

MBBS(Indian Medical Graduate)

The Curriculum

The college is affiliated to Gujarat University and follows the new course curriculum as prescribed by M.C.I. *in toto*. The study period of 5 ½ years is divided into four phases as under:

Note: Clinical Exposure begins right from the first year; ward postings will be from second year though fourth year.

Examinations are taken at the completion of the respective terms and ward postings throughout the course of study. Preliminary examinations based upon the pattern of the respective university examination for I / II / III {Part I & II} M.B.B.S. are taken before the University examination. As per the current guidelines of the University, minimum **75%** attendance and **40%** marks (separately in both theory and practicals) & combined 50% are required to be eligible to appear at the University examination.

The degree of M.B.B.S is awarded by Gujarat University after successful completion of internship.

#	Academic year	Phase	Duration (Months)	Subject
	Foundation Course		1	Foundation course elements
1	I M.B.B.S (1 st professional year)	Pre-Clinical	13	Anatomy, Physiology, Biochemistry, Community Medicine
2	II M.B.B.S (2 nd professional year)	Para-Clinical	12	Pathology, Microbiology, Pharmacology, Forensic Medicine, Community Medicine
3	III M.B.B.S Part I (3 rd professional year)	Clinical	13	Forensic Medicine, ENT, Ophthalmology, Community Medicine
4		ELECTIVES	2	
5	III M.B.B.S Part II (4 th Professional year)	Clinical	13	Surgery & Allied Subjects, Medicine & Allied Subjects, Obstetrics & Gynecology
6	Internship	Post-Examination	12	all clinical departments

Smt NHL MMC (Smt Nathiba Hargovindas Lakshmi Chand Municipal medical college)

- Dean/Head of the institution -Dr Pratik Patel
- HOD Anatomy –Dr Jitendra Patel
- HOD Physiology-Dr Anita Verma
- HOD Biochemistry-Dr C Chakrabarti
- HOD Community medicine /PSM-Dr Aparajita Shukla

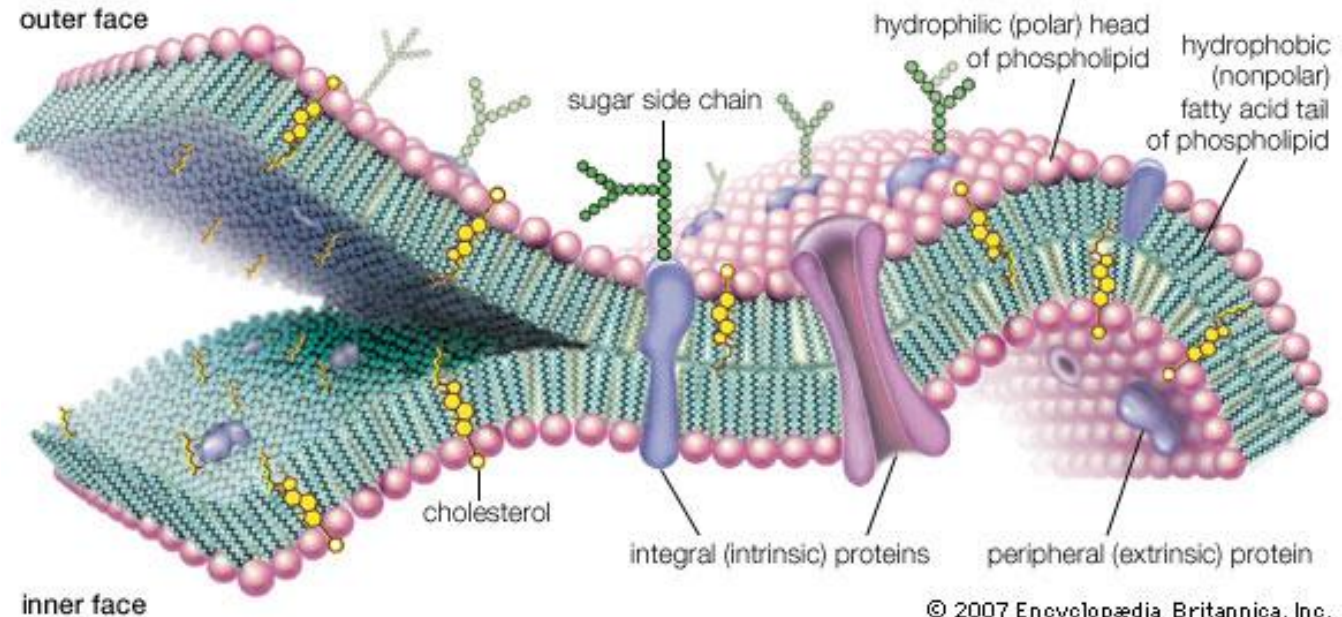
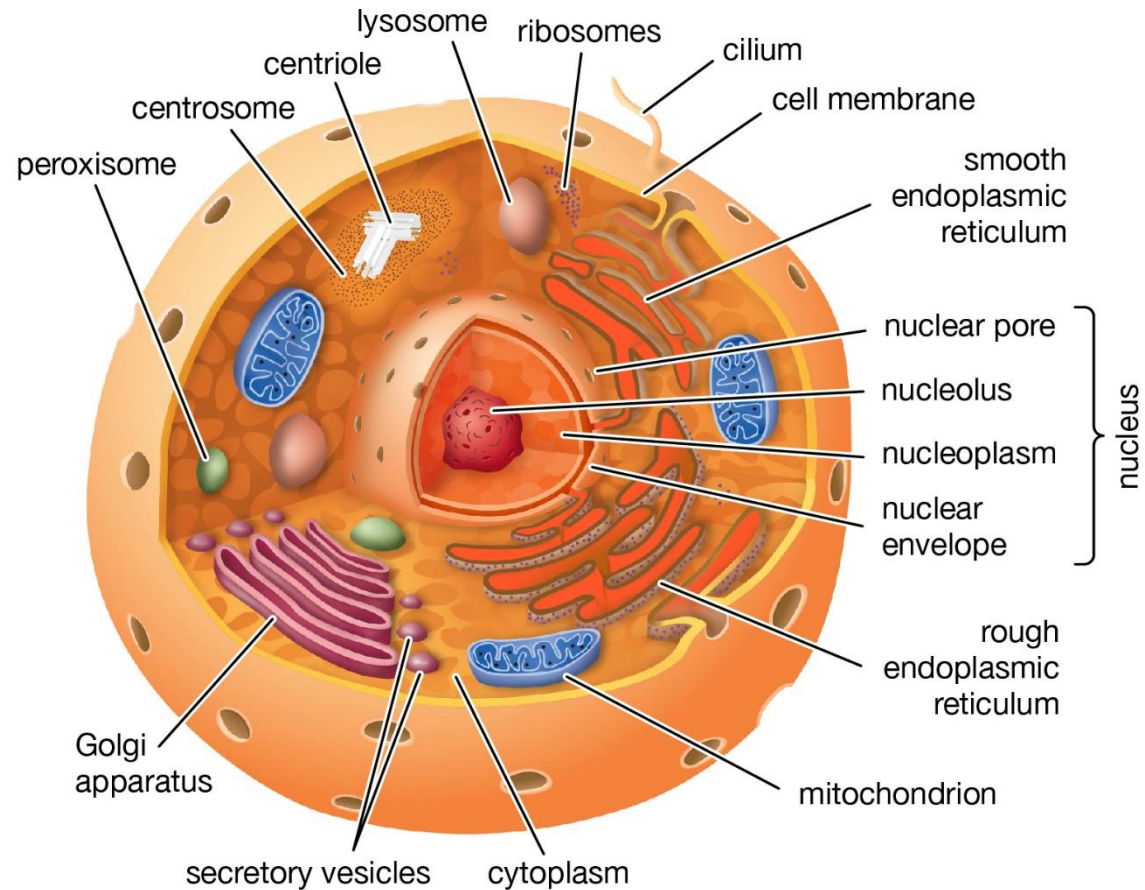
Coordinator Preclinical- Dr Anita Verma

PHYSIOLOGY

- GREEK word physiologia that denotes natural knowledge
- Study of function of the living organisation as a whole or its constituent parts. Deals with bodily functions & their control. concerned only with the normal
- Unicellular & multicellular
- Eukaryotes & prokaryotes
- Cell & its membrane structure ,Functions
- Homeostatsis & feedback

Cell & cell membrane

Animal cell



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CELL

Cytoskeleton, intercellular connection &
intercellular communication

Cell adhesion molecules

Molecular motors

Specific learning objectives(SLO's)

- Name the proteins in & functions of cytoskeleton
- Enumerate Intercellular connections
- Enumerate Intercellular communication
- Name & Functions of Cell adhesion molecules(CAM's)
- Name & functions of Molecular Motors
- Applied physiology of CAM's, Intercellular connections & molecular motors

Intercellular junctions-keep cells together in tissue

- **OCCLUDING JUNCTIONS**-Tight Junction
- **COMMUNICATING JUNCTIONS**-Gap junction
- **ANCHORING JUNCTIONS**-
Desmosome
Hemidesmosome

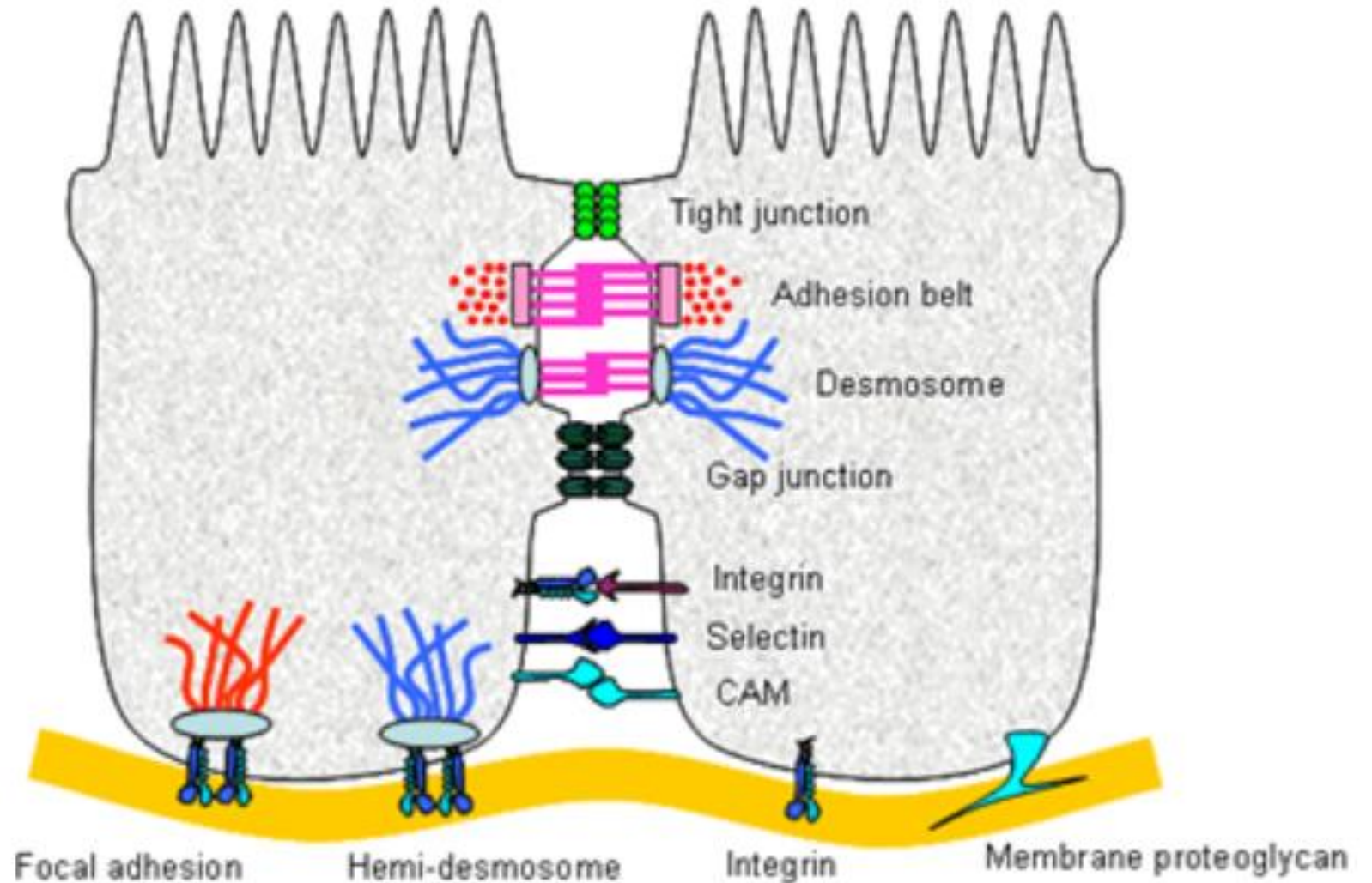
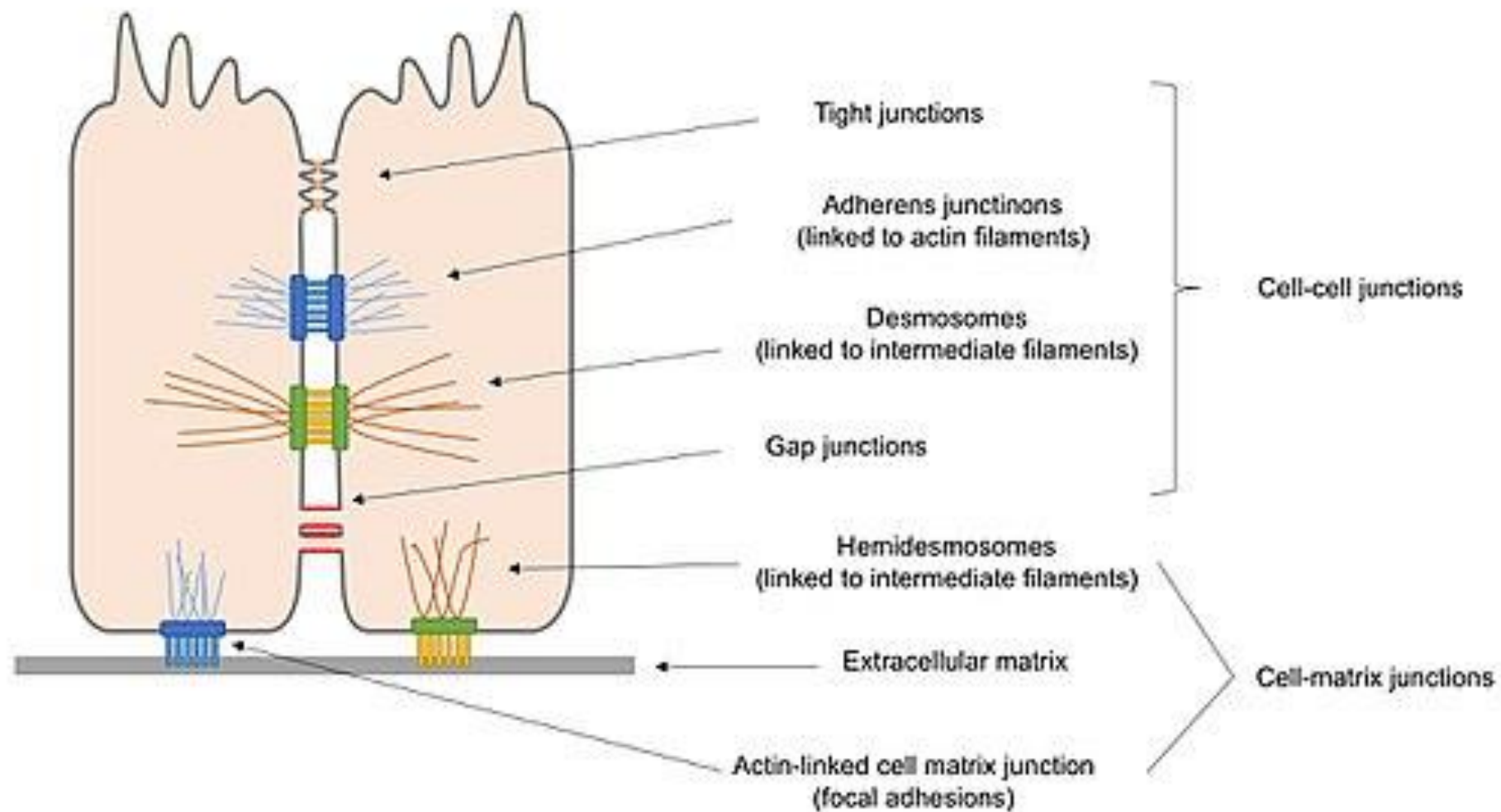


Image of Types of Intercellular Junctions

Intercellular Junctions

- Tight junctions, which are also known as the zonula occludens
- Zonula adherens and Desmosome also help to hold cells together
- Hemidesmosome and focal adhesions attach cells to their basal laminae.
- Gap junction forms a cytoplasmic “tunnel” for diffusion of small molecules (< 1000 Da) between two neighboring cells.



Intercellular communication

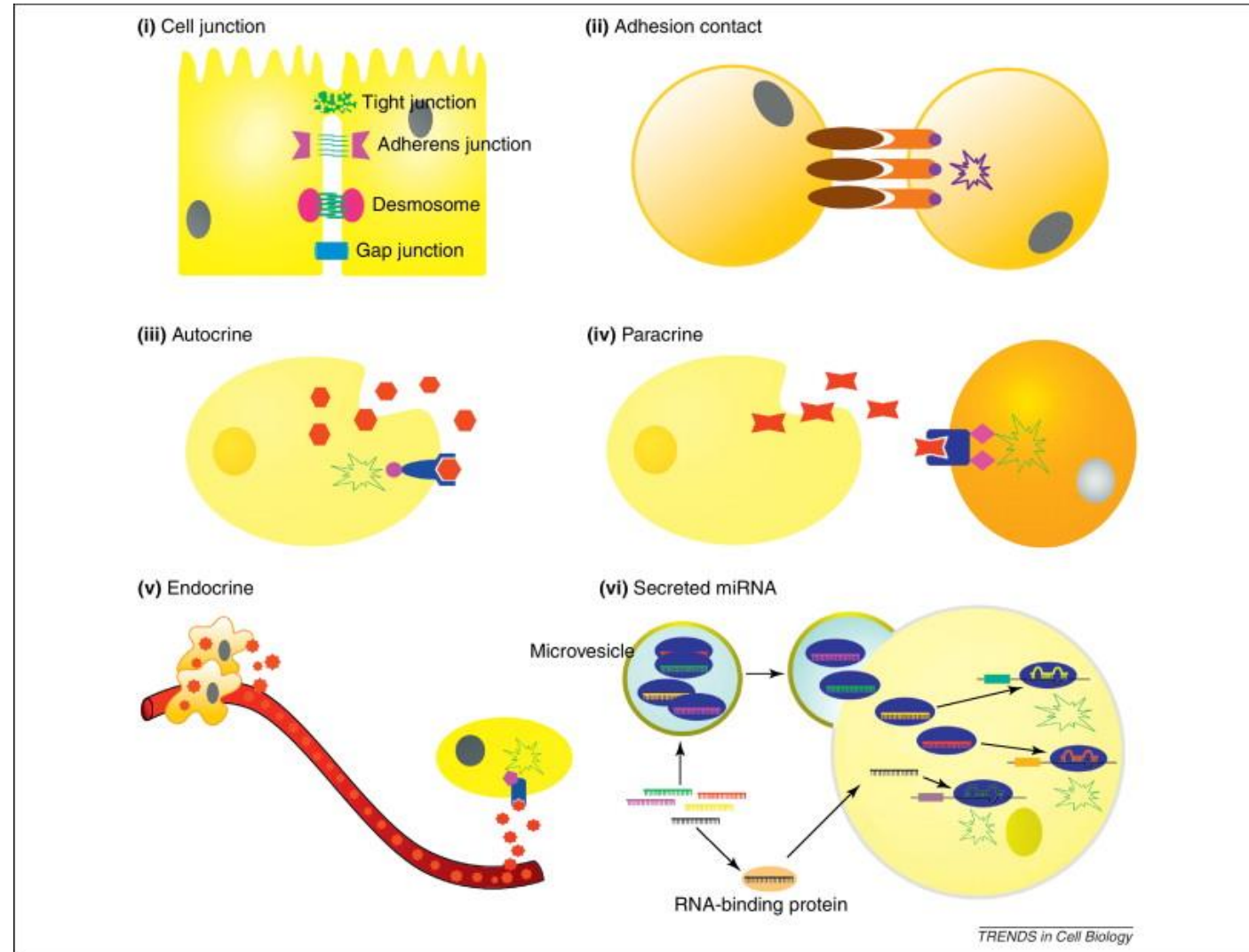
For coordinating organ systems

Direct

- Gap junction

Indirect

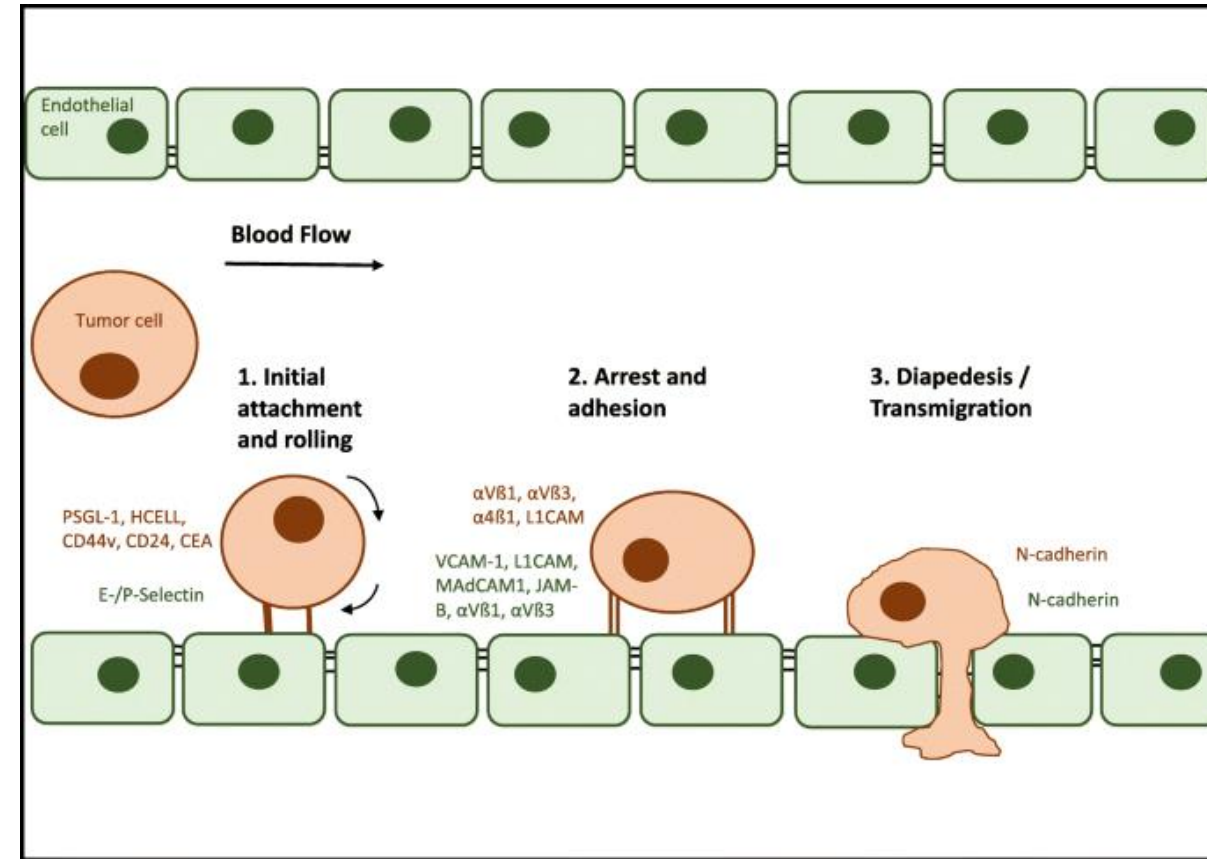
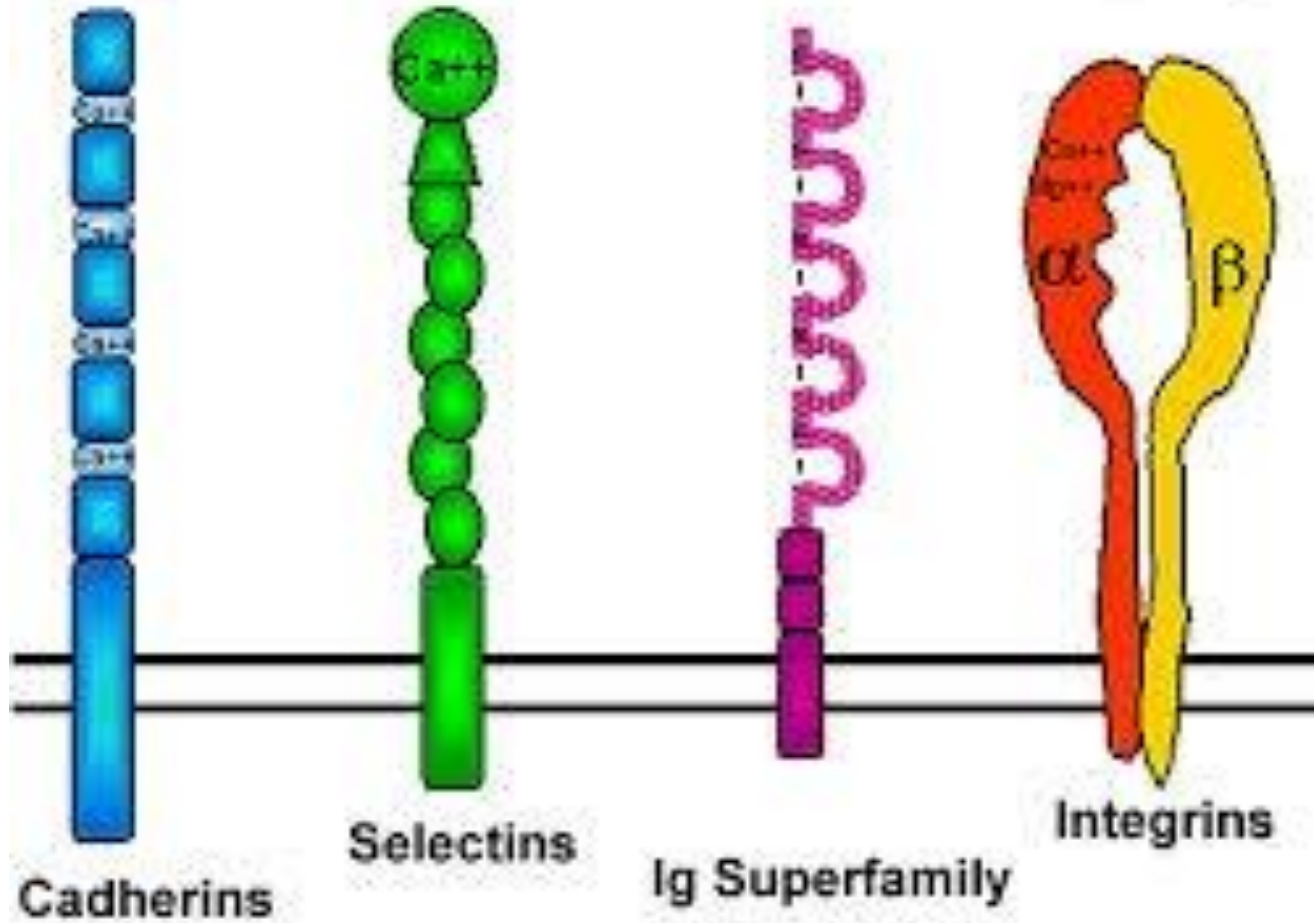
- Neural
- Hormonal
- Paracrine
- Autocrine



Cell Adhesion Molecules (CAM's) -

- i) **Cadherins**, This form adherens junction & desmosomes
- ii) **Integrins**, Form focal adhesion & hemidesmosome
- iii) **Selectins**, Found in platelets & endothelial cells
- iv) **IgG superfamily** Found in nervous system.

Major Families of Cell Adhesion Receptors

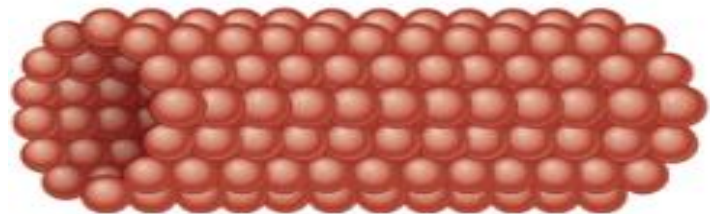


Cytoskeleton

All cells have a cytoskeleton, a system of fibers that not only maintains the structure of the cell but also permits it to change shape and move.

The cytoskeleton is made up primarily of **microtubules, intermediate filaments, and microfilaments.**

In addition, proteins and organelles move along microtubules and microfilaments from one part of the cell to another, propelled by **molecular motors.**



<u>Cytoskeletal filaments</u>	<u>Diameter (nm)</u>	<u>Protein subunit</u>
Microfilament	7	Actin
Intermediate filament	10	Several proteins
Microtubule	25	Tubulin

Molecular Motors

Molecular Motors are the protein based molecular machines that perform intracellular movements in response to specific stimuli

Functions -Transport of synaptic vesicles containing neuro-transmitters from nerve cell body to synaptic terminal

Role in cell division by pulling the chromosome

Transport of viruses & toxins to the interior of the cell for its own detriment

Types

Kinesin

Dynein

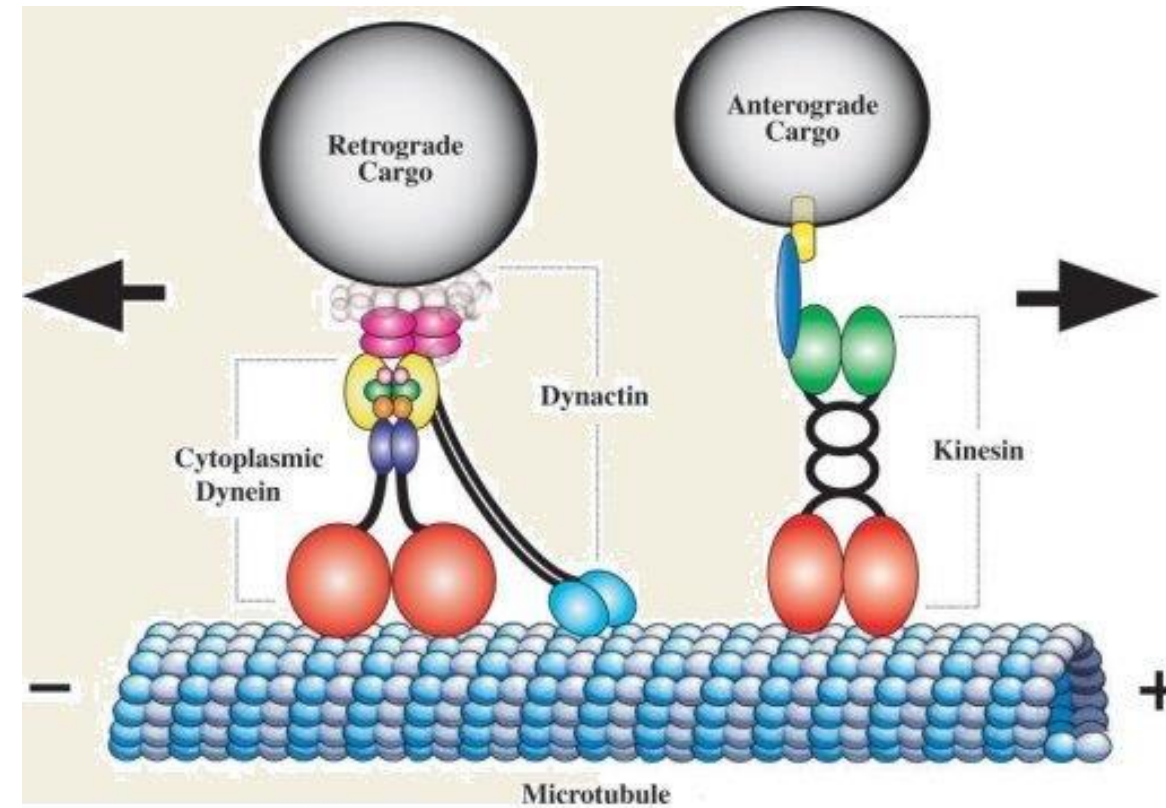
Myosin

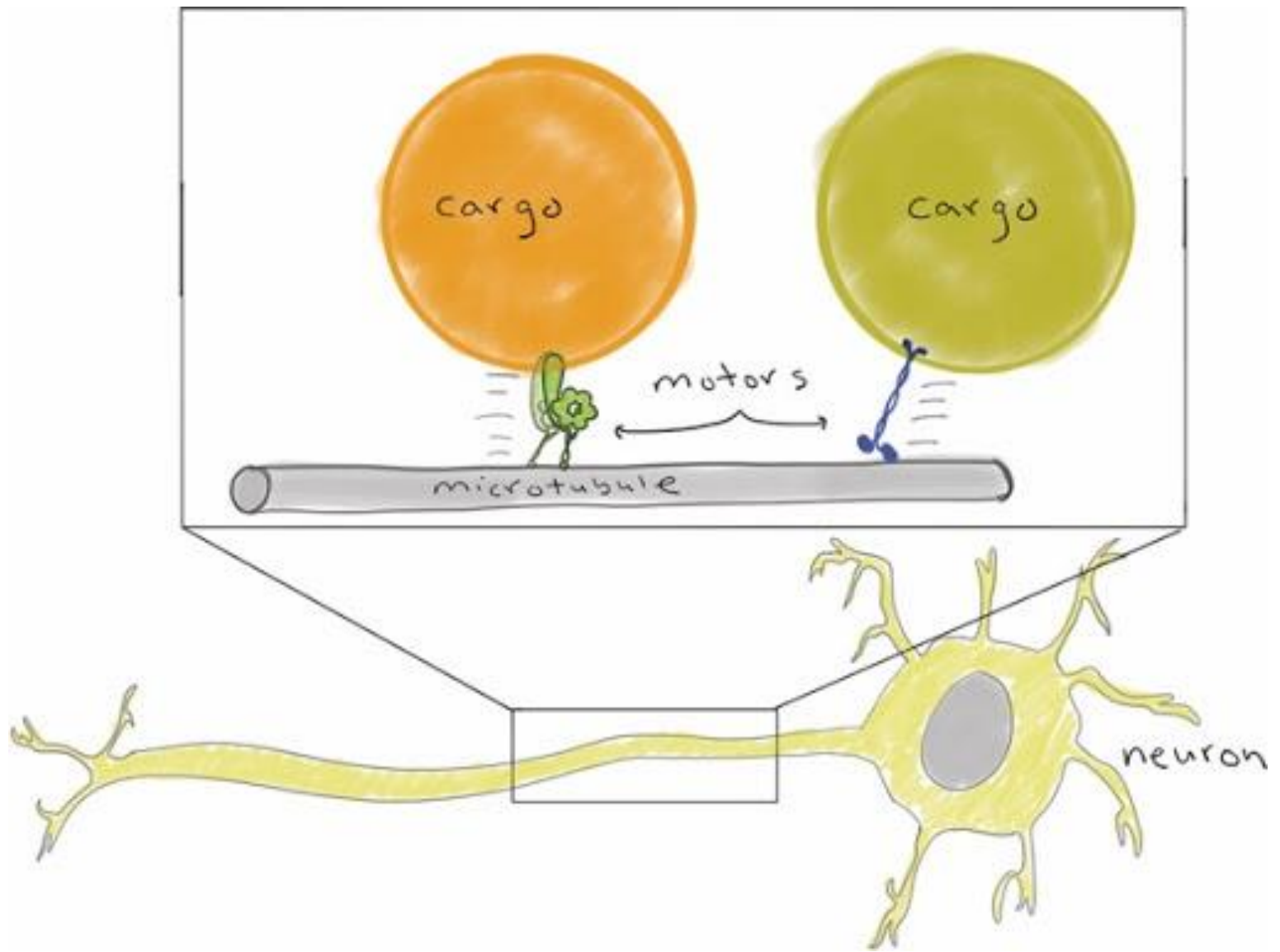
Molecular motors-function

Kinesin is a double headed molecule that tends to move its cargo toward the "+" ends of microtubules.

Dyneins have a function like that of conventional kinesin, except that they tend to move particles and membranes to the "-" end of the microtubules.

Myosin The heads of myosin molecules bind to actin and produce motion by bending their neck regions (myosin II) or walking along microfilaments, one head after the other (myosin V)





Type of questions asked (related to this topic) in exam

- **Intercellular Junctions (short note & viva)**
- **Cell Adhesion Molecules (short note & viva)**
- **Molecular Motors (short note& viva)**
- **Cytoskeleton (short note & viva)**

(To avoid repetition remaining part of cell & cell organelles will be covered in Biochemistry lectures but can be asked in physiology exam also)

Summary

- Intercellular junctions
- Intercellular communication
- Cell adhesion molecules
- Molecular motors