

HEYREOUN AN HAN, Ph.D.

Faculty Associate

The University of Texas Health Science Center at Houston School of Public Health
1200 Pressler Street, RAS 1010, Houston, TX 77030
Phone: 713.500.9466 Email: Heyreoun.anhan@uth.tmc.edu

EDUCATION

- 2002-2009 **Ph.D., Environmental Sciences (Bioaerosol Exposure Sciences)**
Department of Environmental Sciences
Rutgers University, New Brunswick, NJ, USA
Advisor: Professor Gediminas Mainelis
- Thesis : “*Development and application of quantitative bioaerosol analysis method using PCR*”
- 1998-2000 **M.S., Environmental Sciences (Soil Microbiology)**
Department of Environmental Sciences, Hankuk University of Foreign Studies, Seoul, Korea
Advisor: Professor Eung-Soo Kim
- Thesis : “*Molecular biotechnological studies for soil Streptomyces and degrading-enzyme involved in phenolic compounds biodegradation*”
- 1993-1998 **B.S., Environmental Sciences**
Department of Environmental Sciences, Hankuk University of Foreign Studies, Seoul, Korea

PROFESSIONAL EXPERIENCES

- 07/2017-present **Faculty Associate, The University of Texas Health Science Center at Houston School of Public Health**
- Role: Project Manager
- 08/11/14-04/31/20, Sustainable Solutions to Metal Air Pollution in Disadvantaged Neighborhoods (R01 ES 023563, PI, Symanski): The goal of this study is to improve air quality and health in disadvantaged neighborhoods near industrial facilities in Houston by employing an evidence-based public health action plan applying CBPR approach.
 - 09/11/19-04/31/20, Children’s Health and Research on Metals (add on study, R01 ES 023563, PI, Symanski): The goal of this study is to assess metal exposure among children in three underserved Houston neighborhoods residing near heavy industrial activity as well as to evaluate the impact of flooding on exposure.

Role: Investigator

- 03/16/19-7/19/19, Deer Park Chemical Fire study (SWCOEH Disaster response research, PI, Symanski): The goal of this pilot project is to assess residential outdoor air quality and health impact of the fire among residents in the impacted area and provide scientific results for improved literacy.

- 03/2016-06/2017 **Research Coordinator II, The University of Texas Health Science Center at Houston School of Public Health**
- Metal Air Pollution Partnership Solutions (MAPPS) project management
 - Qualitative and Quantitative study methods design, implementation and analysis
 - Oversee stakeholder (including community partners and Community Advisory Board (CAB) engagement
- 01/2010-04/2010 **Faculty Research Associate, University of Maryland School of Public Health**
- Evaluation of a bioaerosol sampler (G-II) for influenza virus in human exhaled breath
 - Project management and lab set up
- 07/2002-07/2008 **Graduate Assistant, Rutgers University**
- Design and evaluation of advanced electrostatic sampler for total bioaerosols in the air
 - Validation of performance of aerosol collecting samplers for aerosolized particles (biological and non-biological)
 - Development and validation of Quantitative Real-Time PCR assay for bioaerosol quantification and identification
 - Sampling bioaerosol in indoor and outdoor environment
- 09/2004 - 12/2004 **Teaching Assistant, Rutgers University**
- Environmental Microbiology
- 03/2001 - 08/2001 **Researcher, Hankuk University of Foreign Studies**
- Development of biosensor for hazardous compounds in soil and water using molecular biology techniques
- 03/2000 - 08/2001 **Part Time Lecturer, Hankuk University of Foreign Studies**
- Environmental Chemistry
 - Introduction to Environmental Science
- 03/1999 - 02/2000 **Teaching Assistant, Hankuk University of Foreign Studies**
- Waste Water Treatment
- 03/1998 - 02/2000 **Research Assistant, Hankuk University of Foreign Studies**
- Field sampling and Isolation of microorganisms degrading hazardous aromatic compounds in soil

SKILLS SUMMARY

Project Management

- Preparing written academic reports, presentations and scientific journals
- Organizing and prioritizing workload of research members to meet deadlines with multiple projects and work commitments
- Excellent organizational skills applied in project accomplishment including method development, safety protocol planning / implementation and manual of operations and procedures (MOP) preparation
- Knowledge of maintaining safe research practice and procedures in accordance with the requirements of Human Subject research and IRB process
- Ability to ensure the validity and reliability of data at all times
- Organizing community meetings, forums and trainings to enhance community capacity to address environmental health concerns

Research skills

- Processing a creative approach to conduct Community Based Participatory Research
- Strategic planning and leading in community outreach activities
- Experience in developing communication plan and study materials to enhance environmental health literacy of community members
- Experience in translating research findings and disseminate to lay public
- Working with community, industry, and governmental representatives to improve community health and resilience
- Applying mixed-methods to understand environmental health perceptions in environmental justice community (Key informant interview, focus groups and community survey)
- Environmental sampling design and data interpretation
- Designing and conducting disaster research response (DR2) activities and research to identify and address environmental health needs of the affected community

Aerosol Characterization and Monitoring

- **Integrated air sampling device and bioaerosol monitoring:** BioSampler, Portable Bioaerosol Impactor (RCS High Flow), Andersen-type Impactor, Button Aerosol Sampler equipped with gelatin filter and electrostatic *bioaerosol* collector
- **Real-time particulate matter sampling device and data analysis:** Optical Particle Counter (GRIMM 1.108), Aerodynamic Particle Size Spectrometer, Aerosol Particle Sizer (APS)
- **Monodisperse Aerosol Generation and Characterization:** Collision Nebulizer and Bubble Aerosol Generator

Molecular Biotechnology

- **Traditional molecular biotechnology:** Cell culture, Colony Forming Units, Direct light microscopy, and Acridine Orange Epifluorescence microscopy
- **Advanced molecular biotechnology:** DNA / RNA extraction (plasmid and genomic DNA), DNA quantification using UV spectrophotometer, conventional PCR, electrophoresis, image analyzer, *Quantitative Real-Time PCR*, DNA transfer using enzyme digestion and various vectors, gene expression using Southern hybridization, *Enzyme analysis and protein expression (PAGE)*

PROFESSIONAL MEMBERSHIPS

2009	International Society of Exposure Science (ISES)
2004-2009	American Association for Aerosol Research (AAAR)
2004-2009	Air and Waste Management Association (AWMA)
2004-2009	American Society for Microbiology (ASM)-Biodefense
2002-2009	American Society for Microbiology (ASM)
2000-2001	The Society for Industrial Microbiology annual meeting (SIM)
1999-2000	The Korean Society for Microbiology and Biotechnology
1999-2000	The Korean Society for Biotechnology and Bioengineering

AWARDS

2002-2008	University Graduate Scholarship , Rutgers University
2006	Best Poster Award , Theobald Smith Society
2005	Travel Award , Department of Environmental Science, Rutgers University
2005	Travel Award , American Association for Aerosol Research
2001	Competitive Internship scholarship , the Korea Science and Engineering Foundation
2000	Travel Award , the Korean Society for Biotechnology and Bioengineering

PEER-REVIEWED JOURNAL ARTICLES

1. Han, T.W.*, **An, H.R.***, and Mainelis, G. (2010). Performance of an Electrostatic Precipitator with Superhydrophobic Surface when Collecting Airborne Bacteria, *Aerosol Science and Technology*. 44:339-348. ***same contribution***
2. **An, H.R.**, Mainelis, G., and White L. (2006) Development and Calibration of Real-Time PCR for Quantification of Airborne Microorganism in Air Sample, *Atmospheric Environment*. 40:7924-7939.
3. Mainelis, G., Berry, D., **An, H.R.**, Yao, M., DeVoe, K., Fennell, D.E., and Jaeger, R., (2005) Design and Performance of a Single-Pass Bubbling Bioaerosol Generator, *Atmospheric Environment*. 39:3521-3533.
4. Yao, M., Mainelis, G., and **An, H.R.**, (2005) Inactivation of Microorganisms using Electrical Fields. *Environmental Science and Technology*. 39:3338-3344.

5. **An, H.R.**, Mainelis, G., Yao, M., (2004) Evaluation of a High Volume Portable Bioaerosol sampler in Laboratory and Field Environments. *Indoor Air*. 14(6): 385-393.
6. **An, H.R.**, Park, H.J., and Kim, E.S., (2001) Cloning and expression of thermophilic catechol 1, 2-dioxygenase gene (*catA*) from *Streptomyces setonii* *FEMS Microbiological Letters*. 195:17-22.
7. **An, H.R.**, Park, H.J., and Kim, E.S., (2000) Characterization of benzoate degradation via *ortho*-cleavage by *Streptomyces setonii*. *Journal of Microbiology and Biotechnology*. 10:111-114.
8. Jeon, E.K., **An, H.R.**, Park, K.J., and Lee, K.H., (1999) LuxR-LuxI type regulators involving in various bacterial quorum-sensing mechanisms. *The Korean Journal of Microbiology*. 35:99-106.

CONFERENCE ABSTRACTS

1. Symanski E, **An Han H**, Christensen B, Flores J, Han I, James D, Jimenez M, Markham C, McCurdy S, Nelson B, Raun R, Richner D, Smith MA, Wu S and the MAPPS Community Advisory Board (2019). Metal Air Pollution Partnership Solutions (MAPPS): Data-driven and Pollution-reducing Initiatives to Improve Environmental Health in Houston Neighborhoods. *NIEHS Research to Action Grantee Meeting* (Durham NC, June 6-7, 2019)
2. **An Han H**, Flores J, Han I, James D, Jimenez M, Lopez Kulsum, Markham C, McCurdy S, Nelson B, Raun L, Richner D, Smith MA, and Simanski E (2018). Metal air pollution partnership solutions (MAPPS): Community Perspectives about Environmental health in underserved Houston neighborhoods near metal recycling facilities. *Southwest Center for Occupational and Environmental Health (SWCOEH) 40TH Anniversary Scientific Symposium* (March 7, 2018)
3. Lee B, Chee A, Jimenez M, **An Han H**, Smith MA, McCurdy S and Symanski E (2017). Identifying key concerns in underserved Houston neighborhoods near metal recycling facilities: Laying the foundation for a public health action plan. *25th UTH Health School of Public Health Student Research Day* (Houston, TX, April 6, 2017)
4. Han, T.W., **An, H.R.***, and Mainelis, G. (2008). Evaluation of an electrostatic sampler with superhydrophobic surface for bioaerosol collection *Abstracts of the 27th Annual Meeting of the American Association for Aerosol Research* (Orlando, Florida, October 20-24, 2008). * **Same contribution***
5. **An, H.R.**, Mainelis, G. and White, L. (2006) Development And Calibration Of Whole-Cell Real-Time PCR For Quantification Of Total Bacterial Number In Air Samples, *7th International Aerosol Conference* (St. Paul, Minnesota, USA, September 10 -15, 2006).
6. **An, H.R.**, Mainelis, G. and White, L. (2006) Calibration of Real-Time PCR for Quantification of Bacteria in Air Samples, *General American Society for Microbiology Meeting*, (Orlando FL, May 21-25, 2006), p. 180.
7. **An, H.R.**, Mainelis, G. and White, L. (2006) Calibration and Validation of Whole Cell Real-Time PCR for Quantification of *B. Subtilis* in Air Samples, *Meeting in Miniature of Theobald Smith*, (New Brunswick FL, April 20, 2006), p. 11.
8. **An, H.R.**, Mainelis, G. and White, L. (2005) Development and Application of Real-Time PCR to Quantify Total Bacterial Load Collected by Liquid Air Samplers, *Abstracts of the 24th Annual Meeting of the American Association for Aerosol Research* (Austin, Texas, October 17-21, 2005), p. 300.

9. Mainelis, G., Berry, D., **An, H.R.**, Yao, M., DeVoe, K., and Jaeger, R. (2005) Utilization Of Bursting Bubbles For Aerosolization Of Biological And Abiological Aerosols, *European Aerosol Conference 2005*, (Ghent, Belgium, August 28 - September 2, 2005).
10. Mainelis, G., Berry, D., Yao, M., **An, H.R.** and Jaeger, R. (2005), Novel Methods for Generating and Collecting Biological Aerosols, *Aerobiology in Biodefense I* (Frederick, Maryland, June 22-23, 2005).
11. **An, H.R.**, Mainelis G., White, L.A. (2005) Development of Real-Time PCR Protocols for the Detection and Quantification of Airborne Microorganisms, *Abstracts of the American Society for Microbiology Biodefense Research Meeting*, (Baltimore, Maryland, March 20-23, 2005), 88(M), p. 37.
12. Mainelis G., **An, H.R.**, Yao, M., and Liroy, P. (2004) A Low Power Collector for Concurrent Measurement of Viable and Total Bioaerosols, *Abstracts of the 14th annual conference of International Society for Exposure Analysis* (Philadelphia, Pennsylvania, October 17-21, 2004), p. 152.
13. Mainelis, G, Jaeger, R., Berry, D., **An, H.R.**, Yao, M., and DeVoe, K. (2004) Performance and Design of a Single-Pass "Bubbling" Bioaerosol Generator, *Abstracts of the 23rd Annual Meeting of the American Association for Aerosol Research* (Atlanta, Georgia, October 4-8, 2004), p. 284.
14. Mainelis G., **An, H.R.**, and Yao, M. (2004) Investigation of Electrobiological Properties of Bioaerosols. General meeting of the American Geophysical Union (Montreal, Canada, May 17-21, 2004).
15. Yao, M., Mainelis, G., and **An, H.R.** (2004) Investigation of Electrical Field Effect on Microorganism Viability. *General American Society for Microbiology Meeting* (New Orleans, Louisiana, May 23-27, 2004).
16. Mainelis G., **An, H.R.**, Yao, M. (2004) Investigation of Electrobiological Properties of Bioaerosols, General meeting of the American Geophysical Union, (Montreal, Canada, May 17-21, 2004), *Eos Trans. AGU, 85(17)*, Jt. Assem. Suppl., Abstract A22A-05.
17. Mainelis G., **An, H.R.**, Yao, M. (2004) Use of Electrostatic Method for Collecting Culturable and Total Airborne Microorganisms. *Abstracts of the 2nd Joint Conference on Point Detection for Chemical and Biological Defense*, (Williamsburg, Virginia, 1-5 March 2004), p.81.
18. Mainelis, G., **An, H.R.**, Yao, M., Liroy, P., and Liroy, M. J. (2003) Concurrent Determination of Culturable and Total Airborne Microorganisms Using Electrostatic Collection Method. *Annual Meeting of the American Association for Aerosol Research* (Anaheim, California, October 20-24, 2003), p. 107.
19. Mainelis, G., Liroy, P., Liroy, M.J., and **An, H.R.** (2003) Application of Electrostatic Precipitation for Simultaneous Determination of Culturable and Total Airborne Microorganisms. *General ASM Meeting* (May 18-22, 2003, Washington D.C., USA), Q-219.
20. Mainelis, G., **An, H.R.**, and Liroy, P. (2003) Evaluation of Physical and Biological Efficiencies of a Portable Air Sampler for Monitoring *Bacillus anthracis*. *ASM: Future Directions for Biodefense Research: Development of Countermeasures* (March 9-12, 2003, Baltimore, USA), 227, p.70.
21. Park, H.J., Lee, B.N., **An, H.R.**, Kim, E.S., (2000) Characterization of thermostable catechol 1, 2-dioxygenase from *Streptomyces setonii*. Poster presentation at the spring meeting of the Korean Society for Biotechnology and Bioengineering (April, 2000, Korea).

CONFERENCE PROCEEDINGS

1. Mainelis G., An., H.R., Yao, M. (2004) Use of Electrostatic Method for Collecting Culturable and Total Airborne Microorganisms, *Proceedings of the 2nd Joint Conference on Point Detection for Chemical and Biological Defense*, (Williamsburg, Virginia, 1-5 March 2004), released on CD-ROM by Conference organizers.

CONFERENCE PRESENTATIONS

1. An, H.R., Mainelis, G. and White, L. (2006) Development And Calibration Of Whole-Cell Real-Time PCR For Quantification Of Total Bacterial Number In Air Samples, 7th *International Aerosol Conference* (St. Paul, Minnesota, USA, September 10 -15, 2006), accepted.
2. An, H.R., Mainelis, G. and White, L. (2006) Calibration and Validation of Whole Cell Real-Time PCR for Quantification of *B. Subtilis* in Air Samples, *Meeting in Miniature of Theobald Smith*, (New Brunswick FL, April 20, 2006), p. 11.
3. An H. R., Mainelis G, and White, L. (2005) Development and Application of Real-Time PCR to Quantify Total Bacterial Load Collected by Liquid Air Samplers. AAAR annual meeting (Austin, TX, October 17-21, 2005), p.300.
4. An H. R., Mainelis, G. and White, L. (2005) Development of Real-Time PCR Protocols for the Detection and Quantification of Airborne Microorganisms. ASM Biodefense meeting (Baltimore, MD, March 20-23, 2005)
5. An, H.R., Park, H.J., Kim, E.S., (2000) Cloning and Expression of Thermostable catechol-1, 2-dioxygenase Gene from *Streptomyces setonii*. Poster presentation at the Annual meeting of the Society for Industrial Microbiology annual meeting (August, 2000, San Diego, CA, USA)
6. An, H.R., Kim, E.S., (1999) Cloning and characterization of a thermostable catechol-1, 2-dioxygenase central region gene in a benzoate-degrading *Streptomyces*. Presentation at the fall meeting of the Korean Society for Biotechnology and Bioengineering (October, 1999, Korea).
7. An, H.R., Kim, E.S., (1999) Cloning of a thermostable catechol-1, 2-dioxygenase central region from a phenol-degrading *Streptomyces*. Poster Presentation at the Annual meeting of the Korean Society for Microbiology and Biotechnology (May, 1999, Korea).
8. An, H.R., Kim, E.S., (1999) Isolation and characterization of soil *Streptomyces* involved in hazardous aromatic compound degradation. Poster presentation at the spring meeting of the Korean Society for Biotechnology and Bioengineering (April, 1999, Korea).