

The 58th Japanese Peptide Symposium

October 20 (Wednesday)

9:00–9:10 **Opening Remarks** (Yoshio Hayashi)

9:10–10:27 **Young Investigator's Oral Presentations** (8 min talk, 3 min discussion & exchange)

Session 1 (chairs: Hiroshi Inaba, Kohei Sato)

Y-01 Development of copper and iron-mediated Cys-Trp-linking reaction

Daishiro Kobayashi, Yutaka Kohmura, Junya Hayashi, Masaya Denda, Akira Otaka (Institute of Biomedical Sciences and Graduate School of Pharmaceutical Sciences, Tokushima University)

Y-02 Fragment coupling reaction of protected peptides using ψ -Wang handle and its vinyl handles

Ayaka Okawara¹, Mariko Kikuchi¹, Reiko Kurotani¹, Kenta Teruya², Hiroyuki Konno¹ (¹Graduate School of Science and Engineering, Yamagata University, ²Graduate School of Medicine, Tohoku University)

Y-03 One-pot peptide ligation mediated by *N*-terminal thiazolidine ring-opening using an 2-aminobenzamide-type formaldehyde scavenger

Koki Nakatsu¹, Hiroshi Murakami^{1,2}, Gosuke Hayashi¹, Akimitsu Okamoto^{3,4} (¹Graduate School of Engineering, Nagoya University, ²Institutes of Innovation for Future Society, Nagoya University, ³Graduate School of Engineering, The University of Tokyo, ⁴Research Center for Advanced Science and Technology, The University of Tokyo)

Y-04 Synthetic study for cyclodepsipeptide teixobactin

Hongbin Zhao¹, Takuya Tokunaga¹, Yuichi Masuda², Kosuke Ohsawa¹, Takayuki Doi¹ (¹Graduate School of Pharmaceutical Sciences, Tohoku University, ²Graduate School of Bioresources, Mie University)

Y-05 Discovery and characterization of a novel peptide prenyltransferase for facile preparation of prenylated macrocyclic peptides

Yuchen Zhang¹, Keisuke Hamada², Dinh Thanh Nguyen¹, Sumika Inoue¹, Masayuki Satake¹, Masahiro Okada³, Toru Sengoku², Yuki Goto¹, Hiroaki Suga¹ (¹Department of Chemistry, Graduate School of Science, The University of Tokyo, ²Department of Biochemistry, Graduate School of Medicine, Yokohama City University, ³Department of Material and Life Chemistry, Kanagawa University)

Y-06 Direct screening of a target-specific covalent binder: stringent regulation of warhead reactivity in a matchmaking environment

Yudai Tabuchi¹, Takahito Watanabe¹, Riku Katsuki¹, Yuji Ito², Masumi Taki¹ (¹Graduate School of Informatics and Engineering, The University of Electro-Communications (UEC), ²Graduate School of Science and Engineering, Kagoshima University)

Y-07 Neutralization of irreversible-inhibition effect of boronic-acid-modified covalent drug by diol-antidote

Takashi Abe, Yudai Tabuchi, Masumi Taki (The Graduate School of Informatics and Engineering, The University of Electro-Communications)

10:27–10:45 **Break**

10:45–12:02 **Young Investigator's Oral Presentations** (8 min talk, 3 min discussion & exchange)

Session 2 (chairs: Yuki Goto, Kazuya Kobayashi)

Y-08 Control of peptide self-assembly and function with DNA-templated co-assembly

Christella K. Gordon, Allisandra Rha, Regina Luu, Alexis Roberson, George Poppitz, David G. Lynn
(Department of Chemistry and Biology, Emory University)

Y-09 Efficient inhibition of myostatin activity by functionalized peptides with photooxygenation catalyst

Hideyuki Okamoto¹, Atsuhiko Taniguchi¹, Shoya Usami¹, Masahiro Katsuyama¹, Sho Konno¹, Akihiro Taguchi¹, Kentaro Takayama^{1,2}, Yoshio Hayashi¹ (¹Department of Medicinal Chemistry, Tokyo University of Pharmacy and Life Sciences, ²Department of Environmental Biochemistry, Kyoto Pharmaceutical University)

Y-10 Development of an ultrapotent and selective human β -factor XIIa inhibitor in a cyclotide scaffold

Wenyu Liu¹, Simon de Veer², Yen-Hua Huang², Toru Sengoku³, Chikako Okada³, Kazuhiro Ogata³, Christina Zdenek⁴, Bryan Fry⁴, Joakim Swedberg², Toby Passioura¹, David Craik², Hiroaki Suga¹ (¹Department of Chemistry, Graduate School of Science, the University of Tokyo, ²Institute for Molecular Bioscience, The University of Queensland, ³Department of Biochemistry, Graduate School of Medicine, Yokohama City University, ⁴Venom Evolution Lab, School of Biological Sciences, The University of Queensland)

Y-11 Identification of a novel anti-cancer peptide that derives from subtilisin

Sibo Wei, Li Li, Michio Suzuki, Peng Lu, Suguru Okuda, Ken Okamoto, Hideaki Itoh, Koji Nagata
(Department of Applied Biological Chemistry, Graduate School of Agriculture and Life Science, The University of Tokyo)

Y-12 PRMT5 methylates tumor suppressor protein p53 to regulate the stability of tetramer

Natsumi Nakagawa¹, Shuya Sakaguchi², Junya Wada², Rui Kamada², Kazuyasu Sakaguchi²
(¹Department of Chemistry, Kurume University School of Medicine, ²Laboratory of Biological Chemistry, Department of Chemistry, Faculty of Science, Hokkaido University)

Y-13 Development of helical peptides containing non-proteinogenic amino acids inhibiting VDR transcription

Mami Takyo^{1,2}, Takashi Misawa², Takashi Kurohara², Hiroaki Ishida³, Keiko Yamamoto³, Yosuke Demizu^{1,2} (¹Graduate School of Medical Life Science, Yokohama City University, ²National Institute of Health Sciences, ³Laboratory of Drug Design and Medical Chemistry, Showa Pharmaceutical University)

Y-14 Novel peptides enhancing ghrelin sensitivity

Ken Shimizu, Kentaro Kaneko, Daiki Koyama, Kazuo Inoue, Kousaku Ohinata (Division of Food Science and Biotechnology, Graduate School of Agriculture, Kyoto University)

- 12:02–12:15 **Break**
- 12:15–13:15 **Lunch Break & Online Business Seminar**
- 13:15–13:25 **Break**
- 13:25–14:31 **Young Investigator's Oral Presentations** (8 min talk, 3 min discussion & exchange)
Session 3 (chairs: Kentaro Takayama, Yuya Asahina)
- Y-15 Development of antimicrobial peptide-antibiotic conjugates for improved antimicrobial activity**
Ruka Yamauchi, Kenichi Kawano, Daigo Kajiwara, Yousuke Yamaoka, Yoshiaki Yano, Kiyosei Takasu, Katsumi Matsuzaki (Graduate School of Pharmaceutical Sciences, Kyoto University)
- Y-16 Saporin toxin-derived cell-penetrating peptide for intracellular delivery of biofunctional molecules**
Momoko Obuki¹, Miku Katayama¹, Kosuke Noguchi¹, Stefania Zuppone², Mayu Yamana³, Tomoka Takatani-Nakase^{4,5}, Masashi Ueda^{3,6}, Riccardo Vago^{2,7}, Shiroh Futaki⁸, Arwyn T. Jones⁹, Ikuhiko Nakase¹ (¹Graduate School of Science, Osaka Prefecture University, ²IRCCS San Raffaele Hospital, ³College of Pharmacy, Okayama University, ⁴College of Pharmacy, Mukogawa Women's University, ⁵Institute for Biosciences, Mukogawa Women's University, ⁶Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences, Okayama University, ⁷University Vita-Salute San Raffaele, ⁸Institute for Chemical Research, Kyoto University, ⁹School of Pharmacy and Pharmaceutical Sciences, Cardiff University)
- Y-17 Intracellular delivery of antibodies by liquid-liquid phase separation**
Takahiro Iwata, Hisaaki Hirose, Kentarou Sakamoto, Yusuke Hirai, Jan Vincent V. Arafiles, Misao Akishiba, Miki Imanishi, Shiroh Futaki (Institute for Chemical Research, Kyoto University)
- Y-18 Construction of enveloped viral replica embedded with membrane proteins**
Hiroto Furukawa¹, Keigo Nakamura², Hiroshi Inaba¹, Shin-ichi Sawada², Yoshihiro Sasaki², Kazunari Akiyoshi², Kazunori Matsuura¹ (¹Graduate School of Engineering, Tottori University, ²Graduate School of Engineering, Kyoto University)
- Y-19 Enzymatic basis of guanidine bis-prenylation in argicyclamides biosynthesis**
Kenichi Matsuda¹, Chin-Soon Phan², Nandani Balloo², Kei Fujita¹, Tatsufumi Okino², Toshiyuki Wakimoto¹ (¹Faculty of Pharmaceutical Sciences, Hokkaido University, ²Faculty of Environmental Earth Science, Hokkaido University)
- Y-20 Biosynthesis of a carnosine-like peptide in mouse skeletal muscles by dietary γ -aminobutyric acid**
Takumi Komaru, Noriyuki Yanaka, Thanutchaporn Kumrungsee (Graduate School of Integrated Sciences for Life, Hiroshima University)
- 14:31–14:50 **Break**
- 14:50–15:50 **Oral Presentations** (15 min talk, 5 min discussion & exchange)
Session 1 (chairs: Takayuki Doi, Taku Yoshiya)
- O-01 Novel coupling reagent for peptide syntheses with vinyl ester as the key intermediate**

Junfeng Zhao (School of Pharmaceutical Sciences, Guangzhou Medical University, College of Chemistry and Chemical Engineering, Jiangxi Normal University)

O-02 Late-stage installation of dehydroamino acid motif into peptides through *N*-chlorination of amides
Takeshi Nanjo, Takuma Oshita, Ayaka Matsumoto, Yoshiji Takemoto (Graduate School of Pharmaceutical Sciences, Kyoto University)

O-03 Late-stage solubilization strategy to overcome solubility challenges using peptide hydrazide
Kohei Sato^{1,2}, Shoko Tanaka², Shugo Tsuda³, Tetsuo Narumi^{1,2,4}, Taku Yoshiya³, Nobuyuki Mase^{1,2,4}
(¹Graduate School of Integrated Science and Technology, Shizuoka University, ²Graduate School of Science and Technology, Shizuoka University, ³Peptide Institute, Inc., ⁴Research Institute of Green Science and Technology, Shizuoka University)

15:50–16:05 **Break**

16:05–16:55 **Invited Lectures** (20 min talk, 5 min discussion & exchange)
(chair: Atsuhiko Taniguchi)

K-1 Exploring omega-ester-containing macrocyclic peptides of ribosomal origin
Seokhee Kim (Seoul National University)
(chair: Hiroshi Tsutsumi)

K-2 Chemical tools for histidine and arginine phosphorylation
Jung-Min Kee (Ulsan National Institute of Science and Technology (UNIST))

16:55–17:10 **Break**

17:10–18:00 **Invited Lectures** (20 min talk, 5 min discussion & exchange)
(chair: Takaki Koide)

I-1 Studies on protein ubiquitination using chemically synthesized protein tools
Lei Liu (Department of Chemistry, Tsinghua University)
(chair: Hirokazu Tamamura)

I-2 New methods for construction of complex peptide macrocycles
Gong Chen (Nankai University)

18:00–18:15 **Break**

18:15–19:15 **Poster Presentations** (60 min)
Session 1 (P-001–P-042)

October 21 (Thursday)

9:00–9:50 **Invited Lectures** (20 min talk, 5 min discussion & exchange)

(chair: Shiroh Futaki)

I-3 A Sos proteomimetic as a Pan-Ras inhibitor

Seong Ho Hong, Daniel Y. Yoo, Paramjit S. Arora (New York University)

(chair: Yoshio Hayashi)

I-4 Directing biosynthesis in type II NRPS pathways

Michael D. Burkart (University of California, San Diego)

9:50–10:05 **Break**

10:05–11:05 **Oral Presentations** (15 min talk, 5 min discussion & exchange)

Session 2 (chairs: Shinya Oishi, Koushi Hidaka)

O-4 3CL Protease inhibitor with an arylketone warhead group as anti-SARS-CoV-2 agents

Sho Konno¹, Kiyotaka Kobayashi¹, Miki Senda², Yuta Funai³, Yuki Seki³, Ikumi Tamai³, Laura Schakel⁴, Kyoussuke Sakata¹, Thanigaimalai Pillaiyar⁵, Akihiro Taguchi¹, Atsuhiko Taniguchi¹, Michael Gutschow⁴, Christa Muller⁴, Koh Takeuchi⁶, Mikako Hirohama⁷, Atsushi Kawaguchi⁷, Masaki Kojima¹, Toshiya Senda², Yoshiyuki Shirasaka³, Wataru Kamitani⁸, Yoshio Hayashi¹ (¹Tokyo University of Pharmacy and Life Sciences, ²Structural Biology Research Center, Institute of Materials Structure Science, High Energy Accelerator Research Organization, ³Faculty of Pharmacy, Institute of Medical, Pharmaceutical and Health Sciences, Kanazawa University, ⁴Pharmaceutical Institute, Pharmaceutical & Medicinal Chemistry, University of Bonn, ⁵Pharmaceutical Institute, Pharmaceutical/Medicinal Chemistry, University of Tübingen, ⁶Cellular and Molecular Biotechnology Research Institute, National Institute of Advanced Industrial Science and Technology, ⁷Faculty of Medicine, Transborder Medical Research Center, University of Tsukuba, ⁸Department of Infectious Diseases and Host Defense, Graduate School of Medicine, Gunma University)

O-5 Dimerized small molecule HIV-1 fusion inhibitors with dramatic enhancement of their anti-HIV-1 activities

Kohei Tsuji¹, Takuya Kobayakawa¹, Kento Ebihara¹, Takuma Kawada¹, Masayuki Fujino², Yuzuna Honda¹, Nami Ohashi¹, Tsutomu Murakami², Hirokazu Tamamura¹ (¹Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University (TMDU), ²AIDS Research Center, National Institute of Infectious Diseases)

O-6 Anti-antibiotic activity of r-Pep2 derived from putative ORF sequence in *E.coli* rRNA

Yuma Omata, Junya Imaizumi, Rui Kamada, Kazuyasu Sakaguchi (Laboratory of Biological Chemistry, Department of Chemistry, Faculty of Science, Hokkaido University)

11:05–11:20 **Break**

11:20–12:20 **Oral Presentations** (15 min talk, 5 min discussion & exchange)

Session 3 (chairs: Hironobu Hojo, Tetsuo Narumi)

O-7 Metal-catalyzed selective cell tagging of a cytotoxic peptide for cancer therapy

Kyohei Muguruma¹, Peni Ahmadi², Tsung-Che Chang², Katsunori Tanaka^{1,2,3} (¹Department of

Chemical Science and Engineering, School of Materials and Chemical Technology, Tokyo Institute of technology, ²Biofunctional Synthetic Chemistry, RIKEN Cluster for pioneering research, ³Biofunctional Chemistry Laboratory, A. Butlerov Institute of Chemistry, Kazan Federal University)

O-8 Chemical catalyst-promoted photooxygenation of amyloid peptide *in vivo*

Youhei Sohma¹, Nozomu Nagashima², Shuta Ozawa³, Masahiro Furuta², Miku Oi², Yukiko Hori³, Taisuke Tomita³, Motomu Kanai² (¹School of Pharmaceutical Sciences, Wakayama Medical University, ²Synthetic Organic Chemistry Lab., Graduate School of Pharmaceutical Sciences, The University of Tokyo, ³Neuropathology and Neuroscience Lab., Graduate School of Pharmaceutical Sciences, The University of Tokyo)

O-9 Biofunctional peptide-modified exosomes with encapsulation of boron compounds for boron neutron capture therapy (BNCT)

Shiori Hirase¹, Ayako Aoki¹, Kenta Morimoto¹, Kosuke Noguchi¹, Tomoka Takatani-Nakase^{2,3}, Shiroh Futaki⁴, Yoshihide Hattori⁵, Mitsunori Kirihata⁵, Ikuhiko Nakase¹ (¹Department of Biological Science, Graduate School of Science, Osaka Prefecture University, ²College of Pharmacy, Mukogawa Women's University, ³Institute for Biosciences, Mukogawa Women's University, ⁴Institute for Chemical Research, Kyoto University, ⁵Research Center for Boron Neutron Capture Therapy, Osaka Prefecture University)

12:20–12:30 **Break**

12:30–13:30 **Lunch Break & Online Business Seminar**

13:30–13:40 **Break**

13:40–14:40 **The Japanese Peptide Society General Meeting**

14:40–14:50 **Break**

14:50–15:50 **Oral Presentations** (15 min talk, 5 min discussion & exchange)

Session 4 (chairs: Akira Shigenaga, Youhei Sohma)

O-10 Design of curvature-sensing peptides for highly sensitive detection of bacterial extracellular vesicles

Kenichi Kawano^{1,2}, Fumiaki Yokoyama^{1,3}, Kouhei Kamasaka¹, Jun Kawamoto¹, Takuya Ogawa¹, Tatsuo Kurihara¹, Shiroh Futaki¹ (¹Institute for Chemical Research, Kyoto University, ²Graduate School of Pharmaceutical Sciences, Kyoto University, ³Department of Biosystems Science and Engineering, ETH Zurich)

O-11 Intracellular reconstitution and analysis of protein complexes by Yn self-assembling peptide tags

Takayuki Miki, Masahiro Hashimoto, Taichi Nakai, Keigo Kajiware, Hisakazu Mihara (School of Life Science and Technology, Tokyo Institute of Technology)

O-12 Advances in CCAP method for development of functionalized antibody conjugate

Yuji Ito¹, Abdur Rafique¹, Shun Masuda², Yukie Nohara², Shugo Tsuda², Taku Yoshiya² (¹Graduate

School of Science and Engineering, Kagoshima University, ²Peptide Institute, Inc.)

15:50–16:05 **Break**

16:05–17:05 **Oral Presentations** (15 min talk, 5 min discussion & exchange)

Session 5 (chairs: Yuji Ito, Wataru Nomura)

O-13 Peptide-based ionic liquids as an innovative approach to tackle skin and soft tissue infections: antibacterial, antibiofilm and collagenesis-boosting effects

Ana Gomes¹ Lucinda Bessa¹, Iva Fernandes¹, Ricardo Ferraz^{1,2}, Cláudia Monteiro³, Cristina Martins³, Nuno Mateus¹, Paula Gameiro¹, Cátia Teixeira¹, Paula Gomes¹ (¹LAQV- REQUIMTE, Departamento de Química e Bioquímica, Faculdade de Ciências, Universidade do Porto, ²Ciências Químicas e das Biomoléculas, Escola Superior de Saúde, Politécnico do Porto, ³INEB-i3S, Instituto de Engenharia Biomédica, Instituto de Investigação e Inovação em Saúde, Universidade do Porto)

O-14 3D culture of cancer cells in functionalized peptide hydrogels for construction of tumor tissue models and anticancer drug tests

Hiroshi Tsutsumi, Jyh Yea Chia, Takayuki Miki, Hisakazu Mihara (School of Life Science and Technology, Tokyo Institute of Technology)

O-15 High-throughput identification of bivalent peptides by cDNA display and combinatorial approaches

Taro Noguchi, Kanako Nakao, Shigefumi Kumachi, Masayuki Tsuchiya, Naoto Nemoto (Epsilon Molecular Engineering, Inc.)

17:05–17:20 **Break**

17:20–18:20 **Poster Presentations** (60 min)

Session 2 (P-043–P-084)

18:20–18:30 **Break**

18:30–21:00 **Online Social Gathering**

October 22 (Friday)

9:00–9:50 **Ceremony and Lecture of the Akabori Memorial Award 2020**

(chair: Kenichi Akaji)

Chemoselectivity in peptide synthesis

Philip E. Dawson (The Scripps Research Institute)

9:50–10:05 **Break**

10:05–11:05 **Oral Presentations** (15 min talk, 5 min discussion & exchange)

Session 6 (chairs: Akira Otaka, Hiroyuki Konno)

O-16 PEG stapling for enhanced conformational stability within β -sheet proteins and α -helical coiled coils

Joshua L. Price (Department of Chemistry and Biochemistry, Brigham Young University, USA)

O-17 Establishment of HP1 semi-synthesis and structural dynamics of its N-tail detected with ESR

Isao Suetake^{1,2,3}, Toshiaki Arata^{1,4}, Toru Kawakami¹, Risa Mutoh⁵, Yuichi Mishima¹, Kazunobu Sato⁶, Takeji Takui⁶, Toshiki Takei¹, Toshimichi Fujiwara¹, Makoto Miyata⁴, Hironobu Hojo¹ (¹Institute for Protein Research, Osaka University, ²Center for Twin Research, Graduate School of Medicine, Osaka University, ³Department of Nutritional Sciences, Nakamura Gakuen University, ⁴Department of Biology, Graduate School of Science, Osaka City University, ⁵Department of Applied Physics, Fukuoka University, ⁶Department of Chemistry and Molecular Materials Sciences, Graduate School of Science, Osaka City University)

O-18 Chemical synthesis of Torenia plant pollen tube attractant proteins by KAHA ligation

Nandarapu Kumarswamyreddy¹, Damodara N. Reddy¹, Nao Kamiya², Ryoko Tsukamoto², Masahiro M. Kanaoka², Tetsuya Higashiyama^{1,2,3}, Shunsuke Oishi¹, Jeffrey W. Bode^{1,4} (¹Institute of Transformative Bio-Molecules (WPI-ITbM), Nagoya University, ²Division of Biological Science, Graduate School of Science, Nagoya University, ³Department of Biological Sciences, Graduate School of Science, University of Tokyo, ⁴Laboratorium für Organische Chemie, Department of Chemistry and Applied Biosciences, ETH Zurich)

11:05–11:20 **Break**

11:20–12:20 **Poster Presentations** (60 min)

Session 3 (P-085–P-125)

12:20–12:30 **Break**

12:30–13:30 **Lunch Break & Online Business Seminar**

13:30–13:40 **Break**

13:40–15:00 **Oral Presentations** (15 min talk, 5 min discussion & exchange)

Session 7 (chairs: Kazunori Matsuura, Ikuhiko Nakase)

O-19 Stabilization of microtubules by photoaffinity labeling of a Tau-derived peptide

Hiroshi Inaba¹, Soei Watari¹, Arif Md. Rashedul Kabir², Akira Kakugo², Kazuki Sada², Kazunori Matsuura¹ (¹Graduate School of Engineering, Tottori University, ²Graduate School of Science, Hokkaido University)

O-20 Cell adhesion activity of octaarginine

Yuji Yamada, Toru Onda, Keisuke Hamada, Yamato Kikkawa, Motoyoshi Nomizu (School of Pharmacy, Tokyo University of Pharmacy and Life Sciences)

O-21 A method for obtaining protein-binding peptides from a random triple-helical peptide library

Ryo Masuda¹, Khine Phyu Phyu Thant², Tetsuya Kadonosono³, Takaki Koide^{1,2} (¹Waseda Research Institute for Science and Engineering, Waseda University, ²Department of Chemistry and Biochemistry, School of Advanced Science and Engineering, Waseda University, ³Department of Life Science and Technology, School of Life Science and Technology, Tokyo Institute of Technology)

O-22 Single-chain tandem macrocyclic peptides as a scaffold for growth factor and cytokine mimetics

Kenichiro Ito, Yoshihiko Matsuda, Ayako Mine, Natsuki Shikida, Kazutoshi Takahashi, Kyohei Miyairi, Kazutaka Shimbo, Yoshimi Kikuchi, Atsushi Konishi (Research Institute for Bioscience Product & Fine Chemicals, Ajinomoto Co., Inc.)

15:00–15:15 **Break**

15:15–16:05 **Lectures of the Young Investigator Award**

(chair: Yosuke Demizu)

Fundamental studies on the development of next-generation medium-sized peptide drugs

Takashi Misawa (National Institute of Health Sciences)

(chair: Hiroaki Suga)

Conformational studies of alanyl-backbone peptoids and application to biomolecular recognition

Jumpei Morimoto (Graduate School of Engineering, The University of Tokyo)

16:05–16:20 **Break**

16:20–17:00 **Lecture of the Japanese Peptide Society Award**

(chair: Kazuyasu Sakaguchi)

Construction of functional peptides based on de novo design approaches

Hisakazu Mihara (Tokyo Institute of Technology)

17:00–17:10 **Closing Remarks** (Yoshio Hayashi)