

**CURRICULUM VITAE**

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**EDUCATION and TRAINING**

**UNDERGRADUATE:**

August 1985 to May 1989	Georgetown University Washington, DC	Bachelor of Science 1989	Chemistry
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**GRADUATE:**

August 1990 to May 1992	University of Pittsburgh School of Medicine Pittsburgh, Pennsylvania	Doctor of Medicine 1999	Medicine
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July 1997 to May 1999			
June 1992 to August 1996	University of Pittsburgh School of Medicine Pittsburgh, Pennsylvania	Doctor of Philosophy 1997	Microbiology

**POST-GRADUATE:**

June 1999 to June 2002	UPMC Graduate Medical Education Department of Pediatrics Children's Hospital of Pittsburgh Pittsburgh, Pennsylvania Program Director: Dena Hofkosh, MD MEd	Residency	Pediatrics
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June 2002 to June 2003	UPMC Graduate Medical Education Department of Pediatrics Children's Hospital of Pittsburgh Pittsburgh, Pennsylvania Program Director: Dena Hofkosh, MD MEd	Chief Residency	Pediatrics
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June 2003 to June 2005	UPMC Graduate Medical Education Department of Pediatrics Division of Allergy, Immunology, and Infectious Diseases Children's Hospital of Pittsburgh of UPMC Pittsburgh, Pennsylvania Program Director: Marian Michaels, MD MPH	Fellowship	Pediatric Infectious Diseases
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**APPOINTMENTS and POSITIONS**

June 2002 to June 2003	University of Pittsburgh School of Medicine Pittsburgh, Pennsylvania	Instructor General Pediatrics
July 2005 to June 2006	University of Pittsburgh School of Medicine Pittsburgh, Pennsylvania	Instructor Pediatric Infectious Diseases
July 2006 to April 2018	University of Pittsburgh School of Medicine Pittsburgh, Pennsylvania	Assistant Professor Pediatric Infectious Diseases
May 2018 to present	University of Pittsburgh School of Medicine Pittsburgh, Pennsylvania	Associate Professor Pediatric Infectious Diseases
September 2018 to present	University of Pittsburgh School of Medicine Pittsburgh, Pennsylvania	Clinical Director Pediatric Infectious Diseases

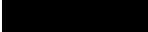
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**CERTIFICATION and LICENSURE**

**SPECIALTY CERTIFICATION:**

American Board of Pediatrics	General Pediatrics Certificate No. 76402	2002 to present
American Board of Pediatrics	Pediatric Infectious Diseases Certificate No. 00955	2005 to present

**MEDICAL or OTHER PROFESSIONAL LICENSURE:**

State of Pennsylvania	MD-418024	Expiration 2020
Drug Enforcement Administration		Expiration 2020

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**MEMBERSHIP in PROFESSIONAL and SCIENTIFIC SOCIETIES**

American Medical Student Association	1990
Alpha Omega Alpha	1999
American Academy of Pediatrics	1999
Infectious Disease Society of America	2003
Pediatric Infectious Disease Society	2003
National Physicians Alliance	2005
American Society for Microbiology	2006
Society for Pediatric Research	2010

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## HONORS

Sigma Xi	1988
NIH Medical Scientist Training Program Scholarship	1990
American Medical Student Association, National President	1996
Alpha Omega Alpha	1999
Allegheny County Medical Society Medical Student Leadership Award	1999
Primary Care Center Senior Resident Award, Children's Hospital of Pittsburgh	2002
Neonatology Senior Resident Award, Children's Hospital of Pittsburgh	2002
A. Vincent Londino Senior Resident Teaching Award, Children's Hospital of Pittsburgh	2002
T32 Fellowship Award, Department of Pediatrics	2004
First Year Fellow Teaching Award, Children's Hospital of Pittsburgh	2004
Endowed Research Instructorship in Pediatrics, Department of Pediatrics	2005
K12 Award, Department of Pediatrics	2007
William I. Cohen Teacher of the Year, Children's Hospital of Pittsburgh	2009, 2014
Excellence in Education Award, Lecturer, University of Pittsburgh School of Medicine	2010, 2017
Excellence in Education Award, Small Group Facilitator, University of Pittsburgh School of Medicine	2012
Charles Watson Teaching Award, Alpha Omega Alpha Honor Medical Society	2014
Pittsburgh Magazine Top Doctors	2014, 2015, 2016, 2017, 2018, 2019
Department of Pediatrics Top 10 Educator	2016, 2017, 2018, 2019
Medical Education Research Certificate (MERC) program, UPMC GME	2016
Outstanding Achievement in Patient Satisfaction, Children's Hospital of Pittsburgh	2016, 2017, 2018
Academy of Master Educators, University of Pittsburgh School of Medicine	2018
Clinical Educator of the Year, University of Pittsburgh School of Medicine	2018
UPMC Award for Commitment and Excellence in Service (ACES)	2019

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## PUBLICATIONS

### 1. Refereed articles

1. **Nowalk AJ**, Tencza SB, Mietzner TA. Coordination of iron by the ferric iron-binding protein of pathogenic *Neisseria* is homologous to the transferrins. *Biochemistry*. 1994 Nov 1;33(43):12769-75. PubMed PMID: 7947682.
2. Adhikari P, Kirby SD, **Nowalk AJ**, Veraldi KL, Schryvers AB, Mietzner TA. Biochemical characterization of a *Haemophilus influenzae* periplasmic iron transport operon. *J Biol Chem*. 1995 Oct 20;270(42):25142-9. PubMed PMID: 7559648.
3. Adhikari P, Berish SA, **Nowalk AJ**, Veraldi KL, Morse SA, Mietzner TA. The fbpABC locus of *Neisseria gonorrhoeae* functions in the periplasm-to-cytosol transport of iron. *J Bacteriol*. 1996 Apr;178(7):2145-9. PubMed PMID: 8606197; PubMed Central PMCID: PMC177918.
4. **Nowalk AJ**, Vaughan KG, Day BW, Tencza SB, Mietzner TA. Metal-dependent conformers of the periplasmic ferric ion binding protein. *Biochemistry*. 1997 Oct 21;36(42):13054-9. PubMed PMID: 9335567.
5. Bruns CM, **Nowalk AJ**, Arvai AS, McTigue MA, Vaughan KG, Mietzner TA, McRee DE. Structure of *Haemophilus influenzae* Fe(+3)-binding protein reveals convergent evolution within a superfamily. *Nat Struct Biol*. 1997 Nov;4(11):919-24. PubMed PMID: 9360608.
6. Mietzner TA, Tencza SB, Adhikari P, Vaughan KG, **Nowalk AJ**. Fe(III) periplasm-to-cytosol transporters of gram-negative pathogens. *Curr Top Microbiol Immunol*. 1998;225:113-35. Review. PubMed PMID: 9386331.

7. Kahn N, Davis A, Wilson M, Wartman S, Sherwood R, **Nowalk AJ**, Kahn R, Bazell C. The Interdisciplinary Generalist Curriculum (IGC) project: an overview of its experience and outcomes. *Acad Med*. 2001 Apr;76(4 Suppl):S9-S12. PubMed PMID: 11299164.
8. Steele D, Steyer T, **Nowalk AJ**. What did we learn about student and faculty "backlash" to the Interdisciplinary Generalist Curriculum Project? *Acad Med*. 2001 Apr;76(4 Suppl):S61-7. PubMed PMID: 11299172.
9. Wartman S, Davis A, Wilson M, Kahn N, Sherwood R, **Nowalk AJ**. Curricular change: recommendations from a national perspective. *Acad Med*. 2001 Apr;76(4Suppl):S140-5. PubMed PMID: 11299188.
10. Bruns CM, Anderson DS, Vaughan KG, Williams PA, **Nowalk AJ**, McRee DE, Mietzner TA. Crystallographic and biochemical analyses of the metal-free *Haemophilus influenzae* Fe<sup>3+</sup>-binding protein. *Biochemistry*. 2001 Dec 25;40(51):15631-7. PubMed PMID: 11747438.
11. Mahnke CB, **Nowalk AJ**, Hofkosh D, Zuberbuhler JR, Law YM. Comparison of two educational interventions on pediatric resident auscultation skills. *Pediatrics*. 2004 May;113(5):1331-5. PubMed PMID: 15121949.
12. Anderson DS, Adhikari P, **Nowalk AJ**, Chen CY, Mietzner TA. The hFbpABC transporter from *Haemophilus influenzae* functions as a binding-protein-dependent ABC transporter with high specificity and affinity for ferric iron. *J Bacteriol*. 2004 Sep;186(18):6220-9. PubMed PMID: 15342592; PubMed Central PMCID: PMC515168.
13. **Nowalk AJ**, Nolder C, Clifton DR, Carroll JA. Comparative proteome analysis of subcellular fractions from *Borrelia burgdorferi* by NEPHGE and IPG. *Proteomics*. 2006 Apr;6(7):2121-34. PubMed PMID: 16485259.
14. Clifton DR, Nolder CL, Hughes JL, **Nowalk AJ**, Carroll JA. Regulation and expression of bba66 encoding an immunogenic infection-associated lipoprotein in *Borrelia burgdorferi*. *Mol Microbiol*. 2006 Jul;61(1):243-58. PubMed PMID: 16824109.
15. **Nowalk AJ**, Gilmore RD Jr, Carroll JA. Serologic proteome analysis of *Borrelia burgdorferi* membrane-associated proteins. *Infect Immun*. 2006 Jul;74(7):3864-73. PubMed PMID: 16790758; PubMed Central PMCID: PMC1489744.
16. **Nowalk AJ**, Green M. Strategies for EBV monitoring, detection and therapy in posttransplant lymphoproliferative disorder. *Future of Virology* 2007; 2: 369-376
17. von Lackum K, Ollison KM, Bykowski T, **Nowalk AJ**, Hughes JL, Carroll JA, Zückert WR, Stevenson B. Regulated synthesis of the *Borrelia burgdorferi* inner-membrane lipoprotein IpLA7 (P22, P22-A) during the Lyme disease spirochaete's mammal-tick infectious cycle. *Microbiology*. 2007 May;153(Pt 5):1361-71. PubMed PMID: 17464050.
18. Gilmore RD Jr, Howison RR, Schmit VL, **Nowalk AJ**, Clifton DR, Nolder C, Hughes JL, Carroll JA. Temporal expression analysis of the *Borrelia burgdorferi* paralogous gene family 54 genes BBA64, BBA65, and BBA66 during persistent infection in mice. *Infect Immun*. 2007 Jun;75(6):2753-64. PubMed PMID: 17371862; PubMed Central PMCID: PMC1932849.
19. Hughes JL, Nolder CL, **Nowalk AJ**, Clifton DR, Howison RR, Schmit VL, Gilmore RD Jr, Carroll JA. *Borrelia burgdorferi* surface-localized proteins expressed during persistent murine infection are conserved among diverse *Borrelia* spp. *Infect Immun*. 2008 Jun;76(6):2498-511. PubMed PMID: 18390998; PubMed Central PMCID: PMC2423095.
20. Weaver KD, Heymann JJ, Mehta A, Roulhac PL, Anderson DS, **Nowalk AJ**, Adhikari P, Mietzner TA, Fitzgerald MC, Crumbliss AL. Ga<sup>3+</sup> as a mechanistic probe in Fe<sup>3+</sup> transport: characterization of Ga<sup>3+</sup> interaction with FbpA. *J Biol Inorg Chem*. 2008 Aug;13(6):887-98. PubMed PMID: 18461372.
21. **Nowalk AJ**, Green M. Update on EBV monitoring, detection and therapy in posttransplant lymphoproliferative disorder after solid organ transplant. *Future Virology* 2010 5:287-296
22. Lee BY, Tai JH, Bailey RR, Smith KJ, **Nowalk AJ**. Economics of influenza vaccine administration timing for children. *Am J Manag Care*. 2010 Mar;16(3):e75-e85. PubMed PMID: 20205492; PubMed Central PMCID: PMC3763213.

23. Lee BY, Ufberg PJ, Bailey RR, Wiringa AE, Smith KJ, **Nowalk AJ**, Higgins C, Wateska AR, Muder RR. The potential economic value of a *Staphylococcus aureus* vaccine for neonates. *Vaccine*. 2010 Jun 23;28(29):4653-60. PubMed PMID: 20472028; PubMed Central PMCID: PMC2896294.
24. Campfield BT, Nolder CL, Davis A, Hirsch R, **Nowalk AJ**. The DBA/1 strain is a novel mouse model for experimental *Borrelia burgdorferi* infection. *Clin Vaccine Immunol*. 2012 Oct;19(10):1567-73. PubMed PMID: 22855391; PubMed Central PMCID: PMC3485876.
25. Georgievskaya Z, **Nowalk AJ**, Randhawa P, Picarsic J. *Bartonella henselae* endocarditis and glomerulonephritis with dominant C3 deposition in a 21-year-old male with a Melody transcatheter pulmonary valve: case report and review of the literature. *Pediatr Dev Pathol*. 2014 Jul-Aug;17(4):312-20. PubMed PMID: 24896298.
26. Campfield BT, Nolder CL, Marinov A, Bushnell D, Davis A, Sychala C, Hirsch R, **Nowalk AJ**. Follistatin-like protein 1 is a critical mediator of experimental Lyme arthritis and the humoral response to *Borrelia burgdorferi* infection. *Microb Pathog*. 2014 Aug;73:70-9. PubMed PMID: 24768929.
27. da Silva YS, Hamilton MF, Horvat C, Fink EL, Palmer F, **Nowalk AJ**, Winger DG, Clark RS. Evaluation of Electronic Medical Record Vital Sign Data Versus a Commercially Available Acuity Score in Predicting Need for Critical Intervention at a Tertiary Children's Hospital. *Pediatr Crit Care Med*. 2015 Sep;16(7):644-51. PubMed PMID: 25901545.
28. Stillwell T, Green M, Barbadora K, Ferrelli JG, Roberts TL, Weissman SJ, **Nowalk AJ**. Outbreak of KPC-3 Producing Carbapenem-Resistant *Klebsiella pneumoniae* in a US Pediatric Hospital. *J Pediatric Infect Dis Soc*. 2015 Dec;4(4):330-8. PubMed PMID: 26582872.
29. Ramgopal S, Obeid R, Zuccoli G, Cleves-Bayon C, **Nowalk AJ**. Lyme disease-related intracranial hypertension in children: clinical and imaging findings. *J Neurol* 2016 Mar;263(3):500-7. PubMed PMID: 26739381.
30. Rottgers SA, Camison L, Mai R, Shakir S, Grunwaldt L, **Nowalk AJ**, Natali M, Losee JE. Antibiotic Use in Primary Palatoplasty: A Survey of Practice Patterns, Assessment of Efficacy, and Proposed Guidelines for Use. *Plast Reconstr Surg*. 2016 Feb;137(2):574-82. PubMed PMID:26818293.
31. **Nowalk A**, Green M. Epstein-Barr Virus. *Microbiol Spectr*. 2016 Jun;4(3). PubMed PMID: 27337443.
32. Rothman MJ, Tepas JJ 3rd, **Nowalk AJ**, Levin JE, Rimar JM, Marchetti A, Hsiao AL. Development and validation of a continuously age-adjusted measure of patient condition for hospitalized children using the electronic medical record. *J Biomed Inform*. 2017 Feb; 66:180-193. PubMed PMID: 28057565.
33. Winstead M, Ozolek J, **Nowalk A**, Williams J, Vander Lugt M, Lin P. Disseminated Lichtheimia ramosa Infection After Hematopoietic Stem Cell Transplantation in a Child with Chronic Granulomatous Disease. *Pediatr Infect Dis J*. 2017 Mar 22. PubMed PMID: 28333712.
34. Ye Y, Wagner MM, Cooper GF, Ferraro JP, Su H, Gesteland PH, Haug PJ, Millett NE, Aronis JM, **Nowalk AJ**, Ruiz VM, López Pineda A, Shi L, Van Bree R, Ginter T, Tsui F. A study of the transferability of influenza case detection systems between two large healthcare systems. *PLoS One*. 2017 Apr 5;12(4):e0174970. PubMed PMID: 28380048; PubMed Central PMCID: PMC5381795.
35. Yamada M, **Nowalk AJ**. Two sides of the Epstein-Barr virus (EBV) coin: Long-term control of EBV after liver transplantation? *Pediatr Transplant*. 2017 Aug;21(5):10.1111/petr.12943. doi: 10.1111/petr.12943. Epub 2017 May 22. PMID: 28544040.
36. Ferraro JP, Ye Y, Gesteland PH, Haug PJ, Tsui FR, Cooper GF, Van Bree R, Ginter T, **Nowalk AJ**, Wagner M. The effects of natural language processing on cross-institutional portability of influenza case detection for disease surveillance. *Appl Clin Inform*. 2017 May 31;8(2):560-580. PubMed PMID: 28561130.
37. Bowen A, Wiesenfeld HC, Kloesz JL, Pasculle AW, **Nowalk AJ**, Brink L, Elliot E, Martin H, Tarr CL. Notes from the Field: *Cronobacter sakazakii* Infection Associated with Feeding Extrinsicly Contaminated Expressed Human Milk to a Premature Infant - Pennsylvania, 2016. *MMWR Morb Mortal Wkly Rep*. 2017 Jul 21;66(28):761-762. PubMed PMID: 28727679.

38. Ramgopal S, Rosenkranz M, **Nowalk AJ**, Zuckerbraun NS. Sternoclavicular Arthritis as a Clinical Presentation for Lyme Disease. *Pediatrics*. 2018 Apr;141(Suppl 5): S466-S469. PMID: 29610173
39. Sommerfeld CG, Weiner DJ, **Nowalk A**, Larkin A. Hypersensitivity Pneumonitis and Acute Respiratory Distress Syndrome From E-Cigarette Use *Pediatrics*. 2018Jun;141(6):e20163927. doi: 10.1542/peds.2016-3927. Epub 2018 May 17. PMID: 29773665.
40. Lopez SMC, Campfield BT, **Nowalk AJ**. Oral Management for Pediatric Lyme Meningitis. 2019 Jul 1;8(3):272-275. doi:10.1093/jpids/piy072. PMID: 30169816.
41. Eddens T, Kaplan DJ, Anderson AJM, **Nowalk AJ**, Campfield BT. Insights from the Geographic Spread of the Lyme Disease Epidemic. *Clin Infect Dis*. 2019 Jan 18;68(3):426-434. doi: 10.1093/cid/ciy510. PMID: 29920580; PMCID: PMC6336907.
42. Sick-Samuels AC, Goodman KE, Rapsinski G, Colantouni E, Milstone AM, **Nowalk AJ**, Tamma PD. A Decision Tree Using Patient Characteristics to Predict Resistance to Commonly Used Broad-Spectrum Antibiotics in Children with Gram-Negative Bloodstream Infections. *J Pediatric Infect Dis Soc*. 2019 Jan 25:10.1093/jpids/piy137. doi: 10.1093/jpids/piy137. Epub ahead of print. PMID: 30690525.
43. Raghu VK, **Nowalk AJ**, Srinath AI. Should Children with Constipation Undergo Blood Lead Level Screening? *Clin Pediatr (Phila)*. 2019 Jun;58(6):627-632. doi: 10.1177/0009922819832029. Epub 2019 Feb 21. PMID: 30789011; PMCID: PMC6615939.
44. Shaikh N, Martin JM, Hoberman A, Skae M, Milkovich L, **Nowalk A**, McElheny C, Hickey RW, Kearney D, Majd M, Shalaby-Rana E, Tseng G, Alcorn JF, Kolls J, Kurs-Lasky M, Huo Z, Horne W, Lockhart G, Pohl H, Shope TR. Host and Bacterial Markers that Differ in Children with Cystitis and Pyelonephritis. *J Pediatr*. 2019 Jun;209:146-153.e1. doi: 10.1016/j.jpeds.2019.01.012. Epub 2019 Mar 21. PMID: 30905425; PMCID: PMC6535366.
45. Ramgopal S, Walker LW, Vitale MA, **Nowalk AJ**. Factors associated with serious bacterial infections in infants ≤60 days with hypothermia in the emergency department. *Am J Emerg Med*. 2019 Jun;37(6):1139-1143. doi: 10.1016/j.ajem.2019.04.015. Epub 2019 Apr 11. PMID: 31006603.
46. Ramgopal S, Walker LW, Tavarez MM, **Nowalk AJ**, Vitale MA. Serious Bacterial Infections in Neonates Presenting Afebrile With History of Fever. *Pediatrics*. 2019 Aug;144(2):e20183964. doi: 10.1542/peds.2018-3964. PMID: 31345996.
47. Ramgopal S, Walker LW, **Nowalk AJ**, Cruz AT, Vitale MA. Immature neutrophils in young febrile infants. *Arch Dis Child*. 2019 Sep;104(9):884-886. doi: 10.1136/archdischild-2019-317143. Epub 2019 Jun 20. PMID: 31221623.
48. Beach CM, Hart SA, **Nowalk A**, Feingold B, Kurland K, Arora G. Increasing Burden of Lyme Carditis in United States Children's Hospitals. *Pediatr Cardiol*. 2019 Nov 14:10.1007/s00246-019-02250-9. doi: 10.1007/s00246-019-02250-9. Epub ahead of print. PMID: 31728570.

## 2. Reviews, invited published papers, proceedings of conference and symposia, monographs, books, and book chapters

1. **Nowalk, AJ**. The Fbp Family of Free Fe(III) Transporters. Ph.D. thesis. University of Pittsburgh, 1997.
2. **Nowalk AJ**. Green M. Diagnosis, prevention, and management of Epstein-Barr virus-associated posttransplant lymphoproliferative disorders in organ transplant recipients. *Curr Opin Organ Transplant* 2003; 8:276–282
3. Green M, **Nowalk AJ**, Riebel W. *Leuconostoc* species. In: www.antimicrobe.org (Yu VL, ed.) ESun Technologies, 2006.
4. Green M, **Nowalk AJ**, Riebel W. *Leuconostoc* species. In: Antimicrobial Therapy and Vaccines, Vol I. Microbes (Yu VL, ed.), 3rd ed. ESun Technologies, 2007.
5. **Nowalk AJ**. Green M. Viral infections in solid organ transplants: Epstein-Barr virus infection and post-transplant lympho-proliferative disorder. *Rev Argent Transpl* 2010 2(2):76-89.

6. Zitelli, B, McIntire, S, and **Nowalk AJ**, editors. Zitelli and Davis Atlas of Pediatric Physical Diagnosis, 6th edition. Elsevier, 2012.
7. **Nowalk A**, Green M. EBV infection in the Immunocompromised Host. IN: Diagnostic Microbiology of the Immunocompromised Host, 2nd Eds. Eds: Hayden RT. ASM Press, August 2016.
8. Zitelli, B, McIntire, S, and **Nowalk AJ**, editors. Zitelli and Davis Atlas of Pediatric Physical Diagnosis, 7th edition. Elsevier, 2017.
9. Podd BS, Simon DW, Lopez S, **Nowalk A**, Aneja R, Carcillo JA. Rationale for Adjunctive Therapies for Pediatric Sepsis Induced Multiple Organ Failure. *Pediatr Clin North Am.* 2017 Oct;64(5):1071-1088. PMID: 28941536
10. Taylor MD, Allada V, Moritz ML, **Nowalk AJ**, Sindhi R, Aneja RK, Torok K, Morowitz MJ, Michaels M, Carcillo JA. Use of C-Reactive Protein and Ferritin Biomarkers in Daily Pediatric Practice. *Pediatr Rev.* 2020 Apr;41(4):172-183. doi: 10.1542/pir.2018-0101. PMID: 32238546

### 3. Published Abstracts

1. Weisenfeld, HC, **Nowalk, AJ**, Wahlberg, BJ, Adhikari P, and Mietzner, TA. Iron-Acquisition and Diseases Produced by Pathogenic Neisseria. Proceedings of the Ninth International Pathogenic Neisseria Conference, p. 144, Winchester, England, 1994
2. **Nowalk, AJ**, and Mietzner, TA. High Affinity Iron-Binding by Fbp is Homologous to the Transferrins at Both the Structural and Functional Level. Proceedings of the Ninth International Pathogenic Neisseria Conference, P. 178, Winchester, England, 1994.
3. **Nowalk, AJ**, Veraldi, K, McTigue, M, and Mietzner, TA. Structural and functional homology between periplasmic free-iron binding proteins and the transferrins. Program Abstracts for the American Society for Microbiology 1995 Annual Meeting, Washington, D.C., 1995.
4. Bruns, CM, Arvai, AS, **Nowalk, AJ**, Mietzner, TA, McRee, DE, and Tainer, JA. Structure analysis of key drug design target enzymes from human pathogens. Meeting of the International Union of Crystallography, Seattle, Washington, 1996.
5. **Nowalk, AJ**, and Mietzner, TM. The Fbp Family of Periplasmic Binding Proteins. Proceedings of the 10th International Pathogenic Neisseria Conference, Baltimore, MD, 1996. Oral presentation.
6. Bruns, CM, **Nowalk, AJ**, Arvai, AS, McTigue, MS, Mietzner, TA and McRee, DE. Crystal Structure of Haemophilus Ferric-binding Protein: Insights into the evolution of the Transferrin superfamily. West Coast Protein Crystallography Workshop, Asilomar Conference Center, Asilomar, California, 1997.
7. Carroll, J.A., C. Nolder, and **A.J. Nowalk**, Analysis of the soluble proteins of Borrelia burgdorferi by comparative 2D-gel and MALDI-TOF. January 28, 2004. Gordon Research Conference, Biology of Spirochetes, Ventura, California.
8. **Nowalk, AJ**, Barbadora, K, Michaels, M, and Green, M. Probiotic-associated Leuconostoc bacteremia in children with intestinal failure. October 2, 2004. Infectious Disease Society of America Annual Meeting, Boston, MA, 2004.
9. **Nowalk, AJ**, Barbadora, K, Michaels, M, and Green, M. Probiotic-associated Leuconostoc bacteremia in children with intestinal failure: an intervention. October 7, 2005. Infectious Disease Society of America Annual Meeting, San Francisco, CA, 2005. Oral presentation.
10. **Nowalk AJ**. Gilmore RD. Carroll JA. Serological Proteomic Analysis (SERPA) of mammals infected with Borrelia burgdorferi B31 by tick transmission. September 12, 2005. 10th International Conference on Lyme Borreliosis and Other Tick-Borne Diseases, Vienna, Austria. Abstract 5
11. Howison RR. **Nowalk AJ**. Clifton DR. Nolder C. Hughes JL. Carroll JA. Gilmore RD. Temporal analysis of the Borrelia burgdorferi paralogue gene family 54 expression during chronic infection in mice. September

- 13, 2005. 10th International Conference on Lyme Borreliosis and Other Tick-Borne Diseases, Vienna, Austria. Abstract P76.
12. Hughes, J.L., **A.J. Nowalk**, J.A. Carroll. Localization and expression of immunogenic *Borrelia burgdorferi* lipoproteins associated with early-disseminated Lyme disease. March, 11, 2006. Pittsburgh Bacterial Meeting, Duquesne University, Pittsburgh, Pennsylvania.
  13. Clifton DR. Nolder CL. **Nowalk AJ**. Carroll JA. Characterization of the bba66 promoter region and determination of a putative regulatory protein-binding site in *Borrelia burgdorferi*. April 23, 2006. Gordon Research Conference, Biology of Spirochetes, Il Ciocco, Barga, Italy.
  14. **Nowalk AJ**. Clifton DR. Nolder CL. Hughes J. Carroll JA. Serologic analysis of immune response to *Borrelia burgdorferi* pgf 54 membrane proteins. April 23, 2006. Gordon Research Conference, Biology of Spirochetes, Il Ciocco, Barga, Italy.
  15. **Nowalk AJ**. Gilmore RD. Carroll JA. Serologic proteome analysis of *Borrelia burgdorferi* membrane-associated proteins. May 25, 2006. American Society for Microbiology Annual Meeting, Orlando, Florida.
  16. Howison RR. Carroll JA. **Nowalk AJ**. Clifton DR. Nolder C. Gilmore RD. Modulation of Host Antibody Response to Paralogous Gene Family 54 During Mouse Infection with *Borrelia burgdorferi* B31. May 25, 2006. American Society for Microbiology Annual Meeting, Orlando, Florida.
  17. **Nowalk, AJ** and J.A. Carroll. Proteomic identification of *Borrelia burgdorferi* membrane proteins as novel diagnostic and vaccine antigens. Infectious Diseases Society of America 46th Annual Meeting. October 12-15, 2006. Toronto, Ontario, Canada. Abstract # 408.
  18. Clifton DR, **Nowalk AJ**, and Carroll JA. Serological reactivity of paralogous gene family 54 members in murine and human infection with *Borrelia burgdorferi*. 107th General Meeting of the American Society for Microbiology. May 21-25, 2007. Toronto, Ontario, Canada. Abstract # D-032.
  19. Gilmore Jr., R.D., V.L. Schmit, R.R. Howison, **A.J. Nowalk**, D.R. Clifton, C. Nolder, J.L. Hughes, J.A. Carroll,. *B. burgdorferi* temporal gene expression during persistent infection in mice. January 26, 2008. Gordon Research Conference, Biology of Spirochetes, Ventura, California.
  20. **Nowalk, A.J.**, D.R. Clifton, and J.A. Carroll. Serologic reactivity and protective capacity of linear plasmid 54 lipoproteins. January 26, 2008. Gordon Research Conference, Biology of Spirochetes, Ventura, California.
  21. Hughes, J.L., D.R. Clifton, C.L. Nolder, **A.J. Nowalk**, R.R. Howison, V.L. Schmit, R.D. Gilmore, Jr., and J.A. Carroll. Characterization of a conserved group of immunogenic outer-surface lipoproteins that are encoded by linear plasmid 54 in *B. burgdorferi*. January 26, 2008. Gordon Research Conference, Biology of Spirochetes, Ventura, California.
  22. Green, M, E. Green, K. Barbadora, C. Creech, **A. Nowalk**, E. R. Wald. Cefepime (CPE) Resistance & Extended-Spectrum Beta-Lactamase (ESBL) in Pediatric Isolates of *Enterobacter cloacae*: Multicenter Surveillance. October 27, 2008. 48th Annual ICAAC/IDSA 47th Annual Meeting, Washington, DC. Abstract #C2-3921.
  23. Spector, Z., W. Mcghee, M. Green, M. Michaels, and **A. Nowalk**. Antibiotic Lock Therapy (ALT) for Catheter-Related Bloodstream Infections (CRBSI) in Children. October 26, 2008. 48th Annual ICAAC/IDSA 47th Annual Meeting, Washington, DC. Oral presentation.
  24. Spector, Z., W. Mcghee, M. Green, M. Michaels, and **A. Nowalk**. Case Control Study of Antibiotic Lock Therapy in the Treatment of Persistent Catheter-related Bloodstream Infection in Children. October 31, 2009. Infectious Diseases Society of America 47th Annual Meeting, Philadelphia, PA. Abstract #811.
  25. Malec, L., Cooper, J., and **A. Nowalk**. Development of Deep Vein Thrombosis and Pulmonary Emboli in the Setting of Osteomyelitis. April 7, 2010. 23rd Annual American Society of Pediatric Hematology/Oncology Meeting. Montreal, Quebec, Canada.



26. Stillwell T, Green M, Barbadora K, Garcia JG, Roberts TL, **Nowalk A**. Molecular Analysis of an Outbreak of Carbapenem-Resistant Klebsiella pneumoniae in a Pediatric Hospital. October 23, 2010. Infectious Diseases Society of America 48th Annual Meeting, Vancouver, BC. Abstract #ABST LB-35.
27. **Nowalk, A.J**. Liposomal Amphotericin Lock Therapy (LAB-ALT) For Catheter-Associated Candidemia: Case Control Study. October 23, 2010. Infectious Diseases Society of America 48th Annual Meeting, Vancouver, BC. Abstract #633.
28. Campfield B, Hirsch R, **Nowalk A**. Follistatin-like Protein 1, a Novel Inflammatory Modulator, is an Early Biomarker for Borrelia burgdorferi Infection. October 22, 2011. Infectious Diseases Society of America 49th Annual Meeting, Boston, MA. Abstract #1151.
29. Tawa, L, Wearden, P, Feingold, B, **Nowalk, A**. 1108. Fever in Ventricular Assist Device Patients . October 22, 2011. Infectious Diseases Society of America 49th Annual Meeting, Boston, MA. Abstract #1108.
30. Czervionke BL, Fox MD, **Nowalk AJ**, Dewar SB. Financial education curriculum for pediatric residents, fellows, and faculty. 2015 UPMC Graduate Medical Education Leadership Conference, Pittsburgh, PA, February 2015.
31. Beach C, Hart SA, **Nowalk A**, Feingold B, Arora G. Increasing burden of Lyme carditis in US children's hospitals. Heart Rhythm Society Scientific Session, Boston, MA, May 2015.
32. McGreevy, M, Wearden, P, **Nowalk, AJ**. Fever and Inflammatory Markers Do Not Predict Infection in Pediatric Ventricular Assist Device Patients. American Heart Association Great Rivers Affiliate Fellows Research Day, University of Pittsburgh, Pittsburgh, 2015.
33. Mayo, A, John, L, Witchel, S, March, C, Woolley, A, **Nowalk, A**. Efficiency and Learning in Family-Centered Rounding. 17<sup>th</sup> UPMC Graduate Medical Education Leadership Conference, Pittsburgh, PA, February 2018.
34. Friehling E, Proud L, **Nowalk A**. Longitudinal Subspecialty Clinic for Pediatric Residents: Enhancing Preparedness for Fellowship Through Continuity and Mentorship. 17<sup>th</sup> UPMC Graduate Medical Education Leadership Conference, Pittsburgh, PA, February 2018.
35. Woods KS, Alcamo AM, Valente M, Prigge A, Hamilton M, **Nowalk AJ**. Formation of interdisciplinary pediatric intensive care unit leadership committee improved ratings of resident rotation. 17<sup>th</sup> UPMC Graduate Medical Education Leadership Conference, Pittsburgh, PA, February 2018.
36. **Nowalk A**, Ho J, Brown J. Design and Implementation of a Flexible Pediatric Scientist Development Track. Association of Pediatric Program Directors 2019 Spring Meeting, New Orleans, LA, March 2019.
37. Mador J, Serbin S, Brickley A, Bernard H, **Nowalk A**, Dewar S, Wise A, Watson K. Encouraging Jeopardy Use for Mental Health and Fatigue, And Its Impact on Resident Wellness. Association of Pediatric Program Directors 2019 Spring Meeting, New Orleans, LA, March 2019.
38. Miller B, Dewar S, **Nowalk A**. Lack of Correlation Between Usmle Scores and Performance in Pediatrics Residency Training Based On ACGME Milestones Ratings. Association of Pediatric Program Directors 2019 Spring Meeting, New Orleans, LA, March 2019.
39. Landzberg L, **Nowalk A**, Cummings E, Bohnhoff J, Mols A. Resident Comfort with Core Procedural Requirements. Association of Pediatric Program Directors 2020 Spring Meeting, March 30 – April 2, 2020. San Diego, CA.
40. Dunnick J, Taft M, Tisherman R, Hickey R, **Nowalk A**, Wilson P. Association of Bacteremia with Vaccination Status in Children Aged 2-36 Months. Pediatric Academic Societies, 2020 Meeting, May 2-5, 2020, Philadelphia, PA.

41. Miller B, Dewar S, **Nowalk A**. Lack of Correlation Between USMLE Scores and Performance in Pediatrics Residency Training Based on ACGME Milestones Ratings. Pediatric Academic Societies, 2020 Meeting, May 2-5, 2020, Philadelphia, PA.

#### 4. Other publications

1. Howard, T, and **Nowalk, AJ**. National Project on Childhood Immunization. AMSA Resource Center, 1994.
2. **Nowalk, AJ**, and Vloedman, K. National Project on Domestic Violence. AMSA Resource Center, 1995.
3. **Nowalk, AJ**. Managed Scare. The New Physician. 45(8): 40, 1996.
4. **Nowalk, AJ**. Prescription: Vote! The New Physician. 45(7): 38, 1996.
5. **Nowalk, AJ**. Behind the Scenes. The New Physician. 45(6):44, 1996.
6. **Nowalk, AJ**. Working for Change, 1996-1997. The New Physician. 45(5): 40, 1996.
7. **Nowalk, AJ**. Help Wanted. The New Physician. 46(4): 40, 1997.
8. **Nowalk, AJ**. Hidden Challenges. The New Physician. 46(3): 33, 1997.
9. **Nowalk, AJ**. In Search of a Compass. The New Physician. 46(2): 32, 1997.
10. **Nowalk, AJ**. Home Free. The New Physician. 46(1):44, 1997.

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### PROFESSIONAL ACTIVITIES

#### TEACHING:

##### Medical Student Teaching

1. Lecturer for Infectious Diseases lecture during MS-3 pediatric core clerkship (2005 – present)
  - a. 12 students, one hour lecture, one session per year
2. PBL facilitator, MS-1 Medical Microbiology course (2005 – present)
  - a. 8-10 students, 8 sessions of 1.5 hours, yearly
3. Lecturer, MS-1 Medical Microbiology course (2007 – present)
  - a. One lecture (Group A streptococcus and Neisseria), 2007-2008
  - b. Two lectures (Group A streptococcus and Neisseria, Inhalation infections), 2009-2010
  - c. Three lectures (Group A streptococcus and Neisseria, Inhalation infections, Extracellular pathogens), 2011-present
  - d. 1 hours per lecture for 140 students
4. MSTP Program Longitudinal Clinical Clerkship director (2007-2014)
  - a. Coordinated longitudinal clerkship placements for 10-15 MSTP student per year
5. PBL facilitator, MS-1 Introduction to Being a Physician course (2009 – present)
  - a. 10 students, four 1 hours sessions
6. Advanced Physical Examination II (2009, 2012, 2014, 2015, 2017)
  - a. Two students, three 2 hours sessions each year
7. Vaccine refusal module, Changing Society, Changing Science course (2017—present)
  - a. 18 students, one hour lecture followed by 2 hour standardized patient session, 2 modules in March and April
8. Co-Director, Pediatric Scientist Development Program (PedSDP), Department of Pediatrics (2016-present)

##### Resident Teaching

1. Working with Patients and Families lecture during pediatric intern orientation (2007-present)
  - a. 35 interns, one hour lecture

2. Resident lectures (microbiology and catheter infections) (2006 – present)
  - a. 40 residents and students, one hours lectures twice yearly

### **Graduate Student Teaching**

1. Vaccinology course (Graduate School of Public Health), 2015 – present
  - a. 10-12 students, one hour lecture

### **Advanced Practice Provider Teaching**

1. Basic Microbiology and Catheter Infection Lectures, 2018 – present

### **Invited Educational Presentations**

1. **Nowalk, AJ.** Integration of total quality management into the third and fourth year curriculum. Presentation to the University of Pittsburgh School of Medicine Curriculum Colloquium, Pittsburgh, PA, 1998.
2. **Nowalk, AJ.** Student activity and curricular reform at the University of Pittsburgh School of Medicine. Presentation to the University of Pittsburgh School of Medicine Board of Visitors, Pittsburgh, PA, 1998.
3. **Nowalk, AJ.** A 16 year old male with fever and shock. Pediatric Grand Rounds, Children’s Hospital of Pittsburgh, November 15, 2001.
4. **Nowalk, AJ.** Skin and soft tissue infections. Pediatric Update, Children’s Hospital of Pittsburgh, April 12, 2004.
5. **Nowalk, AJ.** Skin and soft tissue infections. Pediatric Emergency Medicine Grand Rounds, Children’s Hospital of Pittsburgh, January 19, 2005.
6. **Nowalk, AJ.** Pediatric skin and soft tissue infections. Pediatric Resident Teaching Conference, Children’s Hospital of Pittsburgh, March 30, 2005.
7. **Nowalk, AJ.** Pediatric microbiology review. Pediatric Resident Teaching Conference, Children’s Hospital of Pittsburgh, August 17, 2005.
8. **Nowalk, AJ.** Pharmacology+Evidence+Pediatrics: Choosing drugs for common infections. Pittsburgh Pediatric Nurse Practitioner Conference, Pittsburgh, PA, February 6, 2009.
9. **Nowalk, AJ.** Talking with parents about vaccines. Children’s Hospital of Pittsburgh, Pittsburgh, PA, October 3, 2009.
10. **Nowalk, AJ.** There’s something about MRSA: Common sense infection control for The Children’s Institute. The Children’s Institute of Pittsburgh, Pittsburgh, PA, September 9, and November 12, 2009.
11. **Nowalk, AJ.** Take a Deep Breath: Community Acquired Pneumonia, Three Rivers Pediatric Update, Pittsburgh, PA, May 13, 2010.
12. **Nowalk, AJ.** Talking with Parents about Vaccines, Nursing Grand Rounds, Children’s Hospital of Pittsburgh, Pittsburgh, PA, August 17, 2010.
13. **Nowalk, AJ.** Antibiotic and Infectious Disease Update: Old and new drugs for common infections. Three Rivers NAPNAP 14th Annual Symposium. Pittsburgh, PA, February 4, 2011.
14. **Nowalk, AJ.** Chronic candidal infections: Diagnosis, deficiencies, and treatment. Allergy and Immunology Seminar, Department of Pediatrics, December 21, 2011.
15. **Nowalk AJ.** Pharmacology+Evidence+Pediatrics: Picking antibiotics for common and difficult infections. CCP South Hills, Pittsburgh, PA, July 12, 2012.
16. **Nowalk, AJ.** Talking with Parents about Vaccines, Nursing Grand Rounds, Children’s Hospital of Pittsburgh, Pittsburgh, PA, July 23, 2012.
17. **Nowalk, AJ.** Line Sepsis: Etiology, Treatment, Outcomes. 7th International Pediatric Intestinal Failure & Rehabilitation Symposium, Pittsburgh, PA, September 6, 2012.

18. **Nowalk, AJ.** VAP and Antimicrobial Selection. Pediatric Critical Care Medicine Fellow's Conference, Pittsburgh, PA, February 11, 2014.
19. **Nowalk, AJ.** Talking to parents (and patients) about vaccines. Washington Hospital 36th Annual Scientific Day, Pittsburgh, PA, May 2, 2014.
20. **Nowalk, AJ.** The economics of pediatrics: Workforce, money, and jobs in 2014. Pediatric Resident Noon Conference, Pittsburgh, PA, May 13, 2014.
21. **Nowalk, AJ.** Selected topics in pediatric ID. Adult Infectious Disease Fellow's Conference, Pittsburgh, PA, June 24, 2014.
22. **Nowalk, AJ.** Central line infections. Pediatric Resident Noon Conference, Children's Hospital of Pittsburgh, Pittsburgh, PA, October 1, 2014.
23. **Nowalk, AJ.** Pharmacology+Evidence+Pediatrics: Antibiotic choices for pediatric infections. McKeesport Family Medicine Conference, McKeesport, PA, November 12, 2014.
24. **Nowalk, AJ.** Dewar SB, Gosman, G. Clinical Competence Committees, Fourteenth Annual UPMC Graduate Medical Education Leadership Conference, Pittsburgh, Pa., February 2015
25. **Nowalk, AJ.** Infectious Indications for Immunology Workup: An Infectious Disease Specialist's Point of View, Pediatric Allergy/Immunology Teaching Conference, Pittsburgh, Pa., February 2015
26. **Nowalk, AJ.** Pharmacology + Evidence + Pediatrics: Antibiotic Choices for Common and Difficult Pediatric Infections, Family Medicine Resident Teaching Conference, UPMC St. Margaret's Hospital, Pittsburgh, Pa., March 2015
27. **Nowalk, AJ.** How I Learned to Love Fever and Rash, Family Medicine Resident Teaching Conference, UPMC St. Margaret's Hospital, Pittsburgh, Pa., March 2015
28. **Nowalk, AJ.** Anesthesia and Infection Control: Data and Strategies, Pediatric Anesthesia Resident Conference, Children's Hospital of Pittsburgh of UPMC, Pittsburgh, Pa., April 2015
29. **Nowalk, AJ.** Emerging Infectious Diseases: Fear the Germs!! University of Pittsburgh Global Brigades, Pittsburgh, Pa., April 2015
30. **Nowalk, AJ.** Talking to Parents (and Students) about Vaccines, Children's Hospital of Pittsburgh of UPMC School Nurses Conference, Pittsburgh, Pa., May 2015
31. **Nowalk, AJ.** Talking to Parents (and Patients) about Vaccines, Pennsylvania State Nurses Association, Pittsburgh, Pa., May 2015
32. **Nowalk, AJ.** Dewar SB, Cabral, C. Giving Feedback: Setting Expectations, Meaningful Evaluations, Department of Pediatrics Faculty Development Series, Pittsburgh, Pa., August 2015
33. **Nowalk, AJ.** Tick Tock, Tick Tock: Tick-borne Diseases in the Pittsburgh Area, UPMC Mercy Hospital Noon Conference, Pittsburgh, Pa., September 2015
34. **Nowalk, AJ.** There's a Fungus among Us and Some Sorta Virus: Weird Bugs and Drugs for Them, University of Pittsburgh Advanced Pediatric Practitioner Workshop, UPMC Magee-Womens Hospital, Pittsburgh, Pa., November 2015
35. **Nowalk, AJ.** Perioperative Infection Control: Data and strategies, Pediatric Anesthesia Fellows Teaching Conference, Children's Hospital of Pittsburgh, Pittsburgh, PA, January 2016
36. **Nowalk, AJ.** Too Much Cough-y Isn't Good For You: A 4 year old Female with Persistent Cough, University of Pittsburgh Infectious Disease Grand Rounds, UPMC Presbyterian Hospital, Pittsburgh, Pa, January 2016
37. **Bamat T, Washington NR, Fox M, Rezet B, Zaoutis L, Miller B, Nowalk A.** You Down With Your Pd? (Yea, You Know Me!): How To Cultivate A Winning Relationship Between Chief Residents And Program Directors. APPD 2016 Annual Spring Meeting, New Orleans, LA, April 2016.
38. **Nowalk, AJ.** Mosquito Borne Infections from Arbovirus to Zika, Three Rivers Pediatric Update, Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA, May 2016
39. **Nowalk, AJ.** Mosquito Borne Infections from Arbovirus to Zika, Family Medicine Grand Rounds, UPMC St. Margaret's Hospital, Pittsburgh, PA, September 2016

40. **Nowalk, AJ.** Live Viral Vaccines, Vaccinology Course, Graduate School of Public Health, University of Pittsburgh, Pa, November 2016
41. **Nowalk, AJ.** Choosing Wisely: Antibiotic Selection in the Era of MDRO, Pediatric Critical Care Medicine Fellow's Teaching Conference, Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA, December 2016
42. **Nowalk, AJ.** Mosquito Borne Infections from Arbovirus to Zika, UPMC Shadyside Urgent Care, Pittsburgh, PA, March 2017
43. **Nowalk, AJ.** Rational Prescribing for Common Pediatric Infections, UPMC Family Medicine Refresher Course, Pittsburgh, PA, March 2017
44. **Nowalk, AJ.** Lyme update and Mumps Outbreak, CCP Lunch and Learn Webinar, Pittsburgh, PA, April 2017
45. **Nowalk, AJ.** Professionalism, Resident Noon Conference, Pittsburgh, PA, May 2017
46. **Nowalk, AJ.** Infectious Indications for Immunology Workup, Allergy and Immunology Teaching Conference, Pittsburgh, PA, May 2017
47. **Nowalk, AJ.** Lyme disease update, Pediatric Emergency Medicine Conference, Pittsburgh, PA, September 2017
48. **Nowalk, AJ.** Tick Tock, Tick Tock: Tick-borne Diseases in the Pittsburgh Area, NAPNAP Regional Conference, Pittsburgh, Pa., October 2017
49. **Nowalk, AJ.** Lyme disease update from the Rheumatology Perspective, Pediatric Rheumatology Conference, Pittsburgh, Pa., October 2017
50. **Nowalk, AJ.** Lyme disease Dos, Donts and Tips from the Pittsburgh Epidemic, Update in Internal Medicine 2017, Pittsburgh, Pa., October 2017
51. **Nowalk, AJ.** Choosing Wisely: Antibiotic Selection in the Era of MDRO, Pediatric Critical Care Medicine Fellow's Teaching Conference, Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA, December 2017
52. **Nowalk, AJ and Dewar S.** Fatigue Mitigation, Faculty Development Conference, Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA, December 2017
53. **Nowalk, AJ.** Lyme disease: Epidemic Experience, Myths and Science. Franciscan University Science Seminar Series, Steubenville, OH, February 2018
54. **Nowalk, AJ.** Lyme disease Dos, Donts and Tips from the Pittsburgh Epidemic, Adult Infectious Disease Fellows Conference, Pittsburgh, Pa., February 2018
55. **Nowalk, AJ.** Rational Prescribing for Common Pediatric Infections, Grand Rounds, UPMC St. Margaret's Hospital, Pittsburgh, Pa., March 2018
56. **Nowalk, AJ.** How I Learned to Love Fever and Rash, Family Medicine Resident Teaching Conference, UPMC St. Margaret's Hospital, Pittsburgh, Pa., March 2018
57. **Nowalk, AJ.** Congenital Infections, Family Medicine Resident Teaching Conference, UPMC St. Margaret's Hospital, Pittsburgh, Pa., March 2018
58. **Nowalk, AJ.** Tick-tock! Arthropod borne infections on the Rise, UPMC Family Medicine Refresher Course, Pittsburgh, PA, March 2018
59. **Nowalk, AJ.** Lyme disease: Updates, Tips and Tricks, CCP Lunch and Learn Webinar, Pittsburgh, PA, April 2018
60. **Nowalk, AJ.** Lyme arthritis testing. Pediatric Orthopedic Surgery Conference, Pittsburgh, PA, April 2018
61. **Nowalk, AJ.** Rational antibiotic choices for pediatric infections. McKeesport Family Medicine Conference, McKeesport, PA, April 2018.
62. **Nowalk, AJ.** Vaccine Preventable Disease You can Get on a Run. UPMC EMS Conference, Pittsburgh, PA, November 2018
63. **Nowalk, AJ.** Tick borne infections. Pennsylvania Academy of Family Physicians Nemaocolin CME Conference, Nemaocolin, PA, November 2018.
64. **Nowalk AJ.** Faculty professionalism. Pediatric Emergency Medicine Faculty Development Series, UPMC Children's Hospital of Pittsburgh, Pittsburgh, PA, January 2019.
65. **Nowalk, AJ.** Fever and rash. McKeesport Family Medicine Conference, McKeesport, PA, February 2019.

66. **Nowalk, AJ.** Vector borne infections on the Rise, UPMC Family Medicine Refresher Course, Pittsburgh, PA, November 2019
67. **Nowalk, AJ.** How I Learned to Love Fever and Rash, Family Medicine Resident Teaching Conference, UPMC St. Margaret's Hospital, Pittsburgh, Pa., November 2019
68. **Nowalk, AJ.** Rational antibiotic prescribing, Family Medicine Resident Teaching Conference, UPMC St. Margaret's Hospital, Pittsburgh, Pa., March 2018

**MENTORING:**

1. Medical student scholarly projects
  - a. Lindsay Tawa, 2011-2012: VAD related infections
  - b. Zebulon Spector, 2009-2010: Antibiotic lock therapy
  - c. Taylor Eddens, 2017-2018: Lyme disease epidemic
2. Resident scholarly projects
  - a. Brian Campfield, MD, 2008: E. coli septic arthritis
  - b. Sriram Ramgopal MD, 2015: IIH and Lyme disease
  - c. Christian Pulcini MD, 2016: Bactrim and SJS incidence
  - d. Dara Cohn, MD, 2016: Eosinophilia with nematode infections
  - e. Casey Sommerfeld MD, 2017: Vaping and pneumonitis
3. Fellow Scholarship Oversight Committees
  - a. Brian Campfield, MD, 2009-2012: FSTL-1 and Lyme arthritis
  - b. Vanessa Wright, MD, 2010-2011: Antibiotic lock case control study
  - c. Megan McGreevy, MD, 2014-2015: VAD related infections
  - d. Cheyenne Beach, MD, 2015-2016: National survey of Lyme carditis
  - e. Lorne Walker MD PhD, 2017-2020, Antibiotic lock modeling study

**PATIENT CARE:**

2005 – present	Inpatient PID Attending CHP	9-11 weeks/year
	Outpatient PID clinic CHP	15-20 clinics/year

**ADMINISTRATION AND EDUCATIONAL LEADERSHIP:**

**Curriculum Development**

2012	Subspecialty Pathway curriculum development
2013	Standardized Pediatric Infectious Diseases Curriculum
2013	Introduction to Being a Physician: Down Syndrome Module
2016	Pediatric Scientist Development Program, Department of Pediatrics
2017	Changing Science, Changing Society: Vaccine Refusal Module
2018	Pediatric Scientist Development Program Leadership Development Program
2018	Infectious Disease APP Fellowship Curriculum
2018	Burroughs Wellcome Physician Scientist Incubator, Resources Subcommittee

**Educational Leadership Positions**

2013 to present	Advisory Dean, University of Pittsburgh School of Medicine
2013 to 2014	Chair, Pediatric Residency Clinical Competency Committee

2014 to present Associate Program Director, Categorical Pediatrics, UPMC Graduate Medical Education, Department of Pediatrics

2015 to present Faculty Sponsor, Research Oriented Activities for Residents (ROAR)

2016 to present Co-Director, Pediatric Scientist Program, Department of Pediatrics

2018 to present APP Task Force member

**RESEARCH:**

**Prior Grant Support**

Grant Number	Grant Title	Role and % Effort	Years inclusive	Source Amount
T32 HD042987	The Clinical Interface of Molecular and Cellular Biology	Trainee 100%	2004-2006	NICHHD \$1,098,410
K12 HD052892	Molecular Basis of Pediatric Disease	Trainee 100%	2007-2008	NICHHD \$983,620
K08 AI072365-01A2	The Role of BBI36/38 in Lyme Disease Pathogenesis	Principal Investigator 75%	2008-2012	NIAID \$478,116
3K08 AI072365-03S1	ARRA Supplement for "The Role of BBI36/38 in Lyme Disease Pathogenesis	Principal Investigator 75%	2009-2011	NIAID \$70,000
N/A	The Role of Follistatin-like protein 1 in <i>Borrelia burgdorferi</i> infection	Principal Investigator 50%	2011-2013	CHP RAC
1R01DK087870-01A1	Corticosteroids for children with febrile urinary tract infections	Co-Investigator 5%	2011-2016	NIDDK \$2,946,910
1R01LM011370-01A1	Probabilistic Disease Surveillance	Consultant 3%	2013-2016	NLM \$1,770,069
AI104895-01A1	Colistin-Resistant <i>Acinetobacter baumannii</i>	Co-Investigator 5%	2014-2019	NIAID \$1,874,195

**Prior Research in Education**

IRB	Project Title	Role	Years inclusive	Collaborators
PRO15120304	Collective Intelligence in Pediatric Resident Teams	Co-Investigator	2016-2018	Selma Witchel, Liny John, CHP, Anna Mayo, Anita Wooley, Tepper School of Business, CMU
PRO16040244	Defining Key Factors in Burnout and Resilience in Pediatric Residents (APPD LEARN National Study, John Mahan, PI)	Site Co-Principal Investigator	2016-2018	Stephanie Dewar, Dena Hofkosh

## Seminars and Invited Lectureships related to research and scholarly activities

### Local Presentations

1. **Nowalk, AJ.** Serologic proteome analysis of *Borrelia* membrane proteins. Infectious Disease Research Seminar, University of Pittsburgh School of Medicine, Pittsburgh, PA, November 4, 2005.
2. **Nowalk, AJ.** Lyme Disease, Career Development, and Kids: Lessons from an MD/PhD Past. Medical Scientist Training Program Seminar, Pittsburgh, PA, March 30, 2006.
3. **Nowalk, AJ.** Lyme Disease, Three Rivers Pediatric Update, Pittsburgh, PA, May 26, 2006.
4. **Nowalk, AJ.** The Proteomics of Lyme Disease: A New Twist on Diagnosis and Vaccine Development in *Borrelia burgdorferi*. Pediatric Grand Rounds, Children's Hospital of Pittsburgh, August 17, 2006.
5. **Nowalk, AJ.** Community acquired MRSA. Three Rivers Pediatric Update, Pittsburgh, PA, May 18, 2007.
6. **Nowalk, AJ.** *B. burgdorferi* Proteome Analysis: Pathogenesis, Diagnosis and Prevention of Lyme Borreliosis. CHP External Scientific Advisory Board, Pittsburgh, PA, February 25, 2008.
7. **Nowalk, AJ.** Lyme disease and MRSA: Clinical Updates. Division of Adolescent Medicine, Children's Hospital of Pittsburgh, Pittsburgh, PA, March, 20, 2008.
8. **Nowalk, AJ.** From Proteome to Bedside: What Makes *Borrelia burgdorferi* "Tick". CHP K12 Retreat, Pittsburgh, PA, June 5, 2009.
9. **Nowalk, AJ.** Looking at Lyme from proteome to bedside. University of Pittsburgh Infectious Disease Grand Rounds, Pittsburgh, PA, February 18, 2010.
10. **Nowalk, AJ.** Tissue tropism and disease with *Borrelia burgdorferi*. CHP K12 Retreat, Pittsburgh, PA, April 15, 2010.
11. **Nowalk, AJ.** Lyme disease clinical update, Next Generation Pediatrics, Butler, PA, August 25, 2010
12. **Nowalk, AJ.** Lyme Disease: Diagnostic and Therapeutic Challenges. Southwestern Pennsylvania Association of Occupational Health Nurses Symposium, Monroeville, PA, September 16, 2011.
13. **Nowalk, AJ.** Host and Pathogen: Molecular Connections in Murine Lyme Disease. Molecular Medicine Seminar, Department of Pediatrics, Pittsburgh, PA, October 11, 2013.
14. **Nowalk, AJ.** Neurologic Lyme disease: Complications of diagnosis and treatment. Neurology Seminar, Department of Pediatrics, December 14, 2011.
15. **Nowalk, AJ.** Lyme Disease: Diagnostic and Therapeutic Challenges. UPMC St. Margaret Hospital Medical Grand Rounds, Aspinwall, PA, April 12, 2012.
16. **Nowalk, AJ.** Don't be Rash! Lyme disease and other exanthems. Three Rivers Pediatric Update, Pittsburgh, PA, May 17, 2012.
17. **Nowalk, AJ.** Lyme disease: Arthritis diagnosis and management. Pediatric Rheumatology Seminar, Department of Pediatrics, Pittsburgh, PA, May 30, 2012.
18. **Nowalk, AJ.** Lyme disease clinical update, CCP Armstrong Pediatrics, Armstrong, PA, May 31, 2012.
19. **Nowalk, AJ.** Antibiotic resistance in the NICU: The challenge of MDROs in the neonatal patient. Neonatal Nurse Practitioner Conference, UPMC Magee Women's Hospital, October 26, 2013.



20. **Nowalk, AJ.** Antibiotic resistance in the NICU: The challenge of MDROs in the neonatal patient. PSNA Regional Conference, UPMC Magee Women's Hospital, October 26, 2013.
21. **Nowalk, AJ.** The Lyme Disease Epidemic in Western Pennsylvania. Pediatric Grand Rounds, Children's Hospital of Pittsburgh, Pittsburgh, PA, January 9, 2014.
22. **Nowalk, AJ.** Lyme Extravaganza! Some Dos and Don'ts from the Pittsburgh Epidemic. Three Rivers Pediatric Update, Pittsburgh, PA, May 15, 2014.
23. **Nowalk, AJ.** Lyme Disease: Some Tips from the Pittsburgh Epidemic. Children's Community Pediatrics Webinar, Pittsburgh, PA, June 5, 2014.
24. **Nowalk, AJ.** Lyme disease update. Adult Infectious Disease Grand Rounds, Pittsburgh, PA, June 12, 2014.
25. **Nowalk, AJ.** Lyme disease serology. Pediatric Emergency Medicine Conference, Pittsburgh, PA, October 8, 2014.
26. **Nowalk, AJ.** Emerging Multidrug-resistant Pathogens: What's Left in the Antibiotic Cupboard? Pediatric Intensive Care Unit Fellows Conference, Pittsburgh, Pa., February 2015
27. **Nowalk, AJ.** Lyme Extravaganza! Some Dos and Don'ts from the Pittsburgh Epidemic, UPMC St. Margaret's Hospital Grand Rounds, Pittsburgh, Pa., March 2015
28. **Nowalk, AJ.** Lyme Disease, Pennsylvania Academy of Family Physicians Pittsburgh CME Conference and UPMC 43rd Refresher Course in Family Medicine, Pittsburgh, PA, March 2016
29. **Nowalk, AJ.** Lyme disease Quandries and Enigmas, Pediatric Rheumatology Teaching Conference, Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA, April 2016
30. **Nowalk, AJ.** Lyme disease: Testing, treatment and other enigmas, Pediatric Emergency Medicine Teaching Conference, Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA, June 2016
31. **Nowalk, AJ.** Ophthalmologic Manifestations of Lyme disease, Pediatric Ophthalmology Teaching Conference, Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA, June 2016
32. **Nowalk, AJ.** Neurologic Manifestations of Lyme disease, Child Neurology Fellow's Conference, Children's Hospital of Pittsburgh of UPMC, Pittsburgh, PA, June 2016
33. **Nowalk, AJ.** Lyme Disease: Dos and Don'ts from the Pittsburgh Epidemic, Medical Grand Rounds, Excelsa Westmoreland Hospital, Greensburg Pa, September 2016
34. **Nowalk, AJ.** Lyme Disease: Dos and Don'ts from the Pittsburgh Epidemic, 1st Annual John Govi, MD Memorial Conference, Excelsa Latrobe Hospital, Latrobe, Pa, December 2016
35. **Nowalk, AJ.** Vector borne infections on the Rise, Grand Rounds, UPMC St. Margaret's Hospital, Pittsburgh, Pa., November 2019

#### **Regional, National, and International Presentations**

1. **Nowalk, AJ.** Probiotic-associated Leuconostoc bacteremia in children with intestinal failure. Infectious Disease Society of America Annual Meeting, San Francisco, CA, October 6, 2005.
2. **Nowalk, AJ.** Lyme disease. Pediatric Grand Rounds, Al DuPont Children's Hospital, Wilmington, DE, April 27, 2011.
3. **Nowalk, AJ.** Lyme Disease: Diagnostic and Therapeutic Challenges. Indiana Hospital Medical Grand Rounds, Indiana, PA, August 15, 2012.

4. **Nowalk, AJ.** Pharmacology + Evidence + Pediatrics: Antibiotics choices for common and difficult pediatric infections. Nurse Practitioner Association of Southwestern Pennsylvania Infectious Disease Update, Butler, PA, April 20, 2013
5. **Nowalk, AJ.** Talking to parents (and patients) about vaccines. Indiana Hospital Grand Rounds, Indiana, PA, July 16, 2014.
6. **Nowalk AJ.** Lyme disease. West Virginia University School of Medicine Department of Pediatrics Grand Rounds, Morgantown, WV, February 2019.
7. **Nowalk AJ.** Lyme disease. UPMC Susquehanna Grand Rounds, Susquehanna, PA, May 2019.
8. **Nowalk AJ.** Infections in people with Down syndrome. Down Syndrome Medical Interest Group, Pittsburgh, PA, June 2019.

**LIST of CURRENT RESEARCH and SCHOLARLY ACTIVITIES and INTERESTS:**

Lyme disease  
 Medical education  
 Antibiotic resistance  
 Gram negative infections  
 Hospital acquired infections

**SERVICE:**

University and Medical School

University of Pittsburgh School of Medicine Curriculum Committee	July 1997 to May 1999
University of Pittsburgh School of Medicine Admissions Committee	July 1992 to May 1994
	July 2003 to July 2009
MSTP Longitudinal Clinical Clerkship, Course Director	July 2007 to October 2014
Children’s Hospital of Pittsburgh Pediatric Intern Selection Committee	July 2009 to present
Human Facial Allograft Transplantation Data Safety Monitoring Board	July 2010 to present
Faculty and Students Together (FAST) Advisor	July 2012 to June 2013
Advisory Dean, University of Pittsburgh School of Medicine	July 2013 to present

Hospital

Children’s Hospital of Pittsburgh Cerner Physician Advisory Group	July 2001 to present
Infection Prevention Committee	July 2003 to present
Information Technology Executive Committee	October 2004 to October 2006
Children’s Hospital of Pittsburgh Cerner Physician Advisory Group Acting CMIO and Chair	July 2005 to August 2006
Animal Research Care Committee, CHP (alternate)	July 2007 to March 2009
CHP Medical Executive Committee	July 2011 to present
Antimicrobial Stewardship Program	July 2011 to present
CHP Credentials Committee	July 2013 to present
President-Elect, CHP Medical Staff	July 2013 to July 2015
President, CHP Medical Staff	July 2015 to June 2017
Chair, CHP Credentials Committee	July 2015 to June 2017
Past President, CHP Medical Staff	July 2017 to December 2019
APP Taskforce	July 2016 to present
CHP Professional Practice Evaluation Committee	October 2018 to present

National and governmental

Primary Care Organization Consortium (PCOC), AMSA representative	May 1996 to May 1997
AAMC, Consultant on Match algorithm change, AMSA representative	May 1996 to May 1997
Interdisciplinary Generalist Curriculum Project (HRSA)	May 1996 to May 2000
Genetics in Primary Care Project (HRSA/NIH)	July 1998 to June 2000

**Editorial**

Associate Editor, *Atlas of Pediatric Physical Diagnosis*

Reviewer, *Pediatric Transplantation*, *Journal of the Pediatric Infectious Disease Society*, *Transplant Infectious Disease*, *Clinical Microbiology Reviews*