

Andrea Fernanda Monroy Licht

Department of Chemistry and Biology, Universidad del Norte,
Email: alicht@uninorte.edu.co

EDUCATION:

- 2013- **Ph. D candidate.**, Doctorate in Environmental Toxicology. Universidad de Cartagena. Cartagena. Colombia.
- 2004-2006 **M.Sc.**, Environmental management. Pontificia Universidad Javeriana. Bogotá. Colombia.
- 1996-2002 **B.S. Microbiology**, Pontificia Universidad Javeriana. Bogotá. Colombia.

WORK EXPERIENCE:

- 06/2019- **Full time professor.** Department of Chemistry and Biology. Universidad del Norte, Barranquilla, Colombia. Courses taught: Cell Biology, Molecular Biology, Instrumental analysis in Biology, Environmental Chemistry and Microbiology, Microbial biotechnology, Research I, Research II, Research III
- 08/2017-08/2018 **Visitor doctoral student.** Faculty of Biology, Chemistry & Earth Sciences. Department of Plant Physiology. Universität Bayreuth, Bayreuth, Germany.
- 01/2013-06/2017 **Lecturer**, Department of Chemistry and Biology, and Department of Civil and Environmental Engineering. Universidad del Norte, Barranquilla, Colombia. Courses taught: Bioremediation of Soils, Biology, Genome and Society, Water Purification, Cellular and molecular Biology.
- 07/2004-03/2012 **Specialist in Microbiology.** Specialized professional in the Quality Control department. Tocancipa Brewery. SAB-Miller. Tocancipa. Colombia.
- 07/2002-06/2004 **Lecturer**, Faculty of Environmental Engineering. Universidad Manuela Beltrán, Bogotá, Colombia. Courses taught: Biochemistry, Environmental Microbiology and Environmental Biotechnology.

HONORS, AWARDS, AND RECOGNITIONS:

- 2021 Winner of the "Call to identify **best practices in educational innovation and digital transformation in higher education institutions - 2021**", led by the Ministry of Education. Project Ali-Mentes: Education for healthy eating. August, 2021. Bogotá, Colombia.
<https://colab.colombiaaprende.edu.co/experiencias/cognicion-situada-para-fomentar-habilidades-de-pensamiento-critico-en-estudiantes-de-medicina-experiencia-ali-mentes/>
- 2020 UN CC: Learn Challenge 100,000 Stories for Climate Action. **Champion.** This award recognizes the 10 best stories for climate action. March 22, 2021. Geneva, Switzerland
<https://www.unclearn.org/stories/implementing-climate-change-education-to-mitigate-the-effects-of-vector-borne-diseases-in-colombia/>
2020. **Macondo-Ecocampus award.** Nomination. Actions for sustainability. Barranquilla. Colombia
- 2018 **Best Poster Award at 15th Euro Global Summit on Toxicology and Applied Pharmacology.** International congress. Berlin, Germany.
- 2015 **Teaching innovation prize.** Universidad del Norte. Barranquilla. Colombia.

2014 **Best Poster Award.** **Universidad Pedagógica y Tecnológica de Tunja.** Tunja. Colombia.
2002 **B.S. Honors Thesis.** Pontificia Universidad Javeriana. Bogotá. Colombia.
2002 **B.S. Honors Degree.** Pontificia Universidad Javeriana. Bogotá. Colombia.

VISITS:

- Faculty of Biology, Chemistry & Earth Sciences. Department of Plant Physiology. **Universität Bayreuth,** Bayreuth, Germany, August 2017 - September 2018.
- Faculty of Biology, Chemistry & Earth Sciences. Department of Plant Physiology. **Universität Bayreuth,** Bayreuth, Germany, October 2106 - December 2016.

RESEARCH EXPERIENCE

My research interests have focused on Environmental Biotechnology, especially in Bioremediation, exploring the potential uses of biosolids generated in wastewater processes, as well as in the biological treatment of environmental pollutants. I am currently working on phytoremediation of heavy metals, especially mercury and metalloids such as Arsenic and its species (Arsenite, Arsenate, and Monothioarsenate) using the *Eichhornia crassipes* and *Arabidopsis thaliana* model plants. Being a point of deepening the mechanisms of responses of the plants against the stress generated by different pollutants present in the ecosystems.

At the same time, I am interested in Science learning topics. I develop a project of critical thinking, learning, and cognition communities located with undergraduate students of the Universidad del Norte medicine school.

Research Group in Chemistry and Biology. Universidad del Norte. Barranquilla, Colombia. 2018-
Researcher in EUREKA Group Universidad del Norte. Barranquilla, Colombia. 2013-
Researcher in Institute of Plant Physiology. Universität Bayreuth. Bayreuth, Germany, 2017-2018
Researcher in Environmental and Computational Chemistry Group. Universidad de Cartagena. Cartagena, Colombia 2013-2021
Researcher in Environmental and Industrial Biotechnology Group - GBAI. Pontificia Universidad Javeriana, Bogotá, Colombia 2000-2003

RECENT PROJECTS:

Research leader: Constructed wetlands: a green technique for gray water treatment. Call ATLANTIC STRENGTHENING", led by the Foundation Center of Excellence in Innovation Systems - FunCESi - in alliance with the Colombian Observatory of Science and Technology - OcyT. 2021-
<https://app.itriple.co/app/world/ideas/591>

Research team: Monothioarsenate novel Arsenic species. Study of its Phyto-toxicity in model plant *Arabidopsis thaliana*. The project was carried out at the University of Bayreuth. Bayreuth, Germany 2016-2018.

Research team: Elemental mercury: Study of its Phyto-toxicity and accumulation in *Eichhornia crassipes* a macrophyte plant. The project was carried out at the Universidad de Cartagena. Cartagena, Colombia. 2015-2022

RESEARCH SUPERVISOR:

- Role: Co-supervisor in the thesis "*Evaluation of the system of punctual treatment of surface water with Cardón (Stenocereus griseus) in the village of Los Andes, department of Magdalena (Colombia)*". Master Program in Natural Sciences. Master student José Francisco Bohórquez Perea. Universidad del Norte.

- Role: Supervisor in the thesis "*Evaluation of the performance of a bio-prototype under the point-of-use model for the treatment of gray water in rural areas*". Master Program in Natural Sciences. Master student Claudia Vergel. Universidad del Norte.

- Role: Supervisor in the thesis "*Evaluation of Eichhornia crassipes in the bioaccumulation of Manganese as an alternative for the treatment of groundwater for consumption by indigenous communities*". Master Program in Environmental Engineering. Master student Olga Lucia Meza Barragan. Universidad del Norte.

- Role: Co-supervisor in the thesis "*Optimization of the bacterial activity in the removal of organic matter in a bioprototype for the treatment of standard domestic wastewater from biosolids samples obtained in Barranquilla (Colombia)*". Cooperation between Universidad del Norte and Universidad Libre (Barranquilla-Colombia). Program Microbiology (Bachelor of Science). Bachelor students Adrián Alvarado and Diana Cedeño.

CONFERENCES:

- "Arsenic Ecotoxicology". Universidad de Cartagena. Cartagena. Colombia. February 2014. Talk.
- "Genomic instability mechanism induced by Arsenic". Arsenic week Symposium. Universidad de Cartagena. Cartagena. Colombia. February 2014. Poster.
- "Toxicological profile of the water Hyacinth *Eichhornia crassipes* (Mart.) to elemental mercury". Universidad de Cartagena. Cartagena. Colombia. October 2015. Speaker.
- "Applied Environmental Toxicology challenges, a view from the Biotechnology" Biotechnology workshop. Universidad Libre. Barranquilla. Colombia. July 2016. Speaker.
- "A study of elemental mercury accumulation in macrophytes roots". 15th Euro Global Summit on Toxicology and Applied Pharmacology. International congress. July 2-4, 2018. Berlin, Germany. Poster.
- "Analysis of uptake and Toxicity of Monothioarsenate (MTA) in *Arabidopsis thaliana*". SETAC Latin America 13th Biennial Meeting 15 - 18 September. Society of Environmental Toxicology and Chemistry, Cartagena, Colombia. September 2019. Speaker.
- "A study of elemental mercury accumulation in macrophytes roots". SETAC Latin America 13th Biennial Meeting 15 - 18 September. Society of Environmental Toxicology and Chemistry, Cartagena, Colombia. September 2019. Poster.
- Ali-MENTES. Critical thinking through education for healthy eating project. VIII. International Symposium on Sciences and Mathematics. Barranquilla, Colombia. September 20-22th de 2019. Speaker.
- Metals and Metalloids, how can they reach the plants? IX Symposium of Biodiversity Caribe. Barranquilla, Colombia. November 18-19 2019. Speaker.
- "Analysis of uptake and Toxicity of Monothioarsenate (MTA) in *Arabidopsis thaliana*". GROW-Colombia workshop "Strengths and potential of microbial ecology in Colombia", Calí, Colombia. November 19th 2019. Poster.
- Constructed wetlands to face water pollution: effective role of Water hyacinth and the potential effects of this process on plant toxicity. Congress EUROTOX-2021, organized by the European

- Society of Toxicology September 27-october 1, 2021. Poster.
- Health + 1.5°C: Sustainability from Cell Biology. A fair of innovative ideas. Learn about the small changes and big transformations that occur at Universidad del Norte. June 23th, 2022. Barranquilla. Colombia. Speaker.
 - Constructed wetlands: a green technique for gray water treatment in rural areas. IV International Symposium on Sustainable Development Goals. The world regains its development path. September 20-21, 2022. Universidad del Norte. Barranquilla. Speaker.

PUBLICATIONS

- Monroy-Licht, A. & Gutiérrez De Aguas, R. 2022. Ali-Mentes: mejora de las habilidades de pensamiento crítico a través de la educación para una alimentación más saludable en estudiantes universitarios. En Domínguez, E. & Suarez, C. (Eds), Aulas Develadas 5. CEDU. Editorial Uninorte. (Book in editing process, expected to be published in November of 2022).
- Monroy-Licht, A., Méndez-Cuadro, D. & Olivero-Verbel, J. (2022). Elemental mercury accumulation in *Eichhornia crassipes* (Mart.) Solms-Laubach. *Environ Sci Pollut Res*. <https://doi.org/10.1007/s11356-022-22521-y>
- Monroy-Licht A (2022) Effect of phosphate on arsenic species uptake in plants under hydroponic conditions. *J Plant Res*. <https://doi.org/10.1007/s10265-022-01381-0>
- Duque, M., Hernández, N., Monroy, A. (2021). Editorial. Escenarios universitarios para el impulso de las mujeres en las ciencias. *Revista Luciérnaga Comunicación*. ISSN 2027-1557 Vol. 13, Núm. 25. Pp. 4-10. <https://revistas.elpoli.edu.co/index.php/luc/issue/view/121/54>
- Monroy, A. F., Vergel, C., & Pacheco, C. A. 2021. Constructed wetlands to face water pollution: effective role of water hyacinth and the potential effects of this process on plant toxicity. *Toxicology Letters*, 350, S183. [https://doi.org/https://doi.org/10.1016/S0378-4274\(21\)00674-3](https://doi.org/https://doi.org/10.1016/S0378-4274(21)00674-3)
- Monroy-Licht, A & Gutierrez de Aguas, R. 2020. ALI-Mentes. Enhance of Critical Thinking Skills through education for healthier eating in college students. *ICERI2020 Proceedings*, 1490-1499. DOI: 10.21125/iceri.2020.0381 ISBN: 978-84-09-24232-0. ISSN: 2340-1095. V- 2372-2020 <https://library.iated.org/view/MONROYLICHT2020ALI>
- Monroy-Licht, A. 2019. A study of elemental Mercury accumulation in Macrophytes. Abstract Book. SETAC Latin America 13th Biennial Meeting 15 - 18 September. Society of Environmental Toxicology and Chemistry, Cartagena, Colombia. September 2019. https://cdn.ymaws.com/www.setac.org/resource/resmgr/abstract_books/SETAC-Cartagena-abstract-boo.pdf
- Monroy-Licht, A., Rafferty, C., Kerl, CF., Planer-Friedrich, B. Clemens, S. Monothioarsenate uptake and reduction in *Arabidopsis thaliana*. 2019. Abstract Book. SETAC Latin America 13th Biennial Meeting 15 - 18 September. Society of Environmental Toxicology and Chemistry, Cartagena, Colombia. September 2019. https://cdn.ymaws.com/www.setac.org/resource/resmgr/abstract_books/SETAC-Cartagena-abstract-boo.pdf

- Monroy-Licht, A. 2018. A study of elemental Mercury accumulation in macrophytes roots. *Journal of Clinical Toxicology*, 8, 88. DOI: 10.4172/2161-0495-C1-028. Proceedings of 15th Euro-Global Summit on Toxicology and Applied Pharmacology. ISSN: 2161-0495. July 02-04, 2018. Berlin, Germany.
https://books.google.com.co/books?id=hCZmDwAAQBAJ&pg=PA99&lpg=PA99&dq=10.4172/2161-0495-C1-028&source=bl&ots=k4ig0YsFY5&sig=ACfU3U3pRNU7VWLD-LHL3QQ331yX3_SyAw&hl=es&sa=X&ved=2ahUKewjy--3IisHpAhXDI-AKH9DnkQ6AEwCnoECAoQAQ#v=onepage&q=10.4172%2F2161-0495-C1-028&f=false
- De Castro, A., Domingues, E.M., Jiménez, M., Moreno, Ana., González, R., González, A., Miranda, J.C., Monroy-Licht, A., Soto, J.D., Calle, M.G. et al. 2017. *Innovar para Educar: Prácticas universitarias exitosas*. Tomo 5. ISBN 978-958-741-986-3. Ediciones Uninorte. Disponible online: <http://manglar.uninorte.edu.co/handle/10584/7889>.
- Monroy-Licht, A. 2017. Gestión ambiental en el aula: Un espacio para potenciar habilidades de pensamiento crítico en estudiantes universitarios pp 129-134. En: C. F. Arias. (Ed.), *Desafíos del paradigma educativo en el siglo XXI: investigación, innovación y formación*. ISBN 978-84-15665-17-5. Madrid, España: Global Knowledge Akademics.
<https://es.calameo.com/read/0050982495091188ef622>
- Monroy-Licht, A., Collante-Padilla, A. & González-Hernandez, R. 2016. An environmental management project: situated learning to enhance critical thinking skills in college students. *Transformative Dialogues: Teaching & Learning Journal*. ISSN 1918-0853. Volume 8 Issue 3, 1-15.
http://www.kpu.ca/sites/default/files/Transformative%20Dialogues/TD.8.3.5_Monroy-Licht_etal_Situated_Learning_to_Enhance_Critical_Thinking.pdf
- Vargas, G., Rangel, L. & Monroy-Licht, A. 2016. *Phanerochaete chrysosporium*, hongo ligninolítico, promisorio en biorremediación, una mirada global. *Revista Micro-Ciencia. Investigación, Desarrollo e Innovación*. ISSN: 2323-0320. Universidad Libre. Pereira-Barranquilla. Vol 5. 11-25.
https://www.researchgate.net/publication/316180188_Phanerochaete_chrysosporium_hongo_ligninolitico_promisorio_en_biorremediacion_una_mirada_global
- Monroy-Licht, A., Arteta, J. & Collante, A. 2014. Gestión ambiental desde el aula: aplicando la metodología científica en la apropiación y uso social del conocimiento. En M. Valdivieso., N.Y. Gómez. & J.R. Chaparro. (Ed.), *MEMORIAS. IX Encuentro Facultad de Ciencias UPTC I Encuentro Nacional XVIII Jornada de la Investigación. Tunja 7 al 9 de Octubre de 2014. Apropiación social del conocimiento en ciencia y medio ambiente*. Universidad Pedagógica y Tecnológica de Colombia Tunja.
http://www.uptc.edu.co/eventos/2014/cf/encfciencias/inf_general/index.html
- Arteta, J., Escudero, R., Ramos, A., Miranda, J.C., Castro, D., Lobo, R. & Monroy, A. 2012. "Sábado del Docente": investigación, innovación y cambio en la enseñanza de las ciencias. Asociación Colombiana para la investigación en Educación en Ciencias y Tecnología EDUCyT. *Revista EDUCyT* ISSN 2215-8227, 250-272.
- Monroy, A. F. 2005. Desarrollo de la etapa exploratoria y conceptual del plan de gestión para el manejo adecuado de los lodos generados en la planta de tratamiento de aguas residuales de una empresa de bebidas. *Ambiente y Desarrollo. Revista de la Facultad de Estudios Ambientales y Rurales*. Pontificia Universidad Javeriana ISBN: 0122-5197. Num.15-16, nov-jun, 2004-2005, 65-83.

https://www.researchgate.net/publication/275950395_Desarrollo_de_la_etapa_exploratoria_y_conceptual_del_plan_de_gestion_para_el_manejo_adeecuado_de_los_lodos_generados_en_la_planta_de_tratamiento_de_aguas_residuales_en_una_empresa_de_bebidas

- Meza, R.A., Monroy, A.F., Mercado, M., Poutou, R.A., Rodríguez, P. & Pedroza, A.M. 2004. Study of the stability in real time of cryopreserved strain banks. Universitas scientiarum. Revista de la Facultad de Ciencias. Pontificia Universidad Javeriana. ISBN: 0122-7483. 9(2), 35-42.
https://www.researchgate.net/publication/275950171_STUDY_OF_THE_STABILITY_IN_REAL_TIME_OF_CRYOPRESERVED_STRAIN_BANKS
- Amaya, M., Marín, J., Fandiño, C., Rodríguez, Pineda, A., Rodríguez P. & Monroy, A. 2004. Capítulo de Microbiología Básica. 45 Curso Internacional de Cervecería y Maltería. Cervecería Bavaria. Bogotá. Colombia. Edición 45, 100-130.
- Monroy, A. F., Angarita, D., Arango, M. I., Herández, V., Jaramillo, S.J., Maya, D.L., Puertas, L.F., Roza, M.A. (2004). Ambiente y Desarrollo, Recursos y Actores. Bogotá. Javegraf. 1ª. Ed. 143p. ISSN: 01217607.
http://cedir-catalogo.gestiondelriesgo.gov.co/cgi-bin/koha/opac-detail.pl?biblionumber=8336&query_desc=kw%2Cwrdl%3A%20su%0A%20%3A%7B%0A%20Norma%20de%20Biodiversidad%7D%0A

Websites about other topics of interest:

- Girls in Science, mentorship: <https://girls-in-science.blogspot.com/>
- Sustainable thinking from the classroom. Project: Human health - health of the planet: <https://sostenibilidadbiocell.blogspot.com/>
- Cell Biology: Supplementary Materials Blog: <https://peoplescienc.blogspot.com/>

Memberships

- Member of the Association of Javerianos Microbiologists. MICROJAV. 2002-2015
- Member of the Association of Javerianos Alumni. 2002-2007.
- Colombian Network of Women Scientists. Network ascribed to the Colombian Academy of Exact, Physical, and Natural Sciences. 2020-
<https://www.redcolombianamujerescientificas.org/profile/fernandamonroyl/RCMC>