Michael Stevens
Associate Toxicologist and Biomedical Engineer

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Academic and Professional Profile

Michael Stevens is a consultant with Paustenbach and Associates, focused on toxicology, risk assessment, occupational health, environmental engineering, and product stewardship. His current interest is airborne chemicals and has previously worked with ingested chemicals and soil contaminants under the guidance of Dr. Dennis Paustenbach. With a B.S. in Biomedical Engineering and a minor in Chemistry from Rose-Hulman Institute of Technology, Michael uses his engineering background and technical knowledge to analyze data and problem solve effectively. His interest in consulting and human health is driven by his passion for improving the quality of life for current and future generations.

Education and Degrees Earned

- Bachelor of Science in Biomedical Engineering and Minor in Chemistry, Rose-Hulman Institute of Technology, 2022

Experience Summary (Professional Career)

Paustenbach and Associates
Associate Toxicologist and Biomedical Engineer
Office Manager - Jackson Hole, Wyoming
July 2022 – Present

- Consultant in toxicology, risk assessment, occupational health, environmental engineering, litigation work, and product stewardship.
- Involved in conducting exposure assessments, interpreting toxicological studies, assessing mathematical models, characterizing risks posed by chemicals, fibers, and radionuclides.
- Experienced with novel air sampling, conducting simulation studies, dispersion modeling, dose-reconstructions, data analysis, setting OELs, training industry employees, and engineering design.
- Offered support on numerous cases in the areas of food & beverage, pharmaceuticals, PPE, E-cigarettes, asbestos-containing products.
- Served as project manager for a several large projects involving both occupational, environmental, and end-user exposures to potential hazards in the following industries: wastewater treatment, chemical manufacturing, steel manufacturing, automobiles, and construction.

Rose-Hulman Biomechanics Laboratory
Researcher
Terre Haute, Indiana
Summer 2021

- Researched carpal tunnel syndrome and wrist and thumb movement biomechanics.
- Designed and performed several testing procedures to determine the durability of wrist and thumb splints made of 12 different thermoset plastic materials using various application techniques described by occupational therapists.
- Developed Instron fixtures and Bluehill Universal programming.
- Analyzed the collected stiffness and hysteresis data.
- Supervised by Dr. Renee Rogge and intended to be published.

Paragon Medical
Biomedical Engineering Intern
Pierceton, Indiana
Spring Co-op 2020

- Designed, modeled, created drawings, and performed quality testing on fixtures that were used in the manufacturing of orthopedic medical devices and implants.
- These fixtures held the devices in place while allowing lathe, EDM, CMM, and other machines to function properly and within the smallest tolerance possible.
- Used Siemens NX CAD modeling software to do this and both 1994 and 2009 GD&T standards depending on the client.

Union Hospital Bone and Joint Center
Shadowed Orthopedist Dr Carlos Belmar
Terre Haute, Indiana
January 2020

- Shadowed the treatment and assessment of patients.
- Observed steroid injections.
- Interpreted MRIs, CAT scans, and X-rays in knees and hips for patients of all ages.

Key Projects (Partial List)

1. **Assessment of occupational and non-occupational asbestos exposures and the potential for such exposures to yield health effects.** Various claims associated with exposure to allegedly asbestos-containing products including insulation, transite, gaskets, packing, clutches, brakes, duct sealant, and electrical components, among other materials. In addition to end-product users, the various industries in which occupational exposures were assessed incudes asbestos product manufacturing, steel manufacturing, automobile manufacturing and repair shops, construction, shipbuilders and shipyard, chemical manufacturers, and others. Assisted with exposure assessment based on historical industrial hygiene records to examine the potential for either a given product(s) or given occupations to yield health effects at exposure levels likely experienced by direct and/or bystander exposed persons (2022-2023).

2. **Assessment of occupational exposures to various chemicals and bioaerosols in wastewater treatment facilities and the potential for such exposures to yield health effects.** Addressed claims associated with exposure to various chemicals and biohazards. Assisted with hazard identification and exposure assessment to examine the potential of the occupational environment to yield health effects at exposure levels likely experienced by a wastewater treatment worker during various activities (2022).

3. **Assessment of occupational exposures at chemical manufacturing facilities and the potential for such exposures to yield health effects.** Addressed exposure claims amongst various employees at a chemical plant. Assisted with hazard identification, exposure assessment, and dose-response assessment to examine the potential of various processes to yield health effects at plausible exposure levels experienced by employees (2023).

4. **Assessment of exposures amongst consumers of a food/beverage product.** Addressed exposure claims amongst end-product consumers. Assisted with analysis of the manufacturing and packaging process, hazard identification, exposure assessment, and dose-response modeling to examine the potential of contamination and contaminated products to yield health effects on consumers (2023).

5. **Assessment of product contamination as a result of a combustion event(s).** Assisted with hazard identification and dispersion modeling of a large combustion event. In wake of the event, suggested a timely action plan for potentially contaminated food grade products (2023).

6. **Assessment of silica exposures and the potential for such exposures to yield health effects.** Addressed claims associated with bystander exposures to allegedly silica-containing construction products. Assisted with exposure assessment to examine the potential for a given product to yield health effects at exposure levels likely experienced by direct and/or bystanders persons (2023).

7. **Assessment of PPE products and their effectiveness against various hazards in various industries.** PPE products, including respirators, were assessed for their effectiveness and limitations in protecting employees from various hazards. The claim was that they often did not provide a protection factor of 5 or 10 and, as a result, did not always adequately protect persons (2022).

8. **Assessment of remediation efforts and potential radionuclide exposures at a former Naval site:** Reviewed all the available information and assembled a scope of work to conduct a sensitivity analysis and risk assessment based on historic and current soil samples at the site (2022).

Publications

Occupational Exposure to Asbestos in the Steel Industry (1972–2006)

Published in the Journal of Exposure Science & Environmental Epidemiology (2023)
This paper presents all the known personal air sampling data for airborne asbestos for the facilities of the U.S. Steel Corporation in America for the period 1972-2006; about 34 years. It represents among the most complete industrial hygiene data sets to be shared by any corporation in a scientific journal. One of the benefits of presenting these data is that it also provides insight into where asbestos containing materials were used in steel making. We discuss all the uses of asbestos-containing materials (ACM) in the steel industry and various opportunities for exposure in this paper.

Silica and Silica Compounds Chapter

Accepted for Publication in Patty's Industrial Hygiene and Toxicology 7th Edition (2023)
This chapter presents a state-of-the-art review on silica (silicon dioxide in both its crystalline and non-crystalline, or amorphous form) and several of the more significant silicates (silica-containing minerals). It provides the necessary background, defines terminology, explains the use and exposures to various forms of silica and silica compounds, and explains the hazards.

Radiological risk assessment of the Hunters Point Naval Shipyard (HPNS)

Accepted for Publication in The Risk Assessment of Environmental Hazards (A Textbook of Case Studies) (2023)
This chapter presents a risk assessment, conducted in accordance with federal guidelines, represents the first comprehensive evaluation of past, present, and future health risks associated with radionuclides present at Hunters Point Naval Shipyard in San Francisco, California. This site was deemed a Superfund site by the USEPA in 1989 due to chemical and radiological contamination resulting from U.S. Navy operations from 1939 to 1974. During characterization and remediation efforts, over 50,000 radiological soil samples and 19,000 air samples were collected. Risk estimates for all scenarios were found to be significantly below the acceptable risk of 3×10^{-4} approved by regulatory agencies.

Professional Honors and Awards

- Deans List, Rose-Hulman Institute of Technology, 2018-2022
- Samuel F. Hulbert Most Outstanding Graduate in Biomedical Engineering
- Moench Commendation faculty selected nominee for exemplary character
- John T. Royse Award faculty selected nominee based on academic achievement, student leadership, participation in extra-curricular activities, and citizenship
- Rose Show Biomedical Engineering Department Award for outstanding design project
- Barry Goldwater Scholarship Nominee (1/4 Rose-Hulman students nominated)
- Rose-Hulman's nominee for the DIII Commissioner's Association student-athlete of the year award
- Varsity R Club Award for Male Athlete with the Most Outstanding Senior Year
- Football Team Captain, Conference DPOY, Team MVP, All-American, 3X Academic All-Conference, 4X Varsity letter, Conference Champion
- Phi Gamma Delta 1848 Club Outstanding Brother Award

Membership to Professional Societies

- Society of Toxicology (SOT)
    - Associate member and 2023 conference attendee