

GCSE Biology A (Gateway)

J247/04 Biology A B4-B6 and B7 (Higher Tier)

Question Set: 10

1

Retinitis pigmentosa is a genetic condition that affects the eyes.

It is caused by a mutation to a gene. This mutation produces a recessive allele.

The condition causes rod cells in the retina to break down.

- (a) Explain the meaning of these terms.

Gene

..... Length of DNA that codes for a protein

Allele

..... A version of a gene

[2]

- (b) (i) Two people who are heterozygous for retinitis pigmentosa are expecting a baby.

Draw a genetic diagram to calculate the probability that the baby will have the condition.

Use R for the normal allele and r for the allele for retinitis pigmentosa.

	R	r
R	RR	Rr
r	Rr	rr

$$1/4 = \underline{\underline{25\%}}$$

[3]

- (ii) If the baby has retinitis pigmentosa, it will have normal colour vision but will not be able to see well in dim light.

Explain why.

Only rod cells are broken down and they only see in black and white - Also, rod cells work good in dim light so vision won't have much colour.

[3]

- (c) (i) Explain why stem cells could be used as a treatment for this condition.

Stem cells can still differentiate to become rod cells.

[2]

- (ii) Why is it an advantage to use stem cells from the patient rather than from another person?

They would not be detected as foreign cells so won't be rejected by body.

[1]

Total Marks for Question Set 10: 11

OCR
Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge