

CURRICULUM VITA

January 1, 2007

NEAL RICHARD LANGERMAN

BORN:

Philadelphia, PA, 1943

EDUCATION:

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| 1969-1970 | N.I.H. Postdoctoral Fellow, Yale University, New Haven, CT. December 1970. |
| 1965-1969 | Ph.D. Physical and Biophysical Chemistry, Northwestern University, Evanston, IL. August 1969. |
| 1961-1965 | A.B. in Chemistry, Minors in Physics and Math, Franklin and Marshall College, Lancaster, PA. June 1965. |
| 1957-1961 | Atlantic City High School, Atlantic City, NJ |

PROFESSIONAL EXPERIENCE:

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| 1970-1975 | Assistant Professor, Department of Biochemistry and Pharmacology, Tufts University School of Medicine, Boston, MA. |
| 1975-1977 | Assistant Professor, Department of Chemistry and Biochemistry, Utah State University, Logan, UT. |
| 1977-1983 | Associate Professor, Department of Chemistry and Biochemistry, Utah State University, Logan, UT. |
| 1982-1997 | President, Chemical Safety Associates, Inc., San Diego, CA. |
| 1997-Present | President, Advanced Chemical Safety, Inc., San Diego, CA. |
| 1989 | Chairman, Chemical Control Board, City of Torrance, CA. |
| 1999-2005 | Editorial Board, Occupational Hazards |
| 1999-Present | Editorial Board, Journal of Chemical Health and Safety |
| 1999-2005 | Editorial Advisory Board, Laboratory Safety and Environmental Management |
| 2003 | Chair-elect, Division of Chemical Health and Safety of the American Chemical Society |
| 2004 | Chair, Division of Chemical Health and Safety of the American Chemical Society |

AREAS OF SPECIALIZATION:

Environmental Regulations
OSHA Regulations
Work Place Safety
Hazardous Waste and Hazardous Chemical Management
Hazardous Material Safety
Reactive and Explosive Chemical Safety
Hazardous Material Spill Response
Compressed Gas Emergency Response
Hazardous Materials Regulations
Industrial Emergency Response
Biophysical Chemistry
Physical Chemistry of Proteins
Ultracentrifugation
Chemical Thermodynamics

CERTIFICATIONS:

Registered Environmental Assessor (California), 1990 - current
Certified Environmental Inspector, 1991 - current

PROFESSIONAL MEETINGS ATTENDED:

VII International Flavin Conference, March 30, 1975, San Francisco, California
27th International Calorimetry Society, July 26-30, 1975, Seattle Washington
Scripps Institute of Oceanography (visiting Scientist and Lecturer), June, 1975, La Jolla, California
American Society of Biological Chemists, June 1976, San Francisco, California
28th International Calorimetry Conference, September, 1976, Argonne, Illinois
International Calorimetry Conference, July 1977, Montreal, Canada
Biophysical Society, March, 1978, Washington, D.C.
International Calorimetry Conference, July 1980, Eutola, Alabama

PROFESSIONAL MEETINGS ATTENDED (cont.):

Japanese Thermal Analysis Society, (Invited paper), November, 1981,
Hamamatsu, Japan

American Chemical Society, (Invited paper), March, 1982, Las Vegas, Nevada

American Society of Safety Engineers (local chapter), (Invited paper), April, 1984,
San Diego, California

Oklahoma Safety Council, (Invited paper), August, 1984, Oklahoma City,
Oklahoma

American Chemical Society, (Invited paper), April, 1985, San Diego, California

Semiconductor Safety Association Conference, May 1985, Phoenix, Arizona

American Society of Safety Engineers Conference, June, 1985, San Diego,
California

Semiconductor Safety Association Conference, (Invited paper), May 1986,
Phoenix, Arizona

SEMI Conference on Gallium - Arsenide Safety, San Jose, February, 1988

American Chemical Society, Conference on Chemical Entrepreneurship, Las
Vegas, March, 1988

HAZCAT, Los Angeles, June, 1988

American Society of Safety Engineers Conference, October, 1988, San Diego,
California

Semiconductor Safety Association Conference, (Invited paper), April 1990,
Phoenix, Arizona

American Society of Safety Engineers Conference, (Invited paper), April 1990,
San Diego, California

AMOCO Corporation Health & Safety Conference, (2 Invited Papers), May, 1990,
Chicago, Illinois

ACS Meeting, June 1997, San Francisco (Invited Paper)

Laboratory Safety & Environmental Management, June, 1998, Durham, NC

PUBLIC TALKS AND PAPERS READ:

Enthalpy of Oxidation of FMN, September, 1974, A.C.S. Meeting, Chicago, Illinois

Calorimetric Studies of Bacterial Bioluminescence, December, 1975, Gillette
Medical Research Center

Calorimetric Studies of Bacterial Bioluminescence, December, 1975, Brandeis
University, Massachusetts

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Calorimetric Studies of Bacterial Bioluminescence, December, 1975, Naval Medical Research Institute, Bethesda, Maryland

Calorimetric Studies of Bacterial Bioluminescence, December, 1975, N.I.H., Bethesda, Maryland

The Binding of Deoxy-uridylate and Fluoro-desoxyuridylate to Thymidylate Synthetase, September, 1976, International Calorimetry Conference, Montreal, Canada

Nucleotide Binding to Thymidylate Synthetase, July, 1977, Biophysical Society, Washington, D.C.

Properties of Glycoluciferase Isolated from Photobacterium Leiognathi, Strain S1, March, 1978, Biophysical Society Annual Meeting

Biology Department Seminar, March, 1978, Utah State University

Physics Department Seminar, April, 1978, Utah State University

Thermodynamic Description of Iron-Siderochrome Interaction, July, International Calorimetry Conference

Thermodynamic Parameters of Iron Binding to Desferrisiderophores, July, 1979, International Calorimetry Conference

Thermodynamic Studies of Flavin Binding, February, 1981, University of Georgia

Thermodynamic Studies of Flavin Binding, February, 1981, Emory University

Thermodynamic Studies of Flavin Binding, February, 1981, Duke University

Thermodynamic Studies of Flavin Binding, February, 1981, Kumamoto University

Biological Application of Reaction Calorimetry, November, 1981, Tokyo Kenki University

Thermodynamic Studies of Flavin Binding, November, 1981, Osaka University

Thermodynamic Studies of Flavin Binding, November, 1981, Nagoya University

Thermodynamic Studies of Flavin Binding, November, 1981, Tokyo University

Biological Application of Reaction Calorimetry, November, 1981, Gifu University

Biological Application of Reaction Calorimetry, November, 1981, Nagoya University

Thermodynamic Studies of Nucleotide Binding (invited lecture at the 16th meeting of the Japanese Society of Thermal Analysis and Calorimetry), November, 1981

My World, Below and Above, (Invited lecture to the general public as part of the Japanese Conference), November, 1981, Hamamatsu University

Industrial Applications of Reaction Calorimetry, November, 1981, Tukibo Company

Biochemical Thermodynamics (Invited paper), March, 1982, Las Vegas, Nevada

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Industry's Public Perception and Perspectives on Hazardous Waste Management, 1982, Lehigh University

The OSHA Hazard Communication Standard in the Workplace (OSHA 1910.1200), August, 1984, Oklahoma Safety Council

90 Days: The Responsibilities of the Hazardous Waste Generators, October, 1984, National Safety Council

Hazardous Materials: Where We Are-Where We Are Headed, April, 1985, American Society of Safety Engineers

Hazardous Material Emergencies: What We Have Learned from Disaster Review, April, 1985, American Society of Safety Engineers, San Diego, California

New Techniques and Materials: Hazardous Material Clean-up in the Semiconductor Clean Room, May, 1985, Phoenix, Arizona

Chemical Safety: Protect Your Company from Liability, American Chemical Society, March 1988, Las Vegas, Nevada

Chemistry of Hazardous Materials, American Society of Safety Engineers, October, 1985, San Diego, California

Hazardous Materials Management, Industrial Environmental Association of San Diego, August, 1989

OSHA's New Emergency Response Team Standards (OSHA 1910.120), April 1990, Semiconductor Safety Association, Phoenix, Arizona

Chemical Hazard Management, December, 1991, Eastern Analytical Symposium, Newark, NJ

"Options for the Management of MSDSs", American Chemical Society Meeting, Spring, 1997, San Francisco.

"Establishing a Small Spill Response Program in Laboratories", Laboratory Safety & Environmental Management Conference, June, 1998, Durham, NC.

"Spill Response in Academic and Research Laboratories", American Chemical Society Conference, Boston, 1998. Symposium on Small Spills.

"Using a Consultant for EH&S Projects" American Chemical Society, New Orleans 1999 Division of Chemical Safety and Health

"Spill Response" Organized a 15-paper symposium on chemical spill response for the San Francisco American Chemical Society meeting, April, 2000.

"Spill Risk Assessment Tools" American Chemical Society, Washington DC, August, 2000 Division of Chemical Health and Safety

"Public Policy and its Impact on Laboratories" Laboratory Safety and Environmental Management, Alexandria, VA, July, 2000

"Considerations for In-House Training for Emergency Response Teams", American Chemical Society, Div. Chemical Health and Safety, San Diego, April, 2001.

"Laboratory Risk Assessment Tools", American Chemical Society, Div. Chemical Health and Safety, San Diego, April, 2001.

"Safety Engineering during the Design of the IRORI Autowash 10K", American Chemical Society, Div. Chemical Health and Safety, San Diego, April, 2001.

"Security: Another Hat for the Safety Professional" American Chemical Society, Div. Chemical Health and Safety, Orlando, April, 2002.

"Chemicals in the Home" American Chemical Society, Div. Chemical Health and Safety, Orlando, April, 2002.

"You need a leader" American Chemical Society, Div. Chemical Education & Div. Chemical Health and Safety, San Francisco, 2006.

PUBLICATIONS:

1. F.H. Suydam, W.E. Greth and N.R. Langerman, "The Synthesis of Imidate Hydrochlorides by Reaction of Ethyl Chloroformate with Amides and Thioamides". J. Org. Chem., 34, 292, (1969)
2. N.R. Langerman and I.M. Klotz, "Free Energy of Subunit Interactions: Hemerythrin". Biochemistry, 8, 4746 (1969)
3. I.M. Klotz, N.R. Langerman, and D.E. Darnall, "Quaternary Structure of Proteins". Annual Reviews of Biochemistry, 39, 25 (1970)
4. N.R. Langerman and J.M. Sturtveant, "Calorimetric Studies of Quaternary Structure and Ligand Binding: Hemerythrin". Biochemistry, 10, 2809 (1971)
5. I.M. Klotz, D.E. Darnall, N.R. Langerman, "Quaternary Structure of Proteins". The Proteins (1975) 3rd Ed., 1 284-412
6. N.R. Langerman, "Physical Properties of Protein". A Table. Biology Data Book, 2nd Ed., Vol. 1, p. 370. (Federation of American Societies for Experimental Biology, Bethesda, Maryland, (1972)
7. S.W. Rothman, R.L. Kisliuk and N.R. Langerman, "Calorimetric Studies of Thymidylate Synthesis". J. Biol. Chem., 248, 7845
8. N.V. Beaudette and N.R. Langerman, "Enthalpy of Oxidation and Flavin Mononucleotide". Arch. Biochem. Biophys., 161, 125 (1974)
9. A. Ohkubo, N.R. Langerman, A.B.B Righetti and M.M. Kaplan, "Isolation and Physical Properties of Rat Liver Alkaline Phosphatase". J. Bio. Chem. 249, 7174 (1974)
10. A. Mangold and N.R. Langerman, "Enthalpy of Oxidation of Flavin Mononucleotide II. Temperature Dependence of In Vitro Bacterial Luciferase Bioluminescence". Arch. Biochem. Biophys., 169, 126-133 (1975)
11. N.R. Langerman, "Calorimetric Study of the Binding of FMN to Bacterial Luciferase" in Flavine and Flavoproteins (S.J. Singer, Ed.) 77-82 (1976)

12. N.V. Beaudette and N.R. Langerman, "A Review of Oxidases and Related Redox Systems, Vol. 1 and 2". *The Quarterly Review of Biology*, 50, 445-446
13. N.R. Langerman, "A Review of 'Subunits in Biological Systems'", *Amer. Sci.* (1976)
14. N.R. Langerman, "Enthalpy, Entropy, and Free Energy Values for Biochemical Redox Reactions", *Handbook of Biochemistry and Molecular Biology*, p. 121 (1976)
15. P. McIlvaine and N.R. Langerman, "A Calorimetric Investigation of the Growth of the Luminescent Bacteria Beneckea harveyi and Photobacterium leiognathi". *Biophys. J.*, 17, 16-25 (1977)
16. N.V. Beaudette, N.R. Langerman, R.L. Kisliuk and Y. Gaumont, "A Calorimetric Study of the Binding of 2'-Deoxyuridine-5'-Phosphate and 5'-Fluoro-2'-Deoxyuridine-5'-Phosphate to Thymidylate Synthetase", *Arch. Biochem. Biophys.* 272-278 (1977)
17. M.J. Gonzales and N.R. Langerman, "A Thermodynamic Description of the Self-Association of Flavin Mononucleotide", *Arch. Biochem. Biophys.*, 180 75-81 (1977)
18. C.V. Balakrishnan and N.R. Langerman, "The Isolation of a Bacterial Glycoprotein with Luciferase Activity", *Arch. Biochem. Biophys.*, 181, 680-682 (1977)
19. N.R. Langerman and R.L. Biltonen, "Microcalorimetry for Biological Chemistry: Applications, Instrumentation, and Experimental Design". *Methods in Enzymology*, 61, 287-311 (1978)
20. R.L. Biltonen and N.R. Langerman, "Microcalorimetry for Biological Chemistry: Experimental Design, Data Analysis and Interpretation: *Methods in Enzymology*, 61, 261-285 (1978)
21. N.R. Langerman, "The Simultaneous Determination of Heat Changes and Light Production". *Methods in Enzymology*, Chapters 13 and 14, 61, 261 (1978)
22. N.V. Beaudette, and N.R. Langerman, "An Improved Method for Obtaining Thermal Titration Curves Using Submicromolar Quantities for Proteins", *Analyt. Biochem.*, 90, 693-704 (1978)
23. N.V. Beaudette, N.R. Langerman, and R.L. Kisliuk, "A Calorimetric Study of the Binding of 2'-Deoxyuridine-5'-Phosphate and its Analogs to Thymidylate Synthetase". *Arch. Biochem. Biophys.*, 200, 410-417 (1980)
24. N.V. Beaudette and N.R. Langerman, "Thermodynamics of Nucleotide Binding to Proteins". *Critical Reviews of Biochemistry*, pp. 145-170 (1980)
25. N.R. Langerman, "Biological Microcalorimetry" a review. *Analytic. Biochem.*, 111, 401-402
26. H. Nowak and N.R. Langerman, "Calorimetric Studies of Protein-Ligand Reactions: Flavin Binding Proteins". *Arch. Biochem. Biophys.*, (1982)

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27. B Gould and N.R. Langerman, "A Thermodynamic Description of the Binding of Iron to Ferrioxamine in Aqueous Solutions", Arch. Biochem. Biophys. (1983)
28. N.R. Langerman, "Biochemical Thermodynamics", J. Chem. in Two Year Colleges, (1982)
29. N.R. Langerman, "Thermodynamic Studies of Nucleotide Binding", Calorimetry, Thermometry and Thermal Analysis. (1983)
30. N.R. Langerman, "Hazardous Waste Management at Academic Institution" American Chemical Society Forum on Hazardous Waste, (1984)
31. N.R. Langerman, "Management of Hazardous Waste: Responsibilities of Generators" National Safety Congress, (1984)
32. N.R. Langerman, "Chemical Spill Response Workshop", written and developed for the J.T. Baker Chemical Company Office of Training Services, (1984)
33. N.R. Langerman, "Hazardous Chemical Safety" Seminar and manual written and developed for Chemical Safety Associates, Inc. (1985)
34. N.R. Langerman, "Management of Chemical Releases" Seminar and manual written and developed for Chemical Safety Associates, Inc. (1985).
35. N.R. Langerman, "Emergency Response in the Work Place" Seminar and manual written and developed for Chemical Safety Associates, Inc. (1986).
36. N.R. Langerman, "Chemicals in the Work Place: Trends and Solutions" Seminar and manual written and developed for Chemical Safety Associates, Inc. (1986).
37. N.R. Langerman and A. Mossman "Compressed Gas Safety and Emergency Response" Seminar and manual written and developed for Chemical Safety Associates, Inc. (1987).
38. N. Langerman "Fire Clean-up Operations Lead to Second Emergency At Laboratory", Occupational Health and Safety, August, 1988.
39. N. Langerman "Emergency Response Team Development and Training (in compliance with OSHA 1910.120)", SemiConductor Safety Association Journal, February, 1989
40. N. Langerman "Hazardous Waste Operations and Emergency Response: Summary and Interpretation", SemiConductor Safety Association Journal, September, 1989.
41. N. Langerman "Hazardous Materials Management in the SemiConductor Industry: Part 1", Solid State Technology, July, 1989.
42. L. Putnam and N. Langerman "OSHA Bloodborne Pathogen Exposure Control Plan", Lewis Publishers, March, 1992.
43. N. Langerman, "Precautionary Labels for Chemical Containers", Lewis Publishing, May, 1994.

44. N. Langerman, "Material Safety Data Sheets - Who Uses Them?" Chemical Health & Safety, 2,#6, 1995.
45. N. Langerman, "MSDS Management: Options and Limitations" Chemical Health & Safety, 4,#4, 1997.
46. N. Langerman, "Clean-up of Small Spills in Laboratories and Production Areas", Chemical Health & Safety, 6,#1, 1999.
47. N. Langerman and H. Elston, "Regulations and Standards for the Chemical Hygiene Officer (II): A Quick Look at Environmental Management Regulations", Chemical Health & Safety, 6 #2, 11-14, 1999.
48. N. Langerman "Review of the Chemical Safety and Investigation Board Report on the Sierra Chemicals, Inc. Explosion" Chemical Health & Safety,7#1 2000.
49. Elston, H and Langerman, N (eds) J. Chemical Health and Safety, Spill Response. Jan-Feb, 2001
50. N. Langerman "Security: Another Hat for the Safety Professional", Chemical Health and Safety, 9, 20 - 25, 2002
51. N. Langerman, "You need a leader", J. Chemical Health & Safety, in press, Oct. 2006.
52. N. Langerman and S. Sussman, "Water, Water Everywhere – Is It Effective?" J. Chemical Health & Safety, in press, Dec. 2006.

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REACTIVE and EXPLOSIVE CHEMICAL PROJECTS

CLIENT	APPROXIMATE DATE	PROJECT & OUTCOME
UTAH STATE UNIVERSITY	1978-82	Removal and destruction of various amounts of diethyl ether or picrates from laboratories. (1) Two one-pound bottles of picric acid were removed and "shot". One bottle detonated, the other broke. (2) Large amounts of red and white phosphorous, sodium and potassium metal, Thermite ^(tm) , and poly-nitro compounds were removed from various campus buildings and thermally destroyed. (3) Several gallons of diethyl ether were removed from a cold-room and thermally destroyed. (4) Six, aged, five-gallon pails of diethyl ether were removed from the biology building and thermally destroyed. This project was particularly high profile since the cans were "discovered" three days before Graduation Weekend, and the maximum explosive potential was sufficient to destroy the entire-three story building in which the chemicals were discovered.
AMOCO Tulsa Research Center	1982 - 84	Removal and disposal of aged diisopropyl ether, tetrahydrofuran, picric acid, and potassium metal from various buildings. Destruction was done by building and using a remote container puncture device. All work was supervised by CSA. The actual manipulations were done variously by AMOCO and CSA employees.
Cities Service Corporation - OXY Chemicals	1984	Removal and thermal destruction of four one-gallon bottles of diethyl ether, which had been placed in a 55-gallon 17H drum and left in the weather for at least two years.
Tulsa, OK, Police Department	1984	Removal of aged diethyl ether from a crime laboratory. Thermal destruction was performed by the city Police Department.
Hughes Research Facility	1985	Design of a protocol to treat silicon tetrachloride. This project was not authorized at that time, but was ultimately performed in 1990 by Chemical Waste Management, using the protocol designed previously.
Ohio Highway Patrol	1986	Telephone consulting for incident management of a leaking tank car of silicon trichloride on the Ohio Turnpike. The shipper was a CSA client, who advised the Highway Patrol to use CSA's services. All information was provided by phone, working from our San Diego offices on a Saturday morning.
Sola Barnes-Hind	1990	Design of a protocol for the removal and thermal destruction of aged cumene hydroperoxide from a manufacturing facility in a major metropolitan location. The work was performed by Broco.

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CLIENT	APPROXIMATE DATE	PROJECT & OUTCOME
Beckman Instruments, Inc.	1990	Response to and mitigation of a smoking container of an organic peroxide. The material was water reactive and was destroyed by controlled reaction with cold water.
AMOCO Research Facility	1993	Inspection of and recommendations for disposal, of a one-pound bottle of picric acid. CSA did the actual soaking of the material and used a remote opening device to open the container under water. Chemical Waste Management handled the disposal of the resulting solution.
AMOCO Research Facility	1993	Removal and chemical destruction of a one-gallon bottle of diethyl ether. The bottle was opened using a remote opening device.
The following highly reactive material incidents have been investigated by Dr. Langerman.	1975 - 93	<ol style="list-style-type: none"> 1. Explosion of 8.5 million pounds of ammonium perchlorate oxidizer. 2. Explosion of a unique titanium silver nitrate complex. 3. Fire involving trichlorotriazine. 4. Explosion of a mixture of nitrous oxide and silane. 5. Explosion of a truck-load of zinc, zinc chloride, and steel. 6. Explosion of Liquid Explosive Manufacturing Facility in Utah. 7. Explosion of Solid Explosive Manufacturing Facility in Utah.
Joint Consulting Project with New Mexico Technological University School of Explosive Technology	1990-91	Stability of Ammonium Perchlorate and Ammonium Perchlorate Propellants in contact with High Density Poly Ethylene