SS INSTITUTE OF PHARMACY

(A unit of VS Educational & Charitable Trust)

Approved by Tamilnadu Government & Pharmacy Council of India, New Delhi.
Affiliated to the Tamilnadu Dr. M.G.R. Medical University,
and The Directorate of Medical Education, Chennai.

CONTENT BEYOND SYLLABUS

S.No	Semester	Subject Code	Subject Title	Content Beyond Syllabus title
1.	I	BP101T	Human Anatomy and Physiology I– Theory	Neurophysiology
2.	I	BP102T	Pharmaceutical Analysis I – Theory	Spectroscopic Techniques
3.	I	BP103T	Pharmaceutics I – Theory	Advanced Drug Delivery Systems
4.	I	BP104T	Pharmaceutical Inorganic Chemistry – Theory	Regulatory Aspects
5.	I	BP105T	Communication skills – Theory	Advanced Public Speaking
6.	I	BP106RBT	Remedial Biology	Molecular Biology
7.	I	BP106RMT	Remedial mathametics	Advanced problem-solving techniques
8.	II	BP201T	Human Anatomy and Physiology II – Theory	Advanced Neurophysiology
9.	II	BP202T	Pharmaceutical Organic Chemistry I – Theory	Green Chemistry
10.	II	BP203T	Biochemistry – Theory	Structural Biology
11.	II	BP206T	Pathophysiology– Theory	Immunopathology
12.	III	BP301T	Pharmaceutical Organic Chemistry II – Theory	Analytical Techniques
13.	III	BP302T	Physical Pharmaceutics I – Theory	Polymeric Drug Delivery Systems
14.	III	BP303T	Pharmaceutical Microbiology – Theory	Antibiotic Resistance Mechanisms
15.	IV	BP402T	Medicinal Chemistry I – Theory	Biotechnology in Drug Development
16.	IV	BP403T	Physical Pharmaceutics II – Theory	Biopharmaceutics:
17.	IV	BP404T	Pharmacology I – Theory	Pharmacogenomics

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18.	V	BP501T	Medicinal Chemistry II – Theory	Advanced Drug Design Techniques
19.	V	BP502T	Industrial PharmacyI– Theory	Regulatory Affairs
20.	V	BP503T	Pharmacology II – Theory	Nanomedicine
21.	VI	BP603T	Herbal Drug Technology – Theory	Advanced GMP Components
22.	VI	BP605T	Pharmaceutical Biotechnology – Theory	Characterization of Biosimilars
23.	VI	BP606T	Quality Assurance –Theory	Regulatory Approval Processes for Biologics
24.	VII	BP702T	Industrial PharmacyII – Theory	Quality Management Systems
25.	VII	BP703T	Pharmacy Practice – Theory	Collaborative Practice Agreements
26.	VII	BP704T	Novel Drug Delivery System – Theory	Nanotechnology in Drug Delivery
27.	VIII	BP801T	Biostatistics and Research Methodology	Survival analysis
28.	VIII	BP802T	Social and Preventive Pharmacy	Global Health Initiatives
29.	VIII	BP803ET	Pharma Marketing Management	Ethical Marketing Practices

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NANOTECHNOLOGY AND DRUG DELIVERY

INTRODUCTION:

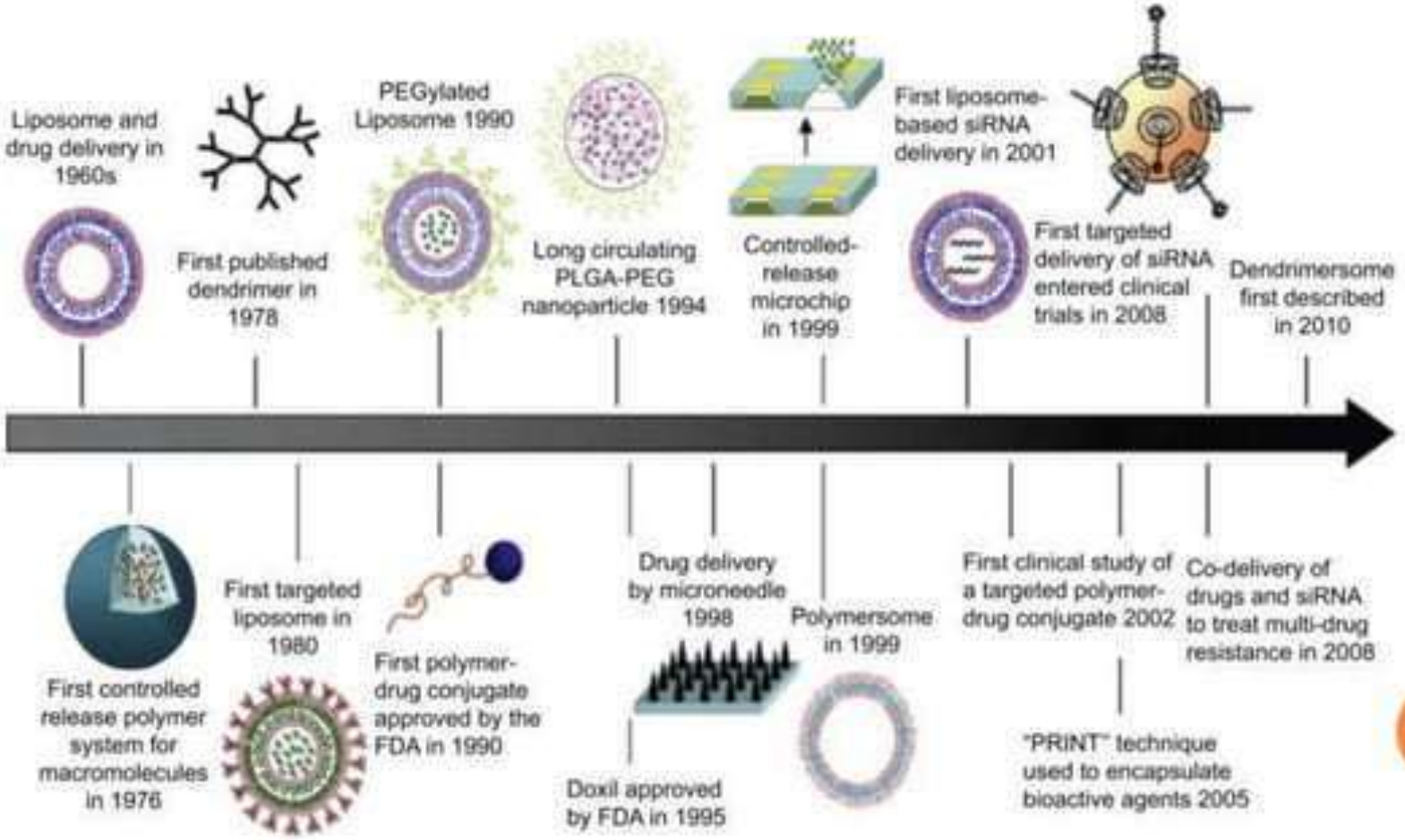
- Drug delivery is transportation of a pharmaceutical compound in the body to safely achieve the desired effect via use of system or technology.
- It concerns with both quantity and duration of drug presence.

Nano-base drug delivery:

- Nanoparticles used as drug delivery vehicles are generally < 100 nm in at least one dimension, and consist of different biodegradable materials.
- Nanoparticles are taken up by cells more efficiently than larger micromolecules and therefore, could be used as effective transport and delivery systems.

TIMELINE:

- Nanotechnology and drug delivery timeline:

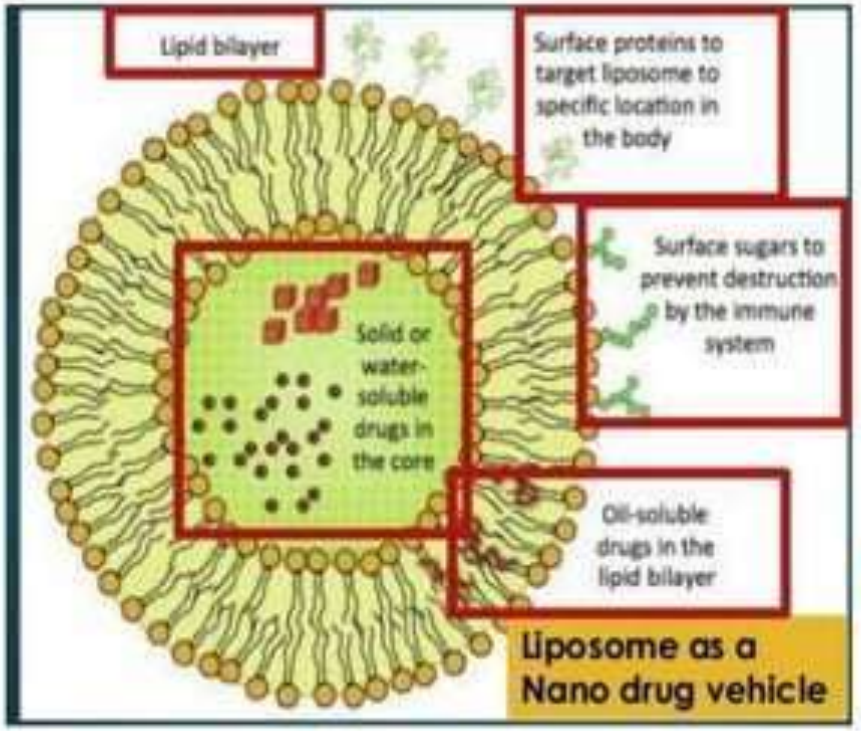


Why nano-particles?

Due to small size and large surface area and increase solubility and availability….	Can cross the blood brain barrier (BBB), enter the pulmonary system and be absorbed through the tight junctions of endothelial cells of the skin……	Similar size range as biological nanostructures and act as vehicles to carry drugs in different ways….

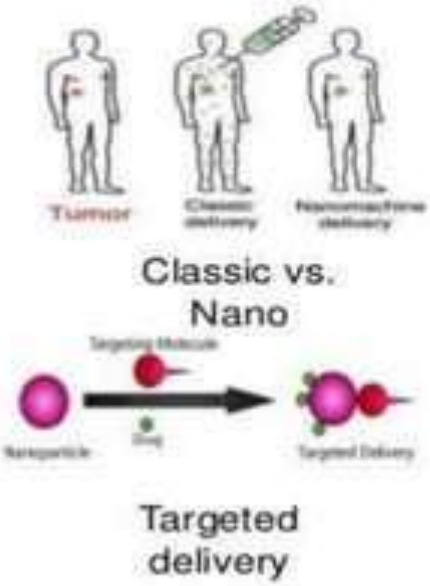
Liposome:

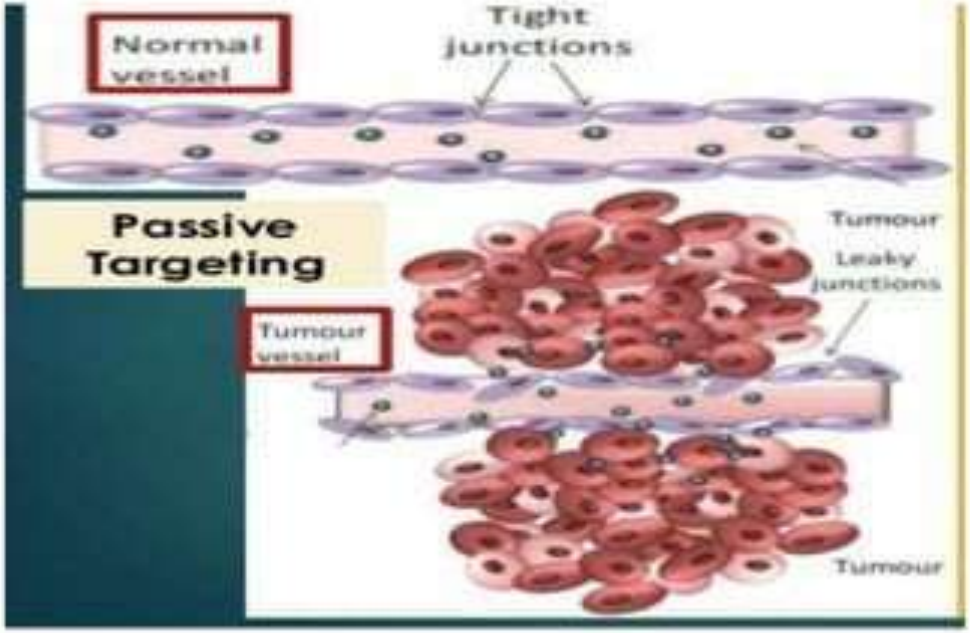
- ✓ Biocompatible…
- ✓ nanorugs are protected…
- ✓ Specifically target certain molecules…
- ✓ Nanodrug of different solubility are carried within liposomes.



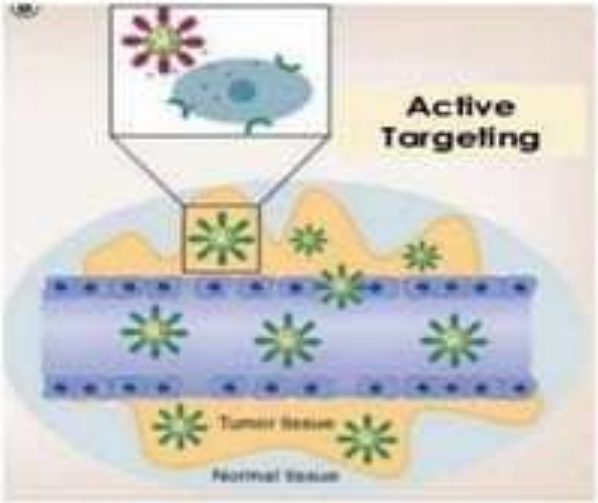
- Why nanotechnology in drug delivery:

1. Targeting
2. Improved solubility
3. Constant rate of drug delivery
4. Increased drug stability





1-Targeting:



2- Improved solubility:

- The poor solubility of drug is a major problem.
- improve solubility by delivering drug of small particle size allowing faster dissolution in blood stream leading to targeted drug delivery in a cell- or tissue- specific manner.
- Highly lipo-philic drugs can also be employed inside the hydrophobic core of biocompatible polymer or surfactant.

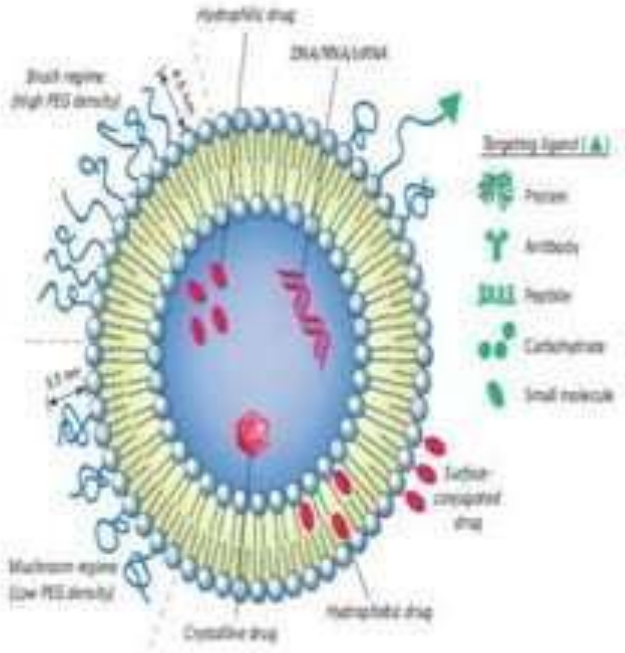
3- Stability:

Three main factors have been reported include bile salts, pH, pancreatic and gastric enzymes to destabilize oral delivery.

To protect the drug from these harsh condition drug is better coated with a biocompatible carrier.

Carrying payloads:

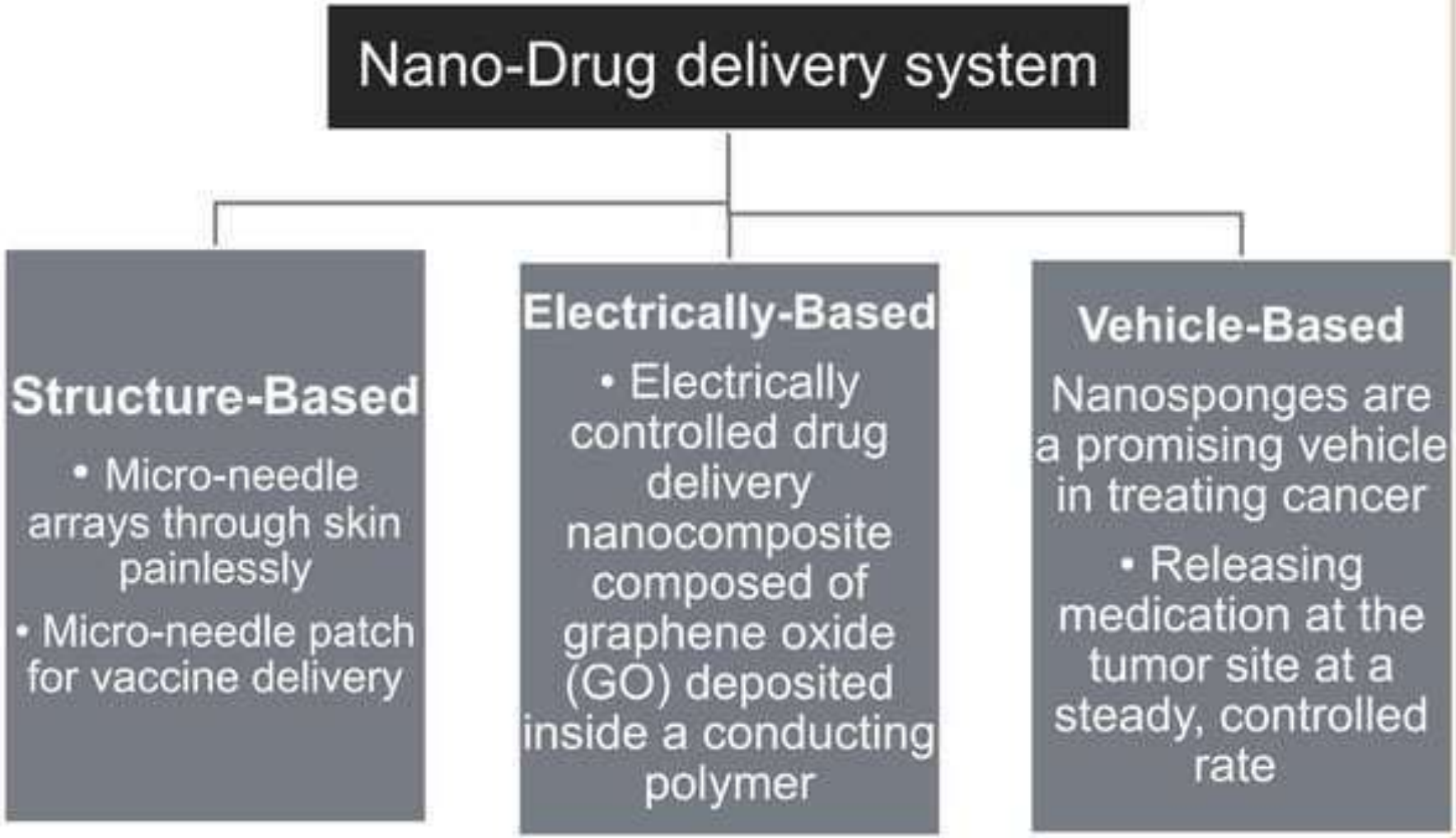
Nano-particles also aid in carrying large payloads, such as designing a delivery system containing multiple components as:



Combined therapeutic agents:

- Sometimes there is a need for combined formulations having more than one active ingredients for treatment of some diseases as tuberculosis.
- Multiple-block nano-particle formulations for example, liposome with its non-polar tails forming a hydrophobic core where the lipo-philic drug is entrapped and a hydrophilic drug can be attached to the surface.

COMPONENT OF DDS



Nano vs. Traditional Drug delivery

Criteria	Traditional	Nano
Specificity	Drugs will pass through unaffected sites before reaching affected site	Delivered in more targeted manner to the affected site
Dosage Release	Higher initial dosage required No control ability	Able to control dosage by trigger, requirement, and even time release
Efficacy	Drug concentration in affected site is low	Drug concentration in affected site is more optimized
Side Effects	Inevitable exposure of unaffected sites to drugs	Lesser exposure of unaffected sites to drugs

Challenges involved


THANK YOU