

# Mina Suh, M.P.H.

ASSOCIATE DIRECTOR / MANAGING EPIDEMIOLOGIST

## CONTACT INFORMATION

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## PROFESSIONAL PROFILE

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Ms. Mina Suh is an Associate Director and Managing Epidemiologist with EpidStrategies and has 15 years of experience in protocol development, study design and conduct, statistical analyses, and interpretation of epidemiology studies of cancer, birth defects, asthma, and infectious diseases. She regularly conducts systematic literature reviews, occupational cohort mortality studies, and safety evaluations of medical devices and consumer and pharmaceutical products. Ms. Suh also manages large-scale research programs studying infectious diseases, including respiratory syncytial virus (RSV) in infants and children, with multi-faceted components that include systematic literature reviews, secondary data analyses, primary data generation, and evidence synthesis and integration.

Ms. Suh has published over 40 papers in journals that include *Journal of Infectious Diseases*, *Open Forum Infectious Diseases*, *Critical Reviews in Toxicology*, *Toxicological Sciences*, and *PLoS One*. Her work on RSV has been cited by the Centers for Disease Control and Prevention (CDC), US Food and Drug Administration (FDA), and various public health agencies. She serves as a peer reviewer for *Pediatrics*, *Journal of Infectious Diseases*, *Open Forum Infectious Diseases*, *Critical Reviews in Toxicology*, *Toxicological Sciences*, *Food and Chemical Toxicology*, *Journal of Exposure Science and Environmental Epidemiology*, *Regulatory Toxicology and Pharmacology*, and *Frontiers in Public Health*.

Based on her body of work with metals toxicology and epidemiology, she served as a member and rapporteur of the ECVAM EURL External Scientific Advisory Committee on Bioelution in 2019–2020. She also served as a member of the OECD Expert Workgroup on Metal Release, representing the United States, in 2019–2024.

## EDUCATION AND DEGREES EARNED

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M.P.H., International Health, Boston University

B.A., Molecular Cell Biology, University of California, Berkeley

## PROFESSIONAL ACTIVITIES AND HONORS

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2019–2024	OECD (Organisation for Economic Co-operation and Development), Expert Workgroup on Metal Release
2019–2020	EURL ECVAM (European Union Reference Library, European Commission), External Scientific Advisory Committee Working Group on Bioelution
2014	Society of Toxicology, Annual Conference — Top 10 Risk Assessment Presentations
2013	Society of Toxicology Risk Assessment Specialty Session (RASS) — Top 10 papers of 2012
2012	Society of Toxicology Risk Assessment Specialty Session (RASS) — Top 10 papers of 2011
2005–2007	Alumni Scholarship, Boston University
1998–2002	William Byrd Scholarship, University of California Berkeley

## PROFESSIONAL ASSOCIATIONS

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International Society of Pharmacoepidemiology

Women in Bio

Infectious Disease Society of America

## SELECTED PROFESSIONAL EXPERIENCE

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### ***Epidemiology***

Designed study protocols for active surveillance and secondary data analyses of RSV in US infants and children.

Conducted systematic literature reviews for burden of disease, healthcare utilization, and mortality for RSV and all-cause bronchiolitis (ACB) among US infants and children.

Constructed analyses of breast cancer science and clinical research developments and submitted public comments to federal agencies. Evaluated the efficacy and safety of therapeutic breast cancer agents in drug development, with preclinical and clinical data analysis and interpretation. Analyzed experimental protocols of Phase III oncology trials.

Assessed potential associations between health effects and occupational and environmental exposures to heavy metals, including hexavalent chromium, titanium dioxide, cobalt, and nickel.

Evaluated cancer and birth defects data at the national, state, and county levels to assess community health and disease trends.

Analyzed National Health and Nutrition Examination Surveys (NHANES) to characterize thyroid hormone effects from environmental exposures to goitrogenic chemicals.

### ***Toxicology and Risk Assessment***

Prepared toxicological review of scientific literature and databases of regulatory agencies to develop carcinogenic modes of action and characterize cancer biomarkers of environmental exposures to heavy metals.

Supported development of physiologically based pharmacokinetic (PBPK) models for mice, rats, and humans orally exposed to chromium. Prepared materials to develop dose-response, exposure, and site/product-based risk assessment in accordance with federal agency guidance and regulation.

Drafted technical memos and reports to state and federal regulatory agencies that assessed the cancer risk of environmental exposures to chemicals, particularly, pesticides and heavy metals.

Designed and developed bioaccessibility and relative oral bioavailability studies of cobalt and nickel.

Prepared technical materials for Proposition 65 compliance.

## PUBLICATIONS

Lipworth L, Panko JM, Allen BC, Mumma MT, Jiang X, Vincent MJ, Bare JL, Antonijevec T, Vivanco SN, Marano DE, **Suh M**, Cohen S, Mittal L, Proctor DM. 2025. Lung cancer mortality among aircraft manufacturing workers with long-term, low-level, hexavalent chromium exposure. *J Occup Environ Hyg* 22(3):214-227; doi: 10.1080/15459624.2024.2439817; [open access](#).

Blatt AZ, **Suh M**, Walter EB Jr, Wood CT, Espinosa C, ... Movva N, Reichert H, Fryzek JP, Nelson CB. 2024. Geographic progression of infant respiratory syncytial virus associated bronchiolitis across the United States before and since the onset of COVID-19: Results from four health systems, 2015-2023. *Influenza Other Respir Viruses* 18(5):e13298; doi: 10.1111/irv.13298.

Blatt AZ, **Suh M**, Walter EB Jr, Wood CT, Espinosa C, ... Movva N, Reichert H, Fryzek JP, Nelson CB. 2024. Trends in RSV testing patterns among infants presenting with bronchiolitis: Results from four United States health systems, 2015-2023. *Ann Epidemiol* 94:72-80; [open access](#).

Yoshino T, Hooda N, Younan D, Muro K, Shitara K, Heinemann V, ... **Suh M**, Reichert H, Mezzi K, Fryzek J, et al. 2024. A meta-analysis of efficacy and safety data from head-to-head first-line trials of epidermal growth factor receptor inhibitors versus bevacizumab in adult patients with RAS wild-type metastatic colorectal cancer by sidedness. *Eur J Cancer* 202:113975; doi: 10.1016/j.ejca.2024.113975.

**Suh M**, Movva N, Jiang X, Reichert H, Pastula ST, Sacks NC, Frankenfeld C, Fryzek JP, Simões AF. 2024. Healthcare utilization among infants covered by Medicaid and newly diagnosed with respiratory syncytial virus. *Open Forum Infect Dis*, [open access](#).

Mitchell M, **Suh M**, Hooda N, Bylsma LC, Cohen S. 2024. The effect of bovine dairy products and their components on the incidence and natural history of infection: A systematic literature review. *Nutr J* 23:26; [online open access](#).

**Suh M**, Mitchell M, Hooda N, Bylsma LC, Cohen SS. 2024. The effects of dairy consumption on vaccine immune response and immunoglobulins: A systematic literature review. *Int J Nutr* 8(1):1-25; DOI 10.14302/issn.2379-7835.ijn-24-4938.

Wharton GT, Becker C, Bennett D, Burcu M, Bushnell G, Ferrajolo C, ... Movva N, Raman SR, Scholle O, **Suh M**, et al. 2023. Overview of global real-world data sources for pediatric pharmacoepidemiologic research. *Pharmacoepidemiol Drug Saf*. doi: 10.1002/pds.5695. <https://doi.org/10.1002/pds.5695>

Daniels D, Wang D, Suryadevara M, Wolf Z, Nelson CB, **Suh M**, et al. 2023. Epidemiology of RSV bronchiolitis among young children in central New York before and after the onset of the COVID-19 pandemic. [Pediatr Infect Dis J](#). doi: 10.1097/INF.0000000000004101, Epub ahead of print. PMID: 37725814.

- Suh M**, Movva N, Jiang X, Bylsma LC, Reichert H, Fryzek JP, Nelson CB. 2022. Respiratory syncytial virus (RSV) is the leading cause of United States infant hospitalizations 2009–2019: A study of the National (Nationwide) Inpatient Sample. *J Infect Dis* 226(Suppl 2):S154–S163, [open access](#).
- Movva N, **Suh M**, Reichert H, Hitze B, Sendak MP, Wolf Z, Carr S, Kaminski T, White M, Fisher K, Wood CT, Fryzek JP, Nelson CB, Malcolm WF. 2022. Respiratory syncytial virus during the COVID-19 pandemic compared to historic levels: A retrospective cohort study of a health system. *J Infect Dis* 226(Suppl 2):S175–S183 [open access](#).
- Suh M**, Movva N, Jiang X, Reichert H, Bylsma LC, Fryzek JP, Nelson CB. 2022. Respiratory syncytial virus burden and healthcare utilization in United States infants, <1 year of age: Study of nationally representative databases, 2011–2019. *J Infect Dis* 226(Suppl 2):S184–S194, [open access](#).
- Suh M**, Movva N, Bylsma LC, Fryzek JP, Nelson CB. 2022. A systematic literature review of the burden of respiratory syncytial virus disease and health care utilization among United States infants younger than 1 year. *J Infect Dis* 226(Suppl 2):S195–S212, [open access](#).
- Movva N, **Suh M**, Bylsma LC, Fryzek JP, Nelson CB. 2022. Systematic literature review of respiratory syncytial virus laboratory testing practices and incidence in United States infants and children <5 years of age. *J Infect Dis* 226(Suppl 2):S213–S224, [open access](#).
- Reichert H, **Suh M**, Jiang X, Movva N, Bylsma LC, Fryzek JP, Nelson CB. 2022. Mortality associated with respiratory syncytial virus, bronchiolitis, and influenza among infants in the United States: A birth cohort study from 1998 to 2018. *J Infect Dis* 226(Suppl 2):S246–S254, [open access](#).
- Bylsma LC, **Suh M**, Movva N, Fryzek JP, Nelson CB. 2022. Mortality among United States infants and children under 5 years of age with respiratory syncytial virus and bronchiolitis: A systematic literature review. *J Infect Dis* 226(Suppl 2):S267–S281, [open access](#).
- Rankin DA, Haddadin Z, Lipworth L, Stahl AL, Fryzek J, **Suh M**, et al. 2022. Comparison of clinical presentations and burden of respiratory syncytial virus in infants across three distinct healthcare settings in Davidson County, Tennessee. *Therapeut Adv Infect Dis*, [open access online](#).
- Proctor DM, Bhat V, **Suh M**, Reichert H, Jiang X, Thompson CM. 2021. Inhalation cancer risk assessment for environmental exposure to hexavalent chromium: Comparison of margin-of-exposure and linear extrapolation approaches. *Regul Toxicol Pharmacol* 124:104969, <https://doi.org/10.1016/j.yrtph.2021.104969>.
- Haddadin Z, Rankin DA, Lipworth L, **Suh M**, McHenry R, Blozinski A, Salib George S, Fernandez KN, Varjabedian R, Spieker AJ, Shepard DS, Halasa NB. 2021. Respiratory virus surveillance in infants across different clinical settings. *J Pediatr*, DOI: <https://doi.org/10.1016/j.jpeds.2021.03.036>.
- Thompson CM, Donahue DA, Hobbs C, Costecalde Y, Franzen A, **Suh M**, Proctor DM, Harris MA. 2020. Exposure to environmentally-relevant concentrations of hexavalent chromium does not induce ovarian toxicity in mice. *Regul Toxicol Pharmacol* 116, open access: <https://doi.org/10.1016/j.yrtph.2020.104729>.
- Fergie J, **Suh M**, Jiang X, Fryzek JP, Gonzales T. 2022. Respiratory syncytial virus and all-cause bronchiolitis hospitalizations among preterm infants using the Pediatric Health Information System (PHIS). *J Infectious Dis* 225(7), [available online](#).
- Eskes C, Corsini E, Hanley V, Karadjova I, Kopp-Schneider A, **Suh M**, Alves P, Clewell R, Cotgreave I, Navas J, Piersma A, Westmoreland C. 2020. ESAC opinion on the scientific validity of the bioelution test method. In: Viegas Barroso J (ed), EUR 30281 EN. Publications Office of the European Union, Luxembourg, ISBN 978-92-76-20004-8 (online), doi:10.2760/023005 (online), JRC121143.

Yoon M, Ring C, Van Landingham CB, **Suh M**, Song G, Antonijevic T, Gentry PR, Taylor MD, Keen AM, Andersen ME, Clewell JH. 2019. Assessing children's exposure to manganese in drinking water using a PBPK model. *Toxicol Appl Pharmacol* 380:114695, <https://doi.org/10.1016/j.taap.2019.114695>.

**Suh M**, Wikoff D, Lipworth L, Goodman M, Fitch S, Mittal L, Ring C, Proctor D. 2019. Hexavalent chromium and stomach cancer: A systematic review and meta-analysis. *Crit Rev Toxicol* [ePub ahead of print]: doi: 10.1080/10408444.2019.1578730.

Rager JE, **Suh M**, Chappell G, Thompson CM, Proctor DM. 2019. Review of transcriptomic responses to hexavalent chromium exposure in lung cells supports a role of epigenetic mediators in carcinogenesis. *Toxicol Lett* 305:40–50.

**Suh M**, Casteel S, Dunsmore M, Ring C, Verwiel A, Proctor DM. 2019. Bioaccessibility and relative oral bioavailability of cobalt and nickel in residential soil and dust affected by metal grinding operations. *Sci Tot Environ* 660:677–689.

**Suh M**, Proctor DM, Chappell G, Rager JE, Thompson CM, Borghoff S, Finch L, Ellis-Hutchings R, Wiench K. 2018. A review of the genotoxic, mutagenic, and carcinogenic potentials of several lower acrylates. *Toxicology* 402–403:50–67, doi: 10.1016/j.tox.2018.04.006.

Proctor DM, **Suh M**, Chappell G, Borghoff SJ, Thompson CM, Wiench K, Finch L, Ellis-Hutchings R. 2018. An adverse outcome pathway (AOP) for forestomach tumors induced by non-genotoxic initiating events. *Regul Toxicol Pharmacol* 96:30–40, doi: 10.1016/j.yrtph.2018.04.016.

Thompson CT, **Suh M**, Chappell G, Borghoff S, Ellis-Hutchings R, Wiench K, Finch L, Proctor DM. 2018. Assessment of the mode of action underlying development of forestomach tumors in rodents following oral exposure to ethyl acrylate and relevance to humans. *Regul Toxicol Pharmacol* 96:178–189 doi: 10.1016/j.yrtph.2018.05.006.

Thompson CM, Kirman CR, Hays SM, **Suh M**, Harvey SE, Proctor DM, Rager JE, Haws LC, Harris MA. 2018. Integration of mechanistic and pharmacokinetic information to derive oral reference dose and margin-of-exposure values for hexavalent chromium. *J Appl Toxicol* 38:351–365. doi: 10.1002/jat.3545.

Thompson CM, **Suh M**, Proctor DM, Haws LC, Harris MA. 2017. Ten factors for considering the mode of action of Cr(VI)-induced gastrointestinal tumors in rodents. *Mut Res/Genetic Toxicol Environ Mutagen* 823:45–57.

Thompson CM, Young RR, Dinesdurage H, **Suh M**, Harris MA, Rohr AC, Proctor DM. 2017. Assessment of the mutagenic potential of hexavalent chromium in the duodenum of Big Blue® rats. *Toxicol Appl Pharmacol* 330(1):48–52.

Rager JE, Ring CL, Fry RC, **Suh M**, Proctor DM, Haws LC, Harris MA, Thompson CM. 2017. High-throughput screening data interpretation in the context of *in vivo* transcriptomic responses to oral Cr(VI) exposure. *Toxicol Sci* kfx085. doi: 10.1093/toxsci/kfx085.

Kirman CR, **Suh M**, Proctor DM, Hays SM. 2017. Improved physiologically based pharmacokinetic model for oral exposures to chromium in mice, rats, and humans to address temporal variation and sensitive populations. *Toxicol Appl Pharmacol* 325:9–17.

Thompson CM, Wolf, JC, McCoy A, **Suh M**, Proctor DM, Kirman CR, Haws LC, Harris MA. 2017. Comparison of toxicity and recovery in the duodenum of B6C3F1 mice following treatment with intestinal carcinogens captan, folpet, and hexavalent chromium. *Toxicol Pathol* 45(8):1091–1101. DOI: 10.1177/0192623317y4324.

Thompson CM, Rager JE, **Suh M**, Ring CL, Proctor DM, Haws LC, Fry RC, Harris MA. 2016. Transcriptomic responses in the oral cavity of F344 rats and B6C3F1 mice following exposure to Cr(VI): Implications for risk assessment. *Environ Molec Mutagen* 57:706–716.

De Flora S., Camoirano A, Micale RT, La Maestra S, Savarino V, Zentilin P, Marabotto E, **Suh M**, Proctor DM. 2016. Reduction of hexavalent chromium by fasted and fed human gastric fluid. I. Chemical reduction and mitigation of mutagenicity. *Toxicol Appl Pharmacol* 306:113–119.

Thompson CM, **Suh M**, Mittal L, Wikoff D, Welsh B, Proctor DM. 2016. Development of linear and threshold no significant risk levels for inhalation exposure to titanium dioxide using systematic review and mode of action considerations. *Regul Toxicol Pharmacol* 80:60–70.

**Suh M**, Thompson CM, Brorby GP, Mittal L, Proctor DM. 2016. Inhalation cancer risk assessment of cobalt metal. *Regul Toxicol Pharmacol* 79:74–82.

Thompson CM, Wolf JC, Elbekai RH, Paranjpe MG, Seiter JM, Chappell MA, Tappero RV, **Suh M**, Proctor DM, Bichteler A, Haws LC, Harris MA. 2015. Duodenal crypt health following exposure to Cr(VI): Micronucleus scoring,  $\gamma$ -H2AX immunostaining, and synchrotron x-ray fluorescence microscopy. *Mut Res* 789–790:61–66.

Proctor DM, **Suh M**, Mittal L, Hirsch S, Salgado RV, Bartlett C, Van Landingham C, Rohr A, Crump K. 2015. Inhalation cancer risk assessment of hexavalent chromium based on updated mortality for Painesville chromate production workers. *J Expo Sci Environ Epidemiol* 26(2):224–231, doi: 10.1038/jes.2015.77.

Thompson CM, Young RR, **Suh M**, Dinesdurage HR, Elbekai RH, Harris MA, Rohr AC, Proctor DM. 2015. Assessment of the mutagenic potential of Cr(VI) in the oral mucosa of Big Blue® transgenic F344 rats. *Environ Mol Mutagen* 56:621–628.

Young RR, Thompson CM, Dinesdurage HR, Elbekai RH, **Suh M**, Rohr AC, Proctor DM. 2015. A robust method for assessing chemically induced mutagenic effects in the oral cavity of transgenic Big Blue® rats. *Environ Mol Mutagen* 56:629–636.

Thompson CM, Seiter J, Chappell MA, Tappero RV, Proctor DM, **Suh M**, Wolf JC, Haws LC, Vitale R, Mittal L, Kirman CR, Hays SM, Harris MA. 2015. Synchrotron-based imaging of chromium and  $\gamma$ -H2AX immunostaining in the duodenum following repeated exposure to Cr(VI) in drinking water. *Toxicol Sci* 143(1):16–25.

Proctor DM, **Suh M**, Campleman S, Thompson C. 2014. Assessment of the mode of action for hexavalent chromium-induced lung cancer following inhalation exposures. *Toxicology* 325:160–179.

**Suh M**, Troese MJ, Hall DA, Yasso B, Yzena JJ, Proctor DM. 2014. Evaluation of electric arc furnace-processed steel slag for dermal corrosion, irritation, and sensitization from dermal contact. *J Appl Toxicol* 34(12):1418–1425, DOI:10.1002/jat.2974.

**Suh M**, Thompson C, Kirman C, Carakostas M, Haws L, Harris M, Proctor D, Abraham L, Hixon JG. 2014. High concentrations of hexavalent chromium in drinking water alter iron homeostasis in F344 rats and B6C3F1 mice. *Food Chem Toxicol* 65:381–388.

**Suh M**, Abraham L, Hixon JG, Proctor D. 2014. The effects of perchlorate, nitrate, and thiocyanate on free thyroxine for potentially sensitive subpopulations of the 2001–2002 and 2007–2008 National Health and Nutrition Examination Surveys. *J Expos Sci Epidemiol* 2013:1–9

Kirman CR, Aylward LL, **Suh M**, Harris MA, Thompson CM, Haws LC, Proctor DM, Parker W, Hays SM. 2013. Physiologically based pharmacokinetic model for humans orally exposed to chromium. *Chem Biol Interact* 204:13–27.

O'Brien T, Ding H, **Suh M**, Thompson C, Parsons BL, Harris MA, Winkelman WA, Wolf JC, Hixon JG, Schwartz AM, Myers MB, Haws LC, Proctor DM. 2013. Assessment of K-Ras mutant frequency and micronucleus incidence in the mouse duodenum following 90-days of exposure to Cr(VI) in drinking water. *Mutat Res* 754(1-2):1521, DOI: 10.1016/j.mrgentox.2013.03.008.



O'Brien TJ, Ding H, **Suh M**, Thompson CM, Parsons BL, Harris MA et al. 2013. Assessment of K-Ras mutant frequency and micronucleus incidence in the mouse duodenum following 90-days of exposure to Cr(VI) in drinking water. *Mutation Res Gen Tox and Environ Mut* 754:15–21.

Thompson CM, Proctor DM, **Suh M**, Haws LC, Kirman CR, Harris MA. 2013. Assessment of the mode of action underlying development of rodent small intestinal tumors following oral exposure to hexavalent chromium and relevance to humans. *Crit Rev Toxicol* 43(3):244–274.

Kirman CR, Hays SM, Aylward LL, **Suh M**, Harris MA, Thompson CM, Haws LC, Proctor DM. 2013. Physiologically based pharmacokinetic model for rats and mice orally exposed to chromium. *Chem Biol Interact* 200(1):45–64.

Proctor DM, **Suh M**, Aylward LL, Kirman CR, Harris MA, Thompson CM, Gürleyük H, Gerads R, Haws LC, Hays, SM. 2012. Hexavalent chromium reduction kinetics in rodent stomach contents. *Chemosphere* 89(5):487–93.

Thompson CM, Fedorov Y, Brown DD, **Suh M**, Proctor DM, Kuriakose L, Haws LC, Harris MA. 2012. Assessment of Cr(VI)-induced cytotoxicity and genotoxicity using high content analysis. *PLoS ONE* 7(8):42720.

Thompson CM, Hixon JG, Proctor DM, Haws LC, **Suh M**, Urban JD, Harris MA. 2012. Assessment of genotoxic potential of Cr(VI) in the mouse duodenum: An in silico comparison with mutagenic and nonmutagenic carcinogens across tissues. *Regul Toxicol Pharmacol* 64(1):6876, DOI: /10.1016/j.yrtph.2012.05.019.

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Gatto NM, Kelsh MA, Mai DH, **Suh M**, Proctor DM. 2010. Occupational exposure to hexavalent chromium and cancers of the gastrointestinal tract: A meta-analysis. *Cancer Epidemiol* 34(4):388–399.

## ABSTRACTS AND PRESENTATIONS

Price M, **Suh M**, Pastula S, Kruchko C, Ostrom Q. Pediatric low-grade glioma (pLGG) incidence in the United States from 2015 through 2019. Abstract LGG-04, Society for NeuroOncology (SNO) Pediatric Neuro-Oncology Conference, San Diego, CA, May 2025.

**Suh M**, Mittal L, Brorby G, Pastula S, Vincent M, Proctor D. Epidemiology is critical in advancing cumulative impact assessment (CIA) research: A pilot study in San Antonio, Texas. International Society of Exposure Science Annual Meeting, Montreal, Canada, October 2024.

Allen B, Vincent M, Lipword L, Panko J, **Suh M**, Jiang X, Mumma, Proctor D. Lung cancer risk and exposure to hexavalent chromium: Results of extended mortality study of workers with low level exposures and quantitative risk assessment using pooled analysis of three cohorts. Society of Toxicology Annual Meeting, Salt Lake City, UT, March 2024.

Yoshino T, Hooda N, Younan D, Shitara K, Heinemann V,... **Suh M**, Reichert H,... Fryzek J, et al. 2023. 127P A meta-analysis of efficacy and safety from head-to-head first-line (1L) trials of epidermal growth factor receptor inhibitors (EGFRIs) versus bevacizumab in combination with chemotherapy (CT) doublets in patients with RAS wild-type (WT) metastatic colorectal cancer (mCRC) by sidedness. *Ann Oncol* 34(Suppl 4):S1519 [abstract]; DOI:<https://doi.org/10.1016/j.annonc.2023.10.262>.

Blatt A, **Suh M**, Walter E, Jr., Wood CT, Espinosa C, Enriquez-Bruce ME, et al. Seasonality of infant respiratory syncytial virus associated bronchiolitis around the US since the onset of COVID-19: Results from four US health systems 2016-17 through 2022-23. Poster 1535431, IDWeek 2023, Boston, MA, October 2023.

Nelson CB, Jiang X, **Suh M**, Fryzek J. Prevention of respiratory syncytial virus hospitalizations (RSVH) in US infants who paid through Medicaid would have a greater benefit for Black, Hispanic, Asian/Pacific Islander, Native American and Other race/ethnicity infants, and have a substantial impact on overall RSVH burden and related costs: Rates of respiratory syncytial virus hospitalization (RSVH) among US infants by race/ethnicity and insurance payer, NIS 2018-2020. Poster 1536169, IDWeek 2023, Boston, MA, October 2023.

Wharton GT, Becker C, Bennett D, Burcu M, Bushnell G, Ferrajolo C, Kaplan S, McMahon AW, Movva N, Raman SR, Scholle O, **Suh M**, Sun JW, Horton DB. 2023. Overview of global real-world data sources for pediatric pharmacoepidemiologic research. Poster presentation at the 39<sup>th</sup> International Conference on Pharmacoepidemiology and Therapeutic Risk Management (ICPE), Halifax, Nova Scotia, August 2023.

Reichert H, Jiang X, **Suh M**, Pastula S, Movva N, Fryzek J, Simões EAF. The burden of RSV and bronchiolitis in the US infant Medicaid population extends beyond the inpatient setting. Poster 192, International Society for Pharmacoepidemiology (ICPE) annual meeting, Halifax, Nova Scotia, August 2023.

Pastula S, **Suh M**, Jiang X, Reichert H, Movva N, Fryzek J, Simões EAF. Respiratory syncytial virus (RSV) and bronchiolitis epidemiology among the United States infant Medicaid populations in seven states. Poster 191, International Society for Pharmacoepidemiology (ICPE) annual meeting, Halifax, Nova Scotia, August 2023.

Wharton GT, Becker C, Bennett D, Burcu M, Bushnell G, ..., Movva N, ..., **Suh M**, et al. Overview of global real world data sources for pediatric pharmacoepidemiological research. Poster 217, International Society for Pharmacoepidemiology (ICPE) annual meeting, Halifax, Nova Scotia, August 2023.

**Suh M**, Reichert H, Movva N, Fisher K, Wood CT, Wolf Z ..., Fryzek JP, et al. Pilot surveillance of infant lower respiratory tract infections and respiratory syncytial virus in the United States during the COVID pandemic. Poster 95, International Society for Pharmacoepidemiology (ICPE) annual meeting, Halifax, Nova Scotia, August 2023.

**Suh M**, Reichert H, Jiang X, Pastula ST, Movva N, Fryzek J, Simoes E. The burden of RSV and bronchiolitis in the US infant Medicaid population extends beyond the inpatient setting. Oral presentation to the Pediatric Academic Societies meeting, Washington, DC, April 2023.

Wood CT, Walter E, Wolf Z, Waddell E, Budhecha S, Espinosa CM, Enriquez-Bruce ME, Domachowske J, Daniels D, **Suh M**, Fryzek J, Nelson CB. Infant hospitalizations and ICU admissions for bronchiolitis and RSV-bronchiolitis are at historic highs during 2022 early seasonal disease: Results from four US health systems. Poster #637 at the Pediatric Academic Societies meeting, Washington, DC, April 2023.

Wood CT, Walter E, Espinosa CM, Enriquez-Bruce ME, Budhecha S, Elliott A, Domachowske J, Daniels D, Wolf Z, Waddell E, **Suh M**, Fryzek J, Nelson CB. Seasonality of infant lower respiratory tract infections, including those caused by RSV, was altered during the COVID-19 pandemic: results from four US health systems. Poster #642 at the Pediatric Academic Societies meeting, Washington, DC, April 2023.

Wood CW, Walter E, Espinosa C, Enriquez-Bruce ME, Budhecha S, Elliott A, Domachowske J, Daniels D, Wolf Z, Waddell EB, **Suh M**, Fryzek J, Nelson CB (presenter). 2023. (1) Seasonality of infant lower respiratory tract infections, including those caused by RSV, was altered during the COVID-19 pandemic: Results from four US health systems. (2) Infant hospitalizations and ICU admissions for bronchiolitis and RSV-bronchiolitis are at historic highs during 2022 early seasonal disease: Results from four US health systems. Companion posters accepted for the 7<sup>th</sup> ReSViNET Conference, Respiratory Syncytial Virus Foundation, Lisbon, Portugal, February 2023.

Movva N, **Suh M**, Jiang X, Reichert H, Bylsma L, Rizzo CP, White M, Fryzek J, Nelson CB. Medicaid infants have the highest respiratory syncytial virus (RSV) hospitalization burden and rates among United States (US) infants aged <1 year: An analysis of the 2011–2018 National (Nationwide) Inpatient Sample (NIS). Presentation to AAP Experience, National Conference & Exhibition (American Academy of Pediatrics), Philadelphia, PA, October 2021.



**Suh M**, Movva N, Bylsma L, Demont C, Rizzo C, Fryzek J, Nelson CB. Systematic literature review (SLR) of respiratory syncytial virus (RSV) burden and health care utilization (HCU) among infants in the United States (US). Poster presentation at 37<sup>th</sup> ICPE (International Conference on Pharmacoepidemiology & Therapeutic Risk Management), virtual conference, August 2021.

Malcolm W, Fisher K, Wood CT, Movva N, **Suh M**, Wolf Z, Balu S, Sendak M, Hintze B, White M, Fryzek J, Nelson CB. Infant lower respiratory tract infections, including those caused by RSV, are significantly below historical levels during the COVID-19 pandemic. Pediatrics Academic Societies 2021, April–May 2021.

Fergie J, Gonzales T, **Suh M**, Jiang X, Fryzek JP, Hooda N, Howard A, Bloomfield A. Higher-risk congenital heart disease (CHD) among children aged  $\leq 24$  months with respiratory syncytial virus hospitalizations (RSVH) and all-cause bronchiolitis hospitalizations (BH). 37th Annual Children's National Symposium: ECMO and the Advanced Therapies for Cardiovascular and Respiratory Failure, Feb 2021.

Fergie J, Gonzales T, **Suh M**, Jiang X, Fryzek J, Hooda N, Howard A, Bloomfield A. Higher-risk congenital heart disease (CHD) among children aged  $\leq 24$  months with respiratory syncytial virus hospitalizations (RSVH) and all-cause bronchiolitis hospitalizations (BH) at RSV season before and after the 2014 American Academy of Pediatrics (AAP) guidance. California Association of Neonatologists' 27th Annual Cool Topics in Neonatology Conference, March 2021.

**Suh M**, Jiang X, Movva N, Fryzek J, Bylsma L, Rizzo C, Nelson CB. Hospitalizations and emergency department visits for respiratory syncytial virus among infants aged  $< 1$  year in the United States: An analysis of nationwide inpatient and emergency room data. Presentation to IDWeek virtual conference on infectious disease, October 2020.

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Fergie J, Gonzales T, **Suh M**, Jiang X, Fryzek J, Howard A, Bloomfield A. 2020. Respiratory syncytial virus hospitalizations (RSVH) and all-cause bronchiolitis hospitalizations (BH) among children aged  $\leq 24$  months at the start of RSV season with bronchopulmonary dysplasia/chronic lung disease of prematurity (BPD/CLDP) before and after the 2014 American Academy of Pediatrics (AAP) policy. Presentation to IDWeek virtual conference on infectious disease, October 2020.

Shepard DS, Perloff J, Jiang S, **Suh M**, Fryzek J, Bowser D, Rizzo C, Nelson CB. Impacts of age and season on rates of hospitalization for respiratory syncytial virus (RSV) in infants in the United States and their use of mechanical ventilation and charges. Presentation to IDWeek virtual conference on infectious disease, October 2020.

Haddadin Z, Rankin DA, Lipworth L, Fryzek J, **Suh M**, Shepard DS, McHenry R, Varjabedian R, Fernandez KN, Rizzo C, Nelson CB, Halasa NB. Clinical characteristics of common respiratory viruses detected in infants across different clinical settings. Presentation to IDWeek virtual conference on infectious disease, October 2020.

Haddadin Z, Rankin DA, Lipworth L, Fryzek J, **Suh M**, Shepard DS, McHenry R, Varjabedian R, Fernandez KN, Rizzo C, Nelson CB, Halasa NB. Distribution of respiratory viral pathogens in infants across different clinical settings from December 2019 to April 2020. Presentation to IDWeek virtual conference on infectious disease, October 2020.

Rankin DA, Haddadin Z, Lipworth L, Fryzek J, **Suh M**, Shepard DS, McHenry R, Varjabedian R, Fernandez KN, Rizzo C, Nelson CB, Halasa NB. Comparison of clinical presentations and burden of respiratory syncytial virus in infants across three distinct healthcare settings. Presentation to IDWeek virtual conference on infectious disease, October 2020.

Verwiel AH, Proctor DP, **Suh M**. Glyphosate risk assessment to assess Proposition 65 requirements for pesticide applicators and construction workers: Risk communication case study. Poster for Society of Toxicology, Virtual Annual Meeting, 2020.

**Suh M**, Verwiel A, Proctor D. Oral and inhalation bioaccessibility of cobalt and nickel in metal alloys: A critical consideration for site-specific human health risk assessments and read across. Poster for Society of Toxicology, Virtual Annual Meeting, 2020,  
<https://eventpilotadmin.com/web/page.php?page=Session&project=SOT20&id=P3190>.

Urban J, Wikoff D, **Suh M**, Britt J, Harvey S, Chappell G, Haws L. Comparison of NTP OHAT and US EPA TSCA study quality criteria: Trichloroethylene (TCE) and congenital heart defects (CHDs) as a case study. Poster at Society of Toxicology Annual Meeting, Baltimore, MD, March 2019.

**Suh M**, Wikoff D, Harvey S, Mittal L, Lipworth L, Goodman M, Goodmanson A, Ring C, Rohr A, Proctor D. Hexavalent chromium and stomach cancer: A systematic review and meta-analysis. Presented at Joint Annual Meeting of International Society of Exposure Science and International Society for Environmental Epidemiology (ISES-ISEE 2018), Ottawa, Canada, August 2018.

Ring CL, **Suh M**, Casteel S, Dunsmore M, Verwiel A, Proctor D. Relative oral bioavailability of cobalt and nickel in residential soil and dust affected by metal grinding operations. Presented at Joint Annual Meeting of International Society of Exposure Science and International Society for Environmental Epidemiology (ISES-ISEE 2018), Ottawa, Canada, August 2018.

Thompson CM, **Suh M**, Proctor DM, Harris MA. Ten factors for considering the mode of action of Cr(VI)-induced intestinal tumors in rodents. Society of Toxicology Annual Meeting, March 11-15, 2018. San Antonio, TX.

Thompson CM, Wolf JC, **Suh M**, Proctor DM, Haws LC, Harris MA. Toxicity and recovery in the duodenum of B6C3F1 mice following treatment with intestinal carcinogens; captan, folpet, and hexavalent chromium: Evidence for an adverse outcome pathway. Society of Toxicology Annual Meeting, March 11-15, 2018. San Antonio, TX.

**Suh M**, Harvey S, Wikoff D, Mittal L, Ring C, Goodmanson A, Proctor D. Meta-analysis of hexavalent chromium and stomach cancer. Poster presented at Society of Toxicology Annual Meeting. March 13, 2017. Baltimore, MD.

Thompson C, Kirman C, **Suh M**, Proctor D, Haws L, Harris M, Hays S. Risk assessment of oral exposure to Cr(VI): Integration of mode of action, pharmacokinetics, and dose-response modeling. Poster presented at Society of Toxicology Annual Meeting. March 14, 2017. Baltimore, MD.

**Suh M**. 2016. Cumulative risk assessment of urban air toxics: A pilot study in San Antonio, Texas. Presented in the "Quantitative Cumulative Risk Assessment: Is it Feasible Today?" session. Presented at the Society of Toxicology's 55th Annual Meeting, March 13-17, 2016. New Orleans, LA.

Kirman CR, Proctor D, **Suh M**, Haws L, Harris M, Thompson C, Hays S. Using physiologically-based pharmacokinetic modeling to address potentially sensitive subpopulations exposure to hexavalent chromium. Poster presented at Society of Toxicology Annual Meeting. March 15, 2017. Baltimore, MD.

Proctor DM, **Suh M**, Dunsmore D, Verwiel A, Casteel S. Bioaccessibility and relative oral bioavailability of cobalt and nickel from metal alloys in soil and dust. Poster presented at Society of Toxicology Annual Meeting. March 15, 2017. Baltimore, MD.

Thompson C, Rager J, **Suh M**, Proctor D, Haws L, Harris M. Mechanistic support for nonlinear risk assessment of rat oral cavity tumors induced by exposure to Cr(VI) in drinking water. Poster presented at Society of Toxicology Annual Meeting. March 15, 2017. Baltimore, MD.

Thompson CM, **Suh M**, Proctor DM, Rager JE, Haws LC, Harris MA. Assessment of the in vivo genotoxicity of CrVI in target organs identified in a two-year cancer bioassay. Presented at the Society of Toxicology's 55th Annual Meeting, March 13-17, 2016. New Orleans, LA.

**Suh M**, Crump K, Mittal L, Hirsch S, Valdes Salgado R, Bartlett C, Van Landingham C, Rohr A, Proctor DM. 2016. Inhalation cancer risk assessment of hexavalent chromium based on updated mortality for Painesville chromate production workers. Presented at the Society of Toxicology's 55th Annual Meeting, March 13-17, 2016. New Orleans, LA.

Brorby GP, **Suh M**, Thompson CM, Mittal L, Proctor DM. 2016. Inhalation cancer risk assessment of cobalt metal. Presented at the Society of Toxicology's 55th Annual Meeting, March 13-17, 2016. New Orleans, LA.

Brorby G, **Suh M**, Bichteler A, Proctor D. Use of cluster analysis and homogeneity testing to characterize distributions of exposures among beryllium workers: Tools for developing occupational exposure limits from quantitative risk assessment. Presented at International Society of Exposure Science 25th Annual Meeting, Henderson, NV, October 18-22, 2015.

Kirman CR, Proctor DM, **Suh M**, Hays S. Reduction of hexavalent chromium by gastric fluids from fed and fasted individuals with applications to toxicokinetic modeling. Presented at the Society of Toxicology's 54th Annual Meeting, March 22-26, 2015. San Diego, CA.

**Suh M**, Mittal L, Hirsch S, Valdes R, Bartlett C, Rohr A, Proctor D. Lung cancer risk in chromate production workers exposed to hexavalent chromium. Presented at the Society of Toxicology's 54th Annual Meeting, March 22-26, 2015. San Diego, CA.

Proctor D, **Suh M**, Thompson C, Hixon G. Inhalation cancer risk assessment of titanium dioxide. Presented at the Society of Toxicology's 54th Annual Meeting, March 22-26, 2015. San Diego, CA.

Harris MA, Thompson CM, Proctor DM, **Suh M**, Wolf JC, Seiter JM, Chappell MA, Haws LC. Analysis of duodenal crypt health following exposure to Cr(VI) in drinking water. Presented at the Society of Toxicology's 54th Annual Meeting, March 22-26, 2015. San Diego, CA.

Thompson CM, Young RR, **Suh M**, Dinesdurage H, Elbekai R, Harris MA, Rohr AC, Proctor DM. Hexavalent chromium does not induce mutations in the oral mucosa of transgenic Big Blue® rats following drinking water exposures at a carcinogenic dose. Presented at the Society of Toxicology's 54th Annual Meeting, March 22-26, 2015. San Diego, CA.

Thompson CM, **Suh M**, Hixon G, Bichteler A. Comparison of smoothing spline regression and conventional modeling approaches for quantitative risk assessments of human dioxin exposure. Presented at the Society of Toxicology's 54th Annual Meeting, March 22-26, 2015. San Diego, CA.

**Suh M**, Yzenas JJ, Proctor DM. Evaluation of electric arc furnace-processed steel slag for dermal corrosion, irritation, and sensitization. Presented at the Society of Toxicology's 53rd Annual Meeting, March 23-27, 2014. Phoenix, AZ.

Proctor DM, **Suh M**, Tachovsky JA, Abrahams L, Hixon JG, Brorby GP, Campleman SL. Cumulative risk assessment of urban air toxics: A pilot study in San Antonio, Texas. Presented at the Society of Toxicology's 53rd Annual Meeting, March 23-27, 2014. Phoenix, AZ.

Hays, SM, Kirman CR, **Suh M**, Proctor DM. Gastric reduction of hexavalent chromium [Cr(VI)] in fed and fasted human stomach samples. Presented at the Society of Toxicology's 53rd Annual Meeting, March 23-27, 2014. Phoenix, AZ.

Thompson CM, Proctor DM, **Suh M**, Wolf JC, Haws LC, Harris MA. X-ray fluorescence microspectroscopic analysis of duodenal mucosae following Cr(VI) exposure in drinking water. Presented at the Society of Toxicology's 53rd Annual Meeting, March 23-27, 2014. Phoenix, AZ.

**Suh M**, Thompson CM, Hixon JG, Harris MA, Kirman C, Hays S, Haws L, Proctor D. Potential involvement in the development of oral cavity tumors in rats exposed to hexavalent chromium. Presented at the Society of Toxicology's 52nd Annual Meeting, March 10-14, 2013. San Antonio, TX.

Kirman C, Thompson C, Proctor D, **Suh M**, Haws L, Harris MA, Hays S. Using PBPK modeling to address diurnal variation and age differences in hexavalent chromium toxicokinetics in humans. Presented at the Society of Toxicology's 52nd Annual Meeting, March 10-14, 2013. San Antonio, TX.

Thompson C, Kirman C, Proctor D, **Suh M**, Hays S, Haws L, Harris MA. A chronic oral reference dose for hexavalent chromium. Presented at the Society of Toxicology's 52nd Annual Meeting, March 10-14, 2013. San Antonio, TX.

Proctor D, **Suh M**, Thompson C, Harris MA. Mode of action evaluation for hexavalent-induced lung cancer. A chronic oral reference dose for hexavalent chromium. Presented at the Society of Toxicology's 52nd Annual Meeting, March 10-14, 2013. San Antonio, TX.

**Suh M**, Ke JG, Hixon G, Proctor DM. Urinary perchlorate, nitrate, thiocyanate and thyroid hormone levels in participants of National Health and Nutrition Examination Survey (NHANES) 2001-2002. Presented at the International Society of Environmental Epidemiology's 24th Annual Meeting, August 26-30, 2012. Columbia, SC.

Harris MA, Thompson CM, Wolf JC, Fedorov Y, Hixon JG, Proctor DM, **Suh M**, Haws LC. Assessment of genotoxic potential of Cr(VI) in the intestine via in vivo intestinal micronucleus assay and in vitro high content analysis in differentiated and undifferentiated Caco-2. Presented at the Society of Toxicology's 51st Annual Meeting, March 11-15, 2012. San Francisco, CA.

Hays SM, Kirman C, Aylward L, **Suh M**, Proctor D. Gastric reduction of Cr(VI) in mice, rats and humans. Presented at the Society of Toxicology's 51st Annual Meeting, March 11-15, 2012. San Francisco, CA.

Kirman CR, Hays SM, Aylward LL, **Suh M**, Proctor D. Physiologically-based pharmacokinetic model for mice, rats and humans orally-exposed to chromium. Presented at the Society of Toxicology's 51st Annual Meeting, March 11-15, 2012. San Francisco, CA.

O'Brien TJ, Hao, D, **Suh M**, Proctor D, Thompson CM, Harris MA, Parsons BL, Meyers MB. K-ras codon 12 GGT to GAT mutation is not elevated in the duodenum of mice subchronically exposed to hexavalent chromium in drinking water. Presented at the Society of Toxicology's 51st Annual Meeting, March 11-15, 2012. San Francisco, CA.

Proctor DM, Thompson CM, **Suh M**, Haws LC, Harris MA. Mode of action for intestinal carcinogenesis of ingested hexavalent chromium in mice. Presented at the Society of Toxicology's 51st Annual Meeting, March 11-15, 2012. San Francisco, CA.

**Suh M**, HaMai D. Society of Toxicology. Analysis of emissions source contributions of arsenic, manganese, and mercury and their implications for the proposed OEHHHA noncancer reference exposure levels. 48th Annual Meeting, Baltimore, MD, March 2009.

HaMai D, **Suh M**. Society of Toxicology. Speciation profiling and size fractioning of total particulate matter emitted from stationary mobile and area wide sources in California. 48th Annual Meeting, Baltimore, MD, March 2009.

Gatto N, Kelsh M, HaMai D, **Suh M**, Proctor D. A meta-analysis of the relationship between occupational exposure to hexavalent chromium and cancers of the gastrointestinal tract. Society of Toxicology 48th Annual Meeting, Baltimore, MD, March 2009.

**Suh M**, HaMai D, Gatto NM, Proctor D. Iron deficiency as a mode of action for rat oral cavity neoplasms in 2007 National Toxicology Program drinking water study of hexavalent chromium. Society of Toxicology 47th Annual Meeting, Seattle WA, March 2008.

HaMai D, **Suh M**, Proctor D. Interspecies differences in gastrointestinal tract anatomy and physiology: Implications for evaluating results of the National Toxicology Program drinking water study of hexavalent chromium. Society of Toxicology 47th Annual Meeting, Seattle WA, March 2008.

## PROTOCOL REGISTRATIONS

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Mitchell M, Cohen S, **Suh M**, Bylsma L, Movva N. 2022. Systematic review of the potential association between whole dairy products and their components on non-inflammatory immune outcomes in humans. PROSPERO 2022 CRD42022333780

**Suh M**, Cloud M, Balasubramanian A, Movva N, Fryzek J, Cohen S. 2022. A systematic literature review (SLR) of MTAP deletions in multiple solid and hematologic cancers. PROSPERO 2022 CRD42022354037.

Fryzek J, **Suh M**, Movva N, Bylsma L. 2020. Protocol: Systematic literature review and meta-analysis of respiratory syncytial virus (RSV) testing patterns, RSV burden, and RSV clinical sequelae among infants and children up to 5 years of age living in the United States. PROSPERO 2020 CRD42020162991 Available from: [https://www.crd.york.ac.uk/prospERO/display\\_record.php?ID=CRD42020162991](https://www.crd.york.ac.uk/prospERO/display_record.php?ID=CRD42020162991)

Urban J, Wikoff D, Haws L, Fitch S, Ring C, Thompson C, **Suh M**. 2018. Systematic review protocol: Systematic review and meta-regression to characterize the dose-response relationship between exposure to dioxin-like compounds during sensitive windows of development and reduced sperm count. Zenodo. <http://doi.org/10.5281/zenodo.1636357>.

Wikoff D, **Suh M**, Harvey S, Proctor D, Beretvas T, Goodman M, Lipworth L. 2016. Systematic review and meta-analysis of occupational exposure to Cr(VI) and stomach cancer. PROSPERO 2016:CRD42016051625 Available from [http://www.crd.york.ac.uk/PROSPERO/display\\_record.asp?ID=CRD42016051625](http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42016051625)