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Phone: +442081445350

www.chemistryonlinetuition.com

Email: asherrana@chemistryonlinetuition.com

BIOLOGY

THE CONTROL OF GENE EXPRESSION

Level & Board	AQA (A-LEVEL)
TOPIC:	STEM CELLS
PAPER TYPE:	SOLUTION - 2
TOTAL QUESTIONS	6
TOTAL MARKS	31

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Stem Cells - 2

1.

(a)

iPS cells divide

iPS cells develop/differentiate into green sensitive cones

(b)

iPS cells are long term

iPS cells have less chance of rejection

iPS cells is a single treatment

2.

(a) They bind to the promoter region of a gene and cause transcription of the gene to be inhibited

(b)

Group A lower than group B.

Group A similar to group C.

Investigation done on mice not humans.

Long-term effects not known.

3.

(a)

ESCs may differentiate into cancerous cells which divide uncontrollably leading to a tumour

(b)

Might divide out of control

Leading to tumour/cancer

(c)

Shows the effects of surgery

Allows effects of transplants / treatment to be seen

4.

(a) There is a significant increase, cardiomyocytes increase the number of capillaries from roughly 75 to 140.

(b)

Greater blood supply to damaged areas

Bringing more oxygen / glucose for respiration

Brings more amino acids for protein synthesis

For cell repair / mitosis / division

5.

(a)

Gives rise to new plants / plantlets

So must be able to develop into different tissues / other specialized cell types / differentiate

(b)

5 : 1/50 : 10/1 : 0.2

6.

(a)

Meiosis / independent assortment / crossing over

Fusion of genetically different gametes / random fertilization

(b)

Will be clones / produced by mitosis / will be genetically identical / less variation / all plants will have desired characteristics



DR. ASHAR RANA



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Email: asherrana@chemistryonlinetuition.com

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CONTACT INFORMATION FOR CHEMISTRY ONLINE TUITION

- UK Contact: 02081445350
- International Phone/WhatsApp: 00442081445350
- Website: www.chemistryonlinetuition.com
- Email: asherrana@chemistryonlinetuition.com
- Address: 210-Old Brompton Road, London SW5 OBS, UK