

Answers to Option B test yourself questions

- 1 Batch culture: nutrients and microorganisms are added to a fermenter, which is closed until the process is complete and the product is removed. Continuous culture: takes place in a fermenter that has nutrients and other requirements monitored and added as necessary so that an uninterrupted supply of the product can be drawn off throughout the process.
- 2 *Aspergillus niger*
- 3 *Saccharomyces*: heterotrophic saprotroph
Euglena: autotrophic (photosynthesises) and heterotrophic
Chlorella: autotrophic (photosynthesises)
- 4 A transgenic organism is one that contains genetic material from another, different species.
- 5 Any three of: using viruses as vectors; using bacterial vectors with recombinant plasmids; liposomes; microinjection; biolistic methods.
- 6 An open reading frame is a significant length of DNA that has no codons that terminate transcription within in.
- 7 Normal potatoes have starch which contains 80% amylopectin and 20% amylose but Amflora starch contains only amylopectin.
- 8 Physical: use of detergents and physical removal of oil using pressure hoses (or other suitable example).
Biological: introducing bacteria that are able to feed on oil and break it down.
- 9 resistance to antibiotics; flexibility; emergent properties (such as bioluminescence).
- 10 Quorum sensing is a method of communication between microorganisms in a biofilm, which involves the release of chemical signalling molecules in response to environmental change.
- 11 Bacteriophages can infect and kill bacteria that form biofilms in waste water treatment plants. Selected viruses (bacteriophages) are used to rid the water of harmful or nuisance bacteria.
- 12 HIV, prostate cancer (or other suitable examples)
- 13 A microarray has thousands of DNA samples attached to its surface. Each contains a specific 'probe' sequence, which will hybridise with target DNA. If a match occurs, the sequence of nucleotides in a DNA sample can be identified.
- 14 Biopharming is the use of genetic engineering to add genes to animals or plants so that they produce useful medicines.
- 15 BLASTn software allows nucleotide sequence alignment.
- 16 Model organisms are non-human species used for study and experimentation to understand particular pathways or processes. Understanding processes in these organisms allows scientists to extrapolate to others.
- 17 Computers use ESTs and scan databases for matches between known and unknown genes. If matches are found the position of a gene within a genome can be mapped.