

Publication List

原著論文（査読有、*責任著者）

- 1) Jizhi Ni, Youhei Sohma,* Motomu Kanai,* Scandium(III)-triflate-promoted serine/threonine-selective peptide bond cleavage. *Chem. Commun.* in press (2017). DOI: 10.1039/c6cc10300f
- 2) Yohei Seki, Takashi Ishiyama, Daisuke Sasaki, Junpei Abe, Youhei Sohma, Kounosuke Oisaki, Motomu Kanai, Transition metal-free tryptophan-selective bioconjugation of proteins, *J. Am. Chem. Soc.* 138, 10798–10801 (2016).
- 3) Atsuhiko Taniguchi, Yusuke Shimizu, Kounosuke Oisaki, Youhei Sohma,* Motomu Kanai,* Switchable photooxygenation catalysts that sense higher-order amyloid structures. *Nature Chem.* 8, 974–982 (2016).
- 4) Ryuto Kino, Takushi Araya, Tadamasa Arai, Youhei Sohma,* Motomu Kanai,* Covalent modifier-type aggregation inhibitor of amyloid- β based on a cyclo-KLVFF motif. *Bioorg. Med. Chem. Lett.* 25, 2972–2975 (2015).
- 5) Kiyomichi Shinoda, Youhei Sohma,* Motomu Kanai,* Synthesis of chemically-tethered amyloid- β segment trimer possessing amyloidogenic properties. *Bioorg. Med. Chem. Lett.* 25, 2976–2979 (2015).
- 6) Tadamasa Arai, Daisuke Sasaki, Takushi Araya, Takeshi Sato, Youhei Sohma,* Motomu Kanai,* A cyclic KLVFF-derived peptide aggregation inhibitor induces the formation of less toxic off-pathway amyloid- β oligomers. *ChemBioChem* 15, 2577–2583 (2014).
- 7) Tadamasa Arai, Takushi Araya, Daisuke Sasaki, Atsuhiko Taniguchi, Takeshi Sato, Youhei Sohma,* Motomu Kanai,* Rational design and identification of non-peptidic aggregation inhibitor of amyloid- β based on a pharmacophore motif obtained from *cyclo*-[Lys-Leu-Val-Phe-Phe-]. *Angew. Chem. Int. Ed.* 53, 8236–8239 (2014). *Hot Paper*
- 8) Yohei Seki, Kana Tanabe, Daisuke Sasaki, Youhei Sohma, Kounosuke Oisaki, Motomu Kanai, Serine-selective aerobic cleavage of peptides and a protein using a water-soluble copper–organoradical conjugate. *Angew. Chem. Int. Ed.* 53, 6501–6505 (2014).
- 9) Atsuhiko Taniguchi, Daisuke Sasaki, Azusa Shiohara, Takeshi Iwatsubo, Taisuke Tomita, Youhei Sohma,* Motomu Kanai,* Attenuation of the aggregation and neurotoxicity of amyloid- β peptides by catalytic photooxygenation, *Angew. Chem. Int. Ed.* 53, 1382–1385 (2014). *Hot Paper*
- 10) Kana Tanabe, Atsuhiko Taniguchi, Takuya Matsumoto, Kounosuke Oisaki, Youhei Sohma,* Motomu Kanai,* Asparagine-selective cleavage of peptide bonds through hypervalent iodine-mediated Hofmann rearrangement in neutral aqueous solution. *Chem. Sci.* 5, 2747–2753 (2014).
- 11) Hiroyuki Kawashima, Tomomi Kuruma, Masayuki Yamashita, Youhei Sohma,* Kenichi Akaji,* Synthesis of an O-acyl isopeptide by using native chemical ligation. *J. Peptide Sci.* 20, 361–365 (2014).
- 12) Taku Yoshiya, Takahiro Maruno, Tsuyoshi Uemura, Shigeru Kubo, Yoshiaki Kiso, Youhei Sohma, Kumiko Yoshizawa-Kumagaye, Yuji Kobayashi, Yuji Nishiuchi, Non-pretreated O-acyl isopeptide of amyloid β peptide 1–42 is monomeric with a random coil structure but starts to aggregate in a concentration-dependent manner. *Bioorg. Med. Chem. Lett.* 24, 3861–3864 (2014).
- 13) Taku Yoshiya, Takahiro Maruno, Tsuyoshi Uemura, Shigeru Kubo, Yoshiaki Kiso, Youhei Sohma, Kumiko Yoshizawa-Kumagaye, Yuji Kobayashi, Yuji Nishiuchi, O-Acyl isopeptide of A β 1–42: Boc SPPS with the aid of isodipeptide unit and its concentration-dependent aggregative state. *J.*

Peptide Sci. 20, 669–674 (2014).

- 14) Hiroyuki Kawashima, Youhei Sohma,* Tomoya Nakanishi, Hitomi Kitamura, Hidehito Mukai, Masayuki Yamashita, Kenichi Akaji, Yoshiaki Kiso,* A new class of aggregation inhibitor of amyloid- β peptide based on an O-acyl isopeptide. *Bioorg. Med. Chem.* 21, 6323–6327 (2013).
- 15) Youhei Sohma,* Moe Yamasaki, Hiroyuki Kawashima, Atsuhiko Taniguchi, Masayuki Yamashita, Kenichi Akaji, Hidehito Mukai, Yoshiaki Kiso,* Comparative properties of A β 1–42, A β 11–42, and [Pyr¹¹]A β 11–42 generated from O-acyl isopeptides. *Bioorg. Med. Chem. Lett.* 23, 1326–1329 (2013).
- 16) Youhei Sohma,* Hitomi Kitamura, Hiroyuki Kawashima, Hironobu Hojo, Masayuki Yamashita, Kenichi Akaji, Yoshiaki Kiso,* Synthesis of an O-acyl isopeptide by using native chemical ligation to efficiently construct a hydrophobic polypeptide. *Tetrahedron Lett.* 52, 7146–7148 (2011).
- 17) Youhei Sohma,* Hui Wang, Atsuhiko Taniguchi, Yuta Hirayama, Taeko Kakizawa, Moe Yamasaki, Hidehito Mukai, Yoshiaki Kiso,* Self-assembly pathways of E22delta-type amyloid β peptide mutants generated from non-aggregative O-acyl isopeptide precursors. *Bioorg. Med. Chem.* 19, 3787–3792 (2011).
- 18) Taku Yoshiya, Ayano Higa, Naoko Abe, Fukue Fukao, Tomomi Kuruma, Yuki Toda, Youhei Sohma,* Yoshiaki Kiso,* “Click peptide” concept: O-acyl isopeptide of islet amyloid polypeptide as a non-aggregative precursor molecule. *ChemBioChem* 12, 1216–1222 (2011).
- 19) Youhei Sohma,* Yuta Hirayama, Atsuhiko Taniguchi, Hidehito Mukai, Yoshiaki Kiso,* ‘Click peptide’ using production of monomer A β from the O-acyl isopeptide: application to assay system of aggregation inhibitors and cellular cytotoxicity. *Bioorg. Med. Chem.* 19, 1729–1733 (2011).
- 20) Hironobu Hojo, Hidekazu Katayama, Chiharu Tano, Yuko Nakahara, Azusa Yoneshige, Junko Matsuda, Youhei Sohma, Yoshiaki Kiso, Yoshiaki Nakahara, Synthesis of the sphingolipid activator protein, saposin C, using an azido-protected O-acyl isopeptide as an aggregation-disrupting element. *Tetrahedron Lett.* 52, 635–639 (2011).
- 21) Taku Yoshiya, Yuka Hasegawa, Wakana Kawamura, Hiroyuki Kawashima, Youhei Sohma, Tooru Kimura, Yoshiaki Kiso, S-Acylation method: use of allyl-type protective group for improved preparation of thioester-containing S-acyl isopeptides by Fmoc-based SPPS. *Biopolymers* 96, 228–239 (2011).
- 22) Harichandra D. Tagad, Yoshio Hamada, Jeffrey-Tri Nguyen, Koushi Hidaka, Takashi Hamada, Youhei Sohma, Tooru Kimura, Yoshiaki Kiso, Structure-guided design and synthesis of P₁' position 1-phenylcycloalkylamine-derived pentapeptidic BACE1 inhibitors. *Bioorg. Med. Chem.* 19, 5238–5246 (2011).
- 23) Youhei Sohma,* Qing-xin Hua, Jonathan Whittaker, Michael A. Weiss, Stephen B. H. Kent,* Design and folding of [Glu^{A4}(O β Thr^{B30})]insulin (‘ester insulin’), a minimal proinsulin surrogate that can be chemically converted into human insulin. *Angew. Chem. Int. Ed.* 49, 5489–5493 (2010). *VIP, Cover picture*
- 24) Youhei Sohma, Qing-xin Hua, Ming Liu, Nelson B. Phillips, Shi-Quan Hu, Jonathan Whittaker, Linda J. Whittaker, Aubree Ng, Charles T. Roberts, Jr., Peter Arvan, Stephen B. H. Kent, Michael A. Weiss, Contribution of residue B5 to the folding and function of insulin and IGF-I: constraints and fine-tuning in the evolution of a protein family. *J. Biol. Chem.* 285, 5040–5055 (2010).
- 25) Harichandra D. Tagad, Yoshio Hamada, Jeffrey-Tri Nguyen, Takashi Hamada, Hamdy Abdel-Rahman, Abdellah Yamani, Ayaka Nagamine, Hayato Ikari, Naoto Igawa, Koushi Hidaka, Youhei Sohma, Tooru Kimura, Yoshiaki Kiso, Design of pentapeptidic BACE1 inhibitors with

- carboxylic acid bioisosteres at P'1 and P4 positions. *Bioorg. Med. Chem.* 18, 3175–3186 (2010).
- 26) Taku Yoshiya, Hiroyuki Kawashima, Yuka Hasegawa, Kazuhiro Okamoto, Tooru Kimura, Youhei Sohma, Yoshiaki Kiso, Epimerization-free synthesis of cyclic peptide by use of the O-acyl isopeptide method. *J. Peptide Sci.* 16, 437–442 (2010).
- 27) Youhei Sohma, Stephen B. H. Kent, Biomimetic synthesis of lispro insulin via a chemically synthesized ‘mini-proinsulin’ prepared by oxime-forming ligation. *J. Am. Chem. Soc.* 131, 16313–16318 (2009).
- 28) Atsuhiko Taniguchi,# Youhei Sohma,# Yuta Hirayama, Hidehito Mukai, Tooru Kimura, Yoshio Hayashi, Katsumi Matsuzaki, Yoshiaki Kiso, “Click peptide”: pH-triggered in situ production and aggregation of monomer A β 1-42. *ChemBioChem* 10, 710–715 (2009). (#equal contribution) *Highlighted in Angew. Chem. Int. Ed.*
- 29) Taku Yoshiya, Hiroyuki Kawashima, Youhei Sohma, Tooru Kimura and Yoshiaki Kiso, O-Acyl isopeptide method: efficient synthesis of isopeptide segment and application to racemization-free segment condensation. *Org. Biomol. Chem.* 7, 2894–2904 (2009). *Cover picture*
- 30) Youhei Sohma, Brad L. Pentelute, Jonathan Whittaker, Qin-xin Hua, Linda J. Whittaker, Michael A. Weiss, Stephen B. H. Kent, Comparative properties of insulin-like growth factor 1 (IGF-1) and [Gly7D-Ala]IGF-1 prepared by total chemical synthesis. *Angew. Chem. Int. Ed.* 47, 1102–1106 (2008).
- 31) Katsumi Matsuzaki, Takuma Okada, Miho Tsukuda, Keisuke Ikeda, Youhei Sohma, Yousuke Chiyomori, Atsuhiko Taniguchi, Setsuko Nakamura, Nui Ito, Yoshio Hayashi, Yoshiaki Kiso, Design, synthesis, and biophysical properties of a helical A β 1–42 analog: inhibition of fibrillogenesis and cytotoxicity, *Biochem. Biophys. Res. Commun.* 371, 777–780 (2008).
- 32) Atsuhiko Taniguchi, Mariusz Skwarczynski, Youhei Sohma, Takuma Okada, Keisuke Ikeda, Halan Prakash, Hidehito Mukai, Yoshio Hayashi, Tooru Kimura, Shun Hirota, Katsumi Matsuzaki, Yoshiaki Kiso, Water-soluble “click peptide” using O-acyl isopeptide method: controlled production of Alzheimer’s amyloid β peptide from photo-triggered precursor peptide, *ChemBioChem* 9, 3055–3065 (2008).
- 33) Taku Yoshiya, Atsuhiko Taniguchi, Youhei Sohma, Fukue Fukao, Setsuko Nakamura, Naoko Abe, Nui Ito, Mariusz Skwarczynski, Tooru Kimura, Yoshio Hayashi, Yoshiaki Kiso, “O-Acyl isopeptide method” for peptide synthesis: synthesis of forty kinds of “O-acyl isodipeptide unit” Boc-Ser/Thr(Fmoc-Xaa)-OH, *Org. Biomol. Chem.* 5, 1720–1730 (2007).
- 34) Atsuhiko Taniguchi, Taku Yoshiya, Naoko Abe, Fukue Fukao, Youhei Sohma, Tooru Kimura, Yoshio Hayashi, Yoshiaki Kiso, “O-Acyl isopeptide method” for peptide synthesis: solvent effects in the synthesis of A β 1–42 isopeptide using “O-acyl isodipeptide unit”. *J. Peptide Sci.* 13, 868–874 (2007).
- 35) Taku Yoshiya, Youhei Sohma, Tooru Kimura, Yoshio Hayashi, Yoshiaki Kiso, “O-Acyl Isopeptide Method”: racemization-free segment condensation in solid phase peptide synthesis, *Tetrahedron Lett.* 47, 7905–7909 (2006).
- 36) Youhei Sohma, Atsuhiko Taniguchi, Mariusz Skwarczynski, Taku Yoshiya, Fukue Fukao, Tooru Kimura, Yoshio Hayashi, Yoshiaki Kiso, “O-Acyl isopeptide method” for the efficient synthesis of difficult sequence-containing peptides: use of “O-acyl isodipeptide unit”. *Tetrahedron Lett.* 47, 3013–3017 (2006).
- 37) Atsuhiko Taniguchi, Youhei Sohma, Maiko Kimura, Takuma Okada, Keisuke Ikeda, Yoshio Hayashi, Tooru Kimura, Shun Hirota, Katsumi Matsuzaki, Yoshiaki Kiso, “Click Peptide” based on

- the “O-acyl isopeptide method”: control of A β 1–42 production from a photo-triggered A β 1–42 analogue. *J. Am. Chem. Soc.* 128, 696–697 (2006).
- 38) Mariusz Skwarczynski, Youhei Sohma, Mayo Noguchi, Yoshio Hayashi, Tooru Kimura, Yoshiaki Kiso, O–N Intramolecular alkoxy carbonyl migration of typical protective groups in hydroxyamino acids. *J. Org. Chem.* 71, 2542–2545 (2006).
- 39) Mariusz Skwarczynski, Mayo Noguchi, Shun Hirota, Youhei Sohma, Tooru Kimura, Yoshio Hayashi, Yoshiaki Kiso, Development of first photoresponsible prodrug of paclitaxel. *Bioorg. Med. Chem. Lett.* 16, 4492–4496 (2006).
- 40) Youhei Sohma, Yousuke Chiyomori, Maiko Kimura, Fukue Fukao, Atsuhiko Taniguchi, Yoshio Hayashi, Tooru Kimura, Yoshiaki Kiso, “O-Acyl isopeptide method” for the efficient preparation of amyloid β peptide (A β) 1–42 mutants. *Bioorg. Med. Chem.* 13, 6167–6174 (2005).
- 41) Youhei Sohma, Yoshio Hayashi, Maiko Kimura, Yousuke Chiyomori, Atsuhiko Taniguchi, Masato Sasaki, Tooru Kimura, Yoshiaki Kiso, “O-Acyl isopeptide method” for the synthesis of difficult sequence-containing peptides: application to the synthesis of Alzheimer’s disease-related amyloid β peptide (A β) 1–42. *J. Peptide Sci.* 11, 441–451 (2005).
- 42) Mariusz Skwarczynski, Youhei Sohma, Mayo Noguchi, Maiko Kimura, Yoshio Hayashi, Yoshio Hamada, Tooru Kimura, Yoshiaki Kiso, No auxiliary, no byproduct strategy for water-soluble prodrugs of taxoids: scope and limitation of O–N intramolecular acyl and acyloxy migration reaction. *J. Med. Chem.* 48, 2655–2666 (2005).
- 43) Youhei Sohma, Masato Sasaki, Yoshio Hayashi, Tooru Kimura, Yoshiaki Kiso, Design and synthesis of a novel water-soluble A β 1–42 isopeptide: an efficient strategy for the preparation of Alzheimer’s disease-related peptide, A β 1–42, via O–N intramolecular acyl migration reaction. *Tetrahedron Lett.* 45, 5965–5968 (2004).
- 44) Youhei Sohma, Masato Sasaki, Yoshio Hayashi, Tooru Kimura, Yoshiaki Kiso, Novel and efficient synthesis of difficult sequence-containing peptides through O–N intramolecular acyl migration reaction of O-acyl isopeptides. *Chem. Commun.* 124–125 (2004).
- 45) Youhei Sohma, Yoshio Hayashi, Tomoko Ito, Hikaru Matsumoto, Tooru Kimura, Yoshiaki Kiso, Development of water-soluble prodrugs of the HIV-1 protease inhibitor KNI-727: importance of the conversion time for higher gastrointestinal absorption of prodrugs based on spontaneous chemical cleavage. *J. Med. Chem.* 46, 4124–4135 (2003).
- 46) Mariusz Skwarczynski, Youhei Sohma, Maiko Kimura, Yoshio Hayashi, Tooru Kimura, Yoshiaki Kiso, O–N Intramolecular acyl migration strategy in water-soluble prodrugs of toxoids. *Bioorg. Med. Chem. Lett.* 13, 4441–4444 (2003).
- 47) Yoshio Hayashi, Mariusz Skwarczynski, Yoshio Hamada, Youhei Sohma, Tooru Kimura, Yoshiaki Kiso, A novel approach of water-soluble paclitaxel prodrug with no auxiliary and no byproduct: design and synthesis of isotaxel. *J. Med. Chem.* 46, 3782–3784 (2003).
- 48) Yoshio Hamada, Jun Ohtake, Youhei Sohma, Tooru Kimura, Yoshio Hayashi, Yoshiaki Kiso, New water-soluble prodrugs of HIV protease inhibitors based on O–N intramolecular acyl migration. *Bioorg. Med. Chem.* 10, 4155–4167 (2002).
- 49) Hikaru Matsumoto, Youhei Sohma, Tooru Kimura, Yoshio Hayashi, Yoshiaki Kiso, Controlled drug release: new water-soluble prodrugs of an HIV protease inhibitor. *Bioorg. Med. Chem. Lett.* 11, 605–609 (2001).

総合論文

- 1) Youhei Sohma,* Medicinal Chemistry Focusing on Aggregation of Amyloid- β . *Chem. Pharm.*

Bull. 64, 1–7 (2016).

- 2) Youhei Sohma,* Yoshiaki Kiso,* Synthesis of O-acyl isopeptides. *Chem. Rec.* 13, 218–223 (2013).
- 3) Stephen Kent, Youhei Sohma, Suhuai Liu, Duhee Bang, Brad Pentelute and Kalyaneswar Mandal, Through the looking glass – a new world of proteins enabled by chemical synthesis. *J. Peptide Sci.* 18, 428–436 (2012).
- 4) Youhei Sohma, Taku Yoshiya, Atsuhiko Taniguchi, Tooru Kimura, Yoshio Hayashi, Yoshiaki Kiso, Development of O-acyl isopeptide method. *Biopolymers* 88, 253–262 (2007).
- 5) Youhei Sohma, Yoshiaki Kiso, “Click peptide”: chemical biology-oriented synthesis of Alzheimer’s disease-related amyloid β peptide ($A\beta$) analogues based on the “O-acyl isopeptide method”. *ChemBioChem* 7, 1549–1557 (2006).
- 6) Youhei Sohma, Atsuhiko Taniguchi, Taku Yoshiya, Yousuke Chiyomori, Fukue Fukao, Setsuko Nakamura, Mariusz Skwarczynski, Takuma Okada, Keisuke Ikeda, Yoshio Hayashi, Tooru Kimura, Shun Hirota, Katsumi Matsuzaki, Yoshiaki Kiso, “Click peptide”: a novel “O-acyl isopeptide method” for peptide synthesis and chemical biology-oriented synthesis of amyloid β peptide analogues. *J. Peptide Sci.* 12, 823–828 (2006).
- 7) Mariusz Skwarczynski, Mayo Noguchi, Youhei Sohma, Tooru Kimura, Yoshio Hayashi, Yoshiaki Kiso, Application of intramolecular carbonate-carbamate migration. *Chemistry Today*, 24, 30–32 (2006).
- 8) Youhei Sohma, Yoshio Hayashi, Mariusz Skwarczynski, Yoshio Hamada, Masato Sasaki, Tooru Kimura, Yoshiaki Kiso, O–N Intramolecular acyl migration reaction in the development of prodrugs and the synthesis of difficult sequence-containing bioactive peptides. *Biopolymers (Peptide Science)*, 76, 344–356 (2004).

論文（査読無）

- 1) 相馬洋平、新井唯正、新谷卓士、城野柳人、金井求：ペプチド由来ファーマコフォアを有する新規アミロイド β 凝集阻害低分子化合物の創成、*MedChemNews*（日本薬学会 医薬化学部会）, in press.
- 2) 相馬洋平、谷口敦彦、金井求：アミロイド β ペプチドの凝集を標的とした創薬化学、*化学工業*, 65, 837–841 (2014).
- 3) 谷口敦彦、相馬洋平、木曾良明：ペプチド・タンパク質の機能解明のツールとしてのクリックペプチド、*化学と生物*, 48, 232–234 (2010).
- 4) 木曾良明、林良雄、相馬洋平、日高興士：生物分子システムを基盤とする統合創薬科学、*MedChemNews*（日本薬学会 医薬化学部会）, 20, 2–8 (2010).
- 5) 相馬洋平、木村徹、木曾良明：水溶性プロドラッグ、*化学工業*, 53, 465–471 (2002).
- 6) 木曾良明、相馬洋平：新しいHIVプロテアーゼ阻害剤、*医学のあゆみ*, 201, 231–235 (2002).
- 7) 松本光、相馬洋平、木曾良明：生体内で自発的に再生可能な水溶性プロドラッグ、*化学工業*, 52, 439–443 (2001).

著書

- 1) 相馬洋平、木曾良明：第2章ペプチド医薬の基礎・1. クリックペプチドの合成、*ペプチド医薬の最前線*（シーエムシー出版）, 20-24 (2012).
- 2) 相馬洋平、Stephen B.H. Kent : Medicinal chemistry applied to the protein molecule - total protein synthesis by native chemical ligation of synthetic peptides, *遺伝子医学MOOK21号*（メディカルドウ）, 83-87 (2012).

- 3) 相馬洋平、木曾良明：*O*-アシルイソペプチドの合成、*遺伝子医学 MOOK21 号*（メディカルドウ）、43-47 (2012).
- 4) Yoshiaki Kiso, Atsuhiko Taniguchi, Youhei Sohma: Click Peptides: Design and applications. *Wiley Encyclopedia of Chemical Biology* (ed. Tadhg P. Begley) Vol. 1, 379–383 (2009).

解説など

- 1) 相馬洋平、伊藤幸裕：薬学における生命指向型化学（「薬」創りの新発想）、*薬学雑誌*, 137, 281–282 (2017).
- 2) 相馬洋平：アルツハイマー病の原因物質の正体？-脳に存在するアミロイド線維の三次元構造。*化学*, 69, 64–65 (2014).
- 3) 相馬洋平：ペプチドのコンフォメーション固定化のための新手法。 *ファルマシア*, 48, 441 (2012).
- 4) 相馬洋平、木曾良明：抗エイズ薬の現状は？ *化学*, 58, 24–26 (2003).

特許

- 1) 金井求、相馬洋平、新谷卓士、城野柳人、イミダゾール化合物及びこれを含有する医薬、出願人 国立研究開発法人科学技術振興機構、特願 2016-056616、出願日 2016/3/22
- 2) 金井求、相馬洋平、Ni Jizhi、谷口敦彦、クルクミンホウ素錯体及びこれを含有する医薬、出願人 国立研究開発法人科学技術振興機構、特願 2016-056615、出願日 2016/3/22
- 3) 金井求、相馬洋平、清水裕介、谷口敦彦、生長幸之助、國信洋一郎、ジピリンホウ素錯体及びこれを含有する医薬、出願人 独立行政法人科学技術振興機構、【国内出願】特願 2015-044839 出願日 2015/3/6 【外国出願】PCT/JP2016/56803 出願日 2016/3/4
- 4) 金井求、相馬洋平、谷口敦彦、清水裕介、ベンゾチアゾール化合物及びこれを含有する医薬、出願人 独立行政法人科学技術振興機構、【国内出願】特願 2014-145736 出願日 2014/7/16 【外国出願】PCT/JP2015/70317 出願日 2015/7/15
- 5) 金井求、相馬洋平、田辺佳奈、カスケードアミド切断反応による機能性分子逐次徐放システム、出願人 国立大学法人東京大学、【国内出願】特願 2014-046681 出願日 2014/3/10 【外国出願】PCT/JP2015/054423（「機能性分子の逐次徐放システム」）出願日 2015/2/18
- 6) 金井求、相馬洋平、新井唯正、新谷卓士、ピコリン酸アミド誘導体及びこれを含有する医薬、出願人 独立行政法人科学技術振興機構、【国内出願】特願 2013-254908 出願日 2013/12/10 【外国出願】PCT/JP2014/082521（「アミド化合物及びこれを含有する医薬」）出願日 2014/12/9
- 7) 金井求、相馬洋平、谷口敦彦、佐々木大輔、触媒的酸化によるアミロイド β ペプチドの凝集及び毒性発現の抑制、出願人 独立行政法人科学技術振興機構、【国内出願】特願 2013-125797 出願日 2013/6/14 【外国出願】PCT/JP2014/65749（「A β ペプチド酸化体」）出願日 2014/6/13
- 8) 金井求、相馬洋平、新井唯正、佐々木大輔、小林由紀、環状ペプチド及びこれを含有する医薬、出願人 独立行政法人科学技術振興機構、【国内出願】特願 2012-284169 出願日 2012/12/27 【外国出願】PCT/JP2013/78259 出願日 2013/10/18
- 9) Youhei Sohma, Stephen B. H. Kent, Ester insulin. 【米国出願】US 13/394,646 【外国出願】PCT/US2010/047961 出願日 2010/9/7