

APOLLO

Gene expression HL

Biology

First assessment 2025

5 questions | mark schemes

Mark-scheme answers

Biology HL | Paper 1A | May 2025 TZ2 | Q20 | 1 marks

20. A

1.	a		235 / 235.0 / 235.00 (g);		1
1.	b	i	negative correlation / inverse relationship / higher expression (of WIF1) with lower wool production / higher wool production with lower expression (of WIF1);		1
1.	b	ii	a. there could be a causal relationship because there is a (negative) correlation / <i>OWTTE</i> ; b. correlation does not prove/show causation; c. no mechanism shown for/no explanation of (how expression of WIF1 affects hair growth); d. wool growth may be affected by other factors/(expression of) other genes; e. data is only for two levels of wool production/intermediate values not shown; f. not an experiment/variables not manipulated experimentally/ <i>OWTTE</i> (so causal relationship not shown);	<i>Do not award marks for answers that state unequivocally that there is a causal relationship.</i>	2 max
1.	c		pcDNA / (control is the) plasmid/DNA without the WIF1 gene;		1
1.	d		a. no significant effect on EGF expression OR (small) increase in (mean) EGF expression but error bars overlap/difference is not statistically significant/is not within 0.01 confidence/99% confidence; b. SFR2 (expression) is increased/promoted (by pcDNA-WIF1); c. CCND1 (expression) is decreased/inhibited (by pcDNA-WIF1);		3

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2225 – 6021

Question		Answers	Notes	Total
1.	e	a. apoptosis is increased by pcDNA-WIF1 / by WIF1; b. proliferation is decreased by pcDNA-WIF1 / by WIF1; c. increased apoptosis/decreased proliferation of (dermal papilla) cells decreases wool/hair growth; d. protein produced by expressing WIF1 affects/promotes/inhibits expression of other genes; e. (increased) expression of SFRP2 could cause apoptosis/prevent proliferation; f. expression of CCND1 could prevent apoptosis/cause proliferation OR reduced expression of CCND1 (caused by WIF1) could allow apoptosis/reduce proliferation;	<i>Accept the converse in a. and b. (effects on apoptosis or cell proliferation of absence of WIF1)</i> <i>Accept the converse in e. and f. (effects on apoptosis or cell proliferation of non-expression of SFRP2 and CCND1)</i>	4 max

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2225 – 6021

Question	Answers	Notes	Total
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Mark-scheme answers

Biology HL | Paper 1A | Nov 2025 TZ3 | Q32 | 1 marks

32. B

Biology HL | Paper 1A | Specimen 2025 | Q10 | 1 marks

10. B

Biology HL | Paper 1A | Specimen 2025 | Q19 | 1 marks

19. A