

## ***Developmental Biology* 13e, Chapter 25 Literature Cited**

Abouheif, E. 2021. Ant caste evo-devo: It's not all about size. *Trends. Ecol. Evol.* 36: 668–670.

Agrawal, A. A., C. Laforsch and R. Tollrian. 1999. Transgenerational induction of defenses in animals and plants. *Nature* 401: 60–63.

Ardeshir, A. and 8 others. 2014. Breast-fed and bottle-fed infant rhesus macaques develop distinct gut microbiotas and immune systems. *Sci. Transl. Med.* 6: 252r120.

Baker, B. H., L. J. Berg and S. E. Sultan. 2018. Context-dependent developmental effects of parental shade versus sun are mediated by DNA methylation. *Front. Plant Sci.* 9: 1251.

Ball, E. E. and 6 others. 2002. Coral development: From classical embryology to molecular control. *Int. J. Dev. Biol.* 46: 671–678.

Bates, J. M., E. Mittge, J. Kuhlman, K. N. Baden, S. E. Cheesman and K. Guilemin. 2006. Distinct signals from the microbiota promote different aspects of zebrafish gut differentiation. *Dev. Biol.* 297: 374–386.

Bateson, P. and P. Gluckman. 2011. *Plasticity, Robustness, Development, and Evolution*. Cambridge University Press, Cambridge.

Batstone, R.T., A. M.O'Brien, T. L. Harrison and M. E. Frederickson ME. 2020. Experimental evolution makes microbes more cooperative with their local host genotype. *Science* 370: 476–478.

Beldade, P., A. R. Mateus and R. A. Keller. 2011. Evolution and molecular mechanisms of adaptive developmental plasticity. *Mol. Ecol.* 20: 1347–1363.

Bell, D. A. and S. E. Sultan. 1999. Dynamic phenotypic plasticity for root growth in *Polygonum*: A comparative study. *Am. J. Bot.* 86: 807–819.

Bennett, G. M. and N. A. Moran. 2015. Heritable symbiosis: The advantages and perils of an evolutionary rabbit hole. *Proc. Natl. Acad. Sci. USA* 112: 10169–10176.

Bonamour, S., L.-M. Chevin, A. Charmantier and C. Teplitsky. 2019. Phenotypic plasticity in response to climate change: the importance of cue variation. *Philos. Trans. Royal Soc. B* 374: 20180178.

Boorse, G. C. and R. J. Denver. 2003. Endocrine mechanisms underlying plasticity in metamorphic timing in spadefoot toads. *Integr. Comp. Biol.* 43: 646–657.

Booth, M. G. 2004. Mycorrhizal networks mediate overstorey-understorey competition in a temperate forest. *Ecol. Lett.* 7: 538–546.

Brakefield, P. M. and W. A. Frankino. 2009. Polyphenisms in Lepidoptera: Multidisciplinary approaches to studies of evolution. In *Phenotypic Plasticity in Insects: Mechanisms and Consequences*. Science Publishers, Plymouth, MA, pp. 281–312.

Brakefield, P. M. and N. Reitsma. 1991. Phenotypic plasticity, seasonal climate, and the population biology of *Bicyclus* butterflies (Satyridae) in Malawi. *Ecol. Entomol.* 16: 291–303.

Brakefield, P. M. and 7 others. 1996. Development, plasticity, and evolution of butterfly eyespot patterns. *Nature* 384: 236–242.

Bravo, J. A. and 7 others. 2011. Ingestion of *Lactobacillus* strain regulates emotional behavior and central GABA receptor expression in a mouse via the vagus nerve. *Proc. Natl. Acad. Sci. USA* 108: 16050–16055.

Bry, L., P. G. Falk and J. L. Gordon. 1996. Genetic engineering of carbohydrate biosynthetic pathways in transgenic mice demonstrates cell cycle-associated regulation of glycoconjugate production in small intestinal epithelial cells. *Proc. Natl. Acad. Sci. USA* 93: 1161–1166.

Buffington, S. A., G. V. Di Prisco, T. A. Auchtung, N. J. Ajami, J. F. Petrosino and M. Costa-Mattioli. 2016. Microbial reconstitution reverses maternal diet-induced social and synaptic deficits in offspring. *Cell* 165: 1762–1775.

- Buerger, P. and 7 others. 2020. Heat-evolved microalgal symbionts increase coral bleaching tolerance. *Sci. Adv.* 6: eaba2498.
- Burgess, M. D. and 15 others. 2018. Tritrophic phenological match-mismatch in space and time. *Nat. Ecol. Evol.* 2: 970–975.
- Burns, J., H. Zhang, E. Hill, E. Kim and R. R. Kerney. 2017. Transcriptome analysis illuminates the nature of the intracellular interaction in a vertebrate-algal symbiosis. *eLife* 6: e22054.
- Caldwell, M. S., J. G. McDaniel and K. M. Warkentin. 2009. Frequency information in the vibration-cued escape hatching of red-eyed treefrogs. *J. Exp. Biol.* 212: 566–575.
- Cameron, D. D., I. Johnson, D. J. Read and J. R. Lenke. 2008. Giving and receiving: Measuring the carbon cost in the green orchid, *Goodyera repens*. *New Phytol.* 180: 176–184.
- Carlo, M. A., E. A. Riddell, O. Levy and M. W. Sears. 2018. Recurrent sublethal warming reduces embryonic survival, inhibits juvenile growth, and alters species distribution projections under climate change. *Ecol. Lett.* 21: 104–116.
- Cebra, J. J. 1999. Influences of microbiota on intestinal immune system development. *Am. J. Clin. Nutr.* 69[Supplement]: 1046S–1051S.
- Charnov, E. L. and J. J. Bull. 1977. When is sex environmentally determined? *Nature* 266: 828–830.
- Chiu, L. and S. F. Gilbert. 2015. The birth of the holobiont: Multi-species birthing through mutual scaffolding and niche construction. *Biosemiotics* 8: 191–210.
- Chun, C. K. and 12 others. 2008. Effects of colonization, luminescence, and autoinducer on host transcription during development of the squid-*Vibrio* association. *Proc. Natl. Acad. Sci. USA* 105: 11323–11328.

Chung, H. and 14 others. 2012. Gut immune maturation depends on colonization with a host-specific microbiota. *Cell* 149: 1578–1593.

Clarke, G. and 7 others. 2013. The microbiome-gut-brain axis during early life regulates the hippocampal serotonergic system in a sex-dependent manner. *Mol. Psychiatry* 18: 666–673.

Collins, J., R. Borojevic, E. F. Verdu, J. D. Huizinga and E. M. Ratcliffe. 2014. Intestinal microbiota influence the early postnatal development of the enteric nervous system. *Neurogast. Motil.* 26: 98–107.

Conover, D. O. and S. W. Heins. 1987. Adaptive variation in environmental and genetic sex determination in a fish. *Nature* 326: 496–498.

Cordaux, R., A. Michel-Salzat, M. Frelon-Raimond, T. Rigaud and D. Bouchon. 2004. Evidence for a new feminizing *Wolbachia* strain in the isopod *Armadillidium vulgare*: Evolutionary implications. *Heredity* 93: 78–84.

Corinaldisi, C., F. Marcellini, E. Nepote, E. Damiani and R. Danovaro. 2018. Impact of inorganic UV filters contained in sunscreen products on tropical stony corals (*Acropora* spp.). *Sci. Total Environ.* 638: 1279–1285.

Crews, D. and J. J. Bull. 2009. Mode and tempo in environmental sex determination in vertebrates. *Semin. Cell Dev. Biol.* 20: 251–255.

Cruz, D. W. D. and P. L. Harrison. 2017. Enhanced larval supply and recruitment can replenish corals on degraded reefs. *Sci. Rep.* 7(1): 13985.

Cryan, J. F. and 32 others. 2019. The microbiota-gut-brain axis. *Physiol. Rev.* 99: 1877–2013.

De Vadder, F. and 6 others. 2018. Gut microbiota regulates maturation of the adult enteric nervous system via enteric serotonin networks. *Proc Natl Acad Sci USA* 115: 6458–6463.

Dedeine, F., F. Vavre, F. Fleury, B. Loppin, M. E. Hochberg and Boulétreau. 2001. Removing symbiotic *Wolbachia* bacteria specifically inhibits oogenesis in a parasitic wasp. *Proc. Natl. Acad. Sci. USA* 98: 6247–6252.

Denver, R. J., N. Mirhadi and M. Phillips. 1998. Adaptive plasticity in amphibian metamorphosis: Response of *Scaphiopus hammondi* tadpoles to habitat desiccation. *Ecology* 79: 1859–1872.

Diaz Heijtz, R. D. and 8 others. 2011. Normal gut microbiota modulates brain development and behavior. *Proc. Natl. Acad. Sci. USA* 108: 3047–3052.

Duan, J., H. Chung, E. Troy, and D. L. Kasper. 2010. Microbial colonization drives expansion of IL-1 receptor 1-expressing and IL-17-producing gamma/delta T cells. *Cell Host Microbe* 7: 140–150.

Durant, C., John. M. R. and Hammond. 2019. Male ants are pretty much flying sperm (and other amazing ant facts). *Popular Science* June 20, 2019.

Emlen, D. J. 1997. Alternative reproductive tactics and male dimorphism in the horned beetle *Onthophagus acuminatus* (Coleoptera: Scarabaeidae). *Behavior. Ecol. Sociobiol.* 41: 335–341.

Emlen, D. J. 2000. Integrating development with evolution: A case study with beetle horns. *BioScience* 50: 403–418.

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Emlen, D. J. and H. F. Nijhout. 1999. Hormonal control of male horn length dimorphism in the dung beetle *Onthophagus taurus* (Coleoptera: Scarabaeidae). *J. Insect Physiol.* 45: 45–53.

Fast, E. M., M. E. Toomey, K. Panaram, D. Desjardins, E. D. Kolaczyk and H. M. Frydman. 2011. *Wolbachia* enhance *Drosophila* stem cell proliferation and target the germline stem cell niche. *Science* 334: 990–992.

Ferguson, M. W. J. and T. Joanen. 1982. Temperature of egg incubation determines sex in *Alligator mississippiensis*. *Nature* 296: 850–853.

- Ferree, P. M., H. M. Frydman, J. M. Li, J. Cao, E. Wieschhaus and W. Sullivan. 2005. *Wolbachia* utilizes host microtubules and dynein for anterior localization in the *Drosophila* oocyte. *PLoS Pathog* 1: e14. doi:10.1371/journal.ppat.0010014
- Freckelton, M. L., B. T. Nedved and M. G. Hadfield. 2017. Induction of invertebrate larval settlement; different bacteria, different mechanisms? *Science Rep.* 7: 42557.
- Frost, S. D. W. 1999. The immune system as an inducible defense. In R. Tollrian and C. D. Harvell (eds.), *The Ecology and Evolution of Inducible Defenses*. Princeton University Press, Princeton, NJ, pp. 104–126.
- Funkhouser, L. J. and S. R. Bordenstein. 2013. Mom knows best: The universality of maternal microbial transmission. *PLOS Biol* 11: e1001631.
- Genre, A., L. Lanfranco, S. Perotto and P. Bonfante. 2020. Unique and common traits in mycorrhizal symbioses. *Nat. Rev. Microbiol.* 18: 649-660.
- Ghahremani, M. and A. M. MacLean. 2021. Home sweet home: How mutualistic microbes modify root development to promote symbiosis. *J Exp Bot.* 72: 2275–2287.
- Gilbert, P. W. 1944. The alga-egg relationship in *Ambystoma maculatum*: A case of symbiosis. *Ecology* 25: 366–369.
- Gilbert S. F. 2014. A holobiont birth narrative: Epigenetic transmission of the human microbiome. *Front. Genet.* 5: 282.
- Gilbert, S. F. 2021. Evolutionary developmental biology and sustainability: A biology of resilience. *Evol. Devel.* 23: 273–291.
- Gilbert, S. F. and D. Epel. 2015. *Ecological Developmental Biology: The Environmental Regulation of Development, Health, and Evolution*. New York: Oxford University Press.
- Gilbert, S. F., J. Sapp and A. I. Tauber. 2012. A symbiotic view of life: We have never been individuals. *Q. Rev. Biol.* 87: 325–341.
- Gilbert, S. F., T. C. Bosch and C. Ledón-Rettig. 2015. Eco-Evo-Devo: Developmental symbiosis and developmental plasticity as evolutionary agents. *Nature Rev. Genet.* 16:

611–622.

Gray, S. B. and S. M. Brady. 2016. Plant developmental responses to climate change. *Dev. Biol.* 419: 64–77.

Greene, E. 1989. A diet-induced developmental polymorphism in a caterpillar. *Science* 243: 643–646.

Hadfield, M. G. 1977. Metamorphosis in marine molluscan larvae: An analysis of stimulus and response. In R.-S. Chia and M. E. Rice (eds.), *Settlement and Metamorphosis of Marine Invertebrate Larvae*. Elsevier, New York, pp. 165–175.

Hadfield, M. G. 2011. Biofilms and marine invertebrate larvae: What bacteria produce that larvae use to choose settlement sites. *Annu. Rev. Mar. Sci.* 3: 453–470.

Hanna, L. and E. Abouheif. 2021. The origin of wing polyphenism in ants: An eco-evo-devo perspective. *Curr Top Dev Biol.* 141: 279–336.

Hill, J. F., E. A. Franzosa, C. Huttenhower and K. Guillemin. 2016. A conserved bacterial protein induces pancreatic beta cell expansion during zebrafish development. *eLife* 5: e20145

Hill, J. H. and 12 others. 2022. BefA, a microbiota-secreted membrane disrupter, disseminates to the pancreas and increases  $\beta$  cell mass. *Cell Metab.* 34: 1779–1791.e9

Hoegh-Guldberg, O. and 6 others. 2015. Reviving the ocean economy: The case for action. World Wildlife Fund.

Hooper, L. V., L. Bry, P. G. Falk and J. I. Gordon. 1998. Host-microbial symbiosis in the mammalian intestine: Exploring an internal ecosystem. *BioEssays* 20: 336–343.

Hooper, L. V., M. H. Wong, A. Thelin, L. Hansson, P. G. Falk and J. I. Gordon. 2001. Molecular analysis of commensal host-microbial relationships in the intestine. *Science* 291: 881–884.

Hu, Y., D. M. Linz and A. P. Moczek. 2019. Beetle horns evolved from wing serial homologs. *Science* 366: 1004–1007.

Hughes, T. P. and 45 others. 2017. Global warming and recurrent mass bleaching of corals. *Nature* 543: 373–377.

IPCC (Intergovernmental Panel on Climate Change). 2014. *Climate Change 2014. Synthesis Report*, Core Writing Team. P. K. Pachauri and L. Meyer, eds., Geneva Intergovernmental Panel on Climate Change.

Janzen, F. J. and G. L. Paukstis. 1991. Environmental sex determination in reptiles: Ecology, evolution, and experimental design. *Q. Rev. Biol.* 66: 149–179.

Jensen, M. P. and 7 others. 2018. Environmental warming and feminization of one of the largest sea turtle populations in the world. *Curr. Biol.* 28: 154–159.

Kamakura, M. 2011. Royalactin induces queen differentiation in honeybees. *Nature* 473: 478–483.

Kelly, M. 2019. Adaptation to climate change through genetic accommodation and assimilation of plastic phenotypes. *Philos. Trans. Royal Soc. B* 374: 20180176.

Kerney, R., E. Kim, R. P. Hangarter, A. A. Heiss, C. D. Bishop and B. K. Hall. 2011. Intracellular invasion of green algae in a salamander host. *Proc. Natl. Acad. Sci. USA* 108: 6497–6502.

Kimura I., and 24 others. 2020. Maternal gut microbiota in pregnancy influences offspring metabolic phenotype in mice. *Science* 367: eaaw8429.

Koren, O. and 13 others. 2012. Host remodeling of the gut microbiome and metabolic changes during pregnancy. *Cell* 150: 470–480.

Koropatnick, T. A., J. T. Engle, M. A. Apicella, E. V. Stabb, W. E. Goldman and M. J. McFall-Ngai. 2004. Microbial factor-mediated development in a host-bacterial mutualism. *Science* 306: 1186–1188.



Krueger, D. M., R. G. Gustafson and C. M. Cavanaugh. 1996. Vertical transmission of chemoautotrophic symbionts in the bivalve *Solemya velum* (Bivalvia: Protobranchia). *Biol. Bull.* 190: 195–202.

Kucharski, R., J. Maleszka, S. Foret and R. Maleszka. 2008. Nutritional control of reproductive status in honeybees via DNA methylation. *Science* 319: 1827–1830.

LaJeunesse, T. C. and 6 others. 2018. Systematic revision of symbiodiniaceae highlights the antiquity and diversity of coral endosymbionts. *Curr. Biol.* 28: 2570–2580.

Landmann, F., J. M. Foster, M. L. Michalski, B. E. Slatko and W. Sullivan. 2014. Co-evolution between a nematode and its nematode host: *Wolbachia* asymmetric localization and A-P polarity establishment. *PLoS Negl. Diseases.* 8: e3096.

Liang, P. and 11 others. 2021. Formin-mediated bridging of cell wall, plasma membrane, and cytoskeleton in symbiotic infections of *Medicago truncatula*. *Curr. Biol.* 31: 2712–2719.e5

Lillicrop, K. A., E. S. Phillips, A. A. Jackson, M. A. Hanson and G. C. Burdge. 2005. Dietary protein restriction of pregnant rats induces and folic acid supplementation prevents epigenetic modification of hepatic gene expression in the offspring. *J. Nutrition* 135: 1382–1386.

Liu, E. T., S. Pott and M. Huss. 2010. Q&A: ChIP-seq technologies and the study of gene regulation. *BMC Biol.* 8: 56.

Lyko, F., S. Foret, R. Kucharski, S. Wolf, C. Falckenhayn and R. Maleszka. 2010. The honey bee epigenomes: Differential methylation of brain DNA in queens and workers. *PLoS Biol.* 8: e1000506.

Margulis, L. 1971. *Origin of Eukaryotic Cells*. Yale University Press, New Haven.

Martin, F., A. Kohler and S. Duplessis. 2007. Living in harmony in the wood underground: Ectomycorrhizal genomics. *Curr. Opin. Plant Biol.* 10: 204–210.

Mazmanian, S. K., C. H. Liu, A. O. Tzianabos and D. L. Kaspar. 2005. An immunomodulatory molecule of symbiotic bacteria directs maturation of the host

immune system. *Cell* 122: 107–108.

McCollum, S. A. and J. Van Buskirk. 1996. Costs and benefits of a predator induced polyphenism in the gray treefrog *Hyla chrysoscelis*. *Evolution* 50: 583–593.

McFall-Ngai, M. J. 2002. Unseen forces: The influence of bacteria on animal development. *Dev. Biol.* 242: 1–14.

McFall-Ngai, M. 2008a. Host-microbe symbiosis: The squid-*Vibrio* association, a naturally occurring, experimental model of animal-bacterial partnerships. *Adv. Exp. Med. Biol.* 635: 102–112.

McFall-Ngai, M. 2008b. Hawaiian bobtail squid. *Curr. Biol.* 22: R1043–R1044.

McFall-Ngai, M. J. 2014. The importance of microbes in animal development: Lessons from the squid-*Vibrio* symbiosis. *Annu. Rev. Microbiol.* 68:177–194.

McFall-Ngai, M. and T. C. G. Bosch. 2021. Animal development in the microbial world: The power of experimental model systems. *Curr Top Dev Biol.* 141: 371–397.

McFall-Ngai, M. J. and 25 others. 2013. Animals in a bacterial world: A new imperative for the life sciences. *Proc. Natl. Acad. Sci. USA* 110: 3229–3236.

Middlemis Maher, J., E. E. Werner and R. J. Denver. 2013. Stress hormones mediate predator-induced phenotypic plasticity in amphibian tadpoles. *Proc. Biol. Sci.* 280: 20123075.

Miller, D., J. Summers and S. Silber. 2004. Environmental versus genetic sex determination: A possible factor in dinosaur extinction? *Fertil. Steril.* 81: 954–964.

Mills, N. E. and M. C. Barnhart. 1999. Effects of hypoxia on embryonic development in two *Ambystoma* and two *Rana* species. *Physiol. Biochem. Zool.* 72: 179–188.

Moczek, A. P. 2005. The evolution of development of novel traits, or how beetles got their horns. *BioScience* 55: 937–951.

Moczek, A. P. and D. J. Emlen. 2000. Male horn dimorphism in the scarab beetle *Onthophagus taurus*: Do alternative tactics favor alternative phenotypes? *Anim. Behav.* 59: 459–466.

Montgomery, M. K. and M. J. McFall-Ngai. 1995. The inductive role of bacterial symbionts in the morphogenesis of a squid light organ. *Am. Zool.* 35: 372–380.

Morais, L. H., H. L. Schreiber 4th and S. K. Mazmanian. 2021. The gut microbiota-brain axis in behaviour and brain disorders. *Nature Rev Microbiol.* 9: 241–255.

Moriano-Gutierrez, S., E. G. Ruby and M. J. McFall-Ngai. 2021. MicroRNA-mediated regulation of initial host responses in a symbiotic organ. *mSystems* 6: e00081-21.

Motta, E. V. S., K. Raymann and N. A. Moran. 2018. Glyphosate perturbs the gut microbiota of honey bees. *Proc Natl Acad Sci USA* 115: 10305–10310.

Mroue, S., A. Simeunovic and H. S. Robert. 2018. Auxin production as an integrator of environmental cues for developmental growth regulation. *J. Exp. Bot.* 69: 201–212.

Muscatine, L., P. G. Falkowski, J. W. Porter, Z. Dubinsky and D. C. Smith. 1984. Fate of photosynthetic fixed carbon in light- and shade-adapted colonies of the symbiotic coral *Stylophora pistillata*. *Proc. R. Soc. London Series B* 222: 181–202.

Newman, R. A. 1989. Developmental plasticity of *Scaphiopus couchii* tadpoles in an unpredictable environment. *Ecology* 70: 1775–1787.

Newman, R. A. 1992. Adaptive plasticity in amphibian metamorphosis. *BioScience* 42: 671–678.

Niess, J. H., F. Leithäuser, G. Adler and J. Reimann. 2008. Commensal gut flora drives the expansion of proinflammatory CD4 T cells in the colonic lamina propria under normal and inflammatory conditions. *J. Immunol.* 180: 559–568.

Nijhout, H. F. 1999. When developmental pathways diverge. *Proc. Natl. Acad. Sci. USA* 96: 5348–5350.

Nijhout, H. F. 2019. Larval development: Making ants into soldiers. *Curr Biol.* 29: R32-R34.

Nyholm, S. V., E. V. Stabb, E. G. Ruby and M. J. McFall-Ngai. 2000. Establishment of an animal-bacterial association: Recruiting symbiotic *Vibrios* from the environment. *Proc. Natl. Acad. Sci. USA* 97: 10231–10235.

Ohnmacht, C. and 17 others. 2015. Mucosal immunology. The microbiota regulates type 2 immunity through ROR $\gamma$ <sup>+</sup> T cells. *Science* 349: 989–993.

Olivier, H. M. and B. R. Moon. 2010. The effects of atrazine on spotted salamander embryos and their symbiotic alga. *Ecotoxicology*. Online at doi:10.1007/s10646-009-0437-8.

Olofsson, M., A. Vallin, S. Jakobsson and C. Wiklund. 2010. Marginal eyespots on butterfly wings deflect bird attacks under low light intensities with UV wavelengths. *PLoS One* 5(5): e10798.

Olszak, T. and 10 others. 2012. Microbial exposure during early life has persistent effects on natural killer T cell function. *Science* 336: 489–493.

Oostra, V. and 7 others. 2014. Ecdysteroid hormones link the juvenile environment to alternative adult life histories in a seasonal insect. *Amer. Nat.* 184: E79–E92.

Osborne, S. E., Y. S. Leong, S. L. O'Neill and K. N. Johnson. 2009. Variation in antiviral protection mediated by different *Wolbachia* strains in *Drosophila simulans*. *PLoS Pathol.* 5: e1000656.

Pannebakker, B. A., B. Loppin, C. P. Elemans, L. Humblot and F. Vavre. 2007. Parasitic inhibition of cell death facilitates symbiosis. *Proc. Natl. Acad. Sci. USA* 104: 213–215.

- Pechenik, J. A., D. E. Wendt and J. N. Jarrett. 1998. Metamorphosis is not a new beginning. *BioScience* 48: 901–910.
- Perotto, S. and 8 others. 2014. Gene expression in mycorrhizal orchid protocorms suggest a friendly plant-fungus relationship. *Planta* 239: 1337–1349.
- Pfennig, D. W. 2021. Key questions about phenotypic plasticity. In *Phenotypic Plasticity and Evolution: Causes, Consequences, and Controversies*. D. W. Pfennig (Ed.). CRC Press, New York, pp. 55–90.
- Philip, L., S. Simard and M. Jones. 2011. Pathways for below-ground carbon transfer between paper birch and Douglas-fir seedlings. *Plant Ecol. Divers.* 3: 221–233.
- Prud'homme, B. and N. Gompel. 2012. Evolution: Return of the ant supersoldiers. *Curr Biol.* 22: R165–167.
- Prudic, K. L., A. M. Stoehr, B. R. Wasik and A. Monteiro. 2015. Eyespots deflect predator attack increasing fitness and promoting the evolution of phenotypic plasticity. *Proc. R. Soc. Lond. Biol. Sci.* 282: 20141531.
- Pull, S. L., J. M. Doherty, J. C. Mills, J. I. Gordon and T. S. Stappenbeck. 2005. Activated macrophages are an adaptive element of the colonic epithelial progenitor niche necessary for regenerative responses to injury. *Proc. Natl. Acad. Sci. USA* 102: 99–104.
- Qin, J. and 52 others. 2010. A human gut microbial gene catalogue established by metagenomic sequencing. *Nature* 464: 59–65.
- Rädecker, N. and 11 others. 2021. Heat stress destabilizes symbiotic nutrient cycling in corals. *Proc Natl Acad Sci USA* 118: e2022653118.
- Rajakumar, R. and 8 others. 2012. Ancestral developmental potential facilitates parallel evolution in ants. *Science* 335: 79–82.
- Rajakumar, R. and 9 others. 2018. Social regulation of a rudimentary organ generates complex worker-caste systems in ants. *Nature* 562: 574–577.

Rawls, J. F., B. S. Samuel and J. I. Gordon. 2004. Gnotobiotic zebrafish reveal evolutionarily conserved responses to the gut microbiota. *Proc. Natl. Acad. Sci. USA* 101: 4596–4601.

Rawls, J. F., M. A. Mahowald, R. E. Ley and J. I. Gordon. 2006. Reciprocal gut microbiota transplants from zebrafish and mice to germ-free recipients reveal host habitat selection. *Cell* 127: 423–433.

Relyea, R. A. 2003a. Predators come and predators go: The reversibility of predator-induced traits. *Ecology* 84: 1840–1848.

Relyea, R. A. 2003b. Predator cues and pesticides: A double dose of danger for amphibians. *Ecolog. Applic.* 13: 1515–1521.

Relyea, R. A. 2004. Synergistic impacts of malathion and predatory stress on six species of North American tadpoles. *Exper. Toxicol. Chem.* 23: 1080–1084.

Reshef, L., O. Koren, Y. Loya, I. Zilber-Rosenberg and E. Rosenberg. 2006. The coral probiotic hypothesis. *Env. Microbiol.* 8: 2068–2073.

Rhee, K.-J., P. Sethupathi, A. Driks, D. K. Lanning and K. L. Knight. 2004. Role of commensal bacteria in development of gut-associated lymphoid tissues and the pre-immune repertoire. *J. Immunol.* 172: 1118–1124.

Richmond, R. H. 1987. Energetics, competency, and long-distance dispersal of planula larvae of the coral *Pocillopora damicornis*. *Marine Biology* 93: 527–533.

Romney, A. L. T., E. M. Davis, M. M. Corona, J. T. Wagner and J. E. Podrabsky. 2018. Temperature-dependent vitamin D signaling regulates developmental trajectory associated with diapause in an annual killifish. *Proc. Natl. Acad. Sci. USA* 115: 12763–12768.

Rook, G. A. and J. L. Stanford. 1998. Give us this day our daily germs. *Immunol. Today* 19: 113–116.

Rosenberg, E., O. Koren, L. Reshef, R. Efrony, and I. Zilber-Rosenberg. 2007. The role of microorganisms in coral health, disease and evolution. *Nature Rev. Microbiol.* 5: 355–

Sapp, J. 1994. *Evolution by Association: A History of Symbiosis*. Oxford University Press, New York.

Schmalhausen, I. I. 1949. *Factors of Evolution: The Theory of Stabilizing Selection*. University of Chicago Press, Chicago.

Schwarz, J. A., D. A. Krupp and V. M. Weis. 1999. Late larval development and onset of symbiosis in the scleractinian coral *Fungia scutaria*. *The Biological Bulletin* 196: 70–79.

Selosse, M. A., F. Richard, X. He and S. W. Simard. 2006. Mycorrhizal networks: Les liaisons dangereuses? *Trends Ecol. Evol.* 21: 621–628.

Sharon, G., T. R. Sampson, D. H. Geschwind and S. K. Mazmanian. 2016. The central nervous system and the gut microbiome. *Cell* 167: 915–930.

Sherwin, E., S. R. Bordenstein, J. L. Quinn, T. G. Dinan and J. F. Cryan. 2019. Microbiota and the social brain. *Science* 366: eaar2016.

Sifuentes-Romero, I., B. M. Tezak, S. L. Milton and J. Wyneken. 2018. Hydric environmental effects on turtle development and sex ratio. *Zoology (Jena)* 126: 89–97.

Simard, S. W., D. A. Perry, M. D. Jones, D. D. Myrold, D. M. Durall and R. Molina. 1997. Net transfer of carbon between ectomycorrhizal trees in the field. *Nature* 388: 579–582.

Song, H., O. H. Hewitt and S. M. Degnan. 2021. Arginine biosynthesis by a bacterial symbiont enables nitric oxide production and facilitates larval settlement in the marine-sponge host. *Curr. Biol.* 31: 433–437.e3.

Song, Y. Y., R. S. Zeng, J. F. Xu, J. Li, X. Shen and W. G. Yihdego. 2010. Interplant communication of tomato plants through underground common mycorrhizal networks. *PLoS ONE* 5: e13324.

Stappenbeck, T. S., L. V. Hooper and J. I. Gordon. 2002. Developmental regulation of intestinal angiogenesis by indigenous microbes via Paneth cells. *Proc. Natl. Acad. Sci. USA* 99: 15451–15455.

Stearns, S. C., G. de Jong and R. A. Newman. 1991. The effects of phenotypic plasticity on genetic correlations. *Trends Ecol. Evol.* 6: 122–126.

Steidler, L. 2001. Microbiological and immunological strategies for treatment of inflammatory bowel disease. *Microbes Infect.* 3: 1157–1166.

Stilling, R. M., S. R. Bordenstein, T. G. Dinan and J. F. Cryan. 2014. Friends with social benefits: Host-microbe interactions as a driver of brain evolution and development? *Front. Cell. Infect. Microbiol.* 4: 147.

Sultan, S. E. 2015. *Organism and Environment: Ecological Development, Niche Construction and Adaptation*. London: Oxford University Press.

Sultan, S. E. 2017. Developmental plasticity: Re-conceiving the genotype. *Interface Focus* 7: 20170009.

Sultan, S. E. 2021. Phenotypic plasticity as an innate property of organisms. In *Phenotypic Plasticity and Evolution: Causes, Consequences, and Controversies*. D. W. Pfennig (Ed.). CRC Press, New York, pp. 3–25.

Suter, A. H. 2002. Construction noise: Exposure, effects, and the potential for remediation: A review and analysis. *AIHA J* 63: 768–789.

Suzuki, Y., K. Z. McKenna and H. F. Nijhout. 2020. Regulation of phenotypic plasticity from the perspective of evolutionary developmental biology. In *Phenotype Switching: Implications in Biology and Medicine*. Academic Press, New York. Pp. 403–442.

Teixeira, L., A. Ferreira and M. Ashburner. 2008. The bacterial symbiont *Wolbachia* induces resistance to RNA viral infections in *Drosophila melanogaster*. *PLoS Biol.* 6: e2.

Theis, K. R. and 14 others. 2016. Getting the hologenome concept right: An eco-evolutionary framework for hosts and their microbiomes. *mSystems* e00028-16.

Tong, D., N. S. Rozas, T. H. Oakley, J. Mitchell, N. J. Colley and M. J. McFall-Ngai. 2009. Evidence for light perception in a bioluminescent organ. *Proc. Natl. Acad. Sci. USA* 106: 9836–9841.



- Troll, J. V. and 6 others. 2010. Taming the symbiont for coexistence: A host PGRP neutralizes a bacterial symbiont toxin. *Environ. Microbiol.* 12: 2190–2203.
- Turner, E. J., R. K. Zimmer-Faust, M. A. Palmer, M. Luchenbach and N. D. Pentcheff. 1994. Settlement of oyster (*Crassostrea virginica*) larvae: Effects of waterflow and a water-soluble chemical cue. *Limnol. Oceanograph.* 39: 1579–1593.
- Umesaki, Y. 1984. Immunohistochemical and biochemical demonstration of the change in glycolipid composition of the intestinal epithelial cell surface in mice in relation to epithelial cell differentiation and bacterial association. *J. Histochem. Cytochem.* 32: 299–304.
- Van Buskirk, J. and R. A. Relyea. 1998. Selection for phenotypic plasticity in *Rana sylvatica* tadpoles. *Biol. J. Linn. Soc.* 65: 301–328.
- van Heerwaarden, B. and C. M. Sgrò. 2021. Male fertility thermal limits predict vulnerability to climate warming. *Nat. Commun.* 12: 2214.
- van Oppen, M. J. H. and 21 others. 2017. Shifting paradigms in restoration of the world's coral reefs. *Global Change Biology* 23: 3437–3448.
- Visser, M. E. 2005. Keeping up with a warming world: Assessing the rate of adaptation to climate change. *Proc. R Soc. B* 275: 649–659.
- Vuong, H. E. and 9 others. 2020. The maternal microbiome modulates fetal neurodevelopment in mice. *Nature* 586: 281–286.
- Wampach, L. and 16 others. 2018. Birth mode is associated with earliest strain-conferred gut microbiome functions and immunostimulatory potential. *Nat. Commun.* 9: 5091.
- Warkentin, K. M. 2005. How do embryos assess risk? Vibrational cues in predator-induced hatching of red-eyed treefrogs. *Anim. Behav.* 70: 59–71.
- Warkentin, K. M., M. S. Caldwell and J. G. McDaniel. 2006. Temporal pattern cues in vibrational risk assessment by embryos of the red-eyed treefrog, *Agalychnis callidryas*. *J. Exp. Biol.* 209: 1376–1384.

- Waterland, R. A. and R. L. Jirtle. 2003. Transposable elements: Targets for early nutritional effects of epigenetic gene regulation. *Mol. Cell. Biol.* 23: 5293–5300.
- Waterman, R. J. and M. I. Bidartando. 2008. Deception above, deception below: Linking pollination and mycorrhizal biology of orchids. *J. Exp. Botany* 59: 1085–1096.
- Weber, C. and 6 others. 2020. Temperature-dependent sex determination is mediated by pSTAT3 repression of Kdm6b. *Science* 368: 303–306.
- Weiss, L. C. and 11 others. 2018. Identification of *Chaoborus* kairomone chemicals that induce defences in *Daphnia*. *Nature Chem. Biol.* 14: 1133–1139.
- West-Eberhard, M. J. 2003. *Developmental Plasticity and Evolution*. Oxford University Press, New York.
- Wheeler, D. E. and H. F. Nijhout. 1981. Soldier determination in ants: New role for juvenile hormone. *Science* 213: 361–363.
- Woltereck, R. 1909. Weitere experimentelle Untersuchungen über Artveränderung, speziell über das Wesen quantitativer Artunterscheide bei Daphniden. *Versuch. Deutsch. Zool. Ges.* 1909: 110–172.
- Woodward, D. E. and J. D. Murray. 1993. On the effect of temperature-dependent sex determination on sex ratio and survivorship in crocodylians. *Proc. R. Soc. Lond. B* 252: 149–155.
- Xu, J. and J. I. Gordon. 2003. Honor thy symbionts. *Proc. Natl. Acad. Sci. USA* 100: 10452–10459.
- Zardus, J. D., B. T. Nedved, Y. Huang, C. Tran and M. G. Hadfield. 2008. Microbial biofilms facilitate adhesion in biofouling invertebrates. *Biol. Bull.* 214: 91–98.
- Zivkovic, A. M., J. B. German, C. B. Lebrilla and D. A. Mills. 2011. Human milk glycomiome and its impact on the infant gastrointestinal microbiota. *Proc. Natl. Acad. Sci. USA* 108 Suppl 1: 4653–4658.