**Curriculum Vitae**

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**Sang-Ah Lee**

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# Education

Aug. 2021  **University of Science and Technology (UST)**

Department of Biotechnology

Ph. D. in Environmental Biotechnology

* Thesis: “Advanced Microalgal Treatment of Raw Piggery Wastewater, Producing Biodiesel Material with Better Quality”

Advisor: Prof. Chi-Yong Ahn

Aug. 2014 **Chungnam National University (CNU)**

Department of Bioscience and Biotechnology

Master of Science in Biodiversity and Environmental Ecology

* Thesis: “Efficiency of Biomass Production and Wastewater Treatment by Microalgae Cultivation”

Mar. 2012 **Chungbuk National University (CBNU)**

College of Natural Sciences

Bachelor of Microbiology

# Work Experiences

* **Postdoctoral Researcher** at Sep. 2021~present. Korea Institute of Science and Technology-Europe Forschungsgesellschaft mbH, Saarbrücken, Germany

Environmental Safety group

* **Student temporary Researcher** at Mar. 2019 ~ Aug. 2021 Korea Institute of Bioscience and Biotechnology (KRIBB)

Advanced piggery wastewater treatment process system development

Carotenoids pigment production evaluation in microalga

NGS based metagenomics data analysis

* **Chief Researcher** at Jun. 2016 ~ Nov. 2017 LED Agri-bio Fusion Technology Research Center (LAFTRC)

The Gamma-ray random mutation of *Haematococcus lacustris* for higher producing astaxanthin

350-L scale up algal photobioreactor management

* **Researcher** at Dec. 2014 ~ May 2016 AMICOGEN Inc. (Division of Bioprocess engineering team)

Optimization of fermentation engineering process for producing 7-ACA (7-aminocephalosporanic acid)

Methyl-N''-nitro-N-nitrosoguanidine random mutagenesis research on the *Lactobacillus plantarum*

# Research Interest

* **Biotechnological process engineering**
* Microalgal biomass production for raw materials of biofuels
* Carotenoid pigments or secondary metabolites application to model organisms
* Performance advancement of biological wastewater treatment
* **Metagenome research**
* Environmental microbiome interaction
* Bioinformatics data handling
* Plants or microalgae phycosphere bacteria/archaea 16s V3-V4 amplicon network analysis

# technical skills

**Biological engineering process design/ Ecological metagenome/R/ Fermentation/ Molecular work (DNA/RNA)/ HPLC/ GC/ IC/ TOC/ Transformation**

# Publications

* First author
* **S.-A. Lee**, S.-R. Ko, N. Lee, J.-W. Lee, V.V. Le, H.-M. Oh, C.-Y. Ahn. “Two-step microalgal (*Coelastrella* sp.) treatment of raw piggery wastewater resulting in higher lipid and triacylglycerol levels for possible production of higher-quality biodiesel”. Bioresour. Technol. **(2021).** **I.F. 9.6**-JCR 3.6%
* **S.-A. Lee**, N. Lee, H.-M. Oh, C.-Y. Ahn. “Stepwise treatment of undiluted raw piggery wastewater, using three microalgal species adapted to high ammonia”. Chemosphere **(2021). I.F.-7.1-**JCR 10.8%
* **S.-A Lee**, V.V. Le, S.-R. Ko, N. Lee, H.-M. Oh, C.-Y. Ahn. “*Mucilaginibacter inviolabilis* sp. nov. isolated from phycosphere of *Haematococcus lacustris* NIES144 culture”. Int. J. Syst. Ecol. Microbiol. **(2021).** **I.F.-2.7-**JCR 68.3%
* **S.-A. Lee**, N. Lee, H.-M. Oh, C.-Y. Ahn. “Fast-track production of astaxanthin by reduced cultivation time with the “red cell inoculation system” (RCIS) and various chemical cues in *Haematococcus lacustris*”. J. Appl. Phycol. **(2020).** **I.F.-3.6-**JCR 14.1%
* **S.-A. Lee**, N. Lee, H.-M. Oh, C.-Y. Ahn. “Enhanced and balanced microalgal wastewater treatment (COD, N, and P) by interval inoculation of activated sludge”. J. Microbiol. Biotechnol. **(2019)**. **I.F.-2.0-**JCR 72.0%
* **S.-A. Lee**, C. Lee, S.-H Lee, K.-G. An, H.-M. Oh, H.-S. Kim, C.-Y. Ahn. “Development of economic culture system using wastewater for microalgae in winter season”. Korean J. Environ. Biol. **(2014).**
* Co-author
* S.-R. Ko, V.V. Le, Long Jin, **S.-A. Lee**, C.-Y. Ahn, H.-M. Oh. “*Mariniflexile maritimum* sp. nov., isolated from seawater of the South Sea in Korea”. Int. J. Syst. Ecol. Microbiol. **(2021). I.F.-2.7-** JCR 68.3%
* G.S. Moon, N. Lee, S.S. Kang, J.W. Park, Y.E. Kim, **S.-A. Lee**, R. K. Chitumalla, J.K. Jang, Y.S. Choe, Y.-K. Oh. “Hydrothermal synthesis of novel two-dimensional α-quartz nanoplates and their applications in energy-saving, high-efficiency, microalgal biorefineries”. Chem. Eng. J. **(2021). I.F.-13.3-**JCR 2.5%
* V. V. Le, S.-R. Ko, **S.-A. Lee**, L. Jin, C.-Y. Ahn, H.-M. Oh. “*Novosphingobium aquimarinum* sp. nov., isolated from seawater”. Int. J. Syst. Ecol. Microbiol. **(2021). I.F.-2.7-** JCR 68.3%
* C. Lee, **S.-A. Lee**, S.-R. Ko, H.-M. Oh, C.-Y. Ahn. “Effects of photoperiod on nutrient removal, biomass production, and algal-bacterial population dynamic in lab-scale photobioreactors treating municipal wastewater”. Water Res **(2015).** **I.F.-11.2-**JCR 1.5%
* S.-H. Lee, H.-M. Oh, B.-H. Jo, **S.-A. Lee**, S.Y. Shin, H.-S. Kim, S.H. Lee, C.-Y. Ahn. “Higher biomass productivity of microalgae in an attached growth system, using wastewater”. J. Microbiol. Biotechnol. **(2014).** **I.F.-2.0-** JCR 72.0%
* S.-H. Lee, C.-Y. Ahn, B.-H. Jo, **S.-A. Lee**, J.Y. Park, K.-G. An, H.-M. Oh. “Increased microalgae growth and nutrient removal using balanced N: P ratio in wastewater”. J. Microbiol. Biotechnol. **(2013).** **I.F.-2.0-** JCR 72.0%
* T.Y. Kim, S.J. Kim, S.J. Park, J.G. Kim, I.T. Cha, M.Y. Jung, **S.-A. Lee**, S.W. Roh, K.J. Yim, T. Itoh, S.K. Rhee. “*Natronomonas gomsonensis* sp. nov. isolated from a solar saltern”. Anton. Leeuw. Int. J. G. **(2013).** **I.F.-2.3-**82.4%
* S.J. Kim, S.J. Park, Y.S. Oh, **S.-A. Lee**, K.S. Shin, D.H. Rho, S.K. Rhee. “*Shewanella arctica* sp. nov., an iron-reducing bacterium isolated from Arctic marine sediment”. Int. J. Syst. Ecol. Microbiol. **(2012).** **I.F.-2.7-** JCR 68.3%

# Manuscripts Revision processing/under review/preparation

* S.-R. Ko, V.V. Le, L. Jin, **S.-A. Lee**, C.-Y. Ahn, H.-M. Oh. “*Pseudomariniflexile aquimaris* gen. nov. , sp. nov., a new member of the family Flavobacteriacea isolated from seawater of the South Sea in Korea”. (Under Review)
* **S.-A. Lee**, V.V. Le, B.M., Kim, W.-H. Lim, S.-R. Ko, H.-M. Oh, C.-Y. Ahn. “Extended longevity of *Caenorhabditis elegans* by enhanced anti-oxidation effect of carotenoid pigments (β-carotene, canthaxanthin and astaxanthin)”. (Under Review)
* **S.-A. Lee**, V.V. Le, H.-M. Oh, C.-Y. Ahn. “The improved growth of *Haematococcus lacustris* is driven by interaction of algal phycosphere bacterial communities”. (Preparation)
* **S.-A Lee†**, M.-Y†. Jung, H.-M. Oh, M. Kim\*\*, C.-Y. Ahn\*. “A microbe community directional alteration depending on the microalgal pilot-scale piggery wastewater treatment processes”. ISME Journal. (Preparation)

# International Conferences

* **S.-A. Lee**, M. Kim, H.-M. Oh, C.-Y. Ahn. 2021. Improved microalgal treatment of piggery wastewater, producing biodiesel with better quality and reducing ecological burden. 35th Congress of the International Society of Limnology (Poster)
* **S.-A. Lee**, M. Kim, C.-Y. Ahn. 2021. The interrelationship between entering the *Haematococcus lacustris* biomass growth stage and algal phycosphere bacteria community structure changes. KSBB spring meeting and international symposium. KOREA (Oral).
* **S.-A. Lee**, H.-M. Oh, C.-Y. Ahn. 2021. Harmful cyanobacterial blooms are driven by distinct bacterial modules. 10th international conference on Algal Biomass, Biofuels & Bioproducts (AlgalBBB), USA (Poster)

# Research Projects

* UST Young Scientist Research Program 2018 (No. 2018YS03C). Research title- “Culture of high-value microalgae using ICT, purification of anti-activating carotenoid pigments, and human anti-aging activity on *Caenorhabditis elegans*”

# Awards

* The PROUD Conference excellence award (UST), Feb. 2018. (2018-S023)
* Best Poster Award-Korean Society of Environmental Biology (KOSEB), Oct. 2018 (No. 18-20)
* Best Poster Award- Korean Society of Environmental Biology (KOSEB), Oct. 2019 (No. 19-23)
* Award of Excellence for Young Scientist Research Program 2018 (UST), Dec.2019 (No. 2018-YS-03C)
* Oral presentation encouragement Award- Korean Society of Environmental Biology (KOSEB), Nov. 2020 (No. 20-29)
* UST President Excellence Award, Aug. 2021 (No. 2021-S027)

# Patents

* “Method of culturing *Haematococcus pluvialis*”, D.-G. Kim, E.-S. Kim, C.-H. Hong, B. Lee, **S.-A. Lee**, Korea Patent application, 10-2017-0081769 (2017)

# References

* Chi-Yong Ahn, Ph.D (Prof.)

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