



PHARMALOGOS

DEPARTMENT OF PHARMACOLOGY - NEWS LETTER



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ISSUE HIGHLIGHTS

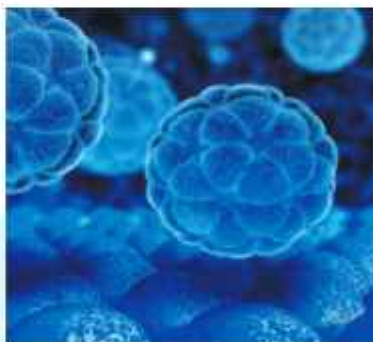
- ☛ 3D cell culture Technology
- ☛ FDA Approved drugs in Past 6 Months
- ☛ Department highlights

3D CELL CULTURE TECHNOLOGY

Cancer is a molecularly heterogeneous disease and one of the major causes of death worldwide. Cancer development is a multistep process, during which cells accumulate genetic abnormalities, especially in oncogenes and tumor suppressor genes, contributing to uncontrolled proliferation.

The advances in the cancer pathobiology study have its origin on the availability of different types of experimental model systems that review the various forms of this disease. Studies of cancer rely on the use of primary tumors, paraffin-embedded samples, cancer cell lines, xenografts, tumor primary cell cultures and/or genetically engineered mice. Each of these diverse models is used for different studies, mainly because certain types of manipulations for the genetic and drug testing are ethically, and in practice, difficult to perform in animals. Cell lines emerge as a feasible alternative to overcome these issues, being at the same time easy to manipulate and molecularly characterize (e.g. genetic and/or epigenetically).

Most research regarding cancer biology is based on experiments using two-dimensional (2D) cell cultures *in-vitro*. However, 2D cultures have many limitations, such as the disturbance of interactions between the cellular and extracellular environments, changes in cell morphology, polarity, and method of division. These disadvantages led to the creation



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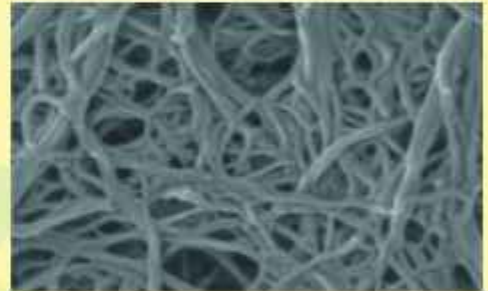
of three dimensional (3D) cell culture technology which is able to mimic the *in-vivo* micro environment of cultured tumor cells. *Ex-vivo* 3D cell culture provides a useful platform for a better understanding of cancer biology and facilitates the study of biomarkers and targeting therapies.

A 3D cell culture is an artificially created environment in which biological cells are permitted to grow or interact with their surroundings in all three dimensions. Unlike 2D environments (e.g. a Petri dish), a 3D cell culture allows cells *in-vitro* to grow in all directions, similar to how they would *in-vivo*. These three-dimensional cultures are usually grown in bioreactors, small capsules in which the cells can grow into spheroids, or 3D cell colonies.

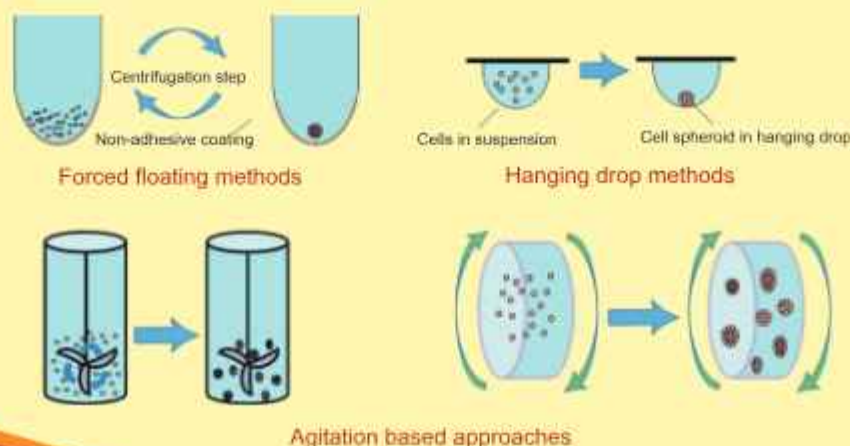
There are a large number of commercially available culturing tools that claim to provide the advantages of 3D cell culture. In general, the platforms can be classified in two types, scaffold techniques and scaffold-free techniques.

CELLULOSE HYDROGEL SCAFFOLD FOR 3D CELL CULTURE

Scaffolds are porous support that regulate cell growth and enhance signaling. To achieve this purpose, they facilitate oxygen, nutriment, soluble factors and waste transportation. Thus, Cells can proliferate and migrate within the scaffold web to eventually adhere on it. As they keep growing, the maturing cells end up interacting with each other and will eventually turn into structures closed to the tissues they were initially originated from. Different scaffold categories can be found: on the one hand, there are *in vitro* 3D scaffolds for cell culture and experimental applications (drug and cosmetic testing), on the other hand biomedical engineering scaffolds are selected as support for tissues regeneration applications. Scaffold currently made are membranes, matrices and above all hydrogels that present excellent properties. In Scaffold free technique, to generate spheroids, cells aggregates that don't rely on solid supports (ECM molecules or biomaterials) can be made. The main scaffold-free 3D cell culture techniques are the forced-floating method, the hanging drop method and the agitation based method.



Cells grown in a 3D cell culture can be stem cells, autologous cells, allogenic cells, xenogenic cells, progenitor and multipotent cells. 3D cell culture presents many interesting applications. Amongst them, tissue engineering specializes in repairing damaged tissues by injecting new one generated by 3D cell culture. This culture method tries to reduce the gap between *in-vitro* and *in-vivo* drug testing models as much as possible. Micro-engineering applications such as organs-on-chips and microfluidic have greatly contributed to the improvement of drug testing process.



Consequently, 3D cell culture can also be described as a cost-effective/time saving culture technique for drug screening since it considerably reduces drug trials periods while making them more precise or and targeted. For instance, using micro-engineering applications (organs-on-chips), cancer therapeutic are getting better, improving the benefit-risk balance by targeting more precisely a particular cell type, a defined bio-mechanism, a precise receptor, etc.,

Unlike 2D monolayer cell culture, 3D cell culture is a much more satisfactory model mimicking *in-vivo* cells morphology and physiology. Due to its novelty, this technique is not fully comprehended, hence not so easy to handle. Beside, while 3D cell culture could be a cost saving technique that would skip the animal drug testing step in drugs trials, developing automation and reproducible applications still remains a very costly and meticulous process.

Ms. Prajitha
III Semester M. Pharm.

FDA APPROVED DRUGS IN PAST 6 MONTHS

The following database contains a list of new drugs approved by Food and Drug Administration (FDA) for sale in the United States. Drug information is as follows.



BRAND NAME	DRUG	MANUFACTURER	TREATMENT	APPROVED MONTH
Xospata	Gilteritinib	Astellas	Refractory acute myeloid leukemia	November 2018
Yupelri	Revefenacin	Mylan	Chronic obstructive pulmonary disease (COPD)	November 2018
Daurismo	Glasdegib	Pfizer	Acute Myeloid Leukemia	November 2018
Talzenna	Talazoparib	Pfizer	Metastatic breast cancer	October 2018
Revcovi	Elapegamase	Leadient biosciences	Adenosine Deaminase-Severe Combined Immunodeficiency (ADA-SCID)	October 2018
Libtayo	Cemiplimab	Regeneron pharmaceuticals	Cutaneous squamous cell carcinoma (CSCC)	September 2018
Vizimpro	Dacomitinib	Pfizer	Lung cancer	September 2018
Emgality	Galcanezumab	Eli Lilly	Preventive treatment of migraine	September 2018
Pifeltro	Doravirine	Merck's	HIV-1 infection	August 2018

BRAND NAME	DRUG	MANUFACTURER	TREATMENT	APPROVED MONTH
Oxervate	Cenegermin	Dompe Pharmaceuticals	Neurotrophic keratitis	August 2018
Diacomit	Stiripentol	Desitin	Seizures associated with Dravet syndrome	August 2018
Poteligeo	Mogamulizumab	Kyowa kirin	Non-Hodgkin lymphoma	August 2018
Krintafel	Tafenoquine	GSK	Radical cure of Plasmodium vivax malaria	July 2018
Tpoxx	Tecovirimat	SIGA	Smallpox	July 2018
Zemdri	Plazomicin	Achaogen	Complicated urinary tract infections	June 2018
Epidiolex	Cannabidiol	Greenwich Research	Epilepsy	June 2018

Ms. Sreelakshmi S. S.
III Semester M. Pharm.

DEPARTMENT HIGHLIGHTS

POST GRADUATE RESEARCH PROJECTS

SL. NO.	TITLE OF THE PROJECT	NAME OF THE STUDENTS	NAME OF THE GUIDE
1	Pharmacological screening of edible unripe fruit extract of <i>Musa balbisiana</i> for antioxidant, anti anemic, anti-spasmodic and hepatoprotective activity.	Anupam Prahalad	Dr. A. Suresh
2	Phytopharmacological assesement of antidiabetic and anti hyperlipidemic potential of <i>Psidium cattleianum</i> Sabine leaves extract through in-vitro and in-vivo methods.	Asma M. A.	Dr. E. Tamil Jothi
3	Acitivity guided phytopharmacological evaluation of <i>Clerodendrum paniculatum</i> leaves with special reference to Diabetes Mellitus.	Aswani K	Mr. S. Venkatesh
4	Phytochemical and pharmacological evaluation of edible unripe fruit extract of <i>Musa balbisiana</i> .	Hanisha K. P.	Dr. A. Suresh
5	Evaluation of hepatoprotective and <i>ex-vivo</i> antispasmodic activity of extract of <i>Psidium cattleianum</i> Sabine leaves in Wistar albino rats.	Joseph Paily	Dr. E. Tamil Jothi

SL. NO.	TITLE OF THE PROJECT	NAME OF THE STUDENTS	NAME OF THE GUIDE
6	Protective effect of the mixture of stem bark, leaf and root extract of <i>Bauhinia accuminata</i> L. against carbon tetrachloride induced liver damage in Wistar albino rats.	Nidhin Devassia M	Mr. S. Venkatesh
7	Scientific evaluation of edible unripe fruit extract of <i>Musa balbisiana</i> in the treatment of depression and stress induced ulcer.	Rafa Zubair N. V.	Dr. A. Suresh

SEMINAR/CONFERENCE ATTENDED



Mr. S. Venkatesh, Asst. Professor, Amritha C. K, P. Prajitha, Sreelakshmi S.S, T. Savitha III Semester M.Pharm (Pharmacology) Students have attended a National Conference on "SUSTAINABLE DEVELOPMENT WITH PHARMACOLOGICAL RESEARCH AND INNOVATIONS" Organized by Department of Pharmacology, JSS College of Pharmacy, Ooty on 28th and 29th September 2018.



Dr. A. Suresh, Professor & Head has attended PCI Sponsored Continuing Education Program on "CHALLENGES AND STRATEGIES IN EFFECTIVE TEACHING AND LEARNING PROCESS" Organized by Vinayaka Mission's College of Pharmacy, Vinayaka Mission's University, Salem on 7th to 9th September 2018.

Dr. E. Tamil Jothi, Associate Professor has attended International Pharmaceutical Summit on "EMINENCE OF PHARMACY PRACTICE AND ADVANCEMENT IN PHARMACEUTICAL AND LIFE SCIENCES", Organized by National Forum for Pharmacy Students Hyderabad on 18th August 2018.

WORKSHOP ATTENDED



Mr. S. Venkatesh, Asst. Professor, has attended Workshop on "COMPRESSION ONLY LIFE SUPPORT [COLS]- EVERY CITIZEN A LIFE SAVER" Organized by Department of Anaesthesiology, Government Medical College, Thrissur on 23rd October 2018.

POSTER PRESENTATION



Dr. E. Tamil Jothi, Associate Professor has presented a research paper entitled "EFFECT OF ANALGESIC ACTIVITY IN ISOLATED COMPONENTS OF *TECOMARIA CAPENSIS*" in International Conference on "Eminence of Pharmacy Practice and Advancement in Pharmaceutical and Life Sciences" Organized by International Pharmaceutical Summit, National Forum for Pharmacy Students, Hyderabad on 18th August 2018.

Mr. S. Venkatesh, Asst. Professor has presented a research paper entitled "ANTI-TUMOR ACTIVITY OF ETHANOLIC EXTRACT OF *EPIPREMNUM AUREUM* LINN. LEAVES AGAINST DAL INDUCED TUMOR IN MICE" in National Conference on "Sustainable Development with Pharmacological Research and Innovations" Organized by Department of Pharmacology, JSS College of Pharmacy, Ooty on 28th and 29th September 2018.



Ms. P. Prajitha has presented a research paper entitled "HEPATOPROTECTIVE ACTIVITY OF *PSIDIUM CATTLEIANUM* SABINE LEAF EXTRACT IN WISTAR ALBINO RATS" in National Conference on "Sustainable Development with Pharmacological Research and Innovations" Organized by Department of Pharmacology, JSS College of Pharmacy, Ooty on 28th and 29th September 2018.



Ms. Sreelakshmi S. S. has presented a research paper entitled “*IN-VITRO ANTI INFLAMMATORY ACTIVITY ON ISOLATED COMPOUNDS OF TECOMARIA CAPENSIS LEAVES*” in National Conference on “*Sustainable Development with Pharmacological Research and Innovations*” Organized by Department of Pharmacology, JSS College of Pharmacy, Ooty on 28th and 29th September 2018.

Ms. Amritha C. K. has presented a research paper entitled “*EVALUATION OF HEPATOPROTECTIVE ACTIVITY OF ALLAMANDA CATHARTICA LINN. LEAVES IN CARBON TETRACHLORIDE CHALLENGED WISTAR ALBINO RATS*” in National Conference on “*Sustainable Development with Pharmacological Research and Innovations*” Organized by Department of Pharmacology, JSS College of Pharmacy, Ooty on 28th and 29th September 2018.



Mrs. T. Savitha has presented a research paper entitled “*TARGETING GLYCOLYTIC STRESS TO STARVE CANCER CELLS BY SODIUM OXAMATE AND 5-BROMO ISATIN IN URETHANE INDUCED LUNG CARCINOGENESIS*” in National Conference on “*Sustainable Development with Pharmacological Research and Innovations*” Organized by Department of Pharmacology, JSS College of Pharmacy, Ooty on 28th and 29th September 2018.

AWARDED

Dr. E. Tamil Jothi, Associate Professor has awarded Dr. H. S. Chandel Memorial Teachers Award in International Conference on “*Eminence of Pharmacy Practice and Advancement in Pharmaceutical and Life Sciences*” Organized by International Pharmaceutical Summit, National Forum for Pharmacy Students, Hyderabad on 18th August 2018.



PAPER PUBLICATIONS

Article Published

- ♦ Rafa Zubair N.V, Suresh A, Babu G, Asma MA, Anupam Prahalad, Hanisha KP. Assessment of anti-ulcer potential of unripe fruit extract of *Musa balbisiana* in stress induced ulcer model. World Journal of Pharmacy and Pharmaceutical Sciences. 2018; 7(8):1328-1336.
- ♦ Sarankumar MS and Suresh A. Lactate transport and acidosis as target for tumor regression by drug repositioning in lung carcinogenesis model. World Journal of Pharmacy and Pharmaceutical Sciences. 2018; 7(8): 752-773.

Papers Communicated

- ♦ Suresh A. *In Vitro* Antioxidant and Hepatoprotective Activities of Edible Unripe Fruits of *Musa balbisiana*. Journal of Pharmaceutical Research.
- ♦ Suresh A. *In Vitro* antioxidant and hepatoprotective activities of edible unripe fruits of *Musa balbisiana*. Indian Journal of Pharmacology.

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