"Dissemination of Education for Knowledge, Science and Culture"

Shikshanmaharshi Dr. Bapuji Salunkhe

Shri. Swami Vivekanand Shikshan Sanstha's

Vivekanand College, Kolhapur (An Empowered Autonomous Institute)

NOTICE

All the students of B.Sc. Part–III (Biotechnology Entire) are hereby informed that the Department of Biotechnology will conduct a Unit Test of Application of Biotechnology in Health on 28 February 2025 at 11:30 a.m. Students are instructed to remain present on time in Hall no.408

Subject Teacher

Ms. V.N. Arekar

Mr. S.G. Kulkarni

HEAD

DEPARTMENT OF BIOTECHNOLOGY (ENTIRE)

(H.O.D. BIOTECHNOLOGY)

VIVEKANAND COLLEGE, KOLHAPUR

(EMPOWERED AUTONOMOUS)

B.Sc III Biotechnology (Entire)
Unit Test :Total Marks- 30
Sem VI: Application of biotechnology in Health **Date: 28 Feb 2025**

20 M

Q.1 MCQs (2M each)

Q1. Which of the following is a major application of health biotechnology?

a) Crop yield improvement
b) Production of therapeutic proteins
c) Soil fertility enhancement
d) Textile manufacturing

Q2. Recombinant DNA technology is commonly used for producing:

a) Antibiotics
b) Recombinant insulin
c) Vitamin B12
d) Mineral supplements

Q3. Embryonic stem cells are considered pluripotent because they:

a) Can give rise to only one type of cell
b) Can differentiate into many cell types
c) Cannot differentiate at all
d) Are restricted to muscle cells only

Q4. Which stem cells are primarily used in bone marrow transplantation?

a) Neural stem cells
b) Hematopoietic stem cells
c) Epithelial stem cells
d) Embryonic stem cells

Q5. Transgenic animals are best defined as:

a) Animals that are cloned
b) Animals carrying foreign genes introduced artificially
c) Animals bred for high productivity
d) Animals resistant to starvation

Q6. The first transgenic animal approved for human use in producing a therapeutic protein was:

a) Transgenic cow
b) Transgenic sheep (Rosie)
c) Transgenic goat
d) Transgenic rabbit

Q7. A vaccine prepared using a weakened form of the pathoger is called:

a) Subunit vaccine
b) DNA vaccine
c) Live attenuated vaccine
d) Toxoid vaccine

Q8. The first genetically engineered vaccine developed was against:

a) Hepatitis B
b) Polio
c) Rabies
d) Influenza

Q9. Which of the following is NOT a type of modern vaccine?

a) Subunit vaccine
b) Conjugate vaccine
c) RNA vaccine
d) Mineral vaccine

Q10. mRNA vaccines (like COVID-19 vaccines) work by:

a) Delivering whole virus particles
b) Inserting DNA into host genome
c) Providing genetic instructions to make viral proteins
d) Killing viral particles before injection

Q.2 Short ans (5 M each): **10 M**

1. Hybridoma technology
2. Gene therapy

nc: Teertha Kamat

॥ ज्ञान, विज्ञान आणि सुसंस्कार यांसाठी शिक्षण प्रसार ॥
– शिक्षणमहर्षी डॉ. बापूजी साळुंखे

35562

Shri Swami Vivekanand Shikshan Sanstha Kolhapur's

VIVEKANAND COLLEGE, KOLHAPUR (AUTONOMOUS)

SUPPLIMENT

17/30

Signature of Supervisor

Subject: Application of Biotechnology in Health

Suppliment No. :

Roll No. : UNIT TEST

Class : BSc. III Biotechnology (Centire)

Subject :

Test / Tutorial No. :

Div. :

Q.1

MCQ.

A 1. b. Production of therepetic proteinase

2

2. b. Recombinant insurine

2

3. b. Can differentiate into many cell types

2

4. b. Hematopoietic stem cells

2

5. b. Aminals carrying foreign genes introduced artificially

2

6. d. Transgenic Rabit

0

7. a. subunit vaccine

10

8. b. Polio

10

9. c. mRNA vaccine.

10

10. 9d. Killing viral particles before Injection.

Q.2. Short Answer.

1. Hybridoma technology.

Hybridoma technology generally refers to production of monoclonal Antibodies. Monoclonal Antibodies (MAb) is a single type of antibody that is a directed against a specific antigenic determinant (epitope) It is Intresting that Imortal monoclonal Antibodies producing cells do exist in nature. They are found in the patients suffering from a disease.

Steps involved in Hybridoma technology.

1) Immunization

2) Cell fusion

3) selection of hybridomas

4) Screening of the products

5) cloning and propogation

6) characterization and storage.

1) Immunization.
Immunize the animal (mouse) with appropriate antigene the antigen adjuvent like Freund's complete and Incomplete ~~anti~~ adjuvant. is injected subcutenously.

2) cell fusion: The thoroughly washed lymphocytes are mixed coith HGPRT with defective myloma cells. The mixture of cells is exposed to polyethylene. glycol for a short period.

3) selection of hybridomas: Cells are cultured in HAT medium where the only hybridoma cells are grows.

election of hybridomas: These happen in 7-10 days. selection of a single Ab producing hybrid cells is very important.
Screening the products: The hybridomas must be screened for the secretion of the antibody of desired specificity.

2. Gene therapy:

Gene therapy is the process of inserting genes into cells to treat diseases. The newly introduced genes or will encode proteins and correct the deficiencies the occur in genetic diseases.
Thus gene therapy, primarily involves genetic manipulations in animals or humans to correct a disease.

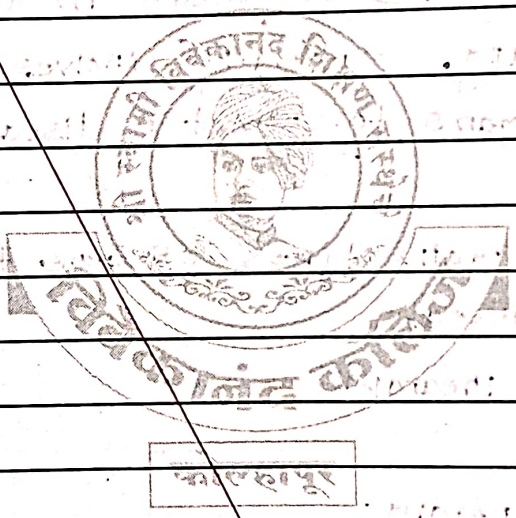
There are Two main types of Gene therapy
1) Ex vivo Gene therapy
2) In vivo Gene therapy

1) Ex vivo gene therapy:
- The ex-vivo gene therapy can be applied to only selected tissue of (bone marrow) whose cells can be cultured in the laboratory.
The techniques of ex vivo gene therapy.
1) Isolate cells with genetic defect form a patient.
2) Grow the cells in culture.
3) Introduce the therapeutic gene to correct gene defect
4) Select the genetically corrected cells
5) Transplant the modified cells to the patient.

2) In vivo gene therapy:

The direct delivery of the therapeutic gene (DNA) into the to
cells of a particular tissue of a patient constitute in vivo g
therapy.

Many tissues are the potential candidates for this approach.



BSc. Biotech Entire - III
Unit Test Exam sem - VI
Advances in Genetic Engineering

28/02/25 67

15

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N.	Roll No.	Name	Sign	Marks
1	9301	Pranav Bhauso Adanna	P. Pradhan	13
2	9302	Shreya Mohan Ambekar	AMBEKAR	11
3	9303	Shreyash Manish Bam		11
4	9304	Shrutika Anant Bawadekar	Bawadekar	08
5	9305	Shravani Kailas Bhambure		06
6	9306	Triveni Punallik Birje	Birje	12
7	9307	Ritesh M. Borgave		14
8	9308	Shruti Nitin Chikalkar		13
9	9309	Shruti Bharat chougule		11
10	9310	Vaishnavi Santosh Dhavan		11
11	9311	Bhakti Kishor Gonugade		15
12	9312	Isha Jagdish Gurav		11
13	9313	Sanika Sambhaji Jadhav		07
14	9314	Alisha Nazir Jamadar	Alisha	06
15	9315	Shambhavi Dhananjay Joshi	Joshi	10
16	9316	Preeti Daniel Kale	Kale	6½
17	9317	Arvind Bhoja Kalel	Akalel	9½
18	9318	Teertha Raj Kamat	R. Kamat	14
19	9319	Shruti Sandip Kanekar		9
20	9320	Yashovardhan Kavathekar		14½
21	9321	Mansi . B. Koravi	Bkoravi	12
22	9322	Somiksha S. Kothale		7½
23	9323	Manish B. kumbhar		06
24	9324	Krishna Gajanan Kunud		13
25	9325	Ajay Dadasaheb Kute	Akute	08

26	9326	Samrudhi Sanjay Mahind.	
27	9327	Sopliya Saleem Mestei	
28	9328	Sanmati RajaBhau Nanghane	
29	9329	Sucheta Ranjeet Parit.	
30	9330	Aashish Tukaram Patil	
31	9331	Chetan Balkrishna Patil	
32	9332	Ketan Avinash Patil	
33	9333	Neha Laxman Patil	
34	9334	Niraj Rajgonda Patil	
35	9335	Pratik Aadargonda Patil.	
36	9336	Pratiksha Dattatray Patil	
37	9337	Shreeya Suresh Patil.	
38	9338	Shridhar Sagar Patil	
39	9339	Swati Pravin Pawar	
40	9340	Arya Heramb Pednekar.	
42	9342	Nayan Amar Pinjare.	
41	9341	Kaumudi Prasad Phope	
43	9343	Eshwari Parsu Pol	
44	9344	Dhanshri Narendra Ranjane.	
45	9345	Sela Ajinkya Rege	
46	9346	Harshdeep Suhas Salokhe	
47	9347	Samiksha Chandrakant Sawant	
48	9348	Viraj Jaydeep Sawant	
49	9349	Mayuri Madhukar Shinde	
50	9350	Soundarya Umesh Shirodkar	
51	9351	Samrudhee Anil Talekar	
52	9352	Kiran Balkrushna Tashildar	

9353	Omkar Santosh Thakare	~~Thakre~~	11
9354	Yashika Damodar Vaswani	~~Yashika~~	14
9355	Manasvi Sagar Bhatkal	M.S Bhatkal	09

Advances in Genetic Engineering.

Unit Test Exam - Sem VI

BSc. Biotech (Entire) - III

(15 M)

1. _____ plasmid is used in production of somatostatin. (PSOM I / PSOM II)

2. _____ interfers with expression of specific gene. with complement nucleotide sequences by degrading mRNA. (siRNA)

3. _____ is used to study the changes in organism when a perticular gene is absent. (knock out mice)

4. When the lac z containing vector is transformed, the bacteria produces _____ colonies. (white)

5. _____ are artificial vesicles, fused with cell membrane, allowing genetic material to enter the cell's cytoplasm. (liposome)

6. The vector used to transfer gene to produce recombinant plant is _____. (Ti Plasmid)

7. _____ is the method in which a sample containing cells is suspended in a fluid and injected into flow cytometer. (Fluroscent activated cell sorter)

8. For transformation _____ microparticles are coated with DNA to be bombarded with gene gun. (tungsten)

9. (Agrobacterium tumifaciens) carries a natural plasmid that can mostly be used in transforming plant cell only.

10. (PEG) DMSO is polycation used to increase the membrane permeability and enhance the uptake of foreign DNA

11. (Gene silencing) is a technique that aims to reduce or eleminate the production of protein from its corresponding gene.

12. The method of gene transfer that involves use of high voltage electric impulses to increase the permeability of membrane. by creating pores is called (Electroporation).

13. Define insertional inactivation.

14. Disadvantage of microinjection mediated gene transfer.

15. Steps involved in insulin production.