Curriculum Vitae

Name Dr. Aem Nuylert

Position Lecturer

Center of Excellence in Innovative Biotechnology for Sustainable Utilization of Bioresources

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Education

2009 B.Sc. (Agro-Industry), Prince of Songkla University, Thailand

2012 M.Sc. (Biotechnology), Prince of Songkla University, Thailand

2020 Ph.D. (Biotechnology Engineering), Toyama Prefectural University, Japan

Scholarships

- Palm Oil Products and Technology Research Center (POPTEC), Prince of Songkla University, Thailand

- MEXT Ph.D. Scholarship (Japanese Government 2013-2016)

Award

Outstanding master thesis in the year 2012 from Faculty of Agro-Industry, Prince of Songkla University, Thailand.

Employment

2012-2013 Scientist, Faculty of Agro-Industry, Prince of Songkla University, Thailand

2017-2018 Researcher (Master equivalent) (JST, ERATO Asano Active Enzyme Molecule Project)

2019 Researcher (Master equivalent) of Toyama Pharmaceutical Valley Development Consortium

2020 Postdoctoral research fellow of Toyama Pharmaceutical Valley Development Consortium

Field of interest

1. Discovery the interesting enzymes for food industry and fine chemical industry.
2. Production, purification, characterization of plants and microbial enzymes and its application
3. Production the recombinant enzymes using molecular genetics techniques.
4. Enzyme engineering using molecular dynamics approach

Current researches

1. Value-added fermented split gill mushroom using co-starter culture GABA-producing and flavor-enhancing bacteria
2. Screening for fungicide substance to control the growth of *Ganoderma* spp. causing basal stem rot in oil palm
3. Comparison of soil microbial diversity with basal stem rot of oil palm trees and normal soil in southern Thailand
4. Biogenic-amines content and selection of biogenic amines-degrading strains from traditional fermented meat and fishery products

Publications

1. **Nuylert, A**. and Hongpattarakere, T. 2013. Improvement of cell-bound lipase from *Rhodotorula mucilaginosa* P11I89 using as methanol-tolerant whole-cell biocatalysts for production of palm-oil biodiesel. Ann. Microbiol. 63(3): 929–939.

2. Hongpattarakere, T., Buntin, N. and **Nuylert, A.** 2016. Histamine development and bacterial diversity in microbially-challenged tonggol (*Thunnus tonggol*) under temperature abuse during canning manufacture. J. Food Sci. Technol. 53(1): 245–256.

3. Motojima, F., **Nuylert, A**., and Asano, Y. 2016. Crystal structure of hydroxynitrile lyase from passion fruit, *Passiflora edulis*. New Biotechnol. 33, (Supplement) S96.

4. **Nuylert, A.**, Ishida, Y., and Asano, Y. 2016. Contribution of N-glycosylation site to the enzyme stability of hydroxynitrile lyase from *Passiflora edulis* in the differential expression system. New Biotechnol. 33, (Supplement) S96.

5. **Nuylert A**, Ishida Y, and Asano Y. 2017. Effect of glycosylation on the biocatalytic properties of hydroxynitrile lyase from the passion fruit, *Passiflora edulis*: A comparison of natural and recombinant enzymes. ChemBioChem 18(3):257-265.

6. Motojima, F., **Nuylert, A**. and Asano, Y. 2017. The crystal structure and catalytic mechanism of hydroxynitrile lyase from passion fruit, *Passiflora edulis*, FEBS J., 285(2), 313-324. DOI: 10.1111/febs.14339.

7. Yamaguchi, T., **Nuylert, A.**, Ina, A., Tanabe, T. and Asano, Y. 2018. Hydroxynitrile lyases from cyanogenic millipedes: molecular cloning, heterologous expression, and whole-cell biocatalysis for the production of (*R*)-mandelonitrile, Sci. Rep. 8, 3051. DOI:10.1038/s41598-018-20190-x.

8. **Nuylert, A.**, Kuwahara, Y., Hongpattarakere, T. and Asano, Y. 2018. Identification of saturated and unsaturated 1-methoxyalkanes from the Thai millipede *Orthomorpha communis* as potential "Raincoat Compounds". Sci. Rep. 8: 11730. DOI:10.1038/s41598-018-30156-8.

9. Zhai, Z. **Nuylert, A.**, Isobe, K., and Asano, Y. 2019. Effects of codon optimization and glycosylation on the high-level production of hydroxynitrile lyase from *Chamberlinius hualienensis* in *Pichia pastoris*. J. Ind. Microbiol. Biotechnol., 46 (7). 887-898.

10. **Nuylert, A.**, Motojima, F., Khanongnuch, C., Hongpattarakere, T. and Asano, Y. 2020. Stabilization of hydroxynitrile lyases from two variants of passion fruit, *Passiflora edulis* Sims and *Passiflora edulis* Forma *flavicarpa*, by C-terminal truncation. ChemBioChem. 21(1-2), 181-189. doi:10.1002/cbic.201900468.

11. **A. Nuylert**, M. Nakabayashi, T. Yamaguchi, and Y. Asano. 2020. Discovery and structural analysis to improve the enantioselectivity of hydroxynitrile lyase from *Parafontaria laminata* millipedes for (*R*)-2-chloromandelonitrile synthesis, ACS Omega, 5 (43), 27896-27908. doi: 10.1021/acsomega.0c03070.

12. Motojima, F., Izumi, A., **Nuylert, A.**, Zhai, Z., Dadashipour, M., Shichida, S., Yamaguchi, T., Nakano, S. and Asano, Y. 2021. *R*-hydroxynitrile lyase from the cyanogenic millipede,

Chamberlinius hualienensis—A new entry to the carrier protein family Lipocalines. FEBS J. 288(5), 1679-1695.

Patent

1. Asano, Y., Chaikaew, S., **Nuylert, A.**, and Motojima, F. 2020. NOVEL HYDROXYNITRILE LYASE MUTANT. WO Patent 2020009168, filed Jul 03, 2019, and issued Jan 09, 2020.

Conferences/Proceeding

Proceeding

Nuylert, A. and Hongpattarakere*, T. 2010. Optimization for producing cell-bound lipase from *Rhodotorula mucilagenosa*. Proceeding in The 22nd Annual Meeting of The Thai Society for Biotechnology TSB 2010: International Conference on Biotechnology for Healthy Living. Prince of Songkla University, Trang Campus. October 20-22, 2010. p 177.

Oral presentations

1. **Nuylert, A.,** Ishida, Y. and Asano, Y. Characterization of wild-type and recombinant hydroxynitrile lyase from *Passiflora edulis* in *Escherichia coli* and *Pichia pastoris* - effect of glycosylation on the enzyme stability. The Annual Meeting of Japan Society for Bioscience, Biotechnology and Agrochemistry. 22-26 March 2015. Okayama, Japan

2. **Nuylert, A.** and Asano, Y. The occurrence of hydroxynitrile lyase in two passion fruits, *Passiflora edulis* Sims and *Passiflora edulis* forma *flavicarpa* and their application in asymmetric synthesis of (*R*)-mandelonitrile. The 28th Annual Meeting of the Thai Society for Biotechnology and International Conference. November 28-30, 2016. Chiang Mai, Thailand.

3. **Nuylert, A**. and Asano, Y. C-terminal truncation improved the enzyme stability of recombinant hydroxynitrile lyase from *Passiflora edulis* in *Escherichia coli*. The Annual Meeting of Japan Society for Bioscience, Biotechnology and Agrochemistry. 17-20 March 2017. Kyoto, Japan

4. **Nuylert, A.** and Asano, Y. Characterization of hydroxynitrile lyases from two passion fruits, *Passiflora edulis* Sims and *Passiflora edulis* forma *flavicarpa*: stabilization effects by glycosylation. 2-3 September 2017. Nagoya, Japan

5. **Nuylert, A.** and Asano, Y. The role of N-linked glycosylation in the secretion and enzymatic stabilities of *Chamberlinius hualienensis* hydroxynitrile lyase expressed in Pichia pastoris. The Annual Meeting of Japan Society for Bioscience, Biotechnology and Agrochemistry. 14-16 March 2018. Nagoya, Japan

6. **Nuylert, A**. and Asano, Y. Structural base to improve the enzyme activity and enantioselectivity of hydroxynitrile lyase from millipede, *Parafonteria laminata* for (*R*) - 2-chloromandelonitrile synthesis. The Annual Meeting of Japan Society for Bioscience, Biotechnology and Agrochemistry. 26-28 March 2020. Fukuoka, Japan

Poster presentations

1. **Nuylert, A.**, Yamaguchi, T., Ishida, Y., Kuwahara, Y.and Asano, Y. Purification and characterization of hydroxynitrile lyase from millipedes, *Parafontaria laminata*. The Annual Meeting of Japan Society for Bioscience, Biotechnology and Agrochemistry. 22-26 March 2016. Hokkaido, Japan

2. **Nuylert, A**., Ishida, Y. and Asano, Y. Contribution of N-glycosylation site to the enzyme stability of hydroxynitrile lyase from *Passiflora edulis* in the differential expression system. the 17th European Congress on Biotechnology. 3- 6 July 2016. Krakow, Poland. http://dx.doi.org/10.1016/j.nbt.2016.06.1057

3. **Nuylert, A.**, Yamaguchi, T., Ishida, Y., Kuwahara, Y.and Asano, Y. Molecular cloning of the full-length cDNA of hydroxynitrile lyase from millipedes, *Parafontaria laminata* and expressed in *Escherchia coli*. The Fifth International Conference on Cofactors (ICC-05) and Active Enzyme Molecule 2016 (AEM 2016). 4-8 September, 2016. Toyama, Japan

4. **Nuylert, A.**, and Asano, Y. Hydroxynitrile lyases from two variants of passion fruits, *Passiflora edulis* Sims and *Passiflora edulis* forma *flavicarpa*: characterization and effect of C-terminal truncation on their stability" in the 1st Japan-Germany-Switzerland Workshop for Enzyme Technology and Bioprocess Development. 10-12 September 2019. Toyama, Japan