

Developmental Biology 13e, Chapter 26 Literature Cited

Abouheif, E., M. J. Favé, A. S. Ibarrarán-Viniegra, M. P. Lesoway, A. M. Rafiqi and R. Rajakumar. 2014. Eco-evo-devo: The time has come. *Adv. Exp. Med. Biol.* 781: 107–125.

Abramovich, C., N. Pineault, H. Ohta and R. K. Humphries. 2005. Hox genes: From leukemia to hematopoietic stem cell expansion. *Ann. N.Y. Acad. Sci.* 1044: 109–116.

Abzhanov, A. and T. C. Kaufman. 1999. Novel regulation of the homeotic gene *Scr* associated with a crustacean leg-to-maxilliped appendage transformation. *Development* 126: 1121–1128.

Abzhanov, A., M. Protas, B. R. Grant, P. R. Grant and C. J. Tabin. 2004. *Bmp4* and morphological variation of beaks in Darwin's finches. *Science* 305: 1462–1465.

Abzhanov, A., W. P. Kuo, C. Hartmann, P. R. Grant, R. Grant and C. Tabin. 2006. The calmodulin pathway and evolution of beak morphology in Darwin's finches. *Nature* 442: 563–567.

Aires, R., A. D. Jurberg, F. Leal, A. Nóvoa, M. J. Cohn and M. Mallo. 2016. Oct4 Is a key regulator of vertebrate trunk length diversity. *Dev. Cell* 38: 262–274.

Alberch, P. 1989. The logic of monsters: Evidence for internal constraints in development and evolution. *Geobios.* 12: 21–57.

Aldea, D. and 8 others. 2021. Repeated mutation of a developmental enhancer contributed to human thermoregulatory evolution. *Proc Natl Acad Sci USA* 118: e2021722118.

Amundson, R. 1994. Two concepts of constraint: Adaptationism and the challenge from developmental biology. *Phil. Sci.* 61: 556–578.

Amundson, R. 2005. *The Changing Role of the Embryo in Evolutionary Thought: The Roots of Evo-Devo*. Cambridge University Press, New York.

Anway, M. D., A. S. Cupp, M. Uzumcu and M. K. Skinner. 2005. Epigenetic transgenerational actions of endocrine disruptors and male fertility. *Science* 308: 1466–1469.

Anway, M. D., C. Leathers and M. K. Skinner. 2006a. Endocrine disruptor vinclozolin induced epigenetic transgenerational adult-onset disease. *Endocrinology* 147: 5515–5523.

Anway, M. D., M. A. Memon, M. Uzumcu and M. K. Skinner. 2006b. Transgenerational effect of the endocrine disruptor vinclozolin on male spermatogenesis. *J. Andrology* 27: 868–879.

Arendt, D., and 10 others. The origin and evolution of cell types. *Nat. Rev. Genet.* 17: 744–757.

Arthur, W. 2004. *Biased Embryos and Evolution*. Cambridge University Press, New York.

Aubret, F. and R. Shine. 2009. Genetic assimilation and the postcolonization erosion of phenotypic plasticity in island tiger snakes. *Curr. Biol.* 19: 1932–1936.

Averof, M. and N. H. Patel. 1997. Crustacean appendage evolution associated with changes in Hox gene expression. *Nature* 388: 682–686.

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.

Baldwin, R. L., R. W. Li, Y. Jia and C.-J. Li. 2018. Transcriptomic impacts of rumen epithelium induced by butyrate infusion in dairy cattle in dry period. *Gene Regul. Syst. Biol.* 12: 1177625018774798.

Ball, E. E., D. C. Hayward, R. Saint and D. J. Miller. 2004. A simple plan: Cnidarians and the origins of developmental mechanisms. *Nat. Rev. Genet.* 5: 567–577.

Bateson, W. 1894. *Materials for the Study of Variation*. Macmillan, London.

Bhullar, B. A. and 6 others. 2012. Birds have paedomorphic dinosaur skulls. *Nature* 487: 223–236.

Bilandžija, H. and 10 others. 2020. Phenotypic plasticity as a mechanism of cave colonization and adaptation. *Elife* 9:e51830.

Blin, M. and 6 others. 2018. Developmental evolution and developmental plasticity of the olfactory epithelium and olfactory skills in Mexican cavefish. *Dev. Biol.* 441: 242–251.

Bonduriansky, R. 2021. Plasticity across generations. In *Phenotypic Plasticity and Evolution: Causes, Consequences, and Controversies*. D. W. Pfennig (Ed.). CRC Press, New York. Pp. 327–348.

Bonner, J. T. 1988. *The Evolution of Complexity*. Princeton University Press, Princeton, NJ.

Booth, D. S. and N. King. 2016. Evolution: Gene regulation in transition. *Nature* 534: 482–483.

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

Brucker, R. M. and S. R. Bordenstein. 2013. The hologenomic basis of speciation: Gut bacteria cause hybrid lethality in the genus *Nasonia*. *Science* 341: 667–669.

Brunet, T. and N. King. 2017. The origin of animal multicellularity and cell differentiation. *Dev. Cell* 43: 124–140.

Buendia-Monreal, M. and C. S. Gillmor. 2018. The times they are a-changin': Heterochrony in plant development and evolution. *Front. Plant Sci.* 9: 1349.

Burdge, G. C., J. Slater-Jefferies, C. Torrens, E. S. Phillips, M. A. Hanson and K. A. Lillycrop. 2007. Dietary protein restriction of pregnant rats in the F0 generation induces altered methylation of hepatic gene promoters in the adult male offspring in the F1 and F2 generations. *Brit. J. Nutrit.* 97: 435–439.

Burke, A. C. 1989. Development of the turtle carapace: Implications for the evolution of a novel bauplan. *J. Morphol.* 199: 363–378.

Burnet, B., K. Connolly and B. Harrison. 1973. Phenocopies of pigmentary and behavioural effects of the *Yellow* mutant in *Drosophila* induced by α -dimethyltyrosine. *Science* 181: 1059–1060.

Campàs, O., R. Mallarino, A. Herrel, A. Abzhanov and M. P. Brenner. 2010. Scaling and shear transformations capture beak shape variation in Darwin's finches. *Proc. Natl. Acad. Sci. USA* 107: 3356–3360.

Carroll, S. B. 2008. Evo-devo and an expanding evolutionary synthesis: A genetic theory of morphological evolution. *Cell* 134: 25–36.

Carroll, S. B., J. K. Grenier and S. D. Weatherbee. 2005. *From DNA to Diversity: Molecular Genetics and the Evolution of Animal Design*, 2nd Ed. Blackwell Publishing, Oxford.

Cebra-Thomas, J., F. Tan, S. Sistla, E. Estes, G. Bender, C. Kim, P. Riccio and S. F. Gilbert. 2005. How the turtle forms its shell: A paracrine hypothesis of carapace formation. *J. Exp. Zool.* 304B: 558–569.

Chan, J. C. and 16 others. 2020. Reproductive tract extracellular vesicles are sufficient to transmit intergenerational stress and program neurodevelopment. *Nat. Commun.* 11: 1499.

Chan, Y. F. and 15 others. 2010. Adaptive evolution of pelvic reduction in sticklebacks by recurrent deletion of a *Pitx1* enhancer. *Science* 327: 302–305.

Charrier, C. and 10 others. 2012. Inhibition of SRGAP2 function by its human-specific paralogs induces neoteny during spine maturation. *Cell* 149: 923–935.

Chavan, A. R. and 8 others. 2021. Evolution of embryo implantation was enabled by the origin of decidual stromal cells in eutherian mammals. *Mol. Biol. Evol.* 38: 1060–1074.

Chiu, L. and S. F. Gilbert. 2020. Niche construction and the transition to herbivory: Phenotype switching and the origination of new nutritional modes. In *Phenotype Switching: Implications in Biology and Medicine*. H. Levine et al. (Eds.) Elsevier, London. Pp. 459–482.

Chow, K. L. and K. W. Chan. 1999. Stress-induced phenocopy of *C. elegans* defines functional steps of sensory organ differentiation. *Dev. Growth Diff.* 41: 629–637.

Christodoulou, F., F. Raible, R. Tomer, O. Simakov, K. Trachana, S. Klaus, H. Snyman, G. J. Hannon, P. Bork and D. Arendt. 2010. Ancient animal microRNAs and the evolution of tissue identity. *Nature* 463: 1084–1088.

Chuong, E. B. 2013. Retroviruses facilitate the rapid evolution of the mammalian placenta. *Bioessays* 35: 853–861.

Chuong, E. B. 2018. The placenta goes viral: Retroviruses control gene expression in pregnancy. *PLoS Biol.* 16: e3000028.

Colosimo, P. F., C. L. Peichel, K. Nereng, B. K. Blackman, M. D. Shapiro, D. Schluter and D. M. Kingsley. 2004. The genetic architecture of parallel armor plate reduction in threespine sticklebacks. *PLOS Biol.* 2: 635–641.

Conith, M. R., Y. Hu, A. J. Conith, M. A. Maginnis, J. F. Webb and R. C. Albertson. 2018. Genetic and developmental origins of a unique foraging adaptation in a Lake Malawi cichlid genus. *Proc Natl Acad Sci USA* 115: 7063–7068.

Cooper, L. N. 2010. “Evolution and Development of Cetacean Appendages.” Ph.D. thesis, Kent State University.

Crews, D. and 7 others. 2007. Transgenerational epigenetic imprints on mate preference. *Proc. Nat. Acad. Sci. USA* 104: 5942–5946.

Crews, D., R. Gillette, S. V. Scarpino, M. Manikkam, M. I. Savenkova and M. K. Skinner. 2012. Epigenetic transgenerational inheritance of altered stress responses. *Proc. Natl. Acad. Sci. USA* 109: 9143–9148.

Cubas, P., C. Vincent and E. Coen. 1999. An epigenetic mutation responsible for natural variation in floral symmetry. *Nature* 401: 157–161.

Damen, W. G. 2002. *Fushi tarazu*: A Hox gene changes its role. *BioEssays* 24: 992–995.

Darwin, C. 1859. *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. John Murray, London.

Darwin, C. 1868. *The Variation of Animals and Plants under Domestication*. John Murray, London.

Davidson, E. H. and D. H. Erwin. 2010. Evolutionary innovation and stability in animal gene networks. *J. Exp. Zool.* 314B: 182–186.

Dayel, M. J. and 6 others. 2011. Cell differentiation and morphogenesis in the colony-forming choanoflagellate *Salpingoeca rosetta*. *Dev. Biol.* 357: 73–82.

Deline, B., J. M. Greenwood, J. W. Clark, M. N. Puttick, K. J. Peterson and P. C. J. Donoghue. 2018. Evolution of metazoan morphological disparity. *Proc. Natl. Acad. Sci. USA* 115: E8909–E8918.

Dennis, M. Y. and 15 others. 2012. Evolution of human-specific neural SRGAP2 genes by incomplete segmental duplication. *Cell* 149: 912–922.

Deutsch, J. S. and E. Mouchel-Vielh. 2003. Hox genes and the crustacean body plan. *BioEssays* 25: 878–887.

DeVeale, B. and 11 others. 2013. Oct4 is required ~E7.5 for proliferation in the primitive streak. *PLoS Genet.* 9: e1003957.

Dubois, A. and 7 others. 2010. Tinkering with the C-function: A molecular frame for the selection of double flowers in cultivated roses. *PLoS ONE* 5: e9288.

Dunbar, H. E., A. C. C. Wilson, N. R. Ferguson and N. A. Moran. 2007. Aphid thermal tolerance is governed by a point mutation in bacterial symbionts. *PLoS Biol.* 5: e96.

Dunn-Fletcher, C. E. and 16 others. 2018. Anthropoid primate-specific retroviral element THE1B controls expression of CRH in placenta and alters gestation length. *PLoS Biol* 16(9): e2006337.

Dupressoir, A and 6 others. 2011. A pair of co-opted retroviral envelope syncytin genes is required for formation of the two-layered murine placental syncytiotrophoblast. *Proc. Natl. Acad. Sci. USA* 108: E1164–E1173.

Dupressoir, A., C. Lavialle and T. Heidmann. 2012. From ancestral infectious retroviruses to bona fide cellular genes: Role of the captured syncytins in placentation. *Placenta* 33 663–671.

Erwin, D. H. 1999. The origin of bodyplans. *Am. Zool.* 39: 617–629.

Feijen, F. A. A., R. A. Vos, J. Nuytinck and V. S. F. T. Merckx. 2018. Evolutionary dynamics of mycorrhizal symbiosis in land plant diversification. *Sci. Rep.* 8: 10698.

Finnerty, J. R., K. Pang, P. Burton, D. Paulson and M. Q. Martindale. 2004. Origins of bilateral symmetry: *Hox* and *Dpp* expression in a sea anemone. *Science* 304: 1335–1337.

Frank, J. A. and 8 others. 2022. Evolution and antiviral activity of a human protein of retroviral origin. *Science* 378: 422–428.

Franz-Odendaal, T. A. and B. K. Hall. 2006. Modularity and sense organs in the blind cavefish, *Astyanax mexicanus*. *Evol. Dev.* 8: 94–100.

Funkhouser, L. J. and S. R. Bordenstein. 2013. Mom knows best: The universality of maternal microbial transmission. *PLoS Biol* 11: e1001631.

Galant, R. and S. B. Carroll. 2002. Evolution of a transcriptional repression domain in an insect Hox protein. *Nature* 415: 910–913.

Galis, F. 1999. Why do almost all mammals have seven cervical vertebrae? Developmental constraints, Hox genes, and cancer. *J. Exp. Zool./Mol. Dev. Evol.* 285: 19–26.

Galis, F. and J. A. Metz. 2001. Testing the vulnerability of the phylotypic stage: On modularity and evolutionary conservation. *J. Exp. Zool./Mol. Dev. Evol.* 291: 195–204.

Galis, F. and 7 others. 2006. Extreme selection against homeotic transformations of cervical vertebrae in humans. *Evolution* 60: 2643–2654.

Gao, F. and E. H. Davidson. 2008. Transfer of a large gene regulatory apparatus to a new developmental address in echinoid evolution. *Proc. Natl. Acad. Sci. USA* 105: 6091–6096.

Gapp, K. and 8 others. 2014. Implication of sperm RNAs in transgenerational inheritance of the effects of early trauma in mice. *Nat. Neurosci.* 17: 667–669.

Garson, J., L. Wang and S. Sarkar. 2003. How development may direct evolution. *Biol. Philos.* 18: 353–370.

Garstang, W. 1922. The theory of recapitulation: A critical restatement of the biogenetic law. *Zool. J. Linn. Soc.* 35: 81–101.

Gawne, R., K. Z. McKenna and H. F. Nijhout. 2018. Unmodern synthesis: Developmental hierarchies and the origin of phenotypes. *BioEssays* 40: 1600265.

Geschwind, D. H. and G. Konopka. 2012. Neuroscience: Genes and human brain evolution. *Nature* 486: 481–482.

Gibson, G. and D. S. Hogness. 1996. Effect of polymorphism in the *Drosophila* regulatory gene *Ultrabithorax* on homeotic stability. *Science* 271: 200–203.

Gilbert, S. F. 2019. Evolutionary transitions revisited: Holobiont evo-devo. *J Exp. Zool./Mol. Dev Biol.* 332: 307–314.

Gilbert, S. F. 2020. Developmental symbiosis facilitates the multiple origins of herbivory. *Evol. Dev.* 22: 154–164.

Gilbert, S. F. and D. Epel. 2015. *Ecological Developmental Biology: The Environmental Regulation of Development, Health, and Evolution*, 2nd Ed. Oxford University Press, Oxford.

Gilbert, S. F., J. M. Opitz and R. A. Raff. 1996. Resynthesizing evolutionary and developmental biology. *Dev. Biol.* 173: 357–372.

Gilbert, S. F., G. A. Loredó, A. Brukman and A. C. Burke. 2001. Morphogenesis of the turtle shell: the development of a novel structure in tetrapod evolution. *Evol. Dev.* 3: 47–58.

Gilbert, S.F., T. C. Bosch and C. Ledón-Rettig. 2015. Eco-Evo-Devo: Developmental symbiosis and developmental plasticity as evolutionary agents. *Nat. Rev. Genet.* 16: 611–622.

Gillette, R., M. J. Son, L. Ton, A. C. Gore and D. Crews. 2018. Passing experiences on to future generations: endocrine disruptors and transgenerational inheritance of epimutations in brain and sperm. *Epigenetics* 13: 1106–1126.

Goldschmidt, R. B. 1938. *Physiological Genetics*. McGraw-Hill, New York.

Gomez, C., E. M. Ozbudak, J. Wunderlich, D. Baumann, J. Lewis and O. Pourquié. 2008. Control of segment number in vertebrate embryos. *Nature* 454: 335–339.

Grant, P. R. and B. R. Grant. 2008. *How and Why Species Multiply*. Princeton University Press, Princeton, NJ.

Guerrant, E. O. 1982. Neotenic evolution of *Delphinium nudicaule* (Ranunculaceae)—A hummingbird-pollinated larkspur. *Evolution* 36: 699–712.

Guerreiro, I. and 8 others. 2013. Role of a polymorphism in a Hox/Pax-responsive enhancer in the evolution of the vertebrate spine. *Proc Natl Acad Sci USA* 110: 10682–10686.

Halder, G., P. Callaerts and W. J. Gehring. 1995. Induction of ectopic eyes by targeted expression of the *eyeless* gene in *Drosophila*. *Science* 267: 1788–1792.

- Hall, B. K. 1999. *Evolutionary Developmental Biology*, 2nd Ed. Kluwer, Boston, MA.
- Haygood, R., C. C. Babbitt, O. Fedrigo and G. A. Wray. 2010. Contrasts between adaptive coding and noncoding changes during human evolution. *Proc. Natl. Acad. Sci. USA* 107: 7853–7857.
- He, S., F. Del Viso, C. Y. Chen, A. Ikmi, A. E. Kroesen and M. C. Gibson. 2018. An axial Hox code controls tissue segmentation and body patterning in *Nematostella vectensis*. *Science* 361: 1377–1380.
- Hejnol, A. and 16 others. 2009. Assessing the root of bilaterian animals with scalable phylogenomic methods. *Proc. Biol. Sci.* 276: 4261–4270.
- Hiyama, A., W. Taira and J. M. Otaki. 2012. Color-pattern evolution in response to environmental stress in butterflies. *Front. Genet.* 3: 15.
- Hockman, D., C. J. Cretekos, M. K. Mason, R. R. Behringer, D. S. Jacobs and N. Illing. 2008. A second wave of Sonic hedgehog expression during the development of the bat limb. *Proc. Natl. Acad. Sci. USA* 105: 16982–16987.
- Holder, N. 1983. Developmental constraints and the evolution of vertebrate limb patterns. *J. Theor. Biol.* 104: 451–471.
- Holland, P. W., F. Marlétaz, I. Maeso, T. L. Dunwell and J. Paps. 2017. New genes from old: asymmetric divergence of gene duplicates and the evolution of development. *Philos. Trans. R. Soc. London* 372B: 20150480.
- Holley, S. and 6 others. 1995. A conserved system for dorsal-ventral patterning in insects and vertebrates involving sog and chordin. *Nature* 376: 249–253.
- Hu, H. and 16 others. 2017. Constrained vertebrate evolution by pleiotropic genes. *Nat. Ecol. Evol.* 1: 1722–1730.
- Hu, Y. and R. C. Albertson. 2017. Baby fish working out: An epigenetic source of adaptive variation in the cichlid jaw. *Proc. Biol. Sci.* 284: 20171018.

Hughes, C. L. and T. C. Kaufman. 2002. Hox genes and the evolution of the arthropod body plan. *Evo. Dev.* 4: 459–499.

Hunt, T. and 15 others. 2007. A comprehensive phylogeny of beetles reveals the evolutionary origins of a superradiation. *Science* 318: 1913–1916.

Huxley, J. 1942. *Evolution: The Modern Synthesis*. Allen and Unwin, London.

Huxley, T. H. 1864. *On the Classification of Animals and on the Vertebrate Skull*. J. Churchill and Sons, London.

Huxley, T. H. 1857. Letter of July 7, 1857, quoted in W. E. Friedman and P. K. Dingle, *Charles Darwin and the Origin of Plant Evolutionary Developmental Biology*. *Plant Cell* 23: 1194–1207.

Huxley, T. H. 1893. *Darwiniana: Collected Essays, Vol. II*. Macmillan & Co., London.

Jablonka, E. and G. Raz. 2009. Transgenerational epigenetic inheritance: Prevalence, mechanisms, and implications for the study of heredity. *Q. Rev. Biol.* 84: 131–176.

Jablonka, E. and M. J. Lamb. 2006. *Evolution in Four Dimensions: Genetic, Epigenetic, Behavioral, and Symbolic Variation in the History of Life*. Cambridge, MA: MIT Press.

Jablonski, N. and G. Chaplin. 2012. The naked truth. *Scientific American*, November 1, 2012.

Jacob, F. 1977. Evolution and tinkering. *Science* 196: 1161–1166.

Jirtle, R. L. and M. K. Skinner. 2007. Environmental epigenomics and disease susceptibility. *Nat. Rev. Genet.* 8: 253–262.

Jurberg, A. D., R. Aires, I. Varela-Lasheras, A. Nóvoa and M. Mallo. 2013. Switching axial progenitors from producing trunk to tail tissues in vertebrate embryos. *Dev. Cell* 25: 451–462.

Kamberov, Y. G. and 8 others. 2018. Comparative evidence for the independent evolution of hair and sweat gland traits in primates. *J. Hum. Evol.* 125: 99–105.

Kanno, A., H. Saeki, T. Kameya, H. Saedler and G. Theissen. 2003. Heterotopic expression of class B floral homeotic genes supports a modified ABC model for tulip (*Tulipa gesneriana*). *Plant Mol. Biol.* 52: 831–841.

King, M. C. and A. C. Wilson. 1975. Evolution at two levels in humans and chimpanzees. *Science* 188: 107–116.

King, R. C. and W. D. Stanfield. 1985. *A Dictionary of Genetics*, 3rd Ed. Oxford University Press, Oxford.

Kirschner, M. and J. Gerhart. 2005. *The Plausibility of Life*. Yale University Press, New Haven, CT.

Klimovich, A. V. and T. C. G. Bosch. 2018. Rethinking the role of the nervous system: Lessons from the Hydra holobiont. *BioEssays* 40: 1800060.

Kmita, M. F., F. van der Hoeven, J. Zákány, R. Krumlauf and D. Duboula. 2000. Mechanisms of Hox gene colinearity: Transposition of the anterior *Hoxb-1* gene into the posterior HoxD complex. *Genes Dev.* 14: 198–211.

Kmita, M. F., N. Frandeau, Y. Hérault and D. Duboule. 2002. Serial deletions and duplications suggest a mechanism for the collinearity of *Hoxd* genes in limbs. *Nature* 420: 145–150.

Konings, A. 2007. *Malawi Cichlids in Their Natural Habitat*, 4th Ed. Cichlid Press, El Paso, TX.

Kostyun, J. L. and L. C. Moyle. 2017. Heterochronic developmental shifts underlie floral diversity within *Jaltomata* (Solanaceae). *EvoDevo* 8: 17.

Krizek, B. A. and E. M. Myerowitz. 1996. The *Arabidopsis* homeotic genes *APETALA3* and *PISTILLATA* are sufficient to provide the B class organ identity function. *Development* 122: 11–22.

Kuratani, S. 2009. Modularity, comparative embryology and evo-devo: Developmental dissection of body plans. *Dev. Biol.* 332: 61–69.

Kvon, E. Z. and 18 others. 2016. Progressive loss of function in a limb enhancer during snake evolution. *Cell* 167: 633–642.

Laland, K. N. and 7 others. 2015. The extended evolutionary synthesis: Its structure, assumptions and predictions. *Proc. Biol. Sci.* 282: 20151019.

- Lander, E. S. and many others. 2001. Initial sequencing and analysis of the human genome. *Nature* 409: 860–921.
- Larrain, J., M. Oelgeschlager, N. I. Ketpura, B. Reversade, L. Zakin and E. M. De Robertis. 2001. Proteolytic cleavage of Chordin as a switch for the dual activities of Twisted gastrulation in BMP signaling. *Development* 128: 4439–4447.
- Laufer, E. and 8 others. 1997. The *Radical fringe* expression boundary in the limb bud ectoderm regulates AER formation. *Nature* 386: 366–367.
- Lavialle, C. and 6 others. 2013. Paleovirology of ‘syncytins’, retroviral *env* genes exapted for a role in placentation. *Philos. Trans. R. Soc. London B* 368: 20120507.
- Leal, F. and M. J. Cohn 2016. Loss and re-emergence of legs in snakes by modular evolution of sonic hedgehog and HOXD enhancers. *Curr. Biol.* 26: 2966–2973.
- Leal, F. and M. J. Cohn. 2018. Developmental, genetic, and genomic insights into the evolutionary loss of limbs in snakes. *Genesis* 56.
- Levis, N. A. and D. W. Pfennig. 2018. Phenotypic plasticity, canalization, and the origins of novelty: evidence and mechanisms from amphibians. *Semin. Cell Dev. Biol.* 88: 80–90.
- Levis, N. A. and D. W. Pfennig. 2020. Plasticity-led evolution: A survey of developmental mechanisms and empirical tests. *Evol. Dev.* 22: 71–87.
- Levis, N. A., A. J. Isdaner and D. W. Pfennig. 2018. Morphological novelty emerges from pre-existing phenotypic plasticity. *Nat. Ecol. Evol.* 2: 1289–1297.
- Li, P. and M. O. Johnston. 2000. Heterochrony in plant evolutionary studies through the twentieth century. *Bot. Rev.* 66: 57–88.
- Lillicrop, K. A. and G. C. Burdge. 2015. Maternal diet as a modifier of offspring epigenetics. *J. Dev. Orig. Health Dis.* 6: 88–95.
- Liubicich, D. M. and 9 others. 2009. Knockdown of *Parhyale Ultrabithorax* recapitulates evolutionary changes in crustacean appendage morphology. *Proc Natl Acad Sci USA* 106: 13892–13896.

Locascio, A., M. Manjanares, M. J. Blanco and M. A. Nieto. 2002. Modularity and reshuffling of *Snail* and *Slug* expression during vertebrate evolution. *Proc. Natl. Acad. Sci. USA* 99: 16841–16846.

Logan, M. and C. J. Tabin. 1999. Role of *Pitx1* upstream of *Tbx4* in specification of hindlimb identity. *Science* 283: 1736–1739.

Lonfat, N., T. Montavon, F. Darbellay, S. Gitto and D. Duboule. 2014. Convergent evolution of complex regulatory landscapes and pleiotropy at Hox loci. *Science* 346: 1004–1006.

Loredo, G. A. and 11 others. 2001. Development of an evolutionarily novel structure: Fibroblast growth factor expression in the carapacial ridge of turtle embryos. *J. Exp. Zool.* 291: 274–281.

Lu, C. P., L. Polak, B. E. Keyes and E. Fuchs. 2016. Spatiotemporal antagonism in mesenchymal-epithelial signaling in sweat versus hair fate decision. *Science* 354: aah6102.

Lu, H. L., D. R. Price, A. Wikramanayake, C.-C. Chang and A. C. Wilson. 2016. Ontogenetic differences in localization of glutamine transporter ApGLNT1 in the pea aphid demonstrate that mechanisms of host/symbiont integration are not similar in the maternal versus embryonic bacteriome. *EvoDevo* 7: 1.

Lynch, M. and J. S. Conery. 2000. The evolutionary fate and consequences of duplicate genes. *Science* 290: 1151–1155.

Lynch, V. J. and G. P. Wagner. 2011. Revisiting a classic example of transcription factor functional equivalence: Are *Eyeless* and *Pax6* functionally equivalent or divergent? *J. Exp. Zool.* 316B: 93–98.

Lynch, V. J. and 6 others. 2004. Adaptive evolution of HoxA-11 and HoxA-13 at the origin of the uterus in mammals. *Proc. Biol. Sci.* 271: 2201–2207.

Lynch, V. J. and 6 others. 2008. Adaptive changes in the transcription factor HoxA11 are essential for evolution of pregnancy in mammals. *Proc. Natl. Acad. Sci. USA* 105: 14928–14933.

Lynch, V. J., R. D. Leclerc, G. May and G. P. Wagner. 2011. Transposon-mediated rewiring of gene regulatory networks contributed to the evolution of pregnancy in mammals. *Nat. Genet.* 43: 1154–1159.

Lyson, T. R., G. S. Bever, T. M. Scheyer, A. Y. Hsiang and J. A. Gauthier. 2013. Evolutionary origin of the turtle shell. *Curr. Biol.* 23: 1113–1119.

Malicki, J., L. C. Cianetti, C. Peschle and W. McGinnis. 1992. Human *HOX4B* regulatory element provides head-specific expression in *Drosophila* embryos. *Nature* 358: 345–347.

Mallarino, R. and 6 others. 2012. Closely related bird species demonstrate flexibility between beak morphology and underlying developmental programs. *Proc. Natl. Acad. Sci. USA* 109: 16222–16227.

Mallarino, R., P. R. Grant, B. R. Grant, A. Herrel, W. P. Kuo and A. Abzhanov. 2011. Two developmental modules establish 3D beak-shape variation in Darwin's finches. *Proc. Natl. Acad. Sci. USA* 108: 4057–4062.

Mallo, M. 2018. Reassessing the role of Hox genes during vertebrate development and evolution. *Trends Genet.* 34L: 209–217.

Margulis, L. 1993a. Origins of species: Acquired genomes and individuality. *BioSystems* 31: 121–125.

Margulis, L. 1993b. *Symbiosis in Cell Evolution*. W. H. Freeman, New York.

Margulis, L. and D. Sagan. 1986. *Origins of Sex: Three Billion Years of Genetic Recombination*. Yale University Press, New Haven.

Margulis, L. and D. Sagan. 2003. *Acquiring New Genomes: A Theory of the Origins of Species*. Basic Books, New York.

Markoš, A. and J. Švorcová. 2019. *Epigenetic Processes and the Evolution of Life*. CRC Press, Boca Raton, FL.

Martin, A. and 8 others. 2016. CRISPR/Cas9 mutagenesis reveals versatile roles of Hox genes in crustacean limb specification and evolution. *Curr Biol.* 26: 14–26.

Matsuura, Y., Y. Kikuchi, T. Miura and T. Fukatsu. 2015. Ultrabithorax is essential for bacteriocyte development. *Proc. Natl. Acad. Sci. USA* 112: 9376–9381.

McNamara, K. J. 2012. Heterochrony: The evolution of development. *Evol. Educ. Outreach* 2: 203–218.

McNamara, K. J. and J. Long. 2012. Heterochrony on dinosaur evolution. In J. Farlow (ed.), *The Complete Dinosaur*, 2nd Ed. Indiana University Press, Bloomington, IN, 761–784.

Meaney, M. J. 2001. Maternal care, gene expression, and the transmission of individual differences in stress reactivity across generations. *Annu. Rev. Neurosci.* 24: 1161–1192.

Mennigen, J. A., L. M. Thompson, M. Bell, M. Tellez Santos and A. C. Gore. 2018. Transgenerational effects of polychlorinated biphenyls: 1. Development and physiology across three generations of rats. *Environ. Health* 17: 18.

Merezhkowsky, C. 1909. The theory of two plasms as foundation of symbiogenesis, new doctrine on the origin of organisms. *Proc. Stud. Imp. Kazan Univ.* 12: 1–102.

Mizrahi, I., 2013. Rumen symbioses. In *The Prokaryotes: Prokaryotic Biology and Symbiotic Associations*. E. Rosenberg et al. (Eds.). Springer: Berlin/Heidelberg, pp. 533–544.

Mizutani, C. M. and E. Bier. 2008. EvoD/Vo: The origins of BMP signalling in the neuroectoderm. *Nat. Rev. Genet.* 9: 663–677.

Moczek, A. 2015. Re-evaluating the environment in developmental evolution. *Front Ecol. Evol.*

Moraïs, S. and I. Mizrahi. 2019. The road not taken: The rumen microbiome, functional groups, and community states. *Trends Microbiol.* 27: 538–549.

Morris, J. J. 2018. What is the hologenome concept of evolution? Version 1. *F1000Res* Faculty Rev-1664.

Moyroud, E. and B. Glover. 2017. The evolution of diverse floral morphologies. *Curr. Biol.* 27: R941–R951.

Müller, F. 1869. *Facts and Arguments for Darwin*. John Murray, London.

Müller, G. B. 2017. Why an extended evolutionary synthesis is necessary. *Interface Focus* 7: 20170015.

Nagashima, H. and 6 others. 2009. Evolution of the turtle body plan by the folding and creation of new muscle connections. *Science* 325: 193–196.

- Newbold, R. R., E. P. Banks and W. N. Jefferson. 2006. Adverse effects of the model environmental estrogen diethylstilbestrol are transmitted to subsequent generations. *Endocrinology* 147: S11–S17.
- Newman, S. A. and G. B. Müller. 2005. Origination and innovation in the vertebrate limb skeleton: An epigenetic perspective. *J. Exp. Zool.* 304B: 593–609.
- Nijhout, H. F., A. M. Kudla and C. C. Hazelwood. 2021. Genetic assimilation and accommodation: Models and mechanisms. *Curr. Top. Dev. Biol.* 141: 337–369.
- Nijhout, H. F. 1984. Colour pattern modification by cold shock in Lepidoptera. *J. Embryol. Exp. Morphol.* 81: 287–305.
- Ohno, S. 1970. *Evolution by Gene Duplication*. Springer, Berlin.
- Oliver, K. M., P. H. Degnan, M. S. Hunter and N. A. Moran. 2009. Bacteriophages encode factors required for protection in a symbiotic mutualism. *Science* 325: 992–994.
- Oster, G. F., N. Shubin, J. D. Murray and P. Alberch. 1988. Evolution and morphogenetic rules: The shape of the vertebrate limb in ontogeny and phylogeny. *Evolution* 42: 862–884.
- Osterwalder, M. and 19 others. 2018. Enhancer redundancy provides phenotypic robustness in mammalian development. *Nature* 554: 239–243.
- Otaki, J. M., A. Hiyama, M. Iwata and T. Kudo. 2010. Phenotypic plasticity in the range-margin population of the lycaenid butterfly *Zizeeria maha*. *BMC Evol. Biol.* 10: 252.
- Paps, J. and P. W. H. Holland. 2018. Reconstruction of the ancestral metazoan genome reveals an increase in genomic novelty. *Nat. Commun.* 9: 1730.
- Parsons, K. J., A. T. Taylor, K. E. Powder and R. C. Albertson. 2014. Wnt signalling underlies the evolution of new phenotypes and craniofacial variability in Lake Malawi cichlids. *Nat. Commun.* 5: 3629.
- Pavlopoulos, A. and 6 others. 2009. Probing the evolution of appendage specialization by Hox gene misexpression in an emerging model crustacean. *Proc Natl Acad Sci USA* 106: 13897–13902.

Pfent, C., K. J. Pobursky, D. N. Sather and E. M. Golenberg. 2005. Characterization of *SpAPETALA3* and *SpPISTILLATA*, B class floral identity genes in *Spinacia oleracea*, and their relationship to sexual dimorphism. *Dev. Genes Evol.* 215: 132–142.

Pirozynski K. A. and D. W. Malloch. 1975. The origin of land plants: A matter of mycotrophism. *BioSystems* 6: 153–164.

Putnam, N. H. and 18 others. 2007. Sea anemone genome reveals ancestral eumetazoan gene repertoire and genomic organization. *Science* 317: 86–94.

Queitsch, C., T. A. Sangster and S. Lindquist. 2002. Hsp90 as a capacitor of phenotypic variation. *Nature* 417: 618–624.

Raff, R. A. 1996. *The Shape of Life: Genes, Development, and the Evolution of Animal Form*. University of Chicago Press, Chicago.

Rice, R., P. Riccio, S. F. Gilbert and J. Cebra-Thomas. 2015. Emerging from the rib: Resolving the turtle controversies. *J. Exp. Zool.* 324B: 208–220.

Richardson, M. K. and A. D. Chipman. 2003. Developmental constraints in a comparative framework: A test case using variations in phalanx number during amniote evolution. *J. Exp. Zool.* 296B: 8–22.

Richardson, M. K. and H. H. Oelschläger. 2002. Time, pattern, and heterochrony: A study of hyperphalangy in the dolphin embryo flipper. *Evol. Dev.* 4: 435–444.

Riedl, R. 1978. *Order in Living Systems: A Systems Analysis of Evolution*. John Wiley and Sons, New York.

Rockman, M. V., M. W. Hahn, N. Soranzo, D. B. Goldstein and G. A. Wray. 2003. Positive selection on a human-specific transcription factor binding site regulating IL4 expression. *Curr. Biol.* 13: 2118–2123.

Rodgers, A. B., C. P. Morgan, N. A. Leu and T. L. Bale. 2015. Transgenerational epigenetic programming via sperm microRNA recapitulates effects of paternal stress. *Proc. Natl. Acad. Sci. USA* 112: 13699–13704.

Rohner, N. and 7 others. 2013. Cryptic variation in morphological evolution: HSP90 as a capacitor for loss of eyes in cavefish. *Science* 342: 1372–1375.

Ronse de Craene, L. P. 2003. The evolutionary significance of homeosis in flowers: A morphological perspective. *Int. J. Plant Sci.* 164: S225–S235.

Ronschaugen, M., N. McGinnis and W. McGinnis. 2002. Hox protein mutation and macroevolution of the insect body plan. *Nature* 415: 914–917.

Roper, M., M. J. Dayel, R. E. Pepper and M. A. Koehl. 2013. Cooperatively generated stresslet flows supply fresh fluid to multicellular choanoflagellate colonies. *Phys. Rev. Lett.* 110: 228104.

Rosenberg, E. and I. Zilber-Rosenberg. 2018. The hologenome concept of evolution after 10 years. *Microbiome* 6: 78.

Rosenberg, E., O. Koren, L. Reshef, R. Efrony and I. Zilber-Rosenberg. 2007. The role of microorganisms in coral health, disease, and evolution. *Nat. Rev. Microbiol.* 5: 355–362.

Roughgarden, J., S. F. Gilbert, E. Rosenberg, I. Zilber-Rosenberg and E. A. Lloyd. 2017. Holobionts as units of selection and a model of their population dynamics and evolution. *Biol. Theory* 13: 44–65.

Rutherford, S. L. and S. Lindquist. 1998. Hsp90 as a capacitor for morphological evolution. *Nature* 396: 336–342.

Ruxton, G. D. and D. M. Wilkinson. 2011. Avoidance of overheating and selection for both hair loss and bipedality in hominins. *Proc. Natl. Acad. Sci. USA* 108: 20965–20969.

Ryan, J. F. and 6 others. 2007. Pre-bilaterian origins of the Hox cluster and the Hox code: Evidence from the sea anemone *Nematostella vectensis*. *PLoS ONE* 2: e153.

Sander, E.G., R. G. Warner, H. N. Harrison and J. K. Loosli. 1959. The stimulatory effect of sodium butyrate and sodium propionate on the development of rumen mucosa in the young calf. *J. Dairy Sci.* 42: 1600–1605.

Sangster, T. A. and 9 others. 2008. Hsp90-buffered genetic variation is common in *Arabidopsis thaliana*. *Proc. Natl. Acad. Sci. USA* 105: 2969–2974.

Schiedlmeier, B. and 10 others. 2007. HOXB4's road map to stem cell expansion. *Proc. Natl. Acad. Sci. USA* 104: 16952–16957.

Schlosser, G. and G. P. Wagner (eds.). 2004. *Modularity in Developmental Evolution*. University of Chicago Press, Chicago.

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

Schneider, R. A. and J. A. Helms. 2003. The cellular and molecular origins of beak morphology. *Science* 299: 565–568.

Schumacher, R., A. Mai and P. Gutjahr. 1992. Association of rib anomalies and malignancy in childhood. *Eur. J. Pediatr.* 151: 432–434.

Sears, K. E. 2004. Constraints on the evolution of morphological evolution of marsupial shoulder girdles. *Evolution* 58: 2353–2370.

Sears, K. E. 2008. Molecular determinants of bat wing development. *Cells Tissues Organs* 187: 6–12.

Sebé-Pedrós, A. and 8 others. 2016. The dynamic regulatory genome of *Capsaspora* and the origin of animal multicellularity. *Cell* 165: 1224–1237.

Sebé-Pedrós, A. and 9 others. 2018. Early metazoan cell type diversity and the evolution of multicellular gene regulation. *Nat. Ecol. Evol.* 2: 1176–1188.

Selosse, M. A. and F. Le Tacon. 1998. The land flora: A phototroph-fungus partnership? *Trends Ecol Evol.* 13: 15–20.

Shapiro, A. M. 1976. Seasonal polyphenism. *Evol. Biol.* 9: 259–333.

Shapiro, M. D., J. Hanken and N. Rosenthal. 2003. Developmental basis of evolutionary digit loss in the Australian lizard *Hemiergis*. *J. Exp. Zool.* 279B: 48–56.

Shapiro, M. D. and 7 others. 2004. Genetic and developmental basis of evolutionary pelvic reduction in threespine sticklebacks. *Nature* 428: 717–723.

Sharon. G., D. Segal, J. M. Ringo, A. Hefetz, I. Zilber-Rosenberg and E. Rosenberg. 2010. Commensal bacteria play a role in mating preference of *Drosophila melanogaster*. *Proc. Natl. Acad. Sci USA* 107: 20051–20056.

Shubin, N., C. Tabin and S. B. Carroll. 2009. Deep homology and the origins of evolutionary novelty. *Nature* 457: 818–823.

Shubin, N., C. Tabin and S. Carroll. 1997. Fossils, genes, and the evolution of animal limbs. *Nature* 388: 639–648.

Smith, K. 2003. Time's arrow: Heterochrony and the evolution of development. *Int. J. Dev. Biol.* 47: 613–621.

Somel, M. and 13 others. 2009. Transcriptional neoteny in the human brain. *Proc. Natl. Acad. Sci. USA* 106: 5743–5748.

Standfuss, M. 1896. *Handbuch der palaearctischen Gross-Schmetterlinge für Forscher und Sammler*. Gustav Fischer, Jena.

Stern, D. L. and V. Orgogozo. 2008. The loci of evolution: How predictable is genetic evolution? *Evolution* 62: 2155–2177.

Strausfeld, N. J. and F. Hirth. 2013. Deep homology of arthropod central complex and vertebrate basal ganglia. *Science* 340: 157–161.

Strullu-Derrien, C., M. A. Selosse, P. Kenrick and F. M. Martin. 2018. The origin and evolution of mycorrhizal symbioses: From palaeomycology to phylogenomics. *New Phytol.* 220: 1012–1030.

Stundl, J., P. Y. Bertucci, A. Lauri, D. Arendt and M. E. Bronner. 2021. Evolution of new cell types at the lateral neural border. *Curr. Top. Dev. Biol.* 141:173–205.

Sucena, E. and D. Stern. 2000. Divergence of larval morphology between *Drosophila sechellia* and its sibling species caused by *cis*-regulatory evolution of *ovo/shaven-baby*. *Proc. Natl. Acad. Sci. USA* 97: 4530–4534.

Sugimoto, J., D. J. Schust, T. Kinjo, Y. Aoki, Y. Jinno and Y. Kudo. 2019. Suppressyn localization and dynamic expression patterns in primary human tissues support a physiologic role

in human placentation. *Sci. Rep.* 9: 19502–19512.

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

Sultan, S. E. 2017. Eco-Evo-Devo. In L. Nuño de la Rosa and G. B. Müller, *Evolutionary Developmental Biology*. Springer, Switzerland.

Suzuki, Y. and H. F. Nijhout. 2006. Evolution of a polyphenism by genetic accommodation. *Science* 311: 650–652.

Suzuki, Y. and H. F. Nijhout. 2007. Genetic basis of adaptive evolution of a polyphenism by genetic accommodation. *J. Evol. Biol.* 21: 57–66.

Technau, U. and G. Genikhovich. 2018. Evolution: Directives from sea anemone *Hox* genes. *Curr. Biol.* 28: R1303–R1305.

Thiessen, G. 2010. Homeosis of the angiosperm flower: Studies on three candidate cases of saltational evolution. *Palaeodiversity* 3: 131–139.

Tomoyasu, Y., Y. Arakane, K. J. Kramer and R. E. Denell. 2009. Repeated co-options of exoskeleton formation during wing-to-elytron evolution in beetles. *Curr. Biol.* 19: 2057–2065.

Tsuchida, T., R. Koga, M. Horikawa, T. Tsunoda, T. Maoka, S. Matsumoto, J. C. Simon and T. Fukatsu. 2010. Symbiotic bacterium modifies aphid body color. *Science* 330: 1102–1104.

Turing, A. M. 1952. The chemical basis of morphology. *Philos. Trans. R. Soc. London* 237B: 37–72.

Twitty, V. C. and H. A. Elliott. 1934. The relative growth of the amphibian eye, studied by means of transplantation. *J. Exp. Zool.* 68: 247–291.

Twitty, V. C. and J. L. Schwind. 1931. The growth of eyes and limbs transplanted heteroplastically between two species of *Amblystoma*. *J. Exp. Zool.* 59: 61–86.

Tyler-Smith, C. and Y. Xue. 2012. Sibling rivalry among paralogs promotes evolution of the human brain. *Cell* 149: 737–739.

Vermeij, G. J. 2004. *Nature: An Economic History*. Princeton University Press, Princeton, NJ.

Vermeij, G. J. and D. R. Lindberg. 2000. Delayed herbivory and the assembly of marine benthic ecosystems. *Paleobiology* 26: 419–430.

Villarreal, L. and F. Ryan. 2011. Viruses in host evolution: General principles and future extrapolations. *Curr. Top. Virol.* 9: 79–90.

Waddington, C. H. 1942. Canalization of development and the inheritance of acquired characters. *Nature* 150: 563.

Waddington, C. H. 1953. Genetic assimilation of an acquired character. *Evolution* 7: 118–126.

Waddington, C. H. 1956. Genetic assimilation of the Bithorax phenotype. *Evolution* 10: 1–13.

Waddington, C. H. 1961. Genetic assimilation. *Adv. Genet.* 10: 257–290.

Wagner, G. P. 1996. Homologues, natural kinds, and the evolution of modularity. *Am. Zool.* 36: 36–43.

Wake, D. B. and A. Larson. 1987. A multidimensional analysis of an evolving lineage. *Science* 238: 42–48.

Wang, S. and 7 others. 2017. Heterochronic truncation of odontogenesis in theropod dinosaurs provides insight into the macroevolution of avian beaks. *Proc Natl Acad Sci USA* 114: 10930–10935.

Wang, H., T. Nussbaum-Wagler, B. Li, Q. Zhao, Y. Vigouroux, M. Faller, K. Bomblies, L. Lukens and J. F. Doebley. 2005. The origin of the naked grains of maize. *Nature* 436: 714–719.

Weatherbee, S. D., R. R. Behringer, J. J. Rasweiler IV and L. A. Niswander. 2006. Interdigital webbing retention in bat wings illustrates genetic changes underlying amniote limb diversification. *Proc. Natl. Acad. Sci. USA* 103: 15103–15107.

Weiner, J. 1994. *The Beak of the Finch: A Story of Evolution in Our Time*. Random House, New York.

Wellik, D. M. and M. R. Capecchi. 2003. Hox10 and Hox11 genes are required to globally pattern the mammalian skeleton. *Science* 301: 363–367.

West-Eberhard, M. J. 1989. Phenotypic plasticity and the origins of diversity. *Annu. Rev. Ecol. Syst.* 20: 249–278.

West-Eberhard, M. J. 2003. *Developmental Plasticity and Evolution*. Oxford University Press, New York.

West-Eberhard, M. J. 2005. Developmental plasticity and the origin of species differences. *Proc. Natl. Acad. Sci. USA*. 102: 6543–6549.

Wu, D.-D., D. M. Irwin and Y. P. Zhang. 2011. De novo origin of human protein-coding genes. *PLOS Genet.* 7: e1002379

Wu, P., T. X. Jiang, S. Suksaweang, R. B. Widelitz and C. M. Chuong. 2004. Molecular shaping of the beak. *Science* 305: 1465–1466.

Yamamoto, Y., M. S. Byerly, W. R. Jackman and W. R. Jeffery. 2009. Pleiotropic functions of embryonic sonic hedgehog expression link jaw and taste bud amplification with eye loss during cavefish evolution. *Dev. Biol.* 330: 200–211.

Yoffe, M. and 6 others. 2020. Morphological malleability of the lateral line allows for surface fish (*Astyanax mexicanus*) adaptation to cave environments. *J Exp Zool B: Mol Dev Evol.* 334: 511–517.

Yu, J. K. and 7 others. 2007. Axial patterning in cephalochordates and the evolution of the organizer. *Nature* 445: 613–617.

Zilber-Rosenberg, I. and E. Rosenberg. 2008. Role of microorganisms in the evolution of animals and plants: the hologenome theory of evolution. *FEMS Microbiol. Rev.* 32: 723–735.

Zuckerklund, E. 1994. Molecular pathways to parallel evolution. I. Gene nexuses and their morphological correlates. *J. Mol. Evol.* 39: 661–678.