

Curriculum Vitae

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CURRENT POSITION

President, AES Armitage Environmental Sciences, Inc.

ACADEMIC BACKGROUND

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|----------------------------|---|
| May 2011 -
May 2018 | University of Toronto
Department of Physical & Environmental Sciences <ul style="list-style-type: none">• Banting Postdoctoral Fellow and Research Associate |
| April 2005 -
April 2009 | Stockholm University
Institute of Applied Environment Science <ul style="list-style-type: none">• Degree of Doctor of Philosophy (PhD) |
| Sept 2001 -
May 2004 | Simon Fraser University
School of Resource and Environmental Management <ul style="list-style-type: none">• Masters of Resource Management (MRM) |
| Sept 1993-
May 1997 | University of Toronto
Department of Pharmacology and Toxicology <ul style="list-style-type: none">• Honours Bachelor of Science (BSc) |

RESEARCH INTERESTS/EXPERIENCE

Bioaccumulation potential of organic pollutants; influence of physical-chemical properties and susceptibility to biotransformation

Fate and transport of contaminants in the environment; improving and evaluating environmental process descriptions

Development and application of tools for categorization, screening level assessment and human and ecological risk assessment of chemicals in commercial use

PROFESSIONAL AND ACADEMIC ASSOCIATIONS

Member of the Society of Environmental Toxicology and Chemistry (2005 – present)
Peer reviews for: Environmental Science & Technology, Chemosphere, Science of the Total Environment, Environmental Pollution, Environmental Toxicology & Chemistry

PUBLICATIONS

1. Scholz, S.; Schreiber, R.; Armitage, J.; Mayer, P.; Escher, B. I.; Lidzba, A.; Leonard, M.; Altenburger, R., Meta-Analysis of Fish Early Life Stage Tests - Association of Toxic Ratios and Acute-To-Chronic Ratios with Modes of Action. *Environ. Toxicol. Chem.* **2018**.
2. Armitage, J. M.; Erickson, R. J.; Luckenbach, T.; Ng, C. A.; Prosser, R. S.; Arnot, J. A.; Schirmer, K.; Nichols, J. W., Assessing the bioaccumulation potential of ionizable organic compounds: Current knowledge and research priorities. *Environ. Toxicol. Chem.* **2017**, *36*, (4), 882-897.
3. Wood, S. A.; Xu, F.; Armitage, J. M.; Wania, F., Unravelling the Relationship between Body Mass Index and Polychlorinated Biphenyl Concentrations Using a Mechanistic Model. *Environ. Sci. Technol.* **2016**, *50*, (18), 10055-10064.
4. Wood, S. A.; Armitage, J. M.; Binnington, M. J.; Wania, F., Deterministic modeling of the exposure of individual participants in the National Health and Nutrition Examination Survey (NHANES) to polychlorinated biphenyls. *Environmental Science: Processes & Impacts* **2016**, *18*, (9), 1157-1168.
5. Chen, Y.; Hermens, J. L. M.; Jonker, M. T. O.; Arnot, J. A.; Armitage, J. M.; Brown, T.; Nichols, J. W.; Fay, K. A.; Droge, S. T. J., Which Molecular Features Affect the Intrinsic Hepatic Clearance Rate of Ionizable Organic Chemicals in Fish? *Environ. Sci. Technol.* **2016**, *50*, (23), 12722-12731.
6. Brown, T. N.; Armitage, J. M.; Egeghy, P.; Kircanski, I.; Arnot, J. A., Dermal permeation data and models for the prioritization and screening-level exposure assessment of organic chemicals. *Environ. Int.* **2016**, *94*, 424-35.
7. Breivik, K.; Armitage, J. M.; Wania, F.; Sweetman, A. J.; Jones, K. C., Tracking the Global Distribution of Persistent Organic Pollutants Accounting for E-Waste Exports to Developing Regions. *Environ. Sci. Technol.* **2016**, *50*, (2), 798-805.
8. Binnington, M. J.; Curren, M. S.; Quinn, C. L.; Armitage, J. M.; Arnot, J. A.; Chan, H. M.; Wania, F., Mechanistic polychlorinated biphenyl exposure modeling of mothers in the Canadian Arctic: the challenge of reliably establishing dietary composition. *Environ. Int.* **2016**, *92-93*, 256-68.
9. Armitage, J. M.; Erickson, R. J.; Luckenbach, T.; Ng, C. A.; Prosser, R. S.; Arnot, J. A.; Schirmer, K.; Nichols, J. W., Assessing the bioaccumulation potential of ionizable organic compounds: Current knowledge and research priorities. *Environmental Toxicology and Chemistry, In press* **2016**.
10. Ross, J. H.; Hewitt, A.; Armitage, J.; Solomon, K.; Watkins, D. K.; Ginevan, M. E., Exposure to TCDD from base perimeter application of Agent Orange in Vietnam. *Sci. Total Environ.* **2015**, *511*, 82-90.
11. Ross, J. H.; Hewitt, A.; Armitage, J.; Solomon, K.; Watkins, D. K.; Ginevan, M. E., Handler, bystander and reentry exposure to TCDD from application of Agent Orange by C-123 aircraft during the Vietnam War. *Sci. Total Environ.* **2015**, *505*, 514-25.
12. Restrepo, A. R.; Hayward, S. J.; Armitage, J. M.; Wania, F., Evaluating the PAS-SIM model using a passive air sampler calibration study for pesticides. *Environmental Science: Processes & Impacts* **2015**, *17*, (7), 1228-1237.

13. Armitage, J. M.; Ginevan, M. E.; Hewitt, A.; Ross, J. H.; Watkins, D. K.; Solomon, K. R., Environmental fate and dietary exposures of humans to TCDD as a result of the spraying of Agent Orange in upland forests of Vietnam. *Sci. Total Environ.* **2015**, 506-507, 621-30.
14. Breivik, K.; Armitage, J. M.; Wania, F.; Jones, K. C., Tracking the Global Generation and Exports of e-Waste. Do Existing Estimates Add up? *Environ. Sci. Technol.* **2014**, 48, (15), 8735-43.
15. Armitage, J. M.; Wania, F.; Arnot, J. A., Application of mass balance models and the chemical activity concept to facilitate the use of in vitro toxicity data for risk assessment. *Environ. Sci. Technol.* **2014**, 48, (16), 9770-9.
16. Gouin, T.; Armitage, J. M.; Cousins, I. T.; Muir, D. C. G.; Ng, C. A.; Reid, L.; Tao, S., Influence of global climate change on chemical fate and bioaccumulation: The role of multimedia models. *Environ. Toxicol. Chem.* **2013**, 32, (1), 20-31.
17. Armitage, J. M.; Wania, F., Exploring the potential influence of climate change and particulate organic carbon scenarios on the fate of neutral organic contaminants in the Arctic environment. *Environmental Science-Processes & Impacts* **2013**, 15, (12), 2263-2272.
18. Armitage, J. M.; Hayward, S. J.; Wania, F., Modeling the Uptake of Neutral Organic Chemicals on XAD Passive Air Samplers under Variable Temperatures, External Wind Speeds and Ambient Air Concentrations (PAS-SIM). *Environ. Sci. Technol.* **2013**, 47, (23), 13546-13554.
19. Armitage, J. M.; Choi, S.-D.; Meyer, T.; Brown, T. N.; Wania, F., Exploring the Role of Shelf Sediments in the Arctic Ocean in Determining the Arctic Contamination Potential of Neutral Organic Contaminants. *Environ. Sci. Technol.* **2013**, 47, (2), 923-931.
20. Armitage, J. M.; Arnot, J. A.; Wania, F.; Mackay, D., Development and evaluation of a mechanistic bioconcentration model for ionogenic organic chemicals in fish. *Environ. Toxicol. Chem.* **2013**, 32, (1), 115-128.
21. Quinn, C. L.; Armitage, J. M.; Breivik, K.; Wania, F., A methodology for evaluating the influence of diets and intergenerational dietary transitions on historic and future human exposure to persistent organic pollutants in the Arctic. *Environ. Int.* **2012**, 49, 83-91.
22. Armitage, J. M.; Arnot, J. A.; Wania, F., Potential Role of Phospholipids in Determining the Internal Tissue Distribution of Perfluoroalkyl Acids in Biota. *Environ. Sci. Technol.* **2012**, 46, (22), 12285-12286.
23. Nfon, E.; Armitage, J. M.; Cousins, I. T., Development of a dynamic model for estimating the food web transfer of chemicals in small aquatic ecosystems. *Sci. Total Environ.* **2011**, 409, (24), 5416-5422.
24. Marvin, C. H.; Tomy, G. T.; Armitage, J. M.; Arnot, J. A.; McCarty, L.; Covaci, A.; Palace, V., Hexabromocyclododecane: Current Understanding of Chemistry, Environmental Fate and Toxicology and Implications for Global Management. *Environ. Sci. Technol.* **2011**, 45, (20), 8613-8623.
25. MacLeod, M.; von Waldow, H.; Tay, P.; Armitage, J. M.; Woehrschimmel, H.; Riley, W. J.; McKone, T. E.; Hungerbuhler, K., BETR global - A geographically-explicit global-scale multimedia contaminant fate model. *Environ. Pollut.* **2011**, 159, (5), 1442-1445.

26. Armitage, J. M.; Quinn, C. L.; Wania, F., Global climate change and contaminants-an overview of opportunities and priorities for modelling the potential implications for long-term human exposure to organic compounds in the Arctic. *J. Environ. Monit.* **2011**, *13*, (6), 1532-1546.
27. Arnot, J. A.; Armitage, J. M.; McCarty, L. S.; Wania, F.; Cousins, I. T.; Toose-Reid, L., Toward a Consistent Evaluative Framework for POP Risk Characterization†. *Environ. Sci. Technol.* **2010**, *45*, (1), 97-103.
28. Armitage, J. M.; Schenker, U.; Scheringer, M.; Martin, J. W.; MacLeod, M.; Cousins, I. T., Modeling the Global Fate and Transport of Perfluorooctane Sulfonate (PFOS) and Precursor Compounds in Relation to Temporal Trends in Wildlife Exposure. *Environ. Sci. Technol.* **2009**, *43*, (24), 9274-9280.
29. Armitage, J. M.; McLachlan, M. S.; Wiberg, K.; Jonsson, P., A model assessment of polychlorinated dibenzo-p-dioxin and dibenzofuran sources and fate in the Baltic Sea. *Sci. Total Environ.* **2009**, *407*, (12), 3784-3792.
30. Armitage, J. M.; MacLeod, M.; Cousins, I. T., Modeling the Global Fate and Transport of Perfluorooctanoic Acid (PFOA) and Perfluorooctanoate (PFO) Emitted from Direct Sources Using a Multispecies Mass Balance Model. *Environ. Sci. Technol.* **2009**, *43*, (4), 1134-1140.
31. Armitage, J. M.; MacLeod, M.; Cousins, I. T., Comparative Assessment of the Global Fate and Transport Pathways of Long-Chain Perfluorocarboxylic Acids (PFCAs) and Perfluorocarboxylates (PFCs) Emitted from Direct Sources. *Environ. Sci. Technol.* **2009**, *43*, (15), 5830-5836.
32. Saloranta, T. M.; Armitage, J. M.; Haario, H.; Naes, K.; Cousins, I. T.; Barton, D. N., Modeling the effects and uncertainties of contaminated sediment remediation scenarios in a Norwegian Fjord by Markov chain Monte Carlo simulation. *Environ. Sci. Technol.* **2008**, *42*, (1), 200-206.
33. Hauck, M.; Huijbregts, M. A. J.; Armitage, J. M.; Cousins, I. T.; Ragas, A. M. J.; van de Meent, D., Model and input uncertainty in multi-media fate modeling: Benzo a pyrene concentrations in Europe. *Chemosphere* **2008**, *72*, (6), 959-967.
34. Armitage, J. M.; Franco, A.; Gomez, S.; Cousins, I. T., Modeling the potential influence of particle deposition on the accumulation of organic contaminants by submerged aquatic vegetation. *Environ. Sci. Technol.* **2008**, *42*, (11), 4052-4059.
35. Armitage, J. M.; Cousins, I. T.; Persson, N. J.; Gustafsson, O.; Cornelissen, G.; Saloranta, T.; Broman, D.; Naes, K., Black carbon-inclusive modeling approaches for estimating the aquatic fate of dibenzo-p-dioxins and dibenzofurans. *Environ. Sci. Technol.* **2008**, *42*, (10), 3697-3703.
36. Armitage, J. M.; Gobas, F. A. P. C., A terrestrial food-chain bioaccumulation model for POPs. *Environ. Sci. Technol.* **2007**, *41*, (11), 4019-4025.
37. Armitage, J. M.; Cousins, I. T.; Hauck, M.; Harbers, J. V.; Huijbregts, M. A. J., Empirical evaluation of spatial and non-spatial European-scale multimedia fate models: results and implications for chemical risk assessment. *J. Environ. Monit.* **2007**, *9*, (6), 572-581.
38. Armitage, J. M.; Hanson, M.; Axelman, J.; Cousins, I. T., Levels and vertical distribution of PCBs in agricultural and natural soils from Sweden. *Sci. Total Environ.* **2006**, *371*, (1-3), 344-352.

39. Armitage, J.; Cousins, I. T.; Buck, R. C.; Prevedouros, K.; Russell, M. H.; MacLeod, M.; Korzeniowski, S. H., Modeling global-scale fate and transport of perfluorooctanoate emitted from direct sources. *Environ. Sci. Technol.* **2006**, *40*, (22), 6969-6975.

PRESENTATIONS/WORKSHOPS

1. **Armitage, J.M.**; Arnot, J.A.; Wania, F. (2014). Evaluation of long-range transport (LRT) screening tools and models for pre-market assessment of new pesticides. Pest Management Regulatory Agency (PMRA), Health Canada, Ottawa, ON, Canada.
2. Arnot, J.A.; **Armitage, J.M.** (2011). Food web bioaccumulation models. European Food Safety Authority (EFSA), Parma, Italy.
3. **Armitage, J.M.** (2009). Modeling the environmental fate and transport of HFCs: Current & future perspectives. ETH Zurich

POTENTIAL REFEREES

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