

# Chapter 25 – Evolution of Development



1. What is the "evolutionary paradox of development"?

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2. *A review question:* What are **Hox (homeobox) genes**? **MADS box genes**?

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3. What 2 key players are responsible for coordination of development?

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4. What is meant by **heterochrony**? Provide an example where a heterochronic mutation, instead of being lethal, may actually have survival value in the natural world.

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5. What is meant by **homeosis**? *Review:* Describe the *Drosophila/Antennapedia* mutant.

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6. The wide diversity of \_\_\_\_\_ subspecies is due to a point mutation in a single gene!

7. Use the *Brachyury* gene to address the paradox which faces evolutionary developmental biologists (Question 1).

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8. If *Tbx5*, a member of a transcription factor gene family, is a key player in the development of both wings and arms, why are wings and arms so different?

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9. *A review question:* What are **homoplastic structures (analogous structures)**?

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10. The *AP3* gene plays a role in petal development in eudicot flowering plants. How did the *Arabidopsis AP3* gene acquire the domain necessary for petal development in eudicots? How was functional analysis used to support this claim?

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11. Why have researchers selected yeast, *Arabidopsis*, *C. elegans*, *Drosophila*, and the mouse as model systems for use in functional genomics?

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12. Are eyes examples of convergent or divergent evolution? Are they homoplastic (analogous) structures or homologous structures? Explain.

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13. The gene, \_\_\_\_\_, initiates eye (lens) development in both insects and vertebrates!