

# **Won-Yong Lee, D.V.M., M.S., Ph.D.**

SBIR/STTR Grant Development Associate –  
The Office of the Vice President for Research, The University of Utah

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## **EDUCATION**

- Ph.D. (2005) Mayo Clinic (Rochester, MN): Molecular Neuroscience
- M.S. (1994) Konkuk University (Seoul, South Korea): Toxicology
- D.V.M. (1992) Konkuk University (Seoul, South Korea): Veterinary Medicine

## **GRANTS AND FELLOWSHIP AWARDS**

- NIH (National Institute of Dental and Craniofacial Research, 2021-2023): Commercialization Readiness Pilot Program (PI) – SB1DE024024
- NIH (National Institute of Dental and Craniofacial Research, 2016-2018): SBIR Phase 2 - R44DE024024 (PI)
- NIH (National Institute of Dental and Craniofacial Research, 2014): SBIR Phase 1 - R43DE024024 (PI)
- NIH (National Institute of Dental and Craniofacial Research, 2013-2016): SBIR Phase 2 - R44DE022216 (co-PI)
- American Cancer Society Postdoctoral Fellowship (2011-2013, declined)
- NIH Postdoctoral Fellowship in Developmental Biology (2009-2010, T32HD007491)
- College Fellowship (1988) - Konkuk University (Seoul, Korea)

## **HONORS AND ACADEMIC ACTIVITIES**

NIH Study Section (Scientific Review Group)

- Cancer Drug Development & Therapeutics (CDDT) SBIR/STTR: 2022 -
- Musculoskeletal, Oral, Dermatology, Rheumatology, Rehab: invited to join in 2021/2022 – declined due to the overlapping schedule with CDDT

Academic/Professional Societies - Full memberships in

- American Society of Clinical Oncology (ASCO)
- American Association for Cancer Research (AACR)
- Inflammation Research Society (IRS)
- Biophysical Society
- Society for Neuroscience (SfN)
- American Association of Laboratory Animal Science (AALAS)
- Sigma Xi

Academic Journal Contributions

- Topic Editor – Frontiers in Oral Health
- Reviewer - Science Translational Medicine (AAAS)
- Reviewer- PLoS ONE

## PROFESSIONAL EXPERIENCES

**GlycoMira Therapeutics, Inc.** Vice President of Research (2022-2023)  
Director of Research (2011-2022)

- Secured multiple NIH SBIR grant awards (over \$5.3M)
- Functioned as a liaison for academic/industry research collaborations.
- Successfully led the research team to prepare and to meet with the FDA (pre-IND discussion)
- Manage and perform in-house drug development studies (mode of action/proof of concept/validation/safety evaluation)
- Procured and directed CRO research investigations (proof of concept and toxicology studies)
- Organized a group of CROs for drug product manufacturing and analytical tests
- Developed and refined multiple disease models (inflammatory diseases)
- Mentored junior investigators
- Wrote manuscripts for peer-reviewed journals as corresponding authors as well as primary contributing authors
- Networked with federal funding agencies, academic investigators, and CROs.

**EyeGate Pharma (Merged into Kiora Pharma, KPRX:NASDAQ)** Consultant (2016-2022)

- Provide scientific/technical expertise to develop ophthalmological therapeutics and devices
- Conducted core research projects to validate the usage of polymers for medical devices
- Advised collaborative research with academic investigators and CROs

**Jade Therapeutics, Inc. (merged into EyeGate Pharma)** Consultant (2013-2016)

- Developed and conducted assay systems to test ophthalmological therapeutics
- Wrote research papers
- Mentored a medical student research

**Progenitor Life Sciences, LLC.** Consultant (2020- )

- Provided scientific expertise and intellectual property matters in cell therapy.

**Echelon Biosciences, Inc.** Consultant (2012- )

- Provided technical expertise for preclinical development of cancer diagnostic imaging agent ATX-Red (*in vivo* studies – PK, imaging, and pathology) and new chemical entities
- Function as a liaison for academic collaboration
- Contributed research manuscript writing for peer-reviewed publications

**University of Utah** Postdoctoral Research Fellow (2008-2011). Department of Biology (advisor: A. Villu Maricq, M.D., Ph.D.)

- Investigated molecular building blocks of synapse in nematodes (*Caenorhabditis elegans*) using confocal microscopy combined with behavioral testing/genetics/transgenic technologies
- Elucidated molecular interaction between a conotoxin and the Glutamate receptor
- Screened RNAi library to discover candidate molecules

**Mayo Clinic** Postdoctoral Research Fellow (2006-2008). Department of Physiology & Biomedical Engineering (advisor: Steven M. Sine, Ph.D.)

- Investigated molecular dynamic states of the nicotinic acetylcholine receptor using single channel kinetics with patch clamp analysis
- Defined structural motifs critical for agonist binding and channel gating in the nicotinic acetylcholine receptor
- Mentored summer undergraduate research fellowship students

***Dong Wha Pharmaceutical (Korea, KRX:000020)***. Senior Research Scientist (1993-1999)

- Directed and managed safety evaluation of investigational drugs including a radionuclide-based anticancer drug Milican Injectable (market launched in Korea for hepatic tumors)
- Oversaw clinical (Phase 1) studies performed by CROs
- Oversaw and directed nonclinical toxicology/PK/PD studies performed by CROs
- Established/directed in-house preclinical PK/PD study unit (for new drug design)
- Managed/directed in-house laboratory animal (rodents and nonrodents) facility
- Established/directed in-house histopathology study unit

***\*National Institute of Safety Research (Korea)***. Research Assistant (1992-1993)

\*currently, National Institute of Food and Drug Safety Evaluation (under the Ministry of Food and Drug Safety in South Korea)

- Performed rodent toxicology studies to evaluate the safety of investigational drugs and industrial chemicals sponsored by commercial and non-commercial organizations
- Conducted intramural research projects (neurotoxicological studies of industrial chemicals and narcotic drugs) and contributed manuscript writing for publications (government reports and peer-reviewed journals)
- Trained visiting scientists, and undergraduate/graduate students.

## PATENTS

1. European Patent Office (pending). Application No. 12761460.0 -1465.
2. US Patent (pending). Application No. 12/030233.
3. **US Patent (pending)\***. Application No. 17/059982. Methods for preventing a serious health consequence and/or tissue damage after exposure to ionizing radiation and/or chemotherapy.
4. **US Patent (pending)\***. Application No. 19/60834. Methods for potentiating cancer treatment using ionizing radiation.
5. **Chinese Patent (pending)\***. CN 111228653 A. Methods for potentiating cancer treatment using ionizing radiation.
6. US Patent 10,226,481. (2019) Pharmaceutical compositions composed of low molecular weight sulfated hyaluronan.
7. US Patent 9,522,162. (2016) Methods for Treating or Preventing Urological Inflammation.
8. Korean Patent KR 100184350. (1999) Buccal adhesive compositions of omeprazole.
9. Korean Patent KR 10-1997-0010737. (1997) (2-(4-Acetylaminobenzoilamino)benzamide)-derivatives.

\*First inventor.

## PEER REVIEWED PUBLICATIONS

1. Pulsipher A, Savage JR, Kennedy TP, Gupta K, Cuiffo BG, Sonis ST, and **Won Yong Lee** (2021). GM-1111 reduces radiation-induced oral mucositis in mice by targeting pattern recognition receptor-mediated inflammatory signaling. *PLoS ONE*, 16(3):e0249343.
2. Alt J, **Won Yong Lee**, Davis B, Savage J, Kennedy T, Prestwich G, Pulsipher A (2018). A synthetic glycosaminoglycan reduces sinonasal inflammation in a murine model of chronic rhinosinusitis, *PLoS ONE*, 13(9):e0204709.
3. Savage J, Pulsipher A, Rao N, Kennedy T, Prestwich G, Ryan M, and **Won Yong Lee** (2016). A Modified Glycosaminoglycan, GM-0111, Inhibits Molecular Signaling Involved in Periodontitis, *PLoS ONE*, 11(6):e0157310.
4. **Won Yong Lee**, Savage J, Zhang J, Jia W, Oottamasathien S, and Prestwich G. (2013). Prevention of an Anti-microbial Peptide LL-37-induced Apoptosis and ATP Release in the Urinary Bladder by a Modified Glycosaminoglycan, *PLoS ONE*, 8(10): e77854.
5. Damian Madan, Ferguson C, **Won Yong Lee**, Prestwich G, and Testa C. (2013). Non-invasive imaging of autotaxin-expressing tumors using an enzyme-activated near-infrared fluorogenic substrate, *PLoS ONE*, 8(11): e79065.
6. Siam Oottamasathien, Jia W, Roundy L, Zhang J, Wang L, Ye X, Hill A, Savage J, **Won Yong Lee**, Hannon A, Milner S, Prestwich G. (2013). Physiologic Relevance of LL-37 Induced Bladder Inflammation and Mast Cells, *Journal of Urology*, 190(4 Suppl):1596-1602.
7. Craig Walker, Jensen S, Ellison M, Matta J, **Won Yong Lee**, Imperial J, Duclos N, Brockie P, Madsen D, Isaac J, Olivera B, and Maricq A. (2009) A novel *Conus* snail polypeptide causes excitotoxicity by blocking desensitization of AMPA receptors. *Current Biology*, 19:900-908.
8. **Nuriya Mukhtasimova**, **Won Yong Lee** (contributed equally), Wang H, and Sine S. (2009), Detection and Trapping of Intermediate States Priming Nicotinic Receptor Channel Opening, *Nature*. 459:451-454.
9. **Won Yong Lee**, Free C, and Sine S. (2009) The Pre-M1 region links the beta1-beta2 hairpin to the Cys- and M2-M3 loops forming a gating pathway in the nicotinic receptors. *Journal of Neuroscience*, 29:3189-3199.
10. **Won Yong Lee**, Free C, and Sine S. (2008), Nicotinic receptor inter-loop proline anchors  $\beta$ 1-  $\beta$ 2 and Cys-loops in coupling agonist binding to channel gating, *Journal of General Physiology*, 132:265-278.
11. Steven Sine, Gao F, **Won Yong Lee**, Mukhtasimova N, Wang H-L, and Engel A. (2008), Recent structural and mechanistic insights into endplate acetylcholine receptors, *Annals of the New York Academy of Sciences*, 1132:53-60.
12. **Won Yong Lee** and Sine S. (2005), Principal pathway coupling agonist binding to channel gating in nicotinic receptors, *Nature*, 438:243-247. (Ph.D. thesis work)
13. **Won Yong Lee** and Sine S. (2004), Invariant aspartic acid in muscle nicotinic receptor contributes selectively to the kinetics of agonist binding, *Journal of General Physiology*, 124:555-567. (Ph.D. thesis work)
14. Steven Sine, Wang H-L, Ohno K, Shen K-M, **Won Yong Lee**, and Engel A. (2003), Mechanistic diversity underlying fast channel congenital myasthenic syndromes, *Annals of the New York Academy of Sciences*, 998:128-138.
15. Steven Sine, Shen X-M, Wang H-L, Ohno K, **Won Yong Lee**, Tsujino A, Brengmann J, Bren N, Vajsar J, and Engel A. (2002), Naturally occurring mutations at the acetylcholine receptor binding

site independently alter ACh binding and channel gating, *Journal of General Physiology*, 120:483-496.

16. **Won Yong Lee**, Moon E, Lee J, Choi C, Nam S, Park K, Ryu J, Chung Y, Yoon S, Lee D. (1998), Toxicities of 166Holmium-chitosan in Mice, *Arzneimittel-Forschung*, 48:300-304.
17. Sung Joon Yoon, Chung Y, Lee C, Oh Y, Choi D, Kim N, Lim J, Jin Y, Lee D, and **Won Yong Lee** (1997), Synthesis, pharmacokinetics, and biological activity of a series of new pyridonecarboxylic acid antibacterial agents bearing a 5-fluoro-2-pyridyl group or a 3-fluoro-4-pyridyl group at N-1, *Journal of Heterocyclic Chemistry*, 34:1021-1027.
18. **Won Yong Lee**, Lee J, Moon E, and Lee D. (1997), Acute toxicity of DW-166HC (Holmium-165-chitosan) in mice, *Journal of Applied Pharmacology (Korea)*, 5:100-105.
19. **Won Yong Lee**, Hwang S, Cho D, and Kim J. (1995), Behavioral changes with alterations of choline acetyltransferase immunoreactivities induced by N-butyl benzenesulfonamide, *Veterinary and Human Toxicology*, 37:537-542. (Master's thesis work)
20. Dae Hyun Cho, Jeong Y, Kim J, Lee B, Hwang S, **Won Yong Lee**, Kim J, Cho T, Kim J, and Moon H. (1995), The neurotoxicological alterations induced by narcotic drugs and industrial chemicals in the rat are associated with quantitative changes in glial fibrillary acidic protein, *Korean Journal of Toxicology*, 11:315-327.
21. Dae Hyun Cho, Hwang S, **Won Yong Lee**, Ahn B, Chin K, and Cho T. (1994), Effects of methamphetamine on motor activities, immunoreactivities of tyrosine hydroxylase and morphological changes of dopaminergic neurons in the rat, *Korean Journal of Toxicology*, 10:59-71.
22. Dae Hyun Cho, Hwang S, **Won Yong Lee**, Lee J, Yoon H, and Moon B. (1993), Acute oral toxicity studies of WHS-1 and WHS-2 in rats, *Journal of Applied Pharmacology (Korea)*, 2:275-279.
23. Dae Hyun Cho, Hwang S, **Won Yong Lee**, Lee J, Yoon H, and Moon B. (1993), Acute subcutaneous toxicity studies of Banaron cream in rats, *Journal of Applied Pharmacology (Korea)*, 2:280-283.

## PRESENTATION ABSTRACTS

1. **Won Yong Lee**, Ponthan F, and Sonis ST (2022). Targeting oral squamous cell carcinoma tumor microenvironment through simultaneous modulation of pattern recognition receptors and angiogenic factors using a synthetic polymer-based drug. AACR Annual Meeting (New Orleans, LA).
2. **Won Yong Lee** (2018). Synthetic glycosaminoglycan as a novel therapeutic for inflammatory Diseases. RESI Boston Innovation Challenge (Boston, MA). Selected as a showcase.
3. Pulsipher A, Savage JR, Gupta K, Kennedy TP, Prestwich GD, and **Won Yong Lee** (2015). GM-0111, a modified glycosaminoglycan, prevents radiation-induced mucositis. 12th World Congress on Inflammation (Boston, MA).
4. **Won Yong Lee**, Savage JR, Pulsipher A, and Rao RV (2015). A modified glycosaminoglycan, GM-0111, inhibits inflammatory molecules related to periodontitis. 12th World Congress on Inflammation (Boston, MA).
5. **Won Yong Lee**, Savage J, Gupta K, Kennedy P, and Prestwich G (2015). GM-0111, a modified glycosaminoglycan, to prevent radiation-induced mucositis. 2015 American Society of Clinical Oncologist (ASCO) Annual Meeting (Chicago, IL).
6. Bowen RC, **Won Yong Lee**, Grainger D, and Wirostko B (2015). Assessing ocular hyaluronidase to develop a hyaluronan-based polymer drug delivery platform. Association for Research in Vision and Ophthalmology (ARVO) 2015 Annual Meeting (Denver, CO).
7. **Won Yong Lee**, Savage J, Zhang J, Wanjian J, McCoard L, Oottamasathien S, and Prestwich G. (2012). GM-0111, a Modified glycosaminoglycan, protects mice from developing cystitis induced

with LL-37. 17th International Conference of the Inflammation Research Association Conference (Bolton Landing, NY).

8. **Won Yong Lee**, Mukhtasimova N, and Sine S. (2008), Gordon Research Conference – Ion Channels (Tilton, NH).
9. **Won Yong Lee**, Free C, and Sine S. (2008), Inter-loop proline serves as hydrophobic anchor in coupling agonist binding to channel gating in nicotinic receptors. Joint Meeting of the Biophysical Society 52nd Annual Meeting and International Biophysics Congress (Long Beach, CA).
10. **Won Yong Lee** and Steven Sine (2007), Conserved phenylalanines in the Cys-loop functionally link with the pre-M1 and M2-M3 loop of nicotinic receptors. Society for Neuroscience 37th Annual Meeting (San Diego, CA).
11. **Won Yong Lee** and Steven Sine (2006) Principal pathway coupling agonist binding to channel gating in nicotinic receptors. The Biophysical Society Annual Meeting (Salt Lake City, UT).
12. **Won Yong Lee** and Steven Sine (2004), Conserved aspartic acid governs orientation of agonist binding site tryptophan in muscle nicotinic receptor. Society for Neuroscience 34th Annual Meeting (San Diego, CA).
13. **Won Yong Lee** and Steven Sine (2002), Network of hydrophobic side chains contribute to agonist binding in the nicotinic acetylcholine receptor. Society for Neuroscience 32nd Annual Meeting (Orlando, FL).
14. **Won Yong Lee**, Bren N, and Sine S. (2002), Contribution of branched hydrophobic side-chains to acetylcholine binding affinity of the muscle nAChR. Biophysical Society 46th Annual Meeting (San Francisco, CA).
15. Yunha Hwang, Han K, **Won Yong Lee**, Chung Y, Yoon S, and Lee D. (1995), Efficacy of DW-116, A novel synthesized quinolone, for treatment of respiratory tract infection and urinary tract infection, 35th Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) (San Francisco, USA), F194 (p. 147), Annual Meeting of the American Society for Microbiology
16. Yunha Hwang, Han K, **Won Yong Lee**, Chung Y, Yoon S, and Lee D. (1995), Efficacy of DW-116, A new fluoroquinolone, for therapy of experimental thigh infection, 35th Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) (San Francisco, USA), F195, Annual Meeting of the American Society for Microbiology
17. **Won Yong Lee**, Hwang Y, Sung S, Moon E, Chung Y, Yoon S, and Lee D. (1995), The pharmacokinetic studies of DW-116, 35th Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) (San Francisco, USA), F196 (p. 147), Annual Meeting of the American Society for Microbiology
18. **Won Yong Lee** (1993) The 3rd Korea-Japan Toxicology Symposium and Conference on Recent Trends in Toxicological Research and Activities (organized jointly by Korean Society of Toxicology, Korean Environmental Mutagen Society, and Japanese Society of Toxicological Science) - Oral presentation
19. Jin Suk Kim, **Won Yong Lee**, Lee S, and Lee W. (1992), The effects of thiamin on fetal growth and development in CD-1 mice exposed with mercury for the gestation period, Proceeding of Korea Society of Toxicology (Korea), P12.
20. Dae Hyun Cho, Hwang S, **Won Yong Lee**, Park J, and Chin K. (1992), The neurotoxic effects of single and repeated dose of methamphetamine on tyrosine hydroxylase immuno-reactivity in rat brain, Proceeding of Korea Society of Toxicology (Korea), P16.