

Exercise walk-through

7.6

Evidence of Evolution

AP Biology

Evidence and common ancestry

Many independent lines all point to
evolution :

- **Fossils** : change over time
- **Homologous structures** :
same bones
- **Molecular** : shared DNA sequences
- **Biogeography** : where
species live

One near-universal genetic code + ATP
+ ribosomes $\Rightarrow$ common ancestry.



Fossils record change and shared ancestry

What all life shares

the claim

all life descends from a **common ancestor**

the same machinery

DNA and RNA, transcribed and translated the same way in every domain

the same genetic code

the same codons specify the same amino acids, nearly universally

ribosomes

present in every cell, and structurally conserved

shared metabolism

core pathways such as glycolysis appear everywhere

the inference

features this arbitrary and this universal are far better explained by **inheritance** than by repeated invention

The argument is not that the features are useful – it is that the **particular arbitrary choices** are shared. A different code would work just as well.

Exercises 2.1-2.3

2.1 What do homologous structures suggest?

[1]

2.2 Give one type of molecular evidence for evolution.

[1]

2.3 What are transitional fossils?

[1]

Exercises 2.1-2.3

2.1 What do homologous structures suggest? [1]

2.1

- A common ancestor (shared ancestry)
-

2.2 Give one type of molecular evidence for evolution. [1]

2.2

- Similar DNA or protein sequences between species
-

2.3 What are transitional fossils? [1]

2.3

- Fossils showing features intermediate between older and newer groups

Exercise 3.1

3.1 The similar bone arrangement in a human arm and a whale flipper is an example of [1]

☐

A analogous structures

B homologous structures

C vestigial organs

D convergent evolution

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3.1 B

- homologous structures

Exercise 3.2 (a)

3.2 A bird's wing and an insect's wing both allow flight but have very different structures.

(a) State whether they are homologous or analogous.

[1]

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(a)

- Analogous

Exercise 3.2 (b)

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(b) Explain what this tells you about their evolutionary relationship. [2]

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(b)

- They evolved independently (convergent evolution) for the same function, so they do **not** indicate a close common ancestor

Exercise 3.3

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3.3

- The more similar two species' DNA sequences are, the fewer changes have accumulated since they diverged, so the more recently they shared a common ancestor