



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

Accredited "A" Grade by NAAC | 12B Status by UGC | Approved by AICTE

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SCHOOL OF BIO AND CHEMICAL ENGINEERING DEPARTMENT OF BIOTECHNOLOGY

Board of Studies-2016-2017 (ODD SEM)

Minutes of Meeting

Date :06-06-2016 (Wednesday)

10.00am-11.45am

- Chair-person : Dr. Valli Nachiyar C, Prof and HOD
- Attendees : Dr. Parthiban.M., External Member
Professor and Head, Department of Animal Biotechnology,
Madras Veterinary college, Chennai 600007
- Dr. Ramesh kumar V, Internal member
Dr. Jayshree Nellore, Internal member
Dr. Karthick Raja Namasivayam, Internal member

The Chair-person welcomed the internal and external board members to the meeting. Following this, the agenda points were discussed as follows;

Agenda of the meeting; Syllabus revisions and implementation in 2016- 2017;

1. To approve the syllabus of cancer Biology for B.Tech Biotechnology for the batch 2014-2018 (2010 regulations)

The Board considered and approved the syllabi for SBTX1022 Cancer Biology which is being followed in the department since 2016-17

Also, a major reshuffling in the elective courses was approved by the Board.

2. To discuss the curriculum and syllabus for M Tech Biotechnology

Existing modules in 2015 regulations were discussed for the 2015-17 batch M.Tech Biotechnology and the same syllabus for both theory and electives were followed for the even semester.

Dr Jayshree Nellore expressed the implementation new elective courses to keep up with current advances in the field and a major reshuffling in the elective courses was recommended.

Dr Ramesh elaborated on the inclusion of few important topics in the elective paper Stem cell Research (SBT5606) in M.Tech Biotechnology to upgrade the syllabus.



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The members considered the proposed changed which will be approved in the next BOS meeting

The meeting ended with thanks to the chair

External Member	Signature
Dr.Prathiban M	
Internal Member	Signature
Dr. Jayshree Nellore	
Dr. Karthick Raja Namasivayam	
Dr. Ramesh kumar V	


Head of the Department/Chairperson

(Dr.Valli Nachiyar)

HEAD OF THE DEPARTMENT
DEPARTMENT OF BIOTECHNOLOGY
SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
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Jeppiaar Nagar, Rajiv Gandhi Sala
Chennai-600 119



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S.No	Course code	Course name	Deleted topics	Added topics
1	SBTX1022	Cancer biology	NIL	Unit 1: Definition of cancer cell, clonal expansion and normal vs benign vs malignant tumor Unit 2: Cancer diagnostic and prognostic markers. Molecular classification of cancer Unit 4: Clinical significance of proteomics in cancer. Application of serum proteomics in cancer diagnostics. Unit 5: Cancer Immunotherapy – monoclonal antibody harnessing innate immunity, cancer vaccines, dendritic cell vaccine for prevention of cancer.

DEPARTMENT OF BIOTECHNOLOGY
B.Tech. Biotechnology – 23

SBTX1022	CANCER BIOLOGY (OLD SYLLABUS)	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT I THE BASICS OF CANCER BIOLOGY

10 hrs.

Nomenclature, Historical perspective, Oncogenesis, Cell cycle & check points, cancer mechanism, Receptors, Signal molecules, Signal transduction – Modulation study, oncogenesis, Diagnostic tools for detection of cancer gene, treatment and prevention of cancer.

UNIT II CAUSE, TYPES AND DETECTION OF CANCER

10 hrs.

Incidence of cancer, Factors related to transformation- environment, Geography, Genetic modification – telomerase study, Types of carcinogenesis – physical, chemical and biological carcinogenesis. Detection of cancer, Identification of cancer using- signal targets- gene therapy – New techniques of early detection of cancers and early detected cancer-curative methodologies,

UNIT III BIOLOGY OF CANCER

10 hrs.

Differentiation, rate of growth, local invasion, Metastasis, Pathways of spread. Tumor progression, theory of invasion – tumor cell invasion – invasion of extracellular matrix – Vascular dissemination and homing of tumor cells.

UNIT IV ONCOGENES AND ONCOPROTEINS

10 hrs.

Conditions of cancer, protooncogenes, oncogenes and oncoprotein, Tumor suppressor genes – p53 genes, activation- study. Evasion of apoptosis – DNA repair defects and instability of genes in cancer cells. Stromal and microenvironment and carcinogenesis. Dysregulation of cancer, Chromosomal changes, amplification of genes, Molecular profile of cancer cells.

UNIT V CANCER THERAPY

10 hrs.

Cancer therapy: different types of cancer therapy-physical, chemical, biological and conventional method of cancer therapy.

TEXT BOOKS:

1. Maly B.W.J . Virology: A Practical approach IRC press, Oxford, 1987
2. Dunmock N.J and Primrose S.B; Introduction to Modern virology, Blackwell Scientific publication, oxford, 1988

REFERENCES:

- I. Margaret A. Knowles and Peter T. Selvo, An introduction to cellular and molecular biology of cancer, Oxford Medical publications 1991

UNIVERSITY EXAM QUESTION PAPER PATTERN

Max Marks: 80

Exam duration: 3hrs

PART A : 2 Questions from each unit, each carrying 2 marks

20 marks

PART B : 2 Questions from each unit of internal choice, carrying 10Marks each

60 Marks

SBTX1022	CANCER BIOLOGY (REVISED SYLLABUS)	L	T	P	Credits	Total Marks
		3	0	0	3	100

UNIT I THE BASICS OF CANCER BIOLOGY

10 hrs.

Nomenclature, Historical perspective, Oncogenesis, Cell cycle & check points, cancer mechanism, Receptors, Signal molecules, Signal transduction – Modulation study, Definition of cancer cell, clonal expansion and normal vs benign vs malignant tumor, oncogenesis, Diagnostic tools for detection of cancer gene, treatment and prevention of cancer.

UNIT II CAUSE, TYPES AND DETECTION OF CANCER

10 hrs.

Incidence of cancer, Factors related to transformation- environment, Geography, Genetic modification – telomerase study, Types of carcinogenesis – physical, chemical and biological carcinogenesis. Detection of cancer, Identification of cancer using-signal targets- gene therapy – New techniques of early detection of cancers and early detected cancer-curative methodologies, Cancer diagnostic and prognostic markers. Molecular classification of cancer

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10 hrs.

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10 hrs.

Cancer therapy: different types of cancer therapy-physical, chemical, biological and conventional method of cancer therapy. Cancer Immunotherapy – monoclonal antibody harnessing innate immunity, cancer vaccines, dendritic cell vaccine for prevention of cancer.

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Board of Studies 2016-2017 (EVEN SEM)

Minutes of Meeting

Date: 9-01-2017 (Monday)

11.00am-12.15pm

Chair-person : Dr. Valli Nachiyar C, Prof and HOD

Attendees : Dr. Parthiban.M., External Member
Professor and Head, Department of Animal Biotechnology,
Madras Veterinary college, Chennai 600007

Dr. Ramesh kumar V, Internal member

Dr. Jayshree Nellore, Internal member

Dr. Karthick Raja Namasivayam, Internal member

The Chair-person welcomed the members. She invited all the faculty members of Department of Biotechnology to table the agenda.

Agenda of the meeting; Syllabus revisions and implementation in 2016- 2017 even semester. Following which discussions were held as;

1. To consider and approve the curriculum and syllabus for B.Tech Biotechnology

The chairman discussed the Existing modules in 2010 regulations for the 2014-18 batch BTech Biotechnology. The members approved the same syllabus for consideration for both theory and electives for the even semester with major shuffling in elective courses

2. To approve the syllabus of Stem cell Research for M Tech Biotechnology

The Board considered and approved the syllabi for SBT5606 Stem cell research which is being followed in the department since 2017-18.



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Also, a major reshuffling in the elective courses was approved by the Board.

The meeting ended with thanks to the chair

External Member	Signature
Dr.Prathiban M	
Internal Member	Signature
Dr. Jayshree Nellore	
Dr. Karthick Raja Namasivayam	
Dr. Ramesh kumar V	

Head of the Department/Chairperson

(Dr.Valli Nachiyar)

HEAD OF THE DEPARTMENT
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S.No	Course code	Course name	Deleted topics	Added topics
1	SBT5606	Stem cell Research	NIL	Unit 4: Genetic Perspectives for Gene Therapy, Gene Delivery methods: Viral vectors and Non-viral Vectors. Use of Genetically Modified Stem Cells in Experimental Gene Therapies. Unit 5: Modifications of Biomaterials, Role of Nanotechnology. Patent protection and regulation of of tissue-engineered products, ethical issues.

SBT5606	STEM CELL RESEARCH (For M.Sc)	L	T	P	Credits	Total Marks
		3	1	0	4	100

COURSE OBJECTIVE

- Discusses the fundamental concepts in stem cell research that includes various types of stem cells and their applications

UNIT 1 INTRODUCTION**12 Hrs.**

Embryonic development, Evolution of stem cell, Stem cell niche, cell cycle regulation of stem cell, Genetic regulation of stem cell fate. Potential applications for stem cell research. Origin and characterisation of human stem cells, plasticity of human somatic stem cell, stem cell based therapies, scientific and technical obstacles to overcome before realising the potential clinical use of novel human stem cell based therapy, cord blood, stem cell marker.

UNIT 2 HUMAN EMBRYONIC STEM CELL**13 Hrs.**

Human embryonic stem cell research: Possible sources for human embryonic stem cell, Growing human ESC in laboratory, Current advantages and limitations of hESC and human somatic cells, Examination the need for new cell lines, Developments regarding establishment of human stem cell banks and registries. Government of hESC research, Ethical issues in human embryonic stem cells.

UNIT 3 NEURAL STEM CELLS**10 Hrs.**

Neurosphere-sources, isolation, differentiation, Differentiation of cells from human, neurospheres into neurons, astrocytes and oligodendrocytes; Immuno labeling procedure, Therapeutic applications-recent trends

UNIT 4 APPLICATIONS OF STEM CELLS**13 Hrs.**

Gene therapy: Possibilities to overcome immuno - rejection in stem cell therapy, Haematopoietic stem cell transplantation-A new therapy for autoimmune disease, Hematopoietic stem cell mobilization, Isolation and characterization of stem cell, Prenatal diagnosis of genetic abnormalities using fetal CD34+ stem cells. Stem cells in treatment for major disease and reparative medicine, Germ – line therapy.

UNIT 5 TISSUE ENGINEERING**12 Hrs.**

Recent trends in Tissue Engineering: Basic principles and consideration- cell type and source, metabolic requirements of cells, scaffolds-selection and application. Tissue engineering of the liver, heart, kidney, ethical issues in tissue engineering.

Max.60 Hours**COURSE OUTCOMES**

On completion of the course, the student will be able to

CO1 - Stem cells are the pluripotent cells having gained recent attention. The course introduces the various developmental concepts of stem cell research and its behaviours.

CO2 - Overview of stem cells and their progenitor cells developmental stages discussed.

CO3 - To discuss types of stem cells, Properties, characterization and applications.

CO4 - Various stem cells and their features discussed.

CO5 - Applications of various Stem cells were described.

CO6 - Discussing the Ethics and tissue regeneration.

TEXT / REFERENCE BOOKS

1. Kursad Turksen. Embryonic Stem cells, Humana Press. 2002.

2. Stem cell and future of regenerative medicine. By committee on the Biological and Biomedical applications of Stem cell Research, National Academic Press, 2002.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks : 80

Exam Duration : 3 Hrs.

PART A : 6 Questions of 5 Marks each – No Choice

30 Marks

PART B : 2 Questions from each unit of internal choice, carrying 10 Marks each

50 Marks

SBT5606	STEM CELL RESEARCH	L	T	P	Credits	Total-Marks
		3	1	0	4	100

COURSE OBJECTIVE

- Discusses the fundamental concepts in stem cell research that includes various types of stem cells and their applications

UNIT1 INTRODUCTION

12Hrs.

Embryonic development, Evolution of stem cell, Stem cell niche, cell cycle regulation of stem cell, Genetic regulation of stem cell fate. Potential applications for stem cell research. Origin and characterization of human stem cells, plasticity of human somatic stem cell, stem cell-based therapies, scientific and technical obstacles to overcome before realizing the potential clinical use of novel human stem cell-based therapy, cord blood, stem cell marker.

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13Hrs.

Gene therapy: Possibilities to overcome immuno-rejection in stem cell therapy, Haematopoietic stem cell transplantation-A new therapy for autoimmune disease, Hematopoietic stem cell mobilization, Isolation and characterization of stem cell, Prenatal diagnosis of genetic abnormalities using fetal CD34+ stem cells. Genetic Perspectives for Gene Therapy, Gene Delivery methods: Viral vectors and Non-viral Vectors. Use of Genetically Modified Stem Cells in Experimental Gene Therapies.

UNIT5 TISSUEENGINEERING

12 Hrs.

Recent trends in Tissue Engineering: Basic principles and consideration- cell type and source, metabolic requirements of cells, scaffolds-selection and application. Tissue engineering of the liver, heart, kidney, ethical issues in tissue engineering. Modifications of Biomaterials, Role of Nanotechnology. Patent protection and regulation of tissue-engineered products, ethical issues.

Max.60 Hours

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On completion of the course, the student will be able to

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Max. Marks:80

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PART B : 2 Questions from each unit of internal choice

Exam Duration : 3Hrs.

30Marks

50 marks