

2024 Bi H1 Q5

Section: DNA and the Genome

Topic: Cell Differentiation and Stem Cells

Question Summary:

Which listed features apply to tissue stem cells? The features are:
(1) involved in growth and repair; (2) all genes can be switched on; (3) can divide or differentiate.

Worked Solution:

- Tissue stem cells (adult stem cells) are involved in growth and repair of tissues.
- They can self-renew (divide) or differentiate into a limited range of specialised cell types (multipotent).
- In tissue stem cells, many genes are switched off. The statement 'all genes can be switched on' describes early embryonic stem cells, not tissue stem cells.

Therefore, the correct features for tissue stem cells are 1 and 3 only.

Final Answer: **B** (1 and 3 only).

Revision Tips:

- Tissue stem cells = multipotent: growth/repair + divide or differentiate.
- Embryonic stem cells = pluripotent: many genes switched on.