



- *Professor*
  - *Department of Medicine*
  - *Division of Pulmonary, Critical Care & Sleep Medicine*
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### Programs & Services:

- *Department of Medicine*
- *Division of Pulmonary, Critical Care and Sleep Medicine (Adult)*

### Research Interests

Phospholipid transport processes in eukaryotic cells. Pulmonary surfactant proteins – structure and function. My laboratory has two areas of major interest.

The first is elucidation of the mechanisms of intracellular phospholipid transport in eukaryotic cells. This research problem is a fundamental question of cell biology and biochemistry about which we know very little. Resolution of this problem will provide new insights into how cells make their membranes and how this process is related to all cell growth and development. In addition, these research efforts are also enabling us to understand how intracellular pathogens such as certain types of bacteria and parasites interact with their host cells to make membranes necessary for their growth. Our efforts also include studies of the synthesis, transport and secretion of specific phospholipids within the lung that are essential for normal breathing.

The second area of research in my laboratory focuses upon the pulmonary surfactant proteins, SP-A and SP-D. These proteins are present in the airways and alveoli of the lungs and recognize viruses, bacteria and fungi. Our research examines how the proteins recognize these pathogens and how this can be altered by structural changes to the proteins. The SP-A and SP-D also regulate the inflammatory response of the lung in response to pathogens and we are investigating how this affects diseases such as tuberculosis and asthma.

### Education

1972 Indiana University, Undergraduate  
1978 Oak Ridge National Laboratory, PhD

### Fellowship

1981 Harvard Medical School, Postdoctoral

### Affiliations with the University of Colorado Denver

Joint appointments in Biochemistry and Molecular Genetics, Medicine, University of Colorado Denver

### Professional Memberships

American Society for Biochemistry and Molecular Biology (ASBMB) American Society for Cell Biology (ASCB)

### Awards & Recognition

2005: ASBMB Annual Meeting, Chair

2004-Present: ASBMB Meetings CMTE Chair  
2003: ASBMB Thematic Meeting, Chair  
1995: Gordon Research Conference, Chair  
NIH MERIT AWARD 03-13

**Editorial Boards:**

2004-Present: Progress in Lipid Research, Executive Editor Biochemistry 1993-96, Journal of Biological Chemistry 1992-97, 1998-03

**Publications**

Voelker DR. Bridging gaps in phospholipids transport. Trends Biochem Sci 30:398-404, 2005.

Choi JY, Wu, WI and Voelker DR. Phosphatidylserine decarboxylases as biochemical and genetic tools for studying phospholipid traffic. Analytical Biochem 347(2):165-75, 2005.

Gupta N, Zahn MM, Coppens I, Joiner KA, Voelker DR. Selective disruption of phosphatidylcholine metabolism of the intracellular parasite *Toxoplasma gondii* arrests its growth. J Biol Chem 280:16345-53, 2005.

Piboonpocanum S, Chiba H, Mitsuzawa H, Martin W, Murphy RC, Harbeck RJ, Voelker DR. Related Articles, Links Abstract Surfactant protein A binds *Mycoplasma pneumoniae* with high affinity and attenuates its growth by recognition of disaturated phosphatidylglycerols. J Biol Chem 280:9-17, 2005.

Allen JM, Laederach A, Reilly PJ, Mason RJ, Voelker DR. Arg343 in human surfactant protein D governs discrimination between glucose and N-acetylglucosamine ligands. Glycobiology 14:693-700, 2004.

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