Stephen Craig Lee, Ph.D.
Associate Professor

Education

Dr. Lee graduated from St. Ambrose College in Davenport, Iowa in 1978. He did his graduate work at the University of Minnesota, followed by post-doctoral work at the Minneapolis Veterans Administration Medical Center from 1984-1989.

Professional Experience

Dr. Lee was a Senior Research Biologist and a Research Specialist at the Monsanto Company in St. Louis from 1990-1993. He became a Senior Research Investigator for G.D. Searle in St. Louis in 1994, where he worked until 1999. At that time he moved on to the Pharmacia Company and then to Ohio State in 2001.

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Affiliations

Dr. Lee is an Associate Professor in the Departments of Chemical Engineering and Molecular and Cellular Biochemistry and is core faculty in the Biomedical Engineering Department at OSU.

Dr. Lee serves on many committees and boards, including the Scientific Advisory Board, BioMEMs and Biomedical Nanotechnology WORLD in 2001, 2002, 2003, 2004, and 2005. He is a member of the editorial boards of The Journal of Biomedical Nanotechnology, The Journal of Nanoengineering and Nanoscience-Part N and Biomedical Microdevices:BioMEMS and Biomedical Nanotechnology.

Area of expertise

Dr. Lee is trained as a molecular geneticist with specific expertise in gene expression, protein engineering, high diversity screening, molecular devices, vaccine design,

bioconjugate chemistry and applies these skills primarily to oncology and cardiovascular disease.

Research Interests

My interest is in molecular therapeutic devices (for cancer and cardiovascular disease) and technologies that support their realization. I build hybrid nanodevices using biological functional components (nucleic acids and proteins), organized using synthetic structural materials (as scaffolds or containers) such that they can perform multistep work processes. The reliance on biomolecules for nanoscale functional components is technologically necessary, but begs multiple questions concerning biomolecule engineering, device assembly, stability and immunogenicity. My technological thrust is therefore focused on chemoselective bioconjugation methods, protein semisynthesis and computational and materials based methods to engineer enhanced protein therapeutic activity, stability and reduced immunogenicity.

Review and Editorial Service

Professor Lee provides review and editorial service to multiple scientific organizations and professional journals.

Recent Journal article review service was provided to:

2005

- International Journal of Pharmaceutics
- Advances in Clinical Chemistry
- Applied Physics Letters
- Journal of Nanoengineering and Nanosystems
- Journal of the American Chemical Society

2001-2005

- Journal of Nanoengineering and Nanosystems
- Journal of the American Chemical Society
- Biomedical Microdevices: BioMEMS and Biomedical Nanotechnology Biomedical Microdevices: BioMEMS and Biomedical Nanotechnology
- Langmuir
- Journal of the Chinese Institute of Chemical Engineers
- Biomaterials

Recent Editorial Service:

- Section Editor, Nanotechnology, Biomedical Microdevices: BioMEMS and Biomedical Nanotechnology, 2002-present
- Editorial Board, Biomedical Microdevices: BioMEMS and Biomedical Nanotechnology, 2002-present
- Editorial Board, Journal of Biomedical Nanotechnology 2004-present

- Editorial Board, Journal of Nanoengineering and Nanosystems-Part N 2004-present

Review service to national organizations:

2005

- National Cancer Institute, National Institutes of Health
- AAAS panel for Michigan Technology Tri-Corridor Fund

2004

- NASA International Life Science Research Announcement (ILSRA) competition
- Kansas-NIH Center for Biomedical Research Excellence in Protein Structure and Function
- AAAS panel for Michigan Technology Tri-Corridor Fund

2003

- National Cancer Institute, National Institutes of Health
- National Heart Lung and Blood Institute Nanotechnology Working Group

2002

- NASA BioScience Institute Review Panel

Selected Publications

Recent publications (Selected from 57 scientific papers, two edited volumes, five issued patents and six pending patents)

E. Eteshola, C. D. Van Valkenburgh, S. Merlin, E. Rowold, J. Adams, R. Ibdah, L. E. Pegg, A. Donelly, E. Rowold, Jon Klover and S. C. Lee. Screening of a library of circularly permuted proteins on phage to manipulate protein topography. Journal of Nanoengineering and Nanosystems (in press).

E. Eteshola, Leonard Brillson and Stephen Craig Lee. 2005. Selection and characteristics of peptides that bind thermally grown silicon dioxide films. Biomolecular Engineering, in press.

K. D. Bhalerao, E. Eteshola, M. Keener and Stephen Craig Lee. 2005. Nanodevice design through the functional abstraction of biological macromolecules. Applied Physics Letters 87: 143902-143904. (Note: Invited article, cover article)

Stephen Craig Lee, Mathew T. Keener, Dharma R. Tokachichu, B. Bhushan, P. D. Barnes, B. J. Cipriany, M. Gao and L. J. Brillson. 2005. Protein binding on thermally grown silicon dioxide. Journal of Vacuum Science and Technology B 23: 1856-1865.

B. Bhushan, D. R. Tokachichu, M. T. Keener and Stephen Craig Lee. 2005. Morphology and adhesion of biomolecules on silicon-based surface. Acta Biomaterialia 1: 327-341.

P. Decuzzi S. C. Lee, B. Bhushan and M. Ferrari*. 2005. A theoretical model for the margination of particles within the vasculature. Annals of Biomedical Engineering 33: 179-190.

S. C. Lee, R. Parthasarathy, K. Botwin, D. Kunneman, E. Rowold, G. Lange, J. Zobel, T. Beck, T. Miller, W. Hood, J. Monahan R. Jansson, J. P. McKearn and C. F. Voliva. 2004. Biochemical and immunological properties of cytokines conjugated to dendritic polymers. Biomedical Microdevices: Biomems and Biomedical Nanotechnology 6: 191-201.

S. C. Lee, K. Bhalerao, M. Ferrari. 2004. Object oriented design tools for supramolecular devices and biomedical nanotechnology. Annals of the New York Academy of Science 1013: 110-123.

D. B. Buxton, S. C. Lee, S. A. Wickline and M. Ferrari. 2003 Recommendations of the National Heart, Lung, and Blood Institute Nanotechnology Working Group. Circulation 108: 2737-2742.

S. C. Lee, R. Ibdah, C. VanValkenburgh, E. Rowold, A. Donnelly, A. Abegg, J. Klover, S. Merlinb and J. McKearn. 2001. Phage display mutagenesis of the chimeric dual cytokine receptor agonist myelopoietin. Leukemia 15: 1277-1285.

S. C. Lee, R. Parthasarathy, T. Duffin, K. Botwin, T. Beck, G. Lange, J. Zobel D. Kunneman, E. Rowold and C. F. Voliva. 2001. Recognition properties of antibodies to P AMAM dendrimers and their use in immune detection of dendrimers. Biomedical Microdevices: Biomems and Biomedical Nanotechnology. 3: 51-57

S. C. Lee, M. Reugsegger, P. D. Barnes, B. R. Smith, M. Ferrari. 2004. Therapeutic nanodevices. Pp. 279-322 In B. Bhushan (ed.) The Nanotechnology Handbook. Springer-Verlag, Heidelberg, Germany.

S. C. Lee, M. Reugsegger, M. Ferrari . 2004. Biomolecules and nanodevices. Volume 1, pp. 309-327. In H. S. Nalwa (ed.) The Encyclopedia of Nanoscience and Nanotechnology. American Scientific Publishers, Stevenson Ranch, CA.

L. S. Holliday, S. C. Lee and B. S. M. Lee. 2003. Mechanoenzymes in nanodevices. Biomedical Microdevices: Biomems and Biomedical Nanotechnology 5: 269-280.

Edited volumes

Biologic nanotechnology theme issue, Biomedical Microdevices and Biomems and Biomedical Nanotechnology 3 (1) 2001. S. C. Lee*, James R. Baker, Jr. and Miqin Zhang (eds)

Biological molecules in nanotechnology: the convergence of biotechnology, polymer chemistry and materials science. 1998. S. C. Lee*, and L. Savage (eds). Proceedings of the IBC 2nd International Conference on Biological Applications and Novel Applications of Molecular Nanotechnology, IBC Press, Southborough, MA, USA.

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