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| B.Sc., Environmental Chemistry  September 1996 to April 2001  Okanagan University College  Kelowna, British Columbia  Co-operative Education | Ph.D., Chemistry  September 2001 to July 2007  Simon Fraser University  Burnaby, British Columbia  Senior Supervisor: G.R. Agnes |

##### *Contact Information*

75 Coronation Road, Southville, Bristol, UK, BS3 1AT

Email: a.haddrell@bristol.ac.uk

Business Phone: 0-(787)-973-7494

##### *Honours and Awards*

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| $30,000 | Health Research Pilot Project Grants, Southern California Environmental Health Sciences Center | 2008 |
| $80,000 | Post-Doctoral Fellowship, National Science and Engineering Research Council (NSERC) of Canada | 2007 |
| $300 | Graduate Student Oral Competition Travel Award, Simon Fraser University | 2006 |
| $1,500 | Travel Award, 19th Annual Workshop on Tandem Mass Spectrometry, Lake Louise | 2006 |
| $ 6,000 | Graduate Fellowship, Simon Fraser University | 2005 |
| $ 2,000 | 32nd FACSS Student Award | 2005 |
| $ 700 | Simon Fraser University Graduate Travel Award (NSERC) | 2005 |
| $ 6,000 | Graduate Fellowship, Simon Fraser University | 2005 |
| $ 250 | 31st FACSS Outstanding Presentation Award | 2004 |
| $ 6,000 | Graduate Fellowship, Simon Fraser University | 2003 |

##### *Mentions in Popular Media*

1. Canadian Foundation for Climate and Atmospheric Sciences, “*2003-2004 Annual Report”*. (see www.cfcas.org)

##### *Publications*

1. Murray, B.J.; Haddrell, A.E.; Peppe, S.; Davies, J.F.; Reid, J.P.; O'Sullivan, D.; Price, H.C.; Kumar, R.; Saunders, R.W.; Plane, J.M.C.; Umo, N.S.; Wilson, T.W. “Glass formation and unusual hygroscopic growth of iodic acid solution droplets with relevance for iodine oxide particles in the coastal marine boundary layer.” *Atmospheric Chemistry and Physics - Papers in Open Discussion*, 2012, *12*, 7879-7908.
2. Davies, J.F.; Haddrell, A.E.; Reid, J.P. “Time-Resolved Measurements of the Evaporation of Volatile Components from Single Aerosol Droplets”. *Aerosol Science and Technology*, 2012, *46*, 666-677.
3. Reid, J.P.; Haddrell, A.E.; Walker, J.S.; Power, R.; Bones, D.L.; Davies, J.F. “Optical manipulation of aerosol particle arrays.” *Proceedings of SPIE*, 2011, *Volume 8097*.
4. Haddrell, A.E.; van Eeden, S.; Agnes, G. “MALDI-MS of Differential Biomolecule Secretion from Human Lung Cells in Vitro Following Incubation with <150 Particles.” *Journal of Proteome Research*, 2008, *7*, 2539-2545.
5. Draper, N.; Bakhoum, S.; Haddrell, A.E.; Agnes, G. “Ion-Induced Nucleation in Solution: Promotion of Solute Nucleation in Charged Levitated Droplets”. *Journal of the American Chemical Society*, 2007, *129*, 11364 -11377.
6. Eleghasim, N.; Haddrell, A.E.; van Eden, S.; Agnes, G. “The Preparation of < 100 Particles Per Trial Having the Same Mole Fraction of 12 Inorganic Compounds at Diameters of 6.8, 3.8, or 2.6 μm Followed by Their Deposition onto Human Lung Cells (A549) with Measurement of the Relative Downstream Differential Expression of ICAM-1”. *International Journal of Mass Spectrometry*, 2006, *258*, 134-141.
7. Haddrell, A.E.; van Eeden, S.; Agnes, G. “Dose-Response Studies Involving Controlled Deposition of Less Than 100 Particles Generated and Levitated in an AC Trap onto Lung Cells, in vitro, and Quantitation of ICAM-1 Differential Expression”. *Toxicology in vitro*, 2006, *20*, 1030-1039.
8. Haddrell, A.E.; Ishii, H.; van Eeden, S.; Agnes, G. “An Apparatus for Preparing Mimics of Suspended Particles in the Troposphere and Their Controlled Deposition onto Individual Lung Cells in Culture with Measurement of Downstream Biological Response”, *Analytical Chemistry*, **2006**, *77*, 3623-3628.
9. Haddrell, A.E.; Feng, X.; Nassar, R.; Bogan, M.; Agnes, G. “Off-line LDI-TOF-MS monitoring of simultaneous inorganic and organic reactions on particles levitated in a laboratory environment”. *Journal of Aerosol Science.* 2005, *36*, 521-530.
10. Haddrell, A.E.; Agnes, G. “Organic Cation Distributions in the Residues of Levitated Droplets with Net Charge: Validity of the Partition Theory for Droplets Produced by an Electrospray”. *Analytical Chemistry*. **2004**, *76*, 53-61.
11. Haddrell, A.E.; Agnes, G. “A class of heterogeneous/multiphase organic reactions studied on droplets/particles levitated in a laboratory environment: aldehyde+1,8-diaminonaphthalene=imine”. *Atmospheric Environment*. 2004, *38*, 545-556.

Manuscripts in Preparation:

* 1. Haddrell, A.; Davies, J.; Clegg, S.; Reid, J. “Improving the accuracy of hygroscopic measurements collected with an electrodynamic balance”.
  2. Haddrell, A.; Hargreaves, G.; Davies, J.; Reid, J. “Hygroscopic growth of tri-block poloxamer polymer lower than predicted by aerosol model: Implications in drug delivery”.

##### *Oral Presentations and Posters*

Presenting author is underlined. OP = oral presentations for which I was the presenting author.

31. OP Haddrell, A.E.; Agnes, G.R.; van Eeden, S. Understanding Particulate Matter Toxicity, One Particle at a Time. Annual Aerosol Science Conference, April 3-4, 2012.

30. Haddrell, A.E.; Hargreaves, G.; Davies, J.F.; Reid, J.P. Towards Control of the Hygroscopic Response of Aerosol Used in Drug Delivery to the Lungs. Drug Delivery to the Lung 22, December 7-9, 2011.

29. INVITED LECTURE Reid, J.P. Haddrell, A.E.; Davies, J.F.; Bones, D.L.; Miles, R.E.H. Towards a new instrument for investigating and controlling the properties and dynamics of aerosols used in drug delivery to the lungs. Kings College of London, November 22, 2011.

1. OP Davies, J.F.; Haddrell, A.E.; Wills, J.B.; Reid, J.P. Rapid measurements of single aerosol droplets using an electrodynamic balance. European Aerosol Conference, Manchester, September 4-9, 2011.
2. OP Power, R.M.; Walker, J.S.; Haddrell, A.E.; Carruthers, A.E.; Reid, J.P. Using holographic optical landscapes to manipulate aerosol arrays compare particle hygroscopicity and study aerosol coagulation. European Aerosol Conference, Manchester, September 4-9, 2011.
3. OP Haddrell, A.; Reid, J. Comparative study of the effect of the trapping method on the physical properties of single aerosols trapped with an electrodynamic balance or optical tweezers. American Association for Aerosol Research 29th Annual Conference, Portland, Oregon, October 29, 2010.
4. INVITED LECTURE Haddrell, A., Understanding The Adverse Health Effects of Air Pollution One Particle at a Time. University of Cambridge, May 7, 2010.
5. OP Haddrell, A.; Nel, A. SCPC External Science Advisory Committee Meeting, Los Angeles, California, May 30 2008.

23. OP Haddrell, A.; Agnes, G.R.; van Eeden, S.F. 19th Annual Workshop on Tandem Mass Spectrometry, Lake Louise, Alberta, November 29 - December 2, 2006.

22. Haddrell, A.; Agnes, G.R.; Gross, S.; van Eeden, S.F.; Bertram, A. 54th ASMS Conference on Mass Spectrometry, Seattle, Washington, May 28 – June 1, 2006.

1. Haddrell, A.; Lau, E.; Eleghasim, M.N.; van Eeden, S.F.; Agnes, G.R. 102nd International Conference of the American Thoracic Society, San Diego, California, May 19-24, 2006.
2. OP Haddrell, A.; van Eeden, S. F.; Agnes, G. R.; Identification of the Components of Tropospheric Particulate Matter Responsible for Particulate Matter Toxicity, as Demonstrated With Particulate Matter Mimics. 32nd FACSS Conference, Quebec City, Quebec, October 9-13, 2005.
3. Haddrell, A.; Gross, S.; Lau, E.; Eleghasim, M.N.; Kardjaputri, A.; Agnes, G.R.; van Eeden, S.F.; The effect of heterogeneous reactions on the inflammation potential of ambient particles. 32nd FACSS Conference, Quebec City, Quebec, October 9-13, 2005.
4. Agnes, G.R.; Bakhoum, S.; Draper, N.; Haddrell, A.; Ion induced nucleation in solution. 32nd FACSS Conference, Quebec City, Quebec, October 9-13, 2005.
5. Haddrell, A.; van Eeden, S. F.; Agnes, G. R.; Development of an Apparatus for Quantitative Dose-Response Studies to Measure Inflammation Potential Induced as a Function of Ambient Particle Type. 32nd FACSS Conference, Quebec City, Quebec, October 9-13, 2005.
6. OP Haddrell, A.; van Eeden, S. F.; Agnes, G. R.; The Synergistic Toxicity of the Components of Tropospheric Particulate Matter on a Per Particle Basis, as Demonstrated With Particulate Matter Mimics. 53rd ASMS Conference on Mass Spectrometry and Allied Topics, San Antonio, Texas, June 5-9, 2005.
7. Haddrell, A.; van Eeden, S. F.; Agnes, G. R.; Quantitative Dose-Response Studies at the Single Particle, Single Cell Level. 101st Conference of the American Thoracic Society, San Diego, California, May 20-25, 2005.
8. OP Haddrell, A.; van Eeden, S. F.; Agnes, G. R.; Quantitation and identification of proinflammatory cytokines secreted from and expressed on lung cells dosed with mimics of tropospheric particulate matter. BC-MS User Group Meeting, Vancouver, British Columbia, April 29, 2005.
9. Haddrell, A.; van Eeden, S. F.; Agnes, G. R.; Development of an apparatus and quantitative methodologies for discrete particle synthesis and their controlled deposition onto individual lung cells with measurement of downstream biological response, PITTCON, Orlando, Florida, Feb. 27-Mar. 4, 2005.
10. Haddrell, A.; van Eeden, S. F.; Agnes, G.R.; Synergy happens: Particulate air pollution (Studies at the interface between atmospheric particle chemistry and lung cell biology: Identification of compounds on suspended tropospheric particles that lead to adverse effects on human health), Department of Chemistry, Utah State University, Logan, Utah, January 19, 2005.
11. Haddrell, A.; Agnes, G.R.; van Eeden, S.F.; Quantitation of particulate matter toxicity on a per particle per cell basis, 31st FACSS Conference, Portland, Oregon, October 3-7, 2004.
12. Haddrell, A.; Agnes, G.R.; van Eeden, S.F.; A novel method for particle synthesis and their controlled deposition onto individual lung cells, 31st FACSS Conference, Portland, Oregon, October 3-7, 2004.
13. Haddrell, A.; Agnes, G.R.; Determination of Particulate Matter Toxicity Through Designing Particulate Matter, and the Monitoring the Acute Inflammation Response; 52nd ASMS Conference on Mass Spectrometry and Allied Topics, Nashville, Tennessee, May 23-27, 2004.
14. Bogan, M.J.; Bakhoum, S.F.; Haddrell, A.; Agnes, G.R.; “Wall-less sample preparation”; Canadian Society for Chemistry (CSC) Conference, London, Ontario, May 29-June 1, 2004.
15. Parsons, M.T.; Fok, A.; Mak, J.; Lipetz, S.R.; Pant, A.; Bertram, A. K.; Haddrell, A.; Agnes, G.R. Deliquescence and Efflorescence of Organic and Mixed Organic-Inorganic Particles: An FTIR/Optical Microscopy Approach; American Geophysical Union Fall Meeting, San Francisco, California, December 8-12, 2003.
16. Agnes, G. R.; Haddrell, A.; Bogan, M. J.; **LDI (and MALDI)-TOF-MS Monitoring of Simultaneous Inorganic and Organic Heterogeneous Reactions on Particles Levitated in an Electrodynamic Balance;** 51st ASMS Conference on Mass Spectrometry and Allied Topics, Montreal, Quebec, June 8-12, 2003.
17. Haddrell, A.; Agnes, G.R.; Towards Single Cell Proteomics: Using a micrometer-sized droplet to stimulate a single cell and monitoring the response; 51st ASMS Conference on Mass Spectrometry and Allied Topics, Montreal, Quebec, June 8-12, 2003.
18. Agnes, G.R.; Haddrell, A.; Bogan, M.J.; LDI (and MALDI)-TOF-MS monitoring of simultaneous inorganic and organic heterogeneous reactions on particles levitated in an electrodynamic balance; 51st ASMS Conference on Mass Spectrometry and Allied Topics, Montreal, Quebec, June 8-12, 2003.
19. Bogan, M. J.; Haddrell, A.; Cornell, R. B.; Agnes G. R., Wall-less Sample Preparation: A Versatile Tool for Proteomics; 3rd International Conference of the Canadian Proteomics Initiative, University of British Columbia, Vancouver, British Columbia, May 23-27, 2003.
20. Agnes, G. R.; Bogan, M. J.; Haddrell, A. Solute accounting in the system that is a single droplet with net charge; ACS, New Orleans, Louisiana, March 23-27, 2003. A special 1.5 day long session on the fundamentals of the Electrospray Ion Source in honor of John Fenn, a co-recipient of the 2002 Nobel Prize in Chemistry.
21. Agnes, G. R.; Bogan, M. J.; Haddrell, A., Studies of chemistry on the surface of and within levitated droplets and particles; Department of Chemistry, University of British Columbia, Vancouver, British Columbia, Nov. 15, 2002.

##### *Research Experience and Education*

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| **POSTDOCTORAL FELLOW** | **11/2009 – Current** |

University of Bristol, Department of Chemistry, Dr. Jonathon Ried Laboratory

* Funding for this position came from the University of Bristol in support of ESPRC Leadership Fellowship awarded to Prof. J.P. Reid (2009-2014)
* Aided in the development of a new electrodynamic trap for rapid aerosol size measurements, enabling microsecond resolution which enables the detailed evaporation profiles of volatile species, such as water, to be monitored
* Convert the existing electrodynamic balance within the Reid group into a simple, automated device to collect top quality hygroscopic data continuously for predicting and quantifying the response of atmospheric aerosol to relative humidity.
* Develop software to enable someone unfamiliar with the system to rapidly process the collected data
* Developed surface free lab on a chip technology
  + Technique couples optical tweezers technology with ion optics to enable the simultaneous trapping of numerous droplets of designed composition in the gas phase
  + Manipulation of the optics enables selected droplets to be mixed while simultaneously being probed

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| **POSTDOCTORAL FELLOW** | **09/2007 – 09/2009** |

University of California Los Angeles, Department of Medicine, Dr. Andre Nel Laboratory

* Develop instrumentation to monitor in near real time the oxidative stress potential of suspended ambient particulate matter
  + First designed, constructed and characterized a device capable of extracting suspended aerosols from a primary air flow into another
  + Coupled particle extractor to MS/MS technology to monitor heterogeneous reactions between suspended aerosols and the gaseous species that constitutes the secondary air flow. The rate of these reactions will be used to determine the overall oxidative stress potential of the aerosol in near real time. Completion of this goal was unattained in prior to the end of the fellowship

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| **PH. D.** | **09/2001 – 07/2007** |

Simon Fraser University, Analytical Chemistry, Dr. George Agnes Laboratory

* Developed methodology to characterize homogeneous and heterogeneous organic and inorganic reaction products on individual particles
  + Used Stella modeling software to estimate the tropospheric lifetimes of the chemical species formed in the laboratory experiments
* Developed an apparatus for preparing mimics of suspended particles in the troposphere with their controlled deposition onto individual lung cells in culture and measurement of downstream biological response
  + A methodology was developed to create mimics of tropospheric particulate matter (1.5 to 10 micometer), alter their chemical composition while levitated, and then deposit them onto a cell culture *in vitro*, and finally to monitor the downstream biological response following incubation
  + Through antibody assay and MALDI-MS analysis, studied how the components on or within particulate matter, along with the core of the particle itself, behave synergistically to induce a proinflammatory response from lung cells, *in vitro*

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| **UNDERGRADUATE RESEARCH ASSISTANT** | **05/2000 – 08/2000** |

University of British Columbia, Okanagan, Chemistry Department, Dr. Nigel Eggers Laboratory

* + Developed techniques that can be used to analyze the acid concentration, terpene concentration, potassium concentration, pH, and sugar concentration in a variety of grape juice samples. The terpene and sugar analyses required research of literature sources and the development of similar techniques that could be used with the OUC equipment.

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| **B.Sc. – ENVIRONMENTAL CHEMISTRY** | **09/1996 – 04/2001** |

University of British Columbia, Okanagan

##### *Research Skills, Expertise, and Techniques*

Mass Spectrometry

I have extensive experience with:

* MALDI-TOF-MS
* LC-MS/MS
* GC-MS
* ESI-MS

Electrodynamic Levitation of Droplet/Particles for Wall-less Sample Preparation

* + Design and construction of double-ring electrodynamic balances
  + Droplet-on-demand technology

Proteomics

* Familiar with gel electrophoresis, in-gel digestion, peptide mass fingerprinting, and performing MASCOT database searches

Liquid Chromatography

* LC-MALDIprep – capillary LC coupled to MALDI target for offline analysis
* HPLC/UV

Microscopy

* Confocal microscopy
* Motic B5 professional series biological microscope
* Inverted and upright epi-fluorescence microscopy

Radiochemical Methods

Completed UBC Radiation Safety Training (Fall 2004)

Biological Training

* Cell culturing
* Extracting cells from a primary source for cell culturing
* Antibody assays
* RNA extraction
* Western blots
* Virus culturing

Other Techniques

* UV/VIS, IR, ICP-AES, SPME, Raman Spectroscopy, TEM

Software and Programming Languages

I have extensive computer experience. Programs with which I am familiar include, but not limited to:

Stella, Igor Pro 5.03, MassLynx v4.0, Scifinder Scholar, EndNote, Corel Draw 10, Photoshop CS2, ChemOffice, Microsoft Office, Image J, LabView

Website Development

I have extensive experience in the development of websites (e.g. [www.haddrell.ca](http://www.haddrell.ca)). Languages and systems that I have used in these projects include:

html, css, Joomla, WordPress, Frontpage, Macromedia DreamWeaver and Fireworks

##### *Teaching Activities*

TUTORIAL INSTRUCTOR

University of Bristol, Chemistry Department 01/2010-Current

* Taught weekly tutorial sessions to groups of students ranging from 4 to 10 students

Specific Courses for which I have taught:

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| CHEM 1A: Introductory Chemistry  CHEM 1X: Introductory Chemistry |
| CHEM 1Z: Chemistry for Physical Scientists |
| CHEM 214: Chemistry of the Atmosphere Workshop  Physical Chemistry Problem Classes for 2nd and 3rd year students |

TEACHING ASSISTANT

Simon Fraser University, Chemistry Department 09/2001 – 04/2006

* Supervised 2nd and 3rd year Analytical Chemistry Laboratory courses with up to forty students
* Prepared and delivered lectures on the atmospheric modeling program Stella to a 3rd year atmospheric chemistry class (Feb 28th to March 2nd 2005)

Specific Courses for which I have been a Teaching Assistant:

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| CHEM 215: Introduction to Analytical Chemistry |
| CHEM 316: Introductory Instrumental Analysis |
| CHEM 372: Atmospheric Chemistry |

##### *University and Professional Volunteer Service*

2005 53rd ASMS Conference on Mass Spectrometry and Allied Topics, Assistant

2004 31st Annual Conference of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Assistant

2003 51st ASMS Conference on Mass Spectrometry and Allied Topics, Assistant

2001 Member of the Chemistry Department Review Committee, Okanagan University College, Student Representative

2001 Member of the Analytical Professor Selection Committee, Okanagan University College, Student Representative

##### *Extracurricular Activities*

* Completed 2004 Ironman Canada (Swim 2.4 miles, Bike 112 miles and Run 26.2 miles) on August 29, 2004 in 16:25:00.
* Completed 2006 Ironman Canada (Swim 2.4 miles, Bike 112 miles and Run 26.2 miles) on August 27, 2006 in 14:15:31
* Completed 2008 Ironman Canada (Swim 2.4 miles, Bike 112 miles and Run 26.2 miles) on August 24, 2008 in 16:52:31 (I had the flu…)
* Volunteered at a Ghana orphanage for the first two weeks of August 2008. Duties included manual labor around the orphanage as well as childcare
* Volunteer for numerous local races (triathlon, bicycle or running) each year, including Ironman Canada, RSVP, Delta Triathlon, and the Canucks Fan Run
* Founded the “Kevin Haddrell Brain Injury Foundation”
  + Thus far we have raised over $6,900 to purchase hospital equipment required for brain injury patients at the Royal Columbian Hospital in New Westminster, British Columbia. For more information, go to [www.haddrell.ca](http://www.haddrell.ca).
  + Featured on the front page of the Vancouver Sun newspaper, as well as two stories on Global television