

Selective breeding and genetic engineering

① Gene therapy has been used to treat cystic fibrosis by inserting a functional allele into cells to replace a faulty allele. Suggest why this process is not always successful. (2 marks, ★★★)

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② Match each type of genetically modified (GM) organism to its possible function. (3 marks, ★★)

GM bacteria

Drought resistance

GM wheat

Produces human insulin

GM sheep

Produces human blood clotting factors in milk

③ a Describe the process of producing human insulin using *E. coli* bacteria. (5 marks, ★★★)

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b Evaluate the benefits of using genetically modified *E. coli* to produce human insulin. (4 marks, ★★★★★)

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