H. JOHN CRABTREE

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SUMMARY

I am an experienced scientist, technology developer, project manager & businessman with 30+ years of research and product development experience in industry and academia. I help my clients with technical development as well as business development and product landscaping activities (e.g. generation of technical marketing material, IP & competitor landscaping, market research, etc.) to bring microfluidic & analytical chemistry-based technology to market. I also support the technology community to foster strong collaborative networks. I subscribe to best current business practices for communication, project management and client relationships.

EDUCATION

Ph. D.

- Analytical Chemistry, University of Alberta, Edmonton (1991-96)
- Thesis title: "Development of a High Throughput, Multicapillary DNA Sequencer" (Prof. Norman Dovichi)
- Design, construction & evaluation of:
  - microfabricated sheath-flow cuvette for LIF detection
  - 16 capillary DNA sequencer using microfabricated cuvette
- MECC separation of DNPH derivatives of ketones and aldehydes

B. Sc.

- Chemistry, University of Toronto (1987-91)
- Fourth year thesis title: "Gas Phase Study of Thiol-Coated B.A.W. Piezoelectric Transducers" (Prof. Michael Thompson)

WORK EXPERIENCE

2011 – pres. HJC Consulting Inc., Edmonton: Founder & President

- Microfluidics and analytical chemistry consulting
- Product development, troubleshooting
- Intellectual property, patent & market research, subject matter expert
- Casual consulting, long-term clients & collaborators

2018 – 2019 Wilson Analytical Services Inc., Edmonton: Microfluidics Specialist

- Breadboard & alpha prototype development for oil analysis product
- Project management support

WORK EXPERIENCE (CONT'D)

2016 – 2016

Micralyne Inc., Edmonton: BioMed MEMS Technology Strategist

- S&M support in the BioMEMS/microfluidics technology areas
- Early stage microfluidic product development support

2013 – 2015

Metabolistics Inc., Edmonton: Director of Quality Assurance

- Lead for development of the company's Quality System, and ensure delivery of services under this system
- Support for internal research, product development and marketing efforts

2008 – 2012

University of Alberta – AHFMR Team Microfluidics, Edmonton: Project Manager

- Management of ~20 member team with 5 PIs within 5-yr, $5M interdisciplinary microfluidic research programme
- Direct supervision of 6 employees on 2 simultaneous projects
- Bridge for engineering / bio-applications knowledge & culture gap
- Guide Strategic Management Committee during quarterly meetings
- Interface with Team corporate collaborators

1999 – 2008

Micralyne Inc. (formerly Alberta Microelectronic Corp.), Edmonton: R&D Director

- Management of 3-7 employees on large client projects (ea. ~$200k p.a.)
  - progress reports, internal financial analysis
- Management of two internal microfluidic R&D projects (~$600k & $160k):
  - (Co-)Author of successful grant applications for IRAP, NSERC-IRF, AHFMR and AIF funds
- Management of research, development, marketing & sales of microfluidic product lines (~$500k p.a.):
  - Microfluidic Tool Kit™ instrument and associated microfluidic chips
- Design & fabrication of chips for medium-sized customer projects (~ $40k)

1997 – 1998

Imperial College, London, U.K.: Post-Doctoral Fellow

- Design, construction & evaluation of on-chip FT LIF detection system
- Tutorial instructor for first year general chemistry
- Advisor: Prof. Andreas Manz

1988-1991 Undergrad Employment & Research

- Environment Canada, IPB, Hull, QC, summers of 1989 & 1991
  - Halogenated-organic pollutant studies
- U. of Ottawa, Prof. Sandro Gambarotta's Lab, summer of 1990
  - Organo-titanium (III) crystal synthesis and characterisation
- U. of Toronto, Prof. Michael Thompson's Lab, 4th year, 1990-91
  - solvent-vapour interactions with thiolated QCM sensors

GRANTS, AWARDS & SCHOLARSHIPS

Product Development or Research Grants

Principal or co-author for the following successful grant applications:

- NRC-IRAP – Wilson Analytical, oil analysis product prototype development (co-author; 2018; ~$200,000)
- nanoBridge AdvanceMNT – Wilson Analytical, Professor Lucy/UofA, breadboard product prototype development (co-author; 2013; $75,000)
- NSERC Engage – Moussa/UofA, microfluidic chip dilution (principle author; 2013; $25,000)
- NSERC Engage – Donkor/TRU, CE development (principle author; 2013; $25,000)
- Alberta Ingenuity Fund – Industrial Associate (principal author; 2005; $103,000; declined)
- AHFMR – Technology Commercialisation Internship Program (principal author; 2005; $71,000; declined)
- NRC – Industrial Research Assistance Program Grant Amendment (principal author; 2004; ~$80,000)
- NRC – Industrial Research Assistance Program Grant (co-author; 2003; $250,000)
- NSERC – Industrial Research Fellow (co-author; ~2001; $60,000)

Scholarships and Fellowships

- Alberta Microelectronic Centre Fellowship at the University of Alberta (1995; ~$14,000)
- NSERC Summer Scholarship, University of Toronto (1990; ~$2000, declined)
- Edward Blake Scholarship in Chemistry at the University of Toronto (1989; ~$300)
- J. S. McLean Admission Scholarship to the University of Toronto (1987; $5000)
- Ontario Silver Medal, Glebe Collegiate Institute, Ottawa (1987)
- Ontario Scholar, Glebe Collegiate Institute, Ottawa (1987; $100)

CREDENTIALS, SERVICE & TRAINING

Credentials & Affiliations

- Project Management Professional (PMP #516504; 2008), Project Management Institute (Newtown Square, PA)
- Professional Chemist (P.Chem. #0400; 2006), Association of the Chemical Profession of Alberta (ACPA)
- Member, Microfluidics Association (2021)
- Member, Canadian Society for Chemistry (1999)
- Member, American Chemical Society (1998)

Board & Committee Service

- Microfluidics Association, Director (December 2021 – present)
- Association of the Chemical Profession of Alberta (Director, May, 2014 – May 2019; Technical Seminar Committee, May 2014 – November 2021; Marketing Committee, November 2021 – present)

CREDENTIALS, SERVICE & TRAINING (CONT'D)

Board & Committee Service	• nanoCluster Alberta (micro/nano tech industry association; co-founding Director, October, 2014 – December 2018) • Springer Nature, BioChip Journal (appointed Editor, February 2007 – present) • Avalon Instrumental Music Society (casino chair, 2019-20; President, 2020-21)
Grant Reviewer	• Grand Challenges Canada: Stars in Global Health review committee • NanoBridge MNTorship candidate evaluation panellist • Ontario Centre of Excellence research grant applications • NSERC Strategic Project grant applications
Ad hoc Journal Reviewer	• Analytical Chemistry • Lab on a Chip (adjudicative) • Electrophoresis • Analytical and Bioanalytical Chemistry • Journal of Chromatography • Fresnius' Journal of Analytical Chemistry • Journal of Microfluidics and Nanofluidics • International Journal of Machine Tools & Manufacture
Conference Chair & Steering Committees	• Symposium co-chair, Micro- and Nano-fabricated Analytical Devices for Chemical, Biochemical and Biomedical Platforms, Pacifichem 2015, Honolulu, HI (Dec. 2015) • CMC Microsystems' 5-year Technology Roadmap – invited reviewer (July, 2012) • Symposium chair, Microfluidic and Nanofluidic Devices for Chemical and Biochemical Experimentation, Pacifichem 2010, Honolulu, HI (Dec. 2010) • Alberta Ingenuity Fund Nanotechnology Accelerator ($100M) steering committee (August, 2007) • Symposium co-chair, Micro- and Nano-Fluidic Devices for Chemical Analysis, Pacifichem 2005, Honolulu, HI (Dec. 2005)
Training	• Jurisprudence (March 2019) • Professional Ethics for Chemists (September 2014) • Patent Searching (January, March 2010) • Project Management (June 2004; Feb. 2008) • Advanced Statistical Data Analysis; Design of Experiments (Sep.-Oct. 2007) • Advanced Product Quality Planning; Failure Mode & Effects Analysis (Jul. 2007) • Professional Selling Skills (Feb. 2006)

CONFERENCE PRESENTATIONS

Invited Peer-Reviewed Conference Lectures

1. H. J. Crabtree, A. Ghobeity, M. Papini and J. K. Spelt, "Microfluidic chip performance as a function of surface roughness", Pacifichem 2015, Honolulu, HI, Dec. 2015
2. H. J. Crabtree, T. Liang, Y. C. Wong, J. Lauzon, R. W. Johnstone, D. P. Manage, C. J. Backhouse and L. M. Pilarski, "Compatibility challenges for performing PCR on PDMS microfluidic chips", Pacifichem 2010, Honolulu, HI, Dec. 2010
3. H. J. Crabtree, "Chemical Compatibility Issues with PDMS-Glass Hybrid Chips", ASME – IMECE 2010 Conference, Vancouver, BC, November 2010
4. H. J. Crabtree, "Fabrication of Unconventional Microfluidic Chips: Within or Outside the Cleanroom?", FACSS 2007, Memphis, TN, Oct. 2007
5. H. J. Crabtree, "Open Tubular and Gel-Filled Microfluidic Chip Research at Micralyne", 90th Canadian Chemistry Conference and Exhibition, Winnipeg, MB, May 2007
6. H. J. Crabtree and C. J. Backhouse, "Open Tubular and Gel-Filled Microfluidic Chip Research at Micralyne", Pacifichem 2005, Honolulu, HI, Dec. 2005
7. H. J. Crabtree and C. J. Backhouse, "Open Tubular and Gel-Filled Microfluidic Chip Research at Micralyne", 12th Canadian Semiconductor Technology Conference, Ottawa, ON, Aug. 2005
8. H. J. Crabtree, "Microfluidic Chip-Based Research Performed at Micralyne", 88th Canadian Chemistry Conference and Exhibition, Saskatoon, SK, June 2005
9. H. J. Crabtree, "Microfabricated Device Research, Development and Manufacturing at a MEMS Foundry", 1st Annual Symposium of the Korean Society of Microsystem on Life Science and Chemistry, Daejeon, Korea, Oct. 2003

Peer-Reviewed Conference Lectures and Posters

1. Z. C. Guo, L. C. Soliman, J. M. Risley, K. K. Donkor, K. J. Schmidt, H. J. Crabtree, "Determination of Sulphate and Chloride Ions in Highly Saline Oilfield Water by Capillary Electrophoresis using Bilayer-Coated Capillaries and Indirect Absorption Detection", CIC Industrial Chemistry Conference, Edmonton, AB, Nov. 2014 (talk)
2. H. J. Crabtree, "Development of Disease Diagnostics by AHFMR Team Microfluidics: Approach to Knowledge Translation", RTNA Conference 2011, Edmonton, AB, Oct. 2011 (talk)
3. H. J. Crabtree, J. Lauzon, Y.C. Wong, T. Liang, R. W. Johnstone, A. J. Stickel, D. P. Manage, C. J. Backhouse and L. M. Pilarski, "PCR Inhibition Effects from Microfluidic Device Materials", 2011 ASME 9th International Conference on Nanochannels, Microchannels and Minichannels, Edmonton, AB, Jun. 2011 (talk)
4. H. J. Crabtree, L. M. Pilarski and C. J. Backhouse, "Miniaturized Field Inversion Electrophoresis", LabAutomation 2004, San Jose, CA, Feb. 2004 (talk)

CONFERENCE PRESENTATIONS (CONT'D)

Peer-Reviewed Conference Lectures and Posters

5. H. J. Crabtree, D. A. Tilroe, E. C. S. Cheong and C. J. Backhouse, "Microchip Injection and Separation Anomalies due to Pressure Effects", HPCE 2001, Boston, MA, Jan. 2001 (poster)
6. H. J. Crabtree, "Microchip Injection and Separation Anomalies due to Siphoning", BioMEMS & Biomedical Nanotechnology World 2000, Columbus, OH, Sept. 2000 (talk)
7. H. J. Crabtree, "Microchip Injection and Separation Anomalies due to Siphoning", SmallTalk 2000, San Diego, CA, July 2000 (talk)
8. H. J. Crabtree, M. U. Kopp and A. Manz, "Fourier Transform C.E.", HPCE '99, Palm Springs, CA, Jan. 1999 (poster)
9. H. J. Crabtree, M. U. Kopp and A. Manz, "Fourier Transform Detection for µ-TAS", µ-TAS '98, Banff, AB, Oct. 1998 (poster)
10. H. J. Crabtree, S. Bay, D. Lewis and N. J. Dovichi, "Development of a 16-Capillary DNA Sequencer", HPLC '97, Birmingham, U. K., June 1997 (poster)
11. H. J. Crabtree, I. D. Ireland and N. J. Dovichi, "Effect of acetonitrile in the sampling solution on the analyte peak shape in micellar electrokinetic capillary chromatography", 77th Canadian Chemical Conference and Exhibition, Winnipeg, MB, June 1994 (talk)

PUBLICATIONS

Peer-Reviewed Journal Publications

1. V. T. Tran, K. F. Catenza, K. K. Donkor, K. J. Schmidt, H. J. Crabtree, and N. A Warrender, "Analytical characterization of choline chloride in oilfield process waters and commercial samples by capillary electrophoresis", *Candian Journal of Chemistry* **2022,** 100, 552-559
2. L. Pei, K. J. Schmidt, H. J. Crabtree, and C. A. Lucy. "Determination of Inorganic Anions in Oilfield Water Using Capillary Electrophoresis with Indirect Fluorescence Detection", *Analytical Methods* **2015,** *7,* 8689–96
3. K. K. Donkor, Z. C. Guo, L. C. Soliman, Y. T. Law, J. M. Risley, K. J. Schmidt, H. J. Crabtree, and N. A. Warrender, "Determination of Sulfate and Chloride Ions in Highly Saline Oilfield Water by Capillary Electrophoresis Using Bilayer-Coated Capillaries and Indirect Absorption Detection", *International Journal of Environmental Analytical Chemistry* **2015,** *95,* 175-86
4. H. J. Crabtree, J. Lauzon, Y. C. Morrissey, B. J. Taylor, T. Liang, R. W. Johnstone, A. J. Stickel, D. P. Manage, C. J. Backhouse and L. M. Pilarski, "Inhibition of On-Chip PCR Using PDMS-Glass Hybrid Microfluidic Chips", *Microfluidics and Nanofluidics* **2012,** *13,* 383-398
5. D. P. Manage, J. Lauzon, A. Atrazhev, Y. C. Morrissey, A. L. Edwards, A. J. Stickel, H. J. Crabtree, K. Pabbaraju, G. Zahariadis, S. K. Yanow and L. M. Pilarski, "A miniaturized and integrated gel post platform for multiparameter PCR detection of herpes simplex viruses from raw genital swabs", *Lab on a Chip* **2012,** *12,* 1664-1671

PUBLICATIONS (CONT'D)

Peer-Reviewed Journal Publications

6. A. Ghobeity, H. J. Crabtree, M. Papini and J. K. Spelt, "Characterisation and comparison of microfluidic chips formed using abrasive jet machining and wet etching", *Journal of Micromechanics and Microengineering* **2012,** *22,* 025014
7. A. Atrazhev, D. P. Manage, A. J. Stickel, H. J. Crabtree, L. M. Pilarski and J. P. Acker, "In-gel technology for PCR genotyping and pathogen detection", *Analytical Chemistry* **2010,** *82,* 8079-8087
8. Y. Li, C. Dalton, H. J. Crabtree, G. Nilsson and K. V. I. S. Kaler, "Continuous dielectrophoretic cell separation microfluidic device", *Lab on a Chip* **2007,** *7,* 239-248
9. N. S. Cameron, H. Roberge, T. Veres, S. C. Jakeway and H. J. Crabtree, "High fidelity, high yield production of microfluidic devices by hot embossing lithography: rheology and stiction", *Lab on a Chip* **2006,** *6,* 936-941
10. R. Ma, H. J. Crabtree and C. J. Backhouse, "A Rejuvenation Method for Poly(*N,N*-dimethylacrlyamide)-Coated Glass Microfluidic Chips", *Electrophoresis* **2005,** *26,* 2692-2700
11. H. Luesebrink, T. Glinsner, S. C. Jakeway, H. J. Crabtree, N. S. Cameron, H. Roberge and T. Veres, "Transition of MEMS Technology to Nanofabrication", *Journal of Nanoscience and Nanotechnology* **2005,** *5,* 864-868
12. C. J. Backhouse, A. Gajdal, L. M. Pilarski and H. J. Crabtree, "Improved Resolution with Microchip-Based Enhanced Field Inversion Electrophoresis", *Electrophoresis* **2003,** *24,* 1777-1786
13. P. J. Obeid, T. K. Christopoulos, H. J. Crabtree and C. J. Backhouse, "Microfabricated Device for DNA and RNA Amplification by Continuous-Flow Polymerase Chain Reaction and Reverse Transcription-Polymerase Chain Reaction with Cycle Number Selection", *Analytical Chemistry* **2003,** *75,* 288-295
14. C. J. Backhouse, H. J. Crabtree and D. M. Glerum, "Frontal Analysis on a Microchip", *Analyst* **2002,** *127,* 1169-1175
15. T. Footz, S. Wunsam, S. Kulak, H. J. Crabtree, D. M. Glerum and C. J. Backhouse, "Sample Purification on a Microfluidic Device", *Electrophoresis* **2001,** *22,* 3868-3875
16. H. J. Crabtree, E. C. S. Cheong, D. A. Tilroe and C. J. Backhouse, "Microchip Injection and Separation Anomalies Due to Pressure Effects", *Analytical Chemistry* **2001,** *73,* 4079-4086
17. H. J. Crabtree, S. J. Bay, D. F. Lewis, J.Z. Zhang, L. D. Coulson, G. A. Fitzpatrick, S. L. Delinger, D. J. Harrison and N. J. Dovichi, "Construction and Evaluation of a Capillary Array DNA Sequencer Based on a Sheath-Flow Cuvette", *Electrophoresis* **2000,** *21,* 1329-1335
18. H. J. Crabtree, M. U. Kopp and A. Manz, "Shah Convolution Fourier Transform Detection", *Analytical Chemistry* **1999,** *71,* 2130-2138

PUBLICATIONS (CONT'D)

Peer-Reviewed Journal Publications

19. H. J. Crabtree, I. D. Ireland and N. J. Dovichi, "Effect of acetonitrile in the sampling solution on the analyte peak shape in micellar electrokinetic capillary chromatography", *Journal of Chromatography A* **1994,** *669,* 263-267

Conference Proceedings, Reviews & Editorials

1. H. J. Crabtree, N. Y. A. Boadu, E. L. Navid, E. F. Einsiedel, J. P. Acker, S. K. Yanow and L. M. Pilarski, "Approach to KT in Development of Disease Diagnostics", *KT Casebook Vol. 2* published by Alberta Innovates – Health Solutions, 2011 (http://www.aihealthsolutions.ca/rtna/doc/final_pdf_of_Casebook_II.pdf)
2. S. C. Jakeway, H. J. Crabtree, T. Veres, N. S. Cameron, H. Luesebrink and T. Glinsner, "Transition of MEMS technology to nanofabrication", *International Conference on MEMS, Nano and Smart Systems, Proceedings,* 118-122 (2003)
3. H. J. Crabtree, M. Finot, J. J. Lukomskyj and V. Walker, "Microfabrication at Micralyne: evolution of MEMS and microfluidics from exploration to commercialization", *Lab on a Chip* **2001,** *1,* 30N-34N
4. M. U. Kopp, H. J. Crabtree and A. Manz, "Developments in technology and applications of microsystems", *Current Opinion in Chemical Biology* **1997,** *1,* 410-419

NOT JUST A FULL-TIME TECH NERD …

Status

- Married, living in Edmonton with wife, daughter and two young sons
  - now fully comprehend the meaning of "busy" ☺

Leisure Activities

- Languages
  - French: fluent
  - Spanish: proficient
- Sports & outdoor activities:
  - Hockey, XC & DH skiing
  - Backpacking, car camping
  - Swimming, canoeing, sailing, cycling, ultimate frisbee
- Leisure time:
  - Family activities
  - Beer & politics ☺
  - Home renovation/carpentry
  - Photography
  - World travel

:: References available upon request ::