Naoki Yamanaka, Ph.D.

Professor, Department of Entomology, University of California, Riverside
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Education:

● University of Tokyo, Tokyo, Japan	B.S.	03/2002	Agriculture
● University of Tokyo, Tokyo, Japan	Ph.D.	03/2007	Biological Science

Membership and Affiliations:

2024 –	Editor in Chief, *Insect Biochemistry and Molecular Biology* (Elsevier)
2022 –	Editor in Chief, *Comprehensive Molecular Insect Science* (Elsevier)
2019 – 2023	Editorial Board member, *Insect Biochemistry and Molecular Biology* (Elsevier)
2009 –	Member, Genetics Society of America
2009 –	Member, Entomological Society of America
2003 –	Member, Japan Society for Bioscience, Biotechnology, and Agrochemistry

Professional Experience:

2024 –	Professor, Department of Entomology, University of California, Riverside
2020 –	Associate Professor, Department of Entomology, University of California, Riverside
2014 – 2020	Assistant Professor, Department of Entomology, University of California, Riverside
2007 – 2014	Postdoctoral Associate, Department of Genetics, Cell Biology and Development, University of Minnesota, Minneapolis, MN
2007	Research Fellow, Department of Integrated Biosciences, University of Tokyo, Tokyo, Japan

Honors and Awards:

2024	Pacific Branch Physiology, Biochemistry, and Toxicology Award, Entomological Society of America
2022	Japan Academy Medal, Japan Academy, Japan
2022	JSPS Prize, Japan Society for the Promotion of Science, Japan
2018	NIH Director's New Innovator Award (DP2)
2017	Pew Biomedical Scholar
2012	NIH Pathway to Independence Award (K99)
2009	Inoue Research Award for Young Scientists, Inoue Foundation for Science, Japan

Research Publications:

Refereed Journal Articles (30 total)

1. **Yamanaka N**, Hua YJ, Mizoguchi A, Watanabe K, Niwa R, Tanaka Y, Kataoka H. (2005) Identification of a novel prothoracicostatic hormone and its receptor in the silkworm *Bombyx mori*. *J Biol Chem.* 280(15):14684-90.
   https://doi.org/10.1074/jbc.M500308200
2. **Yamanaka N**, Zitnan D, Kim YJ, Adams ME, Hua YJ, Suzuki Y, Suzuki M, Suzuki A, Satake H, Mizoguchi A, Asaoka K, Tanaka Y, Kataoka H. (2006) Regulation of insect steroid hormone biosynthesis by innervating peptidergic neurons. *Proc Natl Acad Sci U S A.* 103(23):8622-7.
   https://doi.org/10.1073/pnas.0511196103

3. **Yamanaka N**, Honda N, Osato N, Niwa R, Mizoguchi A, Kataoka H. (2007) Differential regulation of ecdysteroidogenic P450 gene expression in the silkworm, *Bombyx mori*. *Biosci Biotechnol Biochem.* 71(11):2808-14.
https://doi.org/10.1271/bbb.70420

4. **Yamanaka N**, Yamamoto S, Zitnan D, Watanabe K, Kawada T, Satake H, Kaneko Y, Hiruma K, Tanaka Y, Shinoda T, Kataoka H. (2008) Neuropeptide receptor transcriptome reveals unidentified neuroendocrine pathways. *PLoS One.* 3(8):e3048.
https://doi.org/10.1371/journal.pone.0003048

5. International Silkworm Genome Consortium. (2008) The genome of a lepidopteran model insect, the silkworm *Bombyx mori*. *Insect Biochem Mol Biol*. 38(12):1036-45.
https://doi.org/10.1016/j.ibmb.2008.11.004

6. Roller L, **Yamanaka N**, Watanabe K, Daubnerová I, Zitnan D, Kataoka H, Tanaka Y. (2008) The unique evolution of neuropeptide genes in the silkworm *Bombyx mori*. *Insect Biochem Mol Biol.* 38(12):1147-57.
https://doi.org/10.1016/j.ibmb.2008.04.009

7. Okamoto N, **Yamanaka N**, Satake H, Saegusa H, Kataoka H, Mizoguchi A. (2009) An ecdysteroid-inducible insulin-like growth factor-like peptide regulates adult development of the silkmoth *Bombyx mori*. *FEBS J.* 276(5):1221-32.
https://doi.org/10.1111/j.1742-4658.2008.06859.x

8. Okamoto N, **Yamanaka N**, Yagi Y, Nishida Y, Kataoka H, O'Connor MB, Mizoguchi A. (2009) A fat body-derived IGF-like peptide regulates postfeeding growth in *Drosophila*. *Dev Cell.* 17(6):885-91.
https://doi.org/10.1016/j.devcel.2009.10.008

9. Rewitz KF, **Yamanaka N**, Gilbert LI, O'Connor MB. (2009) The insect neuropeptide PTTH activates receptor tyrosine kinase torso to initiate metamorphosis. *Science.* 326(5958):1403-5.
https://doi.org/10.1126/science.1176450

10. **Yamanaka N**, Hua YJ, Roller L, Spalovská-Valachová I, Mizoguchi A, Kataoka H, Tanaka Y. (2010) *Bombyx* prothoracicostatic peptides activate the sex peptide receptor to regulate ecdysteroid biosynthesis. *Proc Natl Acad Sci U S A.* 107(5):2060-5.
https://doi.org/10.1073/pnas.0907471107

11. Rewitz KF, **Yamanaka N**, O'Connor MB. (2010) Steroid hormone inactivation is required during the juvenile-adult transition in *Drosophila*. *Dev Cell.* 19(6):895-902.
https://doi.org/10.1016/j.devcel.2010.10.021

12. Kim YJ, Bartalska K, Audsley N, **Yamanaka N**, Yapici N, Lee JY, Kim YC, Markovic M, Isaac E, Tanaka Y, Dickson BJ. (2010) MIPs are ancestral ligands for the sex peptide receptor. *Proc Natl Acad Sci U S A.* 107(14):6520-5.
https://doi.org/10.1073/pnas.0914764107

13. Okamoto N, **Yamanaka N**, Endo Y, Kataoka H, Mizoguchi A. (2011) Spatiotemporal patterns of IGF-like peptide expression in the silkmoth *Bombyx mori* predict its pleiotropic actions. *Gen Comp Endocrinol.* 173(1):171-82.
https://doi.org/10.1016/j.ygcen.2011.05.009

14. **Yamanaka N**, Roller L, Zitňan D, Satake H, Mizoguchi A, Kataoka H, Tanaka Y. (2011) *Bombyx* orcokinins are brain-gut peptides involved in the neuronal regulation of ecdysteroidogenesis. *J Comp Neurol.* 519(2):238-46.

https://doi.org/10.1002/cne.22517

15. **Yamanaka N**, Romero NM, Martin FA, Rewitz KF, Sun M, O'Connor MB, Léopold P. (2013) Neuroendocrine control of *Drosophila* larval light preference. *Science.* 341(6150):1113-6.
https://doi.org/10.1126/science.1241210

16. **Yamanaka N**, Marqués G, O'Connor MB. (2015) Vesicle-Mediated Steroid Hormone Secretion in *Drosophila melanogaster*. *Cell.* 163(4):907-19.
https://doi.org/10.1016/j.cell.2015.10.022

17. Ou Q, Zeng J, **Yamanaka N**, Brakken-Thal C, O'Connor MB, King-Jones K. (2016) The Insect Prothoracic Gland as a Model for Steroid Hormone Biosynthesis and Regulation. *Cell Rep.* 16(1):247-262.
https://doi.org/10.1016/j.celrep.2016.05.053

18. Danielsen ET, Moeller ME, **Yamanaka N**, Ou Q, Laursen JM, Soenderholm C, Zhuo R, Phelps B, Tang K, Zeng J, Kondo S, Nielsen CH, Harvald EB, Faergeman NJ, Haley MJ, O'Connor KA, King-Jones K, O'Connor MB, Rewitz KF. (2016) A *Drosophila* Genome-Wide Screen Identifies Regulators of Steroid Hormone Production and Developmental Timing. *Dev Cell.* 37(6):558-70.
https://doi.org/10.1016/j.devcel.2016.05.015

19. Ohhara Y, Kobayashi S, **Yamanaka N**. (2017) Nutrient-Dependent Endocycling in Steroidogenic Tissue Dictates Timing of Metamorphosis in *Drosophila melanogaster*. *PLOS Genet.* 13(1):e1006583.
https://doi.org/10.1371/journal.pgen.1006583

20. Okamoto N, Viswanatha R, Bittar R, Li Z, Haga-Yamanaka S, Perrimon N, **Yamanaka N**. (2018) A Membrane Transporter Is Required for Steroid Hormone Uptake in *Drosophila*. *Dev Cell.* 47(3):294-305.e7.
https://doi.org/10.1016/j.devcel.2018.09.012

21. Ohhara Y, Kobayashi S, Yamakawa-Kobayashi K, **Yamanaka N**. (2018) Adult-specific insulin-producing neurons in *Drosophila melanogaster*. *J Comp Neurol.* 526(8):1351-1367.
https://doi.org/10.1002/cne.24410

22. Costa CP, Duennes MA, Fisher K, Der JP, Watrous KM, Okamoto N, **Yamanaka N**, Woodard SH. (2020) Transcriptome analysis reveals nutrition- and age-related patterns of gene expression in the fat body of pre-overwintering bumble bee queens. *Mol Ecol.* 29(4):720-737.
https://doi.org/10.1111/mec.15361

23. Okamoto N, **Yamanaka N**. (2020) Steroid Hormone Entry into the Brain Requires a Membrane Transporter in *Drosophila*. *Curr Biol.* 30(2):359-366.e3.
https://doi.org/10.1016/j.cub.2019.11.085

24. Costa CP, Fisher K, Guillén BM, **Yamanaka N**, Bloch G, Woodard SH. (2021) Care-giver identity impacts offspring development and performance in an annually social bumble bee. *BMC Ecol Evol.* 21(1):20.
https://doi.org/10.1186/s12862-021-01756-2

25. Sarro E, Sun P, Mauck K, Rodriguez-Arellano D, **Yamanaka N**, Woodard SH. (2021) An organizing feature of bumble bee life history: worker emergence promotes queen reproduction and survival in young nests. *Conserv Physiol.* 9(1):coab047.
https://doi.org/10.1093/conphys/coab047

26. Parks SC, Nguyen S, Nasrolahi S, Bhat C, Juncaj D, Lu D, Ramaswamy R, Dhillon H, Fujiwara H, Buchman A, Akbari OS, **Yamanaka N**, Boulanger MJ, Dillman AR. (2021) Parasitic nematode fatty acid- and retinol-binding proteins compromise host immunity by interfering with host lipid signaling pathways. *PLOS Pathog.* 17(10):e1010027.
https://doi.org/10.1371/journal.ppat.1010027

27. Hun LV, Okamoto N, Imura E, Maxson R, Bittar R, **Yamanaka N**. (2022) Essential functions of mosquito ecdysone importers in development and reproduction. *Proc Natl Acad Sci U S A.* 119(25):e2202932119.
https://doi.org/10.1073/pnas.2202932119

28. Masterson M, Bittar R, Chu H, **Yamanaka N**, Haga-Yamanaka S. (2022) Rapid Assessment of Insect Steroid Hormone Entry Into Cultured Cells. *Front Physiol.* 12:816058.
https://doi.org/10.3389/fphys.2021.816058

29. Costa CP, Okamoto N, Orr M, **Yamanaka N**, Woodard SH. (2022) Convergent Loss of Prothoracicotropic Hormone, A Canonical Regulator of Development, in Social Bee Evolution. *Front Physiol.* 13:831928.
https://doi.org/10.3389/fphys.2022.831928

30. Ohhara Y, **Yamanaka N**. (2022) Internal sensory neurons regulate stage-specific growth in *Drosophila*. *Development.* 149(21):dev200440.
https://doi.org/10.1242/dev.200440

Review Articles & Commentaries (7 total)

1. **Yamanaka N**, O'Connor MB. (2011) Nitric oxide directly regulates gene expression during *Drosophila* development: need some gas to drive into metamorphosis? *Genes Dev.* 25(14):1459-1463.
https://doi.org/10.1101/gad.2080411

2. **Yamanaka N**, O'Connor MB. (2011) Apiology: royal secrets in the queen's fat body. *Curr Biol.* 21(13):R510-512.
https://doi.org/10.1016/j.cub.2011.05.037

3. **Yamanaka N**, Rewitz KF, O'Connor MB. (2013) Ecdysone control of developmental transitions: lessons from *Drosophila* research. *Annu Rev Entomol.* 58:497-516.
https://doi.org/10.1146/annurev-ento-120811-153608

4. Okamoto N, **Yamanaka N**. (2015) Nutrition-dependent control of insect development by insulin-like peptides. *Curr Opin Insect Sci.* 11:21-30.
https://doi.org/10.1016/j.cois.2015.08.001

5. **Yamanaka N**. (2018) A novel molecular mechanism for steroid hormone secretion and its significance. *J Japanese Biochem Soc.* 90(1):90-93.
https://doi.org/10.14952/SEIKAGAKU.2018.900090

6. Okamoto N, **Yamanaka N**. (2021) Transporter-mediated ecdysteroid trafficking across cell membranes: A novel target for insect growth regulators. *J Pestic Sci.* 46(1):23-28.
https://doi.org/10.1584/jpestics.D20-071

7. **Yamanaka N**. (2024) Germ cell migration: Unexpected role of juvenile hormone before juvenile stages. *Curr Biol.* 34(3):R84-86.
https://doi.org/10.1016/j.cub.2023.12.026

Book Chapters (5 total)

1. Rewitz KF, **Yamanaka N**, O'Connor MB. (2013) Developmental checkpoints and feedback circuits time insect maturation. *Animal Metamorphosis.* Editor: Shi Yun-Bo. Academic Press. 103:1-33. https://doi.org/10.1016/B978-0-12-385979-2.00001-0
2. **Yamanaka N**, Okamoto N. (2020) Molecular Functions of Ecdysteroids in Insects. *Advances in Invertebrate (Neuro) Endocrinology.* Editors: Saber Saleuddin, Angela Lange, Ian Orchard. Apple Academic Press. 77-127. https://doi.org/10.1201/9781003029861
3. **Yamanaka N**. (2021) Ecdysteroid signalling in insects—From biosynthesis to gene expression regulation. *Advances in Insect Physiology*. Editor: Michael E. Adams. Academic Press. 60:1-36. https://doi.org/10.1016/bs.aiip.2021.03.002
4. **Yamanaka N**. (2021) Prothoracicotropic hormone. *Handbook of Hormones, 2nd Edition*. Editors: Hironori Ando, Kazuyoshi Ukena, Shinji Nagata. Academic Press. 2:739-741. https://doi.org/10.1016/B978-0-12-820649-2.00198-4
5. Okamoto N, Fujinaga D, **Yamanaka N**. (2023) Steroid hormone signaling: What we can learn from insect models. *Vitamins and Hormones*. Editor: Gerald Litwack. Academic Press. 123:525-554. https://doi.org/10.1016/bs.vh.2022.12.006

Patents:

Active

US10228380B2 Issued 03/12/2019
Inventors: **Yamanaka N**, Yamanaka S, Okamoto N, Bittar R.
Methods for targeting membrane steroid transporters