Shanghyeon Kim

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SUMMARY

The hard, fast, and extensively experienced researcher including drug synthesis to animal testing. Experience in managing laboratory budgets, writing research grant proposals, and acquiring government authorization for pathogen research as a lab manager. Deep understanding and vision on antimicrobial peptides.

EDUCATION

PhD, MS
Gwangju institute of science and technology
2014 – 2022

BA
Chungnam national university
2010 - 2013

HONORS & AWARDS

2016-2022 - Full scholarship for 12 of 12 semesters in Gwangju institution of science and technology

2014-2016 - Full scholarship for 4 of 4
semesters in Gwangju institution of science and technology

2010-2013 - Academic and honour scholarship for 5 of 8 semesters in Chungnam national university

EXPERIENCE AND PROJECT

Antimicrobial peptides
I have designed and tested more than 200 antimicrobial peptides (WCopWs) for 8 years.
More than 80 candidates are as effective as melittin. (melittin: one of the most powerful but toxic non-clinical antimicrobial peptides. it is used as a standardized positive control of antimicrobial peptides development)
More than 3 candidates are as effective as colistin against gram-negative bacteria and
more effective than daptomycin against gram-positive bacteria. (colistin: one of two clinical antimicrobial peptides and only most critical last-resort antibiotic against gram-negative pathogens. Recent rising of colistin-resistant gram-negative pathogens lead to global alarm) (daptomycin: one of two clinical antimicrobial peptides and one of several last-resort antibiotics against gram-positive pathogens)
1 candidate finished a laboratory-level in vivo test. It is now waiting for preclinical studies.
2 research funding projects are granted from our WCopWs studies. Some portion of the data are published at 'Matching amino acids membrane preference profile to improve activity of antimicrobial peptides' and applied for a patent in Korea at 'the application number: 10-2021-0041441'.

Cell-penetrating peptides
I found some of WCopWs have properties as competitive cell-penetrating peptides.(Please understand that I can't tell exact information. I don't know the detailed information because I experimented with those peptides as potential antimicrobial peptides rather than cell-penetrating peptides. However, based on the indirect data I have found, I think that they are more potent than TAT as cell-penetrating peptides.)
Data are not published or released (although some CPP WCopWs are being patented as antibiotics).

Anticancer
I had researched anticancer agents based on DNA repairing systems and nucleolin signalling in vitro level for 1 year. No significant results are acquired.

Antidiabetes
I had supported testing glucose-metabolism regulators in vivo models for 2 years. Work experience and knowledge in mouse surgery and glucose metabolism are gained.

SKILLS

Chemicals (preparing samples)
• Solid-phase peptide synthesis, One-bead-one-compound synthesis, Photocleavable-linker OBOC synthesis, High-performance liquid chromatography, MALDI-TOF

Structure biology (finding motif)
• NMR machine (Bruker), NMR software (NMRpipe, NMRViewJ, Cyana, Xplore), MD simulation (GROMACS)

Genetic science (engineered protein expression)
• DNA extraction, site-directed mutagenesis, PCR, recombination, cloning (bacteria and plasmid base)

Artificial membrane (peptide-membrane interaction)
• Constructing liposomes (small unilamellar vesicles and large unilamellar vesicles), thermodynamics, liposome leakage test, dynamic light scattering

Bacteria and mammalian cells (peptide-cell interaction)
• Bacteria cell culture: biosafety level 2-3 pathogens as like *S. aureus, K. pneumonia, A. baumannii, S. typhimurium, N. gonorrhoea* etc
• Bacteria cell experiments: CLSI-standard antibiotics activity test, biofilm, antibiotics synergy test, resistance-acquisition induction based target finding, preparing samples scanning electron microscope etc
• Mammalian cell culture: mouse primary hepatocytes, HEK293, Hela cell, Caco2, human red blood cell etc
• Mammalian cell experiments: WST(cell survival) assay, immunostaining, western blotting, ELISA etc

Animal (activity and toxicity)
• Antibiotics activity test in a bacteria-infected mouse model (immunosuppression, skin/SC/IM/IP/IT route bacteria infection, drug injection), Mouse toxicity study (LD50, kidney damage parameter, liver damage parameter)

General skills
• General skills as a lab manager and employee as communication with school administration or government administrative agency, writing research grant proposals and manuscripts, presentation at seminars, budget management, and team-playing with colleagues.

PUBLICATION AND PATENT

PUBLICATION
Kim S, Lee J, Lee S, Kim H, Sim JY, Pak B, Kim K, Kim JI. Matching amino acids membrane preference profile to improve activity of antimicrobial peptides. *Commun Biol*. (IF 6.548). accepted for publication
Sim JY, **Kim S**, Lee J, Lim H, Kim HH, Park ZY, Kim JI. A significantly enhanced antibacterial spectrum of D-enantiomeric lipopeptide bactenecin. *Biochem Biophys Res Commun* (IF 2.989). 514(2):497-502 (2019)
Lee J, **Kim S**, Sim JY, Lee D, Kim HH, Hwang JS, Lee DG, Park ZY, Kim JI. A pot ent antibacterial activity of new short D-enantiomeric lipopeptide against multi drug resistant bacteria. *Biochim Biophys Acta Biomembr* (IF 3.47). 1861(1):34-42 (2019)

PATENT
Kim JI, Ryu JH, **Kim S**, Lee S (2021) Korea (patent No. 10-2021-0041441)

REFERENCE

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