

Susan V. Lynch, Ph.D.

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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 led us to speculate on the role of gastrointestinal bacterial communities in modulating both local and systemic inflammatory diseases. We primarily focus our efforts on two areas of research - comprehensive microbial structural and functional analyses of chronic gastrointestinal diseases with a particular focus on ulcerative colitis and early microbial exposure events that shape the developing neonatal immune system and impact subsequent allergic disease development.

Education

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| • 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

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| • 2000-01 | University College Dublin, Ireland | Postdoctoral Fellow | Microbiology |
| • 2002-05 | Stanford University | Postdoctoral Fellow | Bacterial physiology |
| • 2005-2007 | University of California, San Francisco | Assistant Research Microbiologist | Bacterial pathogenesis |
| • 2007-2009 | University of California, San Francisco | Assistant Adjunct Professor | Microbial ecology and bacterial pathogenesis |
| • 2009 - now | University of California, San Francisco | Assistant Professor in Residence | Host Microbiome, Ulcerative Colitis |

Memberships and Affiliations

- 2004-now Member, American Society for Microbiology
- 2005 Member, Cardiovascular Institute, Stanford University, CA
- 2008-now Member, American Thoracic Society

Services to Professional Organizations

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| • 2006 | North American Cystic Fibrosis Conference
"Targeting Mechanisms of <i>Pseudomonas aeruginosa</i> pathogenesis" | Moderator |
| • 2007 | North American Cystic Fibrosis Conference Workshop | Chair |

“Microbial ecology of CF airways”

- 2007-2009 Elizabeth Nash Memorial Fund, CFRI Steering Committee Member
- 2008 Reviewer Department of Defense Deployment Related Medical Research Program

Selected Publications

- Huang Y.J., Kim E., Cox M.J., Brown R., Wiener-Kronish J.P., **Lynch S.V.** A Persistent and Diverse Airway Microbiome in Chronic Obstructive Pulmonary Disease. (In review, OMICS)
- Roediger, F.C., Slusher, N.A., Cox, M.J., Pletcher, S.D., Goldberg, A.N. and **Lynch, S.V.** Optimizing Bacterial DNA Extraction from Maxillary Sinus Samples. (In review, American Journal of Rhinology).
- Induction of intestinal Th17 cells by segmented filamentous bacteria. Ivanov, I.I., Atarashi, K., Manel, N., Brodie, E.L., Shima, T., Karaoz, U. Wei, D., Goldfarb, K.C., Santee, C.A., **Lynch, S.V.**, Imaoka, A. Itoh, K., Takeda, K., Umesaki, Y., Honda K., and Littman D.R. (In review, Cell).
- 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 J.M. Bohannon, Jessica Green, Brian A. Maurer and Roberto Kolter. Cystic fibrosis lung disease severity markers correlate with bacterial community structure. (In review, PNAS).
- Song, Y., Baer, M., Lima, J., Zhou, H., Bebbington, C. and **Lynch, S.V.** Antibody-Antibiotic Combination Therapy Significantly Reduces Lung Injury and Improves Survival in Mice Infected with *P. aeruginosa*. (In review, Clinical and Experimental Pharmacology and Physiology).
- Cox, M., Huang, Y.J., Fujimura, K., Liu, J., McKean, M., Brodie, E.L., Boushey, H., Cabana, M. and **Lynch, S.V.** Competitive Bacterial Colonization of the Infant Gut - Implications for Asthma and Allergy Development. (In review, PLoS One).
- Cox, M.J., Allgaier, M., Taylor, B., Baek, M.S., Huang, Y.J., Daly, R.A., Karaoz, U., Andersen, G.L., Brown, R., Fujimura, K.E., Wu, B., Tran, D., Koff, J., Kleinhenz, M.E., Nielson, D., Brodie, E.L. and Lynch, S.V. Bacterial Community Trajectory and Pathogen Dynamics in Aging Cystic Fibrosis Airways. (In review, PLoS One).
- Ganter, M.T., Roux, J., Su, G., Howard, M., **Lynch, S.V.**, Deutschman, C.S., Weiss, Y.G., Christiaans, S.C., Myazawa, B., Lory, S., Wiener-Kronish, J.P., Pittet, J.-F. Role of RhoA and $\alpha\beta 5$ Integrin in *Pseudomonas*-induced Increase in Lung Endothelial Permeability. American Journal of Respiratory Cell and Molecular Biology. 2009 Jan;40(1):108-1.
- El Solh, A.A., Amsterdam, D. Alhajhusain, A., Akinnusi, M., Saliba, R., Lynch, S.V., Wiener-Kronish, J., and Szarpa, K. Matrix Metalloproteins in Bronchoalveolar lavage fluid of patients with type III *Pseudomonas aeruginosa* Pneumonia. European Respiratory Journal. 2008 Sep 1;178(5):513-9.
- Zhuo, H., Yang, K., **Lynch, S.V.**, Dotson, R.H., Glidden, D.V., Singh, G., Webb, W.R., Elicker, B.M., Garcia, O., Brown, R., Sawa, Y., Misset, B., Wiener-Kronish, J.P. Increased mortality of ventilated patients with endotracheal *Pseudomonas aeruginosa* without clinical signs of infection. 2008 Critical Care Medicine. Sep;36(9):2495-503.
- **Lynch, S.V.** and Wiener-Kronish, J.P. Novel Strategies to Combat Bacterial Virulence. Curr. Opin. Crit. Care. 2008 Oct;14(5):593-9.
- **S.V. Lynch**, K. Yang, E.L. Brodie, C. MacDougall, G.L. Andersen and J.P. Wiener-Kronish. Culture-independent Bacterial Population Analysis – Clinical Implications. Current Respiratory Medicine Reviews. Volume 4, Number 1, February 2008, pp. 35-39(5).
- El Solh AA, Akinnusi ME, Wiener-Kronish JP, **Lynch SV**, Pineda LA, Szarpa K. Persistent Infection with *Pseudomonas aeruginosa* in Ventilator Associated Pneumonia. Am J Respir Crit Care Med. 2008 Sep1;178(5):513-9.
- **S.V. Lynch**, K. Yang, E.L. Brodie, C. MacDougall, G.L. Andersen and J.P. Wiener-Kronish. Culture-independent Bacterial Population Analysis – Clinical Implications. Current Respiratory Medicine Reviews. Volume 4, Number 1, February 2008 , pp. 35-39(5).

- Song Y, Pittet JF, Huang X, He H, **Lynch SV**, Violette SM, Weinreb PH, Horan GS, Carmago A, Sawa Y, Bernstein XL, Wiener-Kronish JP. Role of integrin $\alpha v \beta 6$ in acute lung injury induced by *Pseudomonas aeruginosa*. Infect Immun. 2008 Jun;76(6):2325-32.
- Wong-Beringer, A., Wiener-Kronish, J.P., **Lynch, S.V.** and Flanagan, J. Association of Fluoroquinolone Resistance With Increased Type III Secretion Virulence in Clinical Isolates of *Pseudomonas aeruginosa*. Clin Microbiol Infect. 2008 Apr;14(4):330-6. Epub 2008 Jan 11. PMID: 18190571
- **Lynch, S. V.**, Dixon, L., Brodie, E.L., Keyhan, M., Hu, P., Ackerley, D.F., Andersen, G.A. and Matin, A.C. Role of *rapA* Gene in Controlling Antibiotic Resistance of Uropathogenic *Escherichia coli* Biofilms. 2007, 51(10):3650-8.
- Yoo, J., Tcheurekdjian, H., **Lynch, S.V.**, Cabana, M. and Boushey, H. Microbial Manipulation of Immune Function for Asthma Prevention: Inferring Mechanisms from Clinical Trials. Proc Am Thorac Soc. 2007 Sep;4(3):277-82.
- Flanagan, J.L., Brodie, E.L., Weng, L., **Lynch, S.V.**, Garcia, O., Brown, R., Hugenholtz, P., DeSantis, T.Z., Andersen, G.L., Wiener-Kronish, J.P. 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.
- Augustin, D.A., Song, Y., Baek, M.S., Sawa, Y., Singh, G., Taylor, B., Rubio-Mills, A., Flanagan, J.L., Wiener-Kronish, J.P. and **Lynch, S.V.** The Effect of Lipopolysaccharide O-antigen Serotype on Type III Secretion of *Pseudomonas aeruginosa*. J. Bacteriol. 2007. 189:2203-2209.
- Song, Y, **Lynch, S.V.**, Flanagan, J., Zhuo, H., Baek, M.S., Dotson, R., Tom, W., Rubio-Mills, A. Singh. G., Kipnis, E., Glidden, D., Brown, R., Garcia, O. and Wiener-Kronish, J.P. Increased plasminogen activator inhibitor-1 concentrations in bronchoalveolar lavage fluids are associated with increased mortality in a cohort of patients with *Pseudomonas aeruginosa*. Anesthesiology. 2007. 106(2):252-261.
- Song, Y., Flanagan, J.L., Wiener-Kronish, J.P., **Lynch, S.V.** Alveolar Hemostasis in Patients with Species-specific Bacterial-mediated Ventilator Associated Pneumonia. Critical Care Medicine. 2007. 35:652-653.
- Flanagan, J.F., **Lynch, S.V.**, Wiener-Kronish, J.P. Molecular Approaches to Detection of Bacteria in Critical Care Patients:the Importance of Bacterial Communities. Yearbook of Intensive Care and Emergency Medicine. 2007: 44-52.