S. No	Topic	Class No	Date
1	Introduction	1 2	27/1 29/1
2	Fundamentals of Immunology • Definitions and basic terms • Types of immunity • Organs of immune system • Cells of immune system	3 4	3/2 5/2
	• Innate immunity • PAMPs • PRRs • Phagocytosis	5 6	10/2 12/2
3	• Antigens • Characteristic features of antigens • Types of antigens • Super antigens	7 8	17/2 19/2
4	• Humoral Immunity • Antibody – structure and functions	9 10	24/2 26/2
5	• Ig Biosynthesis • Monoclonal antibody production	11 12	3/3 5/3
6	• Complement system • 3 pathways of complement system	13 14 15	10/3 12/3 17/3
	Reserve	15	19/3
	First mid term (25 marks)	16	17/3 or 19/3
7	Cell mediated immunity • Macrophages • T cells • Th1 and Th2 response	17 18	24/3 26/3
8	MHC and transplantation immunity	19 20	31/3 2/4
9	Disorders of Immune system • Hypersensitivity • Immunodeficiency	21 22	7/4 9/4
10	Tumor immunology • Tumor specific antigens • TIL	23 24	14/4 16/4
11	• Tolerance and autoimmunity	25	21/4
12	Antigen and Antibody reactions	26	23/4
	Reserve	27 28	28/4 30/4
	Second mid term(25 marks) (submit literature review – 10 marks)	27/28	27/4 or 28/4
	Final (40 marks)		

Tumor immunology

By
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Tumor

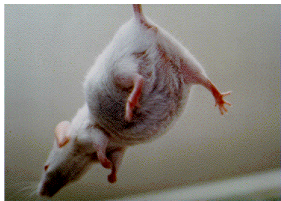
- Normal cell proliferation is strictly regulated
- When cell exposed to carcinogens or irradiation or certain viruses… cell will transform in to tumor
- Tumor cells have uncontrolled growth
- Immune system plays important role in limiting development and progression of tumors
- Many experimental models exist now

Immunity against tumors

- Evidence for immune reactivity of tumors
  - Anti tumor antibodies in patients suffering from tumors
  - Antibodies raised against changes in cellular properties
  - There are tumor infiltrating lymphocytes (TIL) in many tumors
  - Increased incidence of tumors in AIDS patients also demonstrates that immune system plays role in controlling tumor development

Tumor antigens

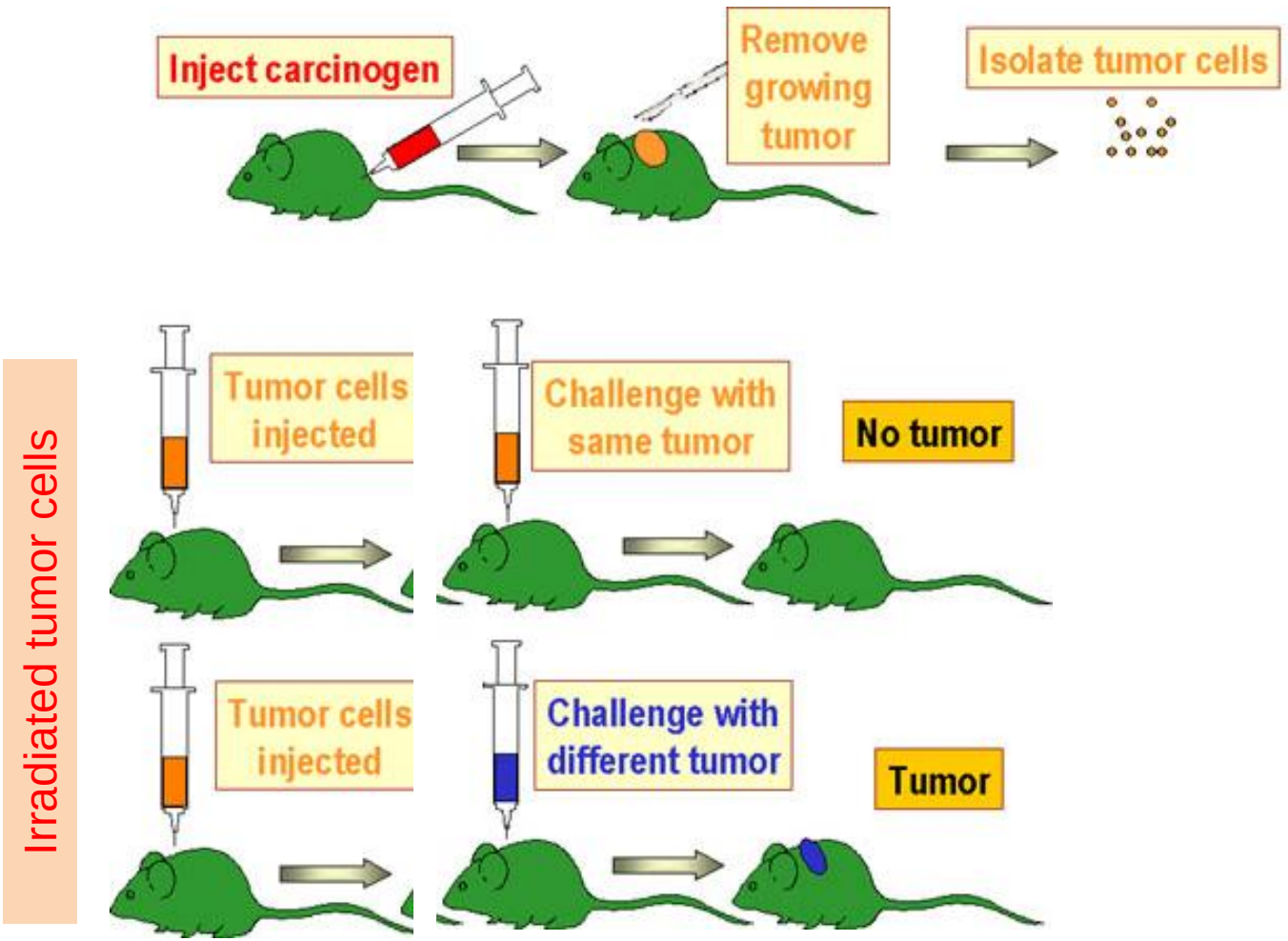
- Tumor antigens
  - Tumor-specific antigens : which are unique to tumor cells
  - Tumor-associated antigens : which are present in both normal cells and tumors
    - Oncofetal proteins : proteins mainly found during fetal development
    - Virus associated antigens : antigens associated with viral infections
- Tumors from one animal can be transferred to another (xenogenic tumors)
  - Ascitis fluid



Immunity against tumors

- Evidence of immune system playing role in controlling tumors comes from experimental models
  - Where tumors are induced by administering carcinogen
  - Isolate tumors and culture
  - Irradiated tumors injected in animals
  - Now the injected animals are resistant to same type of tumors as injected with. Not different type

Immunity against tumors



Immunity against tumors

- Although antibody response is there, cell mediated immunity plays major role in limiting tumors
- And the immunity can be transferred from one animal to another
  - Lymphocytes (especially T cells) against a tumor can be cultured and transferred to syngenic naive animal
  - Such animal when challenged with live tumor cells shows no tumor growth

Immune surveillance

- According to this theory in our body there are continuously cancer cells are produced. lymphocytes recognize and eliminate those cancer cells

How tumors escape immune system

- Primarily due to impaired immunity cancer cells escape destruction
- Other escape mechanism includes
  - Secretion of immunosuppresive cytokines like IL-10, TGF-beta, and induce Tregs
  - Some tumors shed their tumor specific or associated antigens. These antigens interact with anti-tumor antibodies or T cells and engage them
  - Some tumors lack co-stimulatory molecules
  - Some tumors down regulate MHC expression (NK cells are effective here)
  - Low or high conc. of antigen leads of tolerance

Immunotherapy against cancer

- Active immunotherapy
  - Activate the host immune system against cancer by giving vaccines
    - Hepatitis B vaccine against liver cancer
    - HPV against cervical cancer
- Passive immunotherapy
  - Passive transfer of preformed antibodies or immune cells and other cytokines to host
    - Antibodies against tumor antigens
    - Antibodies conjugated with toxins
    - Activated antigen presenting cells in vitro
    - TIL and LAK (Lymphokine activated killer) cells
    - Several cytokines IL-2, INFs, TNF, GM-CSF,.

Next class....

- Antigens and antibody reactions…..