

National University of Ireland, Galway  
Ollscoil na hÉireann, Gaillimh

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SUMMER EXAMINATIONS 2002 HONOURS

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Denominated Degree in Biotechnology (4BY 221)

BIOTECHNOLOGY (BG 401)

Third Paper

External Examiner: Dr. D.K. Apps

Time Allowed: Three hours

Write on *three* of the following topics, choosing at least *one* from each section.  
Start each answer in a new answer book and write the number on the front.

SECTION A

1. Evaluate secondary metabolite production in plants.
2. Oligomannose and complex *N*-glycans are present on the important therapeutic tissue plasminogen activator (tPA). Describe the types of protein expression systems/hosts you would select for production of recombinant tPA, giving reasons for your choice(s), and outline the strategy you would use to characterise the *N*-glycan structures on your glycoprotein product.
3. 'The quality of X-ray diffraction data obtained from protein crystals varies considerably'. Discuss this statement paying particular attention to; (i) how low quality data is recognized, (ii) the factors that influence data quality, (iii) how data quality can be improved, and (iv) the impact of data quality on the structural information that can be obtained.

SECTION B

4. 'Growth factors are among the most important modulators of eukaryotic cell growth.' Discuss this statement with particular reference to their potential therapeutic uses.
5. 'Maintenance of high hygienic standards in the production of biopharmaceuticals is an integral part of good manufacturing practice (GMP). Discuss.
6. Discuss the advantages and disadvantages of large-scale cell culture to biotechnology.