present CPEP Clinical Microbiology Fellow, National Institutes of Health, Clinical Center

Certifications

2021-present Diplomate in Public Health and Medical Microbiology, the American Board of Medical Microbiology of the American Academy of Microbiology

Professional Memberships

2008-2010 American Chemical Society
2014-2019 American Association for the Advancement of Science
2017-2019 American Society for Bone and Mineral Research
2018-present American Society for Microbiology

Employment History

Academic Appointments

2021-present Assistant Professor, Department of Pathology, University of Maryland School of Medicine

Honors and Awards

2009 High Honor Award, Psi Chi International Honor Society
2009 Honor Society Induction, Eta Phi Alpha Honors Fraternity
2010 Honor Society Induction, Golden Key International Honour Society
2010 Best Poster Award, Covidien, awarded for best poster performance at an Intern Poster Symposium
2013 MSCI Scholarship, Lapham-Hickey Steel, awarded academic funds for higher education
2013 Service Outreach Resource Center (SOURCE) Scholar, Johns Hopkins University
2016 Travel Award, International Conference on Gram Positive Pathogens

- 2017 Best Poster Award, Federation of American Societies for Experimental Biology (FASEB) Microbial Pathogenesis: Mechanisms of Infectious Disease
- 2019 Selected Graduate Student Speaker, Vanderbilt Institute for Infection, Immunology, and Inflammation Symposium
- 2020 Public Posting of F31 Full Application and Summary Statement: NIH Educational Sample for Extramural Researchers, NIH Online Resource: <https://www.niaid.nih.gov/grants-contracts/three-new-f31-sample-applications>
- 2020 NIH Clinical Center CEO Award, DLM COVID-19 Testing Response Team

Clinical Activities

- 2015-2018 Vanderbilt Program in Molecular Medicine (VPMM) Training Program
Clinical Mentor: Isaac Thomsen, M.D., Dept of Pediatrics, Division of Infectious Diseases
Shadow 20 hours: Pediatric Infectious Diseases, Orthopedic Surgery
Attend grand rounds, clinical science and bench-to-bedside seminars
- 2017 Clinical Laboratory Medicine Module: ASPIRE Program
Emphasis: Clinical Microbiology
Didactic sessions covering bacteriology, virology, parasitology, and mycology
Inspection of slide preparation
Attend Clinical Microbiology Validation and Diagnostic Management Team meetings
- 2019-2021 Clinical Microbiology Fellowship, National Institutes of Health
One year in clinical microbiology lab rotations: specimen processing, bacteriology, parasitology, mycology, mycobacteriology, molecular diagnostics
2 month as Acting Senior Staff, Bacteriology
4 week rotation with Infectious Disease Consult Service
NIH Clinical Center, 200 bed research hospital
1 week rotation: Johns Hopkins Hospital, Clinical Microbiology Laboratory
2 week rotation: Maryland Department of Health
- 2021-present Assistant Director of Clinical Microbiology, University of Maryland Medical Center

Administrative Service

Local and National Service

- 2013 SOURCE Scholar, Johns Hopkins School of Public Health
- 2017 Organizing Committee, Southeastern Immunology Symposium
- 2020-2021 Ad Hoc Reviewer, *mSphere*, *Journal of Clinical Microbiology*

Teaching Service

Early Student Teaching

- 2016 Microbiology 101, High School for Science and Math at Vanderbilt
1 hour
- 2017 Microbiology Lab, Mini-Medical Scientist Training Program, LEAD Middle School
1 hour
- 2017 Mega-Microbe Nashville Community Event, Children 6-14
8 hours, 1 day

Undergraduate Student Teaching

- 2009 Tutor, Physiological Psychology, 1 undergraduate student
3 hours per week for 6 weeks

Graduate Student Teaching

2013-2017 Lab mentorship
2013: 1 graduate student
2015: 2 graduate students, 1 MSTP student, 1 research assistant I
2016: 2 graduate students, 1 MSTP student, 1 research assistant II
2017: 2 graduate students

2017 Histomorphometry, Vanderbilt Center for Bone Biology, Graduate Students/Fellows
1 hour

2017 Teaching Assistant, Introduction to Clinical and Translational Research, Graduate students
3 hours per week, 6 weeks

Medical Student Teaching

2017 Medical Microbiology and Immunology Lab, First year medical students
8 hours per week, 3 weeks

Infectious Disease Fellow Teaching

2019-2021 Daily Microbiology Rounds, 1-2 fellows
15 minutes per day, 5 days per week, 1x/month

2019-2021 NIH and Visiting Micro Course for Infectious Disease Fellows
2-3 hours per week, 2 weeks per year

Grant Support

Completed Grants

06/01/15 – 08/01/15 Putnam (PI, 10%)
“Effects of Toll-like receptor ligand binding of osteoblast- and osteoclast-lineage cells”
Vanderbilt Institute for Clinical and Translational Research (VICTR) Award
Not peer reviewed
Total Direct Costs: \$2,000

10/01/15-12/31/15 Putnam (PI, 10%)
“Murine bone histology techniques for experimental post-traumatic osteomyelitis model”
Mini-Sabbatical Award, Vanderbilt Center for Microbial Pathogenesis
Not peer reviewed
Total Direct Costs: \$2,000

06/01/17 – 05/31/19 Putnam (PI, 80%)
“The impact of innate immune recognition of *Staphylococcus aureus* on bone homeostasis and skeletal immunity”
NIH/NIAID F31-AI133926
Annual Direct Costs: \$28,500
Total Direct Costs: \$57,000

Publications

Peer-reviewed journal articles

1. Bogerd, HP, Skalsky, RL, Kennedy, EM, Furuse, Y, Whisnant, AW, Flores, O, Shultz, KLW, **Putnam, NE**, Barrows, NJ, Sherry, B, Scholle, F, Garcia-Blanco, MA, Griffin, DE, and BR Cullen. Replication of many human viruses is refractory to inhibition by endogenous cellular microRNAs. *Journal of Virology*. 2014. PMID: 24807715.

2. Stocks BT, Wilhelm AJ, Wilson CS, Marshall AF, **Putnam NE**, Major AS and DJ Moore. (2015). Lupus-prone mice resist immune regulation and transplant tolerance induction. *American Journal of Transplantation*. 2015. PMID: 26372909.
3. Wilde AD, Snyder DE, **Putnam NE**, Valentino MD, Hammer ND, Lonergan, ZR, Hinger SA, Aysanoa EE, Blanchard C, Dunman PM, Wasserman GA, Chen J, Shopsis B, Gilmore MS, Skaar EP, and JE Cassat. Bacterial hypoxic responses revealed as critical determinants of the host-pathogen outcome by TnSeq analysis of *Staphylococcus aureus* invasive infection. *PLoS Pathogens*. 2015. PMID: 26684646.
4. Hendrix AS, Spoonmore TJ, Wilde AD, **Putnam NE**, Hammer ND, Snyder DJ, Guelcher SA, Skaar EP, and JE Cassat. Repurposing the nonsteroidal anti-inflammatory drug diflunisal as an osteoprotective, anti-virulence therapy for *Staphylococcus aureus* osteomyelitis. *Antimicrobial Agents and Chemotherapy*. 2016. PMID: 27324764.
5. Thomsen I, Sapparapu, G, Cassat J, Nagarsheth MB, Kose N, **Putnam NE**, Boguslawsk K, Jones LS, Wood JB, Creech CB, Torres V, and J Crowe. Monoclonal antibodies against the *Staphylococcus aureus* bicomponent leukotoxin AB (LukAB) isolated following invasive human infection reveal diverse binding and modes of action. *Journal of Infectious Diseases*. 2017. PMID: 28186295.
6. Nelson A*, **Putnam NE***, Hauer D, Baxter V, Adams R, and DE Griffin. Evolution of T cell responses during measles virus infection and RNA clearance. *Scientific Reports*. 2017. PMID: 28904342. * *These authors contributed equally to this manuscript.*
7. Brandt SL*, **Putnam NE***, Cassat JE, and CH Serezani. Innate immunity to *Staphylococcus aureus*: Evolving paradigms in superficial and invasive infection. *Journal of Immunology*. 2018. PMID: 29866769. * *These authors contributed equally to this manuscript.*
8. Buenrostro D, Kwakwa KA, **Putnam NE**, Merkel AR, Johnson JR, Cassat JE, and JA Sterling. (2018). Adjuvant TGF- β inhibition in mice reduces the incidence of breast cancer induced bone disease in a myeloid dependent manner. *Bone*. PMID: 29753718.
9. **Putnam NE**, Fulbright LE, Curry JM, Ford CA, Petronglo JR, Hendrix AS, and JE Cassat. MyD88 and IL-1R signaling drive antibacterial immunity and osteoclast-driven bone loss during *Staphylococcus aureus* osteomyelitis. *PLoS Pathogens*. 2019. PMID: 30978245.
10. Ryan D, Patterson N, **Putnam N**, Wilde A, Weiss A, Perry W, Cassat J, Skaar E, Caprioli R, and J Spraggins. MicroLESA: Integrating Autofluorescence Microscopy, *In Situ* Micro-Digestions, and Liquid Extraction Surface Analysis for High Spatial Resolution Targeted Proteomic Studies. *Analytical Chemistry*. 2019. PMID: 31149808.
11. Nelson AN, Lin WW, Shivakoti R, **Putnam NE**, Mangus L, Adams RJ, Hauer D, Baxter VK, and DE Griffin. Association of persistent wild-type measles virus RNA with long-term humoral immunity in rhesus macaques. *JCI Insight*. 2020. PMID: 31935196.
12. Kline A*, **Putnam NE***, Youn JH, East A, Das S, Frank KM, and AM Zelazny. Dacron swab and PBS are acceptable alternatives to flocced swab and viral transport media for SARS-CoV-2. *Diagnostic Microbiology and Infectious Disease*. 2020. PMID: 33080426. * *These authors contributed equally to this manuscript.*
13. **Putnam NE** and Lau AF. Comprehensive study identifies a sensitive, low-risk, closed-system model for detection of fungal contaminants in cell and gene therapy products. *Journal of Clinical Microbiology*. 2021. Epub ahead of print. PMID: 34406794.

Abstracts

1. **Putnam N**, Hendrix A, and J Cassat. The role of innate immune recognition during *S. aureus* osteomyelitis. International Conference on Gram-Positive Pathogens, Omaha, NE. 2016.
2. **Putnam N**, Hendrix A, Curry J, and J Cassat. MyD88-dependent signaling impacts skeletal cell biology and antibacterial defenses during *Staphylococcus aureus* osteomyelitis. American Society for Bone and Mineral Research (ASBMR) Annual Meeting. Denver, CO. 2017.
3. **Putnam N**, Hendrix A, Curry J, and J Cassat. The impact of innate immune recognition of *Staphylococcus aureus* on bone homeostasis and skeletal immunity. Southeastern Immunology Symposium, Nashville, TN. 2017.

4. **Putnam N**, Hendrix A, Curry J, and J Cassat. The impact of innate immune recognition of *Staphylococcus aureus* on bone homeostasis and skeletal immunity. Federation of American Societies for Experimental Biology (FASEB) Molecular Pathogenesis: Mechanisms of Infectious Disease. Snowmass Village, CO. 2017.
5. **Putnam N**, Fulbright L, Curry J, Hendrix A, and J Cassat. *Staphylococcus aureus* alters bone homeostasis and skeletal immunity through innate immune activation. American Society for Microbiology (ASM) Microbe. Atlanta, GA. 2018.
6. **Putnam N**, Fulbright L, Curry J, Hendrix A, and J Cassat. *Staphylococcus aureus* modulates bone remodeling and antibacterial defenses during osteomyelitis via MyD88- and IL-1R-dependent mechanisms. Gordon Research Seminar and Conference (GRS/GRC) Microbial Toxins and Pathogenicity. Waterville Valley, NH. 2018.
7. **Putnam N**, Finin P, Danner RL, Freeman AF, Dulanto Chiang A, Zelazny AM, Ramaswami R, Seyedmousavi S. *Histoplasma capsulatum* in the pleural effusion of an HIV-infected patient with diffuse Kaposi sarcoma. American Society for Microbiology (ASM) Microbe. Accepted: 2020.

Invited Speeches

Local

1. **Putnam N**, Fulbright L, Curry J, Ford C, Petronglo J, Hendrix A, and J Cassat. MyD88 and IL-1R signaling drive antibacterial immunity and osteoclast-mediated bone loss during *Staphylococcus aureus* osteomyelitis. Oral Presentation: Vanderbilt Institute for Infection, Immunology, and Inflammation Symposium. Nashville, TN, 2019.

International

1. **Putnam N**, Hendrix A, Curry J, and J Cassat. The impact of innate immune recognition of *Staphylococcus aureus* on bone homeostasis and skeletal immunity. Oral Presentation: FASEB Molecular Pathogenesis: Mechanisms of Infectious Disease. Snowmass Village, CO, 2017.
2. **Putnam N** and AF Lau. Performance of iLYM media to optimize detection in cell and gene therapy products. Oral Presentation, On Demand: World Microbe Forum. Virtual Conference, 2021.

Proffered Communications

1. **Putnam N**, Rajagopalan R, Karwa A, Nickols M, and L Chinen. Targeted photosensitizer bioconjugates for cancer phototherapy. Covidien Intern Poster Symposium, Covidien, St. Louis, MO. 2010.
2. **Putnam N**, Ford C, Wilde A, Hendrix A, Allaman M, and J Cassat. Mechanisms of inflammatory bone loss during *Staphylococcus aureus*-induced osteomyelitis. Infection & Immunity Symposium, Vanderbilt University, Nashville, TN. 2016.
3. **Putnam N**, Hendrix A, and J Cassat. MyD88-dependent signaling impacts skeletal cell biology and antibacterial defenses during *Staphylococcus aureus* osteomyelitis. Infection & Immunity Symposium, Vanderbilt University, Nashville, TN. 2017.
4. **Putnam N**, Curry J, Allaman M, Zackular J, Washington MK, Wilson K, and J Cassat. Mechanisms of altered bone homeostasis during inflammatory bowel disease. Annual Vanderbilt Digestive Disease Research Center (VDDRC) Retreat, Vanderbilt University, Nashville, TN. 2017.
5. **Putnam N**, Fulbright L, Curry J, Hendrix A, and J Cassat. *Staphylococcus aureus* modulates bone remodeling and antibacterial defenses during osteomyelitis via MyD88- and IL-1R-dependent mechanisms. Vanderbilt Institute for Infection, Immunology, and Inflammation Symposium. Nashville, TN. 2018.
6. **Putnam N**, Fulbright L, Curry J, Ford C, Petronglo J, Hendrix A, and J Cassat. MyD88 and IL-1R signaling drive antibacterial immunity and osteoclast-mediated bone loss during *Staphylococcus aureus* osteomyelitis. Vanderbilt Institute for Infection, Immunology, and Inflammation Symposium. Nashville, TN. 2019.