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**Research Description**

Our group is interested in understanding the complex microbial-host interactions of the human microbiome. Our previous work has identified microbial hallmarks of chronic inflammatory diseases and specific bacterial species that modulate immune responses characteristic of a number of these disorders. We primarily focus our efforts on two areas of research: comprehensive microbiome structural and functional analyses related to aspects of chronic gastrointestinal disease with a particular focus on Inflammatory Bowel Disease and early microbial exposure events that shape the developing neonatal immune system and impact subsequent allergic disease development.

Education

- 1995 University College Dublin, Ireland B.S., Microbiology
- 2000 University College Dublin, Ireland Ph.D., Molecular Microbiology
- 2001 University College Dublin, Ireland Fellow, Biochemistry
- 2002-05 Stanford University Fellow, Microbiology and Immunology

Training

- 2000-01 University College Dublin, Ireland, Postdoctoral Fellow
- 2002-05 Stanford University Postdoctoral Fellow
- 2005-2007 University of California, San Francisco Assistant Research Microbiologist
- 2007-2009 University of California, San Francisco Assistant Adjunct Professor
- 2009 – present University of California, San Francisco, Assistant Professor in Residence

Memberships and Affiliations

- 2010- present Member, International Society for Microbial Ecology
- 2004-present Member, American Society for Microbiology
- 2005 Member, Cardiovascular Institute, Stanford University, CA
- 2008-present Member, American Thoracic Society

Services to Professional Organizations

- 2006 North American Cystic Fibrosis Conference session moderator
- 2007 North American Cystic Fibrosis Conference Workshop Chair
- 2007-2009 Elizabeth Nash Memorial Fund, CFRI Steering Committee Member
- 2008-present Reviewer Department of Defense Deployment Related Medical Research Program
- 2009 - present Lung Human Microbiome Project Steering Committee Member
- 2010 NIH/NIGMS study section
- 2010 PhyloTech - Scientific Advisory Board Member
- Bill and Melinda Gates Foundation, Development of strategic funding initiatives to combat vaccine failure in developing countries - Invited workshop participant
- NIH/NHLBI Future Research Directions in the Pathogenesis, Treatment, and Prevention of Early CF Lung Disease Workshop - Invited workshop participant

Selected Publications

- Havstad S, Wegienka G, Zoratti EM, **Lynch SV**, Boushey HA, Nicholas C, Ownby DR, Johnson CC. Effect of prenatal indoor pet exposure on the trajectory of total IgE levels in early childhood. *J Allergy Clin Immunol.* 2011 Aug 4.
- Saulnier DM, Riehle K, Mistretta TA, Diaz MA, Mandal D, Raza S, Weidler EM, Qin X, Coarfa C,

Milosavljevic A, Petrosino JF, Highlander S, Gibbs R, **Lynch SV**, Shulman RJ, Versalovic J. Gastrointestinal Microbiome Signatures Of Pediatric Patients With Irritable Bowel Syndrome. *Gastroenterology*. 2011 Jul 7.

- Huang YJ, Nelson CE, Brodie EL, DeSantis TZ, Baek MS, Liu J, Woyke T, Allgaier M, Bristow J, Wiener-Kronish JP, Sutherland R, King TS, Icitovic N, Martin RJ, Asthma Clinical Research Network Investigators Boushey HA, and **Lynch SV**. Airway Microbiota and Bronchial Hyperresponsiveness in Patients with Sub-optimally Controlled Asthma. *J Allergy Clin Immunol*. 2011 Feb;127(2):372-381.e1-3
- Fujimura KE, Johnson CC, Ownby DR, Cox MJ, Brodie EL, Havstad SL, Zoratti EM, Woodcroft KJ, Bobbitt KR, Wegienka G, Boushey HA. and **Lynch SV**. Man's best friend? The effect of pet ownership on house dust microbial communities. *J. Allergy Clin. Immunol*. 2010 126(2):410-2. PMID: 20633927
- Rauch M. and **Lynch SV**. Probiotic manipulation of the gastrointestinal microbiota. *Gut Microbes*. 2010. 1(5):1-4
- Roediger FC, Slusher NA, Cox MJ, Pletcher SD, Goldberg AN. and **Lynch SV**. Optimizing Bacterial DNA Extraction from Maxillary Sinus Samples. *Am. J. Rhinol Allergy*. 2010 Jul;24(4):263-5. PMID: 20819463
- Shane AL, Cabana MD, Vidry S, Merenstein D, Hummelen R, Ellis CE, Heimbach JT, Hempel S, **Lynch SV**, Sanders ME, Tancredi D. J. Guide to Designing Conducting Publishing and Communicating Results of Clinical Studies Involving Probiotic Applications in Human Participants. 2010. *Gut Microbes*. 1(4):243-253
- Lemon KP, Klepac-Ceraj V, Schiffer HK, Brodie EL, **Lynch SV**. and Kolter R. Comparative Analyses of the Bacterial Microbiota of the Human Nostril and Oropharynx. *MBIO*. 2010. 22;1(3). PMID: 20802827
- Cox MJ, Allgaier M, Taylor B, Baek MS, Huang YJ, Daly RA, Karaoz U, Anderseⁿ GL, Brown R, Fujimura KE, Wu B, Tran D, Koff^f J, Kleinhenz ME, Nielson D, Brodie EL. and **Lynch SV** Airway Microbiota and Pathogen Abundance in Age-Stratified Cystic Fibrosis Patients. (*PLoS One PLoS One*. 2010 Jun 23;5(6):e11044). PMID: 20585638
- Singh G, Wu B, Baek MS, Camargo A, Nguyen A, Slusher NA, Srinivasan R, Wiener-Kronish JP. and **Lynch SV**. Secretion of *Pseudomonas aeruginosa* Type III Cytotoxins is Dependent on Pseudomonas Quinolone Signal Concentration. *Microbial Pathogenesis*. 2010. 49(4):196-203. PMID: 20570614
- Fujimura KE, Slusher NA, Cabana MD. and **Lynch SV**. Role of the gut microbiota in defining human health. *Expert Rev Anti Infect Ther*. 2010 Apr;8(4):435-54). PMID: 20377338
- **Lynch SV** Flanagan JL Sawa T Fang A Baek MS Rubio-Mills A Ajayi T Yanagihara K Hirakata Y Kohno S Misset B Nguyen JC Wiener-Kronish JP. Polymorphisms in the *Pseudomonas aeruginosa* type III secretion protein PcrV - Implications for anti-PcrV immunotherapy. *Microb Pathog*. 2010 48(6):197-204. PMID: 20211240
- Vanja Klepac-Ceraj Katherine P. Lemon Thomas R. Martin Martin Allgaier Steven W. Kembel Alixandra A. Knapp Stephen Lory Eoin L. Brodie **Susan V. Lynch** Brendan JM. Bohannon Jessica Green Brian A. Maurer and Roberto Kolter. Cystic fibrosis lung disease severity markers correlate with bacterial community structure. *Environ Microbiol* 2010. 12(5):1293-303. PMID: 20192960
- Cox M, Huang YJ, Fujimura K, Liu J, McKean M, Brodie EL, Boushey H, Cabana M. and **Lynch SV**. *Lactobacillus casei* Abundance is Associated with Profound Shifts in the Infant Gut Microbiome. *PLoS One*. 2010 Jan 18;5(1). PMID: 20090909
- Huang YJ, Kim E, Cox MJ, Brown R, Wiener-Kronish JP, **Lynch SV**. A Persistent and Diverse Airway Microbiome in Chronic Obstructive Pulmonary Disease. *OMICS – a Journal of Integrative Biology*. 2010 Feb;14(1):9-59. PMID: 20141328
- Ivanov II, Atarashi K, Manel N, Brodie EL, Shima T, Karaoz U. Wei D, Goldfarb KC, Santee CA, **Lynch SV**, Imaoka A. Itoh K, Takeda K, Umesaki Y, Honda K, and Littman DR. Induction of intestinal Th17 cells by segmented filamentous bacteria. *Cell*. 2009 Oct 30;139(3):485-98. PMID: 19836068
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- **Lynch SV**. and Wiener-Kronish JP. Novel Strategies to Combat Bacterial Virulence. *Current Opinion in Critical Care*. 2008 Oct;14(5):593-9. PMID: 18787455
- **Lynch S. V**, Dixon L, Brodie EL, Keyhan M, Hu P, Ackerley DF, Andersen GA. and Matin AC. Role of *rapA* Gene in Controlling Antibiotic Resistance of Uropathogenic *Escherichia coli* Biofilms. *Antimicrobial Agents and Chemotherapy*. 2007 51(10):3650-8. PMID: 17664315
- Augustin DA, Song Y, Baek MS, Sawa Y, Singh G, Taylor B, Rubio-Mills A, Flanagan JL, Wiener-Kronish JP. and **Lynch SV**. The Effect of Lipopolysaccharide O-antigen Serotype on Type III Secretion of *Pseudomonas aeruginosa*. *J. Bacteriol*. 2007. 189:2203-2209. PMID: 17209027
- Flanagan JL, Brodie EL, Weng L, **Lynch SV**, Garcia O, Brown R, Hugenholtz P, DeSantis TZ Andersen GL, Wiener-Kronish JP. and Bristow J. Loss of Bacterial Diversity During Antibiotic Treatment of Intubated Patients Colonized with *Pseudomonas aeruginosa*. *Journal of Clinical Microbiology*. 2007 45(6):1954-1962. PMID: 17409203

