



Louis J. DeFilippi, Ph.D.

Senior Scientist

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EXECUTIVE SUMMARY

Senior consultant, domestic and international, in the following major areas:

- Environmental science, especially bioremediation
- Regulatory compliance (OSHA, EPA, Groundwater, USDA, Homeland Security, etc.)
- Classical chemistry and biochemistry, especially the separation, purification, characterization and analysis of small molecules, enzymes and proteins and related processes. Adept at assessing and evaluating current processes and procedures
- Chemical and biochemical processes, their development, evaluation, optimization, including biocatalysis and applied biotechnology
- Microbiology & fermentation science
- Patent infringement

REGULATORY, OSHA & EPA

Multiple private consulting projects have been successfully completed to achieve compliance with Federal & State regulations:

Expert in achieving compliance with numerous Federal, State and Municipal regulations, including:

- **PSM (OSHA 29 CFR Part 1910.119, Process Safety Management of Highly Hazardous Chemicals)** all aspects, anhydrous ammonia a specialty. For a significant number of customers developed complete packages for PSM compliance including (but not limited to) the following subsections of note:
 - (c) Employee participation
 - (d) Process safety information... “enable the employer and the employees involved in operating the process to identify and understand the hazards posed by those processes involving highly hazardous chemicals”
 - (e) Process hazard analysis
 - (f) Operating procedures . . . “develop and implement written operating procedures that provide clear instructions for safely conducting activities”
 - (g) Training . . . “emphasis on the specific safety and health hazards, emergency operations including shutdown, and safe work practices applicable to the employee's job tasks”
 - (g)(3) Training documentation. The employer shall ascertain that each employee involved in operating a process has received and understood the training required by this paragraph. The employer shall prepare a record which contains the identity of the employee, the date of training, and the means used to verify that the employee understood the training.
 - (h) Contractors
 - (i) Pre start-up safety review

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- (j) Mechanical integrity
 - (j)(5) Equipment deficiencies. The employer shall correct deficiencies in equipment that are outside acceptable limits (defined by the process safety information in paragraph (d) of this section) before further use or in a safe and timely manner when necessary means are taken to assure safe operation
 - (k) Hot work permit
 - (l) Management of change
 - (m) Incident investigation
 - (n) Emergency planning and response
 - (o) Compliance audits
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- **Emergency Action Plans** (Part of section “n” above: what to do in the event a release of an Extremely Hazardous Substance [EHS], or if another hazardous situation should occur)
 - **RMP** (Risk Management Planning) EPA Section 112(r) of the Clean Air Act; EPA 40 CFR Part 68
 - **SARA Title III** (EPCRA = Emergency Planning and Community Right to Know). **Every hazard:** chemical, solvent, cleaning agent, acid, base, fluid, gas, etc. and their hazard categories [Fire Hazard, Sudden Release of Pressure, Reactivity, Immediate (acute) and Delayed (chronic)] must be addressed to achieve compliance.
 - **Hazard communication** (OSHA 1910.1200) organize and communicate Material Safety Data Sheets
 - **SWPPP** (Storm Water Pollution Prevention Plans) Any industry with activities that can impact storm water runoff must have a SWPPP.
 - **RCRA** (Resource Conservation and Recovery Act) Environmental compliance audit of client’s hazardous waste.
 - **TSCA** (Toxic Substances Control Act) Aid client in managing PCB Articles – Transformers – including supervising testing, collection of bids, transformer decommissioning, removal, licensed disposal and replacement.
 - **Environmental auditing** as per EPA guidance, “a systematic, documented, periodic, and objective review of facility operations and practices related to meeting environmental requirements.”
 - **Environmental inspections** including mold inspection and related analysis interpretation

LABORATORY CHEMISTRY, PROCESSES, ANALYSIS AND SEPARATIONS SCIENCE:

- Broad experience and understanding of physical, chemical and biochemical processes and related analytical methods (assay development) and: spectroscopy, electrophoretic and chromatographic separations, protein modification, ligand binding, enzyme assay and kinetics, thermodynamic calculations etc.
- Small molecule binding studies, ligands, inhibitors especially involving enzymes
- Adsorbents, ion exchange and activated carbon

PROCESS EVALUATION

Adept at evaluating current processes at customer facilities in the Chemical, Biochemical, Microbiological and Food industries and suggested improvements to increase efficiency and reduce costs.

CHEMISTRY and BIOTECHNOLOGY

Expert in applied industrial chemistry, enzymology, biocatalysis, biotransformations & bioprocessing, especially low-waste “green” systems and thermostable enzymes; emphasis on practical aspects of research, development, scale-up, pilot plant and commercialization. Adept at working with both laboratory personnel & development engineers; hands on when needed.

ENVIRONMENTAL BIOTECHNOLOGY, INDUSTRIAL EFFLUENT PRETREATMENT, BIOREMEDIATION AND EMISSIONS TREATMENT

- Nationally recognized consultant in biological and chemical treatment of hazardous waste, hazardous chemicals, water pollution
- Microbial ecology approach to waste treatment and bioremediation
- Extensive field experience... pilot plant direction, data analysis, scale-up estimation
- Developed structured adsorbent used as microbial support in bioremediation of industrial effluent, groundwater and vaporous emissions (patented/commercial)
- Developed mixed media employed as plugging-free microbial support in bioreactor packing (patented/commercial)
- Developed *in situ-ex situ* bioremediation method for detoxification of metals, especially hexavalent chromium, Cr(VI), by combining inorganic chemistry and microbial ecology (sulfate reducing bacterial consortia); patented
- Chemically modified natural polymers for use as heavy metal adsorbers.
- Developed Biological Air Treater (BAT) for low-cost destruction of vaporous organics, air pollution (patented/commercial)
- On-Site international experience (China [PRC], Taiwan [ROC], UK)
- Designed and implemented numerous waste treatment and remediation strategies for diverse industrial effluents, impacted groundwaters, soils, and air emissions
- Supervised replacement of PCB (polychlorinated Biphenyl) -Transformer and replaced with non-toxic, biodegradable electrolyte-containing transformer

FOOD SAFETY AND FDA

- Food storage and handling
- HACCP plans (Hazard Analysis and Critical Control Point)
- SSOP (Sanitation Standard Operating Procedures); Regulatory requirements under the federal meat inspection act and the poultry products inspection act, especially 9cfr PART 416—SANITATION)

EDUCATION

- **Postdoctoral Fellow** under Prof. Quentin H. Gibson, Cornell University, 7/76 - 7/78.
- **Postdoctoral Fellow** under Prof. Donald E. Hultquist, The University of Michigan, 1/76 - 6/76.
- **Ph.D.**, Biological Chemistry, The University of Michigan, 9/71 - 1/76.
- **BA**, Chemistry (Honors), Queens College, The City University of New York 5/71.

SELECT TRAINING/DEVELOPMENT/PRESENTATIONS

- HAZWOPPER Emergency response Refresher Training (40 hour initial training, 8 hour Haz. Waste Operations Management continuing yearly), 1991 to Current.
- Emergency Notification Release Reporting Training, EPCRA 304; CERCLA 103 (EPA Region 5), 1999
- Risk Management Program Assistance (IEMA), 1999
- Basic Ammonia Refrigeration, 1998
- Statistical Design of Experiments (DOE), 1996
- Scorecard Training, 1996
- Convenor, *Pollution Prevention Biotechnology*, Summer Biotechnology Institute, Northwestern University Center for Biotechnology, 1995
- Sales Training Workshop (Institute for Business and Interpersonal Strategies) 1995
- Customer Linked Commercialization & Customer Partnering, 1994

SELECT PRESENTATIONS

“Treatment of Wastewater for Re-Use: Applications Using an Immobilized Cell Bioreactor System”, 2013 Industrial Water Reuse Specialty Conference, Long Beach, CA, 9-10 Dec., 2013

“Physical chemistry and separations principles for [bio-catalyzed (enzymatic) process] yield improvement”, 9th International Symposium on Biocatalysis and Biotransformation, Berne, Switzerland, 5-9 July 2009

“How efficient is my enzymatic process? A little help choosing the right standard curve using error analysis”, Gordon Conference, July 2008, Rhode Island

“Thoughts on International Trends (China) and Emerging Water Issues” Invited speaker, Environmental Practice Specialty, American Society of Safety Engineers ASSE Headquarters, 1800 Oakton, Des Plaines, IL, USA. April 13, 2007

“Chemical modification, physical chemistry, biotransformation and separations science principals combine for the improvement of immobilized enzyme biocatalytic productivity”, University of Iowa 14th Annual Center for Biocatalysis and Bioprocessing Conference on Pharmaceutical and Industrial Biotechnology, October 2004, Iowa City, Iowa

“Use of chemical modification, and application of physical chemistry and separations science principals, for the improvement of immobilized enzyme biocatalytic productivity”, Gordon Conference, July 2004, Vermont

EMPLOYMENT HISTORY

Industrial

- Independent Consultant, President and Member, Louis DeFilippi, LLC, 1999 to present
- Independent Consultant, Sole proprietorship, 1995 to 1996 and 1997 to 1999
- Project Leader, AlliedSignal Aerospace Sector, Extended Consultation Assignment (Space Station / Mars Lander / Lunar Base), Life Support Systems, ‘96 to ‘97

- Manager Biochemical Technology (Technical Marketing and Sales), AlliedSignal Environmental Systems and Services, '94-'95
- Research Scientist, AlliedSignal Research & Technology, '85-'94
- Research Specialist, Biochemistry, Signal-UOP Research Center, '82-'85
- Senior Research Biochemist, Biotechnology Department, UOP Research Center, '78-'82

Academic

- Adjunct Professor (Evening Faculty Member), Columbia College, Dept. of Science, '84-'85.
- Postdoctoral and Teaching Fellow (General biochemistry), Cornell University, Department of Biochemistry, Molecular and Cell Biology, '77-'78.
- Teaching Assistant (General biochemistry, Medical Technology & Nursing) The University of Michigan, '71-'75.

HONORS

- Special (Team) Recognition Award, AlliedSignal (Honeywell), April '95
- Special (Individual) Recognition Award, AlliedSignal (Honeywell), May '92
- Rackham Dissertation Grant, The University of Michigan, '74-'75
- Graduated (BA, Queens College) with honors, '71
- Elected to Beta Delta Chi, Chemistry Honor Society, Queens College, CUNY, '71
- New York State Regents Scholarship, '67-'71

SOCIETY MEMBERSHIPS

- American Chemical Society
- Water Environment Federation

PATENTS AND PUBLICATIONS

Authored approximately 22 publications, 3 book chapters, and is an inventor on 13 issued patents, 2 pending patents (both allowed 12/2009), in biotechnology, including the chemical, food, pharmaceutical, industries, and for biological wastewater treatment; co-Editor, John Wiley & Sons, "Biological Treatment of Hazardous Wastes" 1998.