John R. Jefferson, Ph.D.

Department of Chemistry
Luther College
700 College Drive
Decorah, IA 52101
(563)-387-1119
Email: jeffersj@luther.edu

Professional preparation

Undergraduate Institution	Franklin and Marshall College	B.A.	1979
Graduate Institution	The Catholic University (American Red Cross Research Facility)	Ph.D.	1987
Postdoctoral Institutions	National Institutes of Health Heart Lung and Blood Institute Protein Biochemistry		1986-88
	College of Pharmacy University of Cincinnati Lipid Biochemistry		1988-1991

Appointments:

Assistant Professor of Chemistry 1991-1997	Luther College, Decorah, IA
Associate Professor of Chemistry 1997-2004	Luther College, Decorah, IA
Visiting Scientist (sabbatical) 2000-2001 (academic year)	Mayo Clinic, Rochester, Mn
Professor of Chemistry 2004-present	Luther College, Decorah, IA
Visiting Scientist (sabbatical) 2009 (fall semester)	Mayo Clinic, Rochester, Mn

Teaching and research interests

It was my interest and skills in teaching that led me to Luther because of the emphasis that is placed on educating undergraduates. My philosophy on teaching embraces all kinds of student interactions, including classroom teaching, laboratory activities and participating in the wider campus community. This diversity of teaching interactions has helped me to maintain a fresh approach to my duties. In my work with chemistry majors, I have taught introductory chemistry to first year students, and organic chemistry, and biochemistry to upper class students. As a mentor to these students I have offered advice on their professional career, and discussed how making good choices is an important aspect of their development as people. Another group includes the students who are majoring outside of the sciences. For these I have tried to make chemistry as interesting and accessible as possible. One rewarding aspect of this has been the development of the J-term course, "Great Ideas in the Natural Sciences," with Jeff Wilkerson. My involvement in teaching environmental chemistry and the development of the J-term course on "The Science of Science Fiction" have also enriched my interactions with these non-science majors.

Biochemistry is my specialty within the department, and my enthusiasm for teaching this led me to author a student companion workbook that was published by Oxford University Press in 1998. This workbook accompanies a very good biochemistry textbook and helps to integrate the basic chemistry with the advanced biology in a readable and condensed form. The choice of what to emphasize in the biochemistry courses I teach is a question that I address each year and requires considerable effort to keep up with the explosion of new knowledge that occurs in the field. As an example of my efforts in this pursuit, I attended a Nation Science Foundation sponsored Chautauqua workshop on bioinformatics and biotechnology at the Rensselaer Polytechnic Institute as well as a Pew Foundation sponsored meeting on immunology at Washington University during the summer of 2002. In addition, I participated in a very selective Gordon conference on the molecular and cellular biology of lipids in 2003.

My research efforts have been, for the most part, concentrated in the sub-discipline of lipid chemistry which has been my focus since completing a postdoctoral study in 1991. Of my 17 peer reviewed publications, 13 of these are in the field of lipid chemistry and 11 of these have been published since coming to Luther College. Lipids are involved in a number of important roles in living cells. Some lipids, commonly referred to as fats, function as a source of energy while others, such as the phospholipids and cholesterol, play an important structural role in the formation of membranes. In addition, the lipid steroids are important in the control of cell growth and function. One of my current interests is in the metabolism and transport of these molecules within cells using fluorescent lipid analogs to follow the progress of these reactions. My ability to pursue this area of scholarship was greatly enhanced by my sabbatical year (2000-2001) in the laboratory of Dr. Richard Pagano at the Mayo Clinic. Dr. Pagano is recognized as a pioneer in the use of fluorescent lipid probes to study cellular metabolism and transport.

More recently, during my sabbatical in the fall of 2009, I expanded into the sub discipline of protein biochemistry. This was made possible by working in the laboratory of Dr. Nick LaRusso at the Mayo Clinic, a physician-researcher with whom I have worked before. Rather than continue with my previous focus involving lipids, I chose to expand into a related field and make the most of this opportunity to learn the latest techniques that were being employed in Dr. LaRusso's lab. My lab project for the semester was to implement two new experimental techniques for studying protein-protein interactions. My work in the lab on this project was

significant because proteins do not act in isolation. Rather, their properties are controlled and modified through their interactions with neighboring proteins, and other components of the cell. Although we understand from the sequencing of the human genome which proteins are present in the cell, the challenge of unraveling the intricate network of protein-protein interactions established by the DNA code is far from complete. Many researchers believe that essentially all cellular functions involve protein-protein interactions. In the lab, I employed two techniques to explore some of these questions as they relate to the immune response of cells which line the bile duct connecting the liver with the intestine. These cells are called cholangiocytes, and among their many important functions, the one of interest in Dr. LaRusso's lab is their role as immune-responsive cells which provide the first line of defense against infection by microbes in the biliary system. In the lab, cholangiocytes are grown in small dishes and we are able to stimulate their immunological response with the use of a purified chemical component of the outer membrane of Gram-negative bacteria. The object of these experiments was to see which proteins would form functional complexes in response to the signal alerting them that infectious bacteria were present.

The two techniques I used were quite different, but afforded complementary evidence for the formation of protein-protein complexes. The first technique was called co-affinity purification. In this technique, proteins were isolated from homogenized cells based on whether or not a protein-protein complex had been formed as part of their response to the bacterial stimulation. This co-purification technique used a preselected "bait" protein to try and hook a target protein and thus demonstrate that they were acting together due to the fact that they could be co-purified. The second approach employed the use of fluorescent confocal microscopy in which two proteins which were suspected of forming a complex were labeled separately with two different fluorescent probes. The probes were chosen so that irradiation of only one with a laser would change how the fluorescent signal from the second would be observed, but only if the two were in close enough proximity to undergo an exchange of energy. The basis of this procedure is known in the field as FRET (fluorescent resonance energy transfer). This application made use of a microscope which meant that we could work on intact cells and actually visualize the interaction should it occur. It is my hope to incorporate these techniques into my teaching and research activities with Luther students.

The research projects that I have initiated at Luther have proven to be readily adaptable to student undergraduate research projects. During the last 19 years, I have supervised 31 students and made their involvement in off-campus presentations a priority (12 occasions). I have received outside funding support from the Research Corporation ($28,000) and from the Pew foundation ($15,000), much of which has gone into summer student stipends. As with all of my activities at Luther, in addition to benefiting the individual students involved in these research projects, these activities have a direct benefit to my classroom teaching in terms of being able to lecture with authority on current topics and to develop new laboratory protocols.

By way an update, since submitting this document to the Dean's office in 2010, I have been involved in two projects related to my professional development and community outreach. On Aug. 10, 2010, I gave a power point presentation to the West-side study group, entitled, "Stem Cells: What are they? Where do they come from? How can they change our lives? And why are they so controversial?" And, during J-term 2011, I helped with the Chemistry department's submission of a grant to the Carver Trust for the purchase of a new 300 MHz NMR. Dr. Bradley Chamberlain was the principle author on this grant which was funded in full.

Publications (as of April 2011)

Jefferson, J.R, "Synthesis of ADP Derivatives with Substituents at Carbon-2 and their use in Studies of Human Blood Platelets", *Dissertation Abstracts International*, 48(3), 740-B (1987), Order No. DA8713570.

Jefferson, J.R., Hunt, J.B., and Jamieson, G.A., "Facile synthesis of 2-(3-aminopropylthio)-ADP: A key intermediate for the synthesis of molecular probes of ADP function", *Journal of Medicinal Chemistry*, 30, 2013-2016 (1987).

Jefferson, J.R., Harmon, J.T., and Jamieson, G.A., "Identification of high and low affinity platelet binding sites for ADP and competition by ADP analogues", *Blood*, 71, 110-116 (1988).

Schroeder, F., Butko, P., Nemecz, G., Jefferson, J.R., Powell, D, Rymaszewski, Z., Dempsey, M.E., Kukowska-Latallo, J., and Lowe, J.B., "Sterol Carrier Protein: Ubiquitous Protein in Search of a Function", In *Bioengineered Molecules: Basic and Clinical Aspects* (Verna, R., Blumenthal, R. and Frati, L., eds.) Raven Press, NY (1989) pages 29-45.

Jefferson, J.R., Hunt, J.B. and Ginsburg, A., "Characterization of Indo-1 and Quin-2 as Spectrophotometric Probes for Studying Zn^{2+} Protein Interactions", *Analytical Biochemistry*, 187, 328-336 (1990).

Jefferson, J.R., Hunt, J.B. and Ginsburg, A., "Zinc Interactions with Regulatory Subunits of Aspartate Transcarbamoylase from E. coli", *Biochemistry*, 29, 6687-6698 (1990).

Jefferson, J.R., Powell, D.M., Rymaszewski, Z., Kukowska-Latallo, J. Lowe, J.B., and Schroeder, F., "Altered Membrane Structure in Transfected Mouse L-Cell Fibroblasts Expressing Rat Liver Fatty Acid Binding Protein", *Journal of Biological Chemistry*, 265, 11062-11068 (1990).

Nemecz, G., Hubbell, T., Jefferson, J.R., Lowe, J.B., Schroeder, F., "Interaction of Fatty Acids with Recombinant Rat Intestinal and Liver Fatty Acid-Binding Protein," *Archives of Biochemistry*, 286, 300-309 (1991).

Jefferson, J.R., Slotte, J.P., Nemecz, G., Pastuszyn, A., Scallen, T.J., Schroeder, F., "Intracellular Sterol Distribution in Transfected Mouse L-Cell Fibroblasts Expressing Rat Liver Fatty Acid Binding Protein", *Journal of Biological Chemistry*, 266, 548-5496 (1991).

Schroeder F., Jefferson, J.R., Kier, A.B., Knittel, J., Scallen, T.J. and Hapala, I., "Membrane Cholesterol Dynamics: Cholesterol Domains and Kinetic Pools", *Proceedings of the Society for Experimental Biology and Medicine*, 196, 235-252 (1991).

Nemecz, G., Jefferson, J.R. and Schroeder, F., "Polyene Fatty Acid Interactions with Recombinant Intestinal and Liver Fatty Acid Binding Proteins: Spectroscopic Studies", *Journal of Biological Chemistry*, 266, 17112 (1991).

Incerpi, S., Jefferson, J.R., Wood, W.G., Ball, W.J. and Schroeder, F., "Na^+ Pump and Plasma Membrane Structure in L-cell Fibroblasts Expressing Rat Liver Fatty Acid-Binding Protein", *Archives of Biochemistry* 298 35-42(1992).

Publications (continued):

Woodford, J.K., Jefferson, J.R., Wood, W.G., Hubbell, T. and Schroeder, F., "Expression of liver fatty acid binding protein alters plasma membrane lipid composition and structure in transfected L-cell fibroblasts", *Biochimica et Biophysica Acta*, 1145, 257-265 (1993).

Schroeder, F., Jefferson, J.R., Powell, D., Incerpi, S., Woodford, J.K., Colles, S.M., Myers-Payne, S., Emge, T., Hubbell, T., Moncecchi, D., Prows, D.R. and Heyliger, C.E., "Expression of Rat L-FABP in Mouse Fibroblasts: Role in Fat Absorption", *Molecular and Cellular Biochemistry* 123,73-83 (1993).

Woodford, J.K., Hapala, I. Jefferson, J.R., Knittel, J.J., Kavecansky, J., Powell, D., Scallen, T.J., and Schroeder, F., "Mechanistic Studies of Sterol Carrier Protein-2 effects on L-cell Fibroblast Plasma Membrane Sterol Domains", *Biochimica et Biophysica Acta*, 1189(1), 52-60 (1994).

Murphy, E.J., Prows, D.R., Jefferson, J.R., and Schroeder, F., "Liver Fatty Acid-binding Protein Expression in Transfected Fibroblasts Stimulated Fatty acid Uptake and Metabolism", *Biochimica et Biophysica Acta*, 1301(3), 191-198 (1996).

Murphy, E.J., Prows, D.R., Jefferson, J.R., and Incerpi, S., Hertelendy, Z.I., Heyliger, C.E. and Schroeder, F., "Effect of Insulin on Fatty Acid Uptake and Esterification in L-Cell Fibroblasts", *Archives of Biochemistry and Biophysics,* 335 (2) 267-72 (1996).

Schroeder F, Frolov, A.A, Murphy, E.J., Atshaves, B.P., Jefferson, J. R., Pu, L., Wood, G., Foxworth W. B., and Kier A.B, "Recent Advances in Membrane Cholesterol Domain Dynamics and Intracellular Cholesterol Trafficking", *Proceedings of the Society for Experimental Biology and Medicine*,. 213, 150-177 (1996).

Jefferson, J. R., "*Student Guide and Workbook*", to accompany, "*Biochemistry and Molecular Biology*", Elliott & Elliott, published by Oxford University Press, (1997)

Puri, V., Jefferson, J.R., Singh, R.D., Wheatley,C.L., Marks , D.L., Pagano, R.E., "Sphingolipid Storage Induces Cholesterol Accumulation by Stimulating SREBP Cleavage", *Journal of Biological Chemistry*, 278(23), 20961-70 (2003).

Tietz, P., Jefferson, J.R., Pagano, R.E. and LaRusso, N.F., "Membrane Microdomains in Hepatocytes: Potential Target Areas for Proteins Involved in Canalicular Bile Secretion", *Journal of Lipid Research*, 46 1426-1432 (2005).

Milis*, D.G., Moore*, M.K., Atshaves, B.P., Schroeder, F, and Jefferson J.R., " Sterol carrier protein-2 expression alters sphingolipid metabolism in transfected mouse L-cells fibroblasts", *Molecular and Cellular Biochemistry*, 238, 57-66 (2006).

Mazzone, A., Tietz, P., Jefferson, J.R., Pagano, R.E., and LaRusso, N.F., "Isolation and characterization of lipid microdomains from apical and basolateral plasma membranes of hepatocytes", *Hepatology*, 43(2) 287-296 (2006).

Schroeder, F., Atshaves, B.P., McIntosh, A.L., Gallegos, A.M., Storey, S.M., Parr, R.D., Jefferson, J.R., Ball, J.M., Kier, A.B, "Sterol Carrier Protein-2: New roles in regulating lipid rafts and signaling", *Biochimica et Biophysica Acta*, 1771(6) 700-718 (2007).

Publications (continued):

Atshaves, B. P., Jefferson, J. R., McIntosh, A. L., Gallegos, A., McCann, B. M., Landrock, K. K., Kier, A. B., and Schroeder, F., "Effect of sterol carrier protein-2 expression on sphingolipid distribution in plasma membrane lipid rafts/caveolae", *Lipids*, 42(10) 871-884 (2007).

Abstracts:

Jefferson, J.R., Harmon, J.T., and Jamieson, G.A.: Characterization of ADP-binding sites in platelets. *Fed. Proc.*, 46, 2115 (1987).

Jefferson, J.R., Hunt, J.B., and Ginsburg, A.: Zinc release and uptake by regulatory subunits of E. coli aspartate transcarbamoylase. *Fed. Proc.* 46, 2047 (1987).

Jefferson, J.R., Hunt, J.B. and Ginsburg, A.: Zinc interactions with regulatory subunits of aspartate transcarbamoylase from E. coli, *FASEB J.* 2(5), A1338 (1988).

Jefferson, J.R., Powell, D.M., Rymaszewski, Z., Kukowska-Latallo, J. Lowe, J.B., and Schroeder, F., "Transfection of L-Fibroblasts with L-SCP DNA Alters Cell Growth, Lipid Composition, and Membrane Biophysical Properties", *Biophysical J.* 55, 211a (1989).

Schroeder, F., Hapala, I., Butko, P., Jefferson, J.R. and Scallen, T.J., "Acidic Phospholipids Strikingly Potentiate Sterol Carrier Protein-2 Mediated Intermembrane Sterol Transfer", presented at the Gordon Conference on Lipid Metabolism, (1990).

Nemecz, G., Jefferson, J.R., Schroeder, F., "Polyene Fatty Acid Interactions with Recombinant Intestinal and Liver Fatty Acid-Binding Proteins: Spectroscopic Studies". *FASEB J.*, 5, A805 (1991).

Jefferson, J.R., Nemecz, G.,Slotte, J.P., and Schroeder, F., "Intracellular Sterol Distribution in Transfected Mouse L-Cell Fibroblasts Expressing Rat Liver Fatty Acid Binding Protein", 9th International Symposium on Atherosclerosis, Chicago, Ill., p 214, (1991).

Jefferson, J.R., Taylor, M. and Schroeder, F., "Development of a Fluorescent Assay for the Study of Cholesteryl Esters: A Preliminary Report". Iowa State University Life Science Symposium, March 6-7, (1992).

Jefferson, J.R., Powell, D.M., and Schroeder, F., "Sterol Esterification in Transfected Mouse L-Cell Fibroblasts Expressing Rat Liver Fatty Acid Binding Protein", 25th Great Lakes Regional American Chemical Society Meeting, Milwaukee, WI, #233 (1992).

Zenk, B., Husman, K., Kahatapitiya, N. and Jefferson, J.R., "Synthesis of Fluorescent Cholesterol Ester Analogues for use in Lipid Transport and Metabolic Studies, A Preliminary Report", presented at the Iowa State University Chem CY Symposium, October 24, (1992).

Zenk, B., Shen, J., Kahatapitiya, N. and Jefferson, J.R., "Synthesis of Fluorescent Cholesterol Ester Analogue for use in Lipid Transport and Metabolic Studies", Abstract #41 presented at the Iowa Academy of Science, on April 23, (1993).

Jefferson, J.R., Wartman, A.M., "Synthesis and use of Fluorescent Cholesterol Ester Analogues in Investigations of Cholesterol Metabolism and Transport and Development of Associated Undergraduate Laboratory Protocols", presented at the 1993 General Meeting of the Great Lakes Cluster Pew Science Program, Northwestern University, August 5, (1993).

Abstracts (continued):

Holthouse, T.G., Nelson, R.J. and Jefferson, J.R., "Synthesis and Purification of the Fluorescent Sterol Dehydroergosterol", presented at the 1993 General Meeting of the Great Lakes Cluster Pew Science Program, Northwestern University, August 5, (1993).

Nelson, R.J., Reigstad, J., Jefferson, J.R. and Wartman, A.M., "Use of Fluorescent Sterols to Study the Metabolism of Cholesterol Esters", presented at the 1994 Annual Meeting of the Iowa Academy of Science, April, (1994).

Reigstad, J., Nelson, R.J., Morton, J. and Jefferson, J.R., "Synthesis of Fluorescent Sterol to Study the Metabolism of Cholesterol Esters", presented at the 1994 meeting of the National Conference on Undergraduate Research, April (1994).

Harris, C. (sponsored by J.R. Jefferson), "Progress Toward the Synthesis of 2-SH-ADP. A Nucleotide Probe of Blood Platelet Aggregation" presented at the Luther College Honors Symposium. (1995).

Mottley, C., Jefferson, J.R., Nimrod, D., "Computers in the Luther College General Chemistry Lab" presented at both the Project Kaleidoscope workshop on revitalizing general chemistry and the annual MACTLAC meeting (1995).

Charalambous, S., Lynch, B. and Jefferson, J.R., "Concentration Dependent Quench of a Fluorescent Cholesteryl Ester Analog in Lipid Vesicles", 10th National Conference on Undergraduate Research, abstract #1537, University of North Carolina at Asheville, April 18-20, pOS7-10 (1996).

Lynch, B., Charalambous, S., and Jefferson, J.R., "Concentration dependent quench of a fluorescent cholesteryl ester analogue in lipid vesicles", presented at both the spring meeting of the Iowa Academy of Science, Simpson College, and the Luther College Honors Symposium April 27 (1996).

Harris, C., Aswegan, A, and Jefferson, J.R., "Progress toward the synthesis of C-2 substituted adenosine 5'-diphosphate analogues for the study of platelet aggregation", presented at the spring meeting of the Iowa Academy of Science, Simpson College, April 27 (1996).

Berger, R., and Jefferson, J.R., "Making a Difference: Teaching Initiatives in Math and Chemistry", presented at the Project Kaleidoscope National Assembly in Kansas City, MO, October 11-13, (1996).

Snowden, D., and Hunter, R. (sponsored by J. Jefferson), "Chlorophylls from Different Plants", presented at Luther College Summer Science Symposium, sponsored by a GTE grant for minority high school students (1997).

Hunter, R., and Snowden, D. (sponsored by J. Jefferson), "The color of Chlorophyll and the Effect of Different Metals", presented at Luther College Summer Science Symposium, sponsored by a GTE grant for minority high school students (1997).

Lewis, D. and Christodoulou, M. with Runde, J., (sponsored by J.R. Jefferson), "Cholesterol Metabolism: A Study of Enzymatic Reactions Using a Fluorescent Analogue, presented at the 1997 Pew Summer Science Symposium, Luther College (1997).

Jefferson, J.R., Christodoulou, M., Lewis, D., Velnosky, T., and Bear, M., "Evaluation of Dehydroergosterol and Dehydroergosterylpalmitate as Substrates for Cholesterol Esterase", presented at the spring meeting of the Iowa Academy of Science, Iowa State University, April 24 (1999).

Esqueda, D., McDowell, L., Romero, A., Yang, M. (sponsored by J. R. Jefferson), "The Colors of Porphyrin", presented at Luther College Summer Science Symposium (1999).

Abstracts (continued):

Puri, V., Singh, R.D., Sharma, D.K., Dominguez, M., Jefferson, J.R., Marks, D.L. and Pagano, R.E., "Sphingolipids play an important role in regulating the intracelluar levels and distribution of cholesterol", presented at the Keith R. Porter Symposium on Cytoplasmic Organization and Membrane Traffic, Airlie, Virginia, March 22-25 (2001).

Jefferson, J.R., Puri, V., Marks, D., Wheatley, C., Pagano, R.E., "Internalization of Fluorescent Sphingomyelin Analogs In Human Skin Fibroblasts: Effect of Sphingosine Chain Length", presented at the 46th annual meeting of the Biophysical Society, San Francisco, CA, Biophysical J., 82(1) 613a, 2993-Pos (2002).

Olson, R.S.A, Olsen, J.D., Campbell, L.J., Jefferson, J.R., and Carlson, S, "Mechanisms of Hypertension: Changes in arachidonic acid metabolism in the spontaneously hypertensive rat," presented at the Howard Hughes Undergraduate Research Symposium, Grinnell College, spring, (2002).

Puri, V., Singh, R.D., Jefferson, J.R., Wheatley, C.L., Marks, D.L. and Pagano, R.E., "Role of sphingolipids in regulating intracellular cholesterol levels", presented at 42nd annual meeting of the American Society of Cell Biology, San Francisco, CA. Molecular Biology of the Cell 13, 541a, # 3049 (2002).

Tietz, P., Jefferson, J.R., Pagano, R.E. and LaRusso, N.F., "Isolation and characterization of specialized microdomains of hepatocyte plasma membranes: potential role in canalicular bile formation", submitted for presentation at the American Association of liver Diseases, Boston Mass, October (2003).

Jefferson, J.R.., Milis, D.G., McDowell, L. C., Atshaves, B.P., and Schroeder, F, "Sterol carrier protein-2 expression alters sphingolipid metabolism in transfected mouse L-cells fibroblasts", presented at the Luther College Honors Symposium. (2004), and annual meetoing of the American Society of Biochemistry and Molecular Biology, Boston Mass, FASEB Journal, 18(8)C271 (2004)

Mazzone, Amelia, Tietz, P., Jefferson, J.R., and LaRusso, N.F., "Isolation and characterization of lipid microdomains from apical and basolateral hepatocyte plasma membrane", presentated at the American Association of liver Diseases, Boston Mass, October (2004).

Jefferson, J.R, Mazzone, A., Tietz, Pagano, R., and LaRusso, N.F., "Membrane Microdomains in Hepatocytes: Potential Target Areas for Proteins Involved in Canalicular Bile Secretion", presentation at the annual meeting of the American Society of Cell Biology, San Francisco, CA, December (2005).

Lim, Stephanie*, (Jefferson, J.R.), " Synthesis of a Fluorescent Plasmalogen Precursor and Initial Metabolic Studies" presented at annual meeting of the National Council on Undergraduate Research, Salisbury University, Salisbury, Maryland, April, (2008).

Collaborators

(i) Current

Nicholas F. LaRusso, Ph.D.
Department of Basic Research
Mayo Clinic and Foundation
Rochester, MN 55905-0001

Eric Murphy, Ph.D.
School of Medicine
University of North Dakota
Grand Forks, ND, 58203-9037

Richard E. Pagano, Ph.D.
Professor of Biochemistry
Mayo Clinic and Foundation
Rochester, MN 55905-0001

Friedhelm Schroeder, Ph.D.
Professor of Physiology
Texas A&M University, TVMC
College Station, TX 77843-4466

Graduate Advisors:

John B. Hunt, Ph.D.
National Science Foundation (retired)
Inorganic Chemistry Division
Washington, D.C. 20550

Graham A. Jamieson, Ph.D.
Laboratory Head, Cell Biology (retired)
American Red Cross
Rockville, MD 20855

Postdoctoral advisors:

Ann Ginsburg, Ph.D.
Chief, Section on Protein Chemistry
National Heart, Lung, and Blood Institute
National Institutes of Health, Bld#3
Bethesda, MD. 20892

Friedhelm Schroeder, Ph.D.
Professor of Physiology and Pharmacology
Texas A&M University, TVMC
College Station, TX 77843-4466