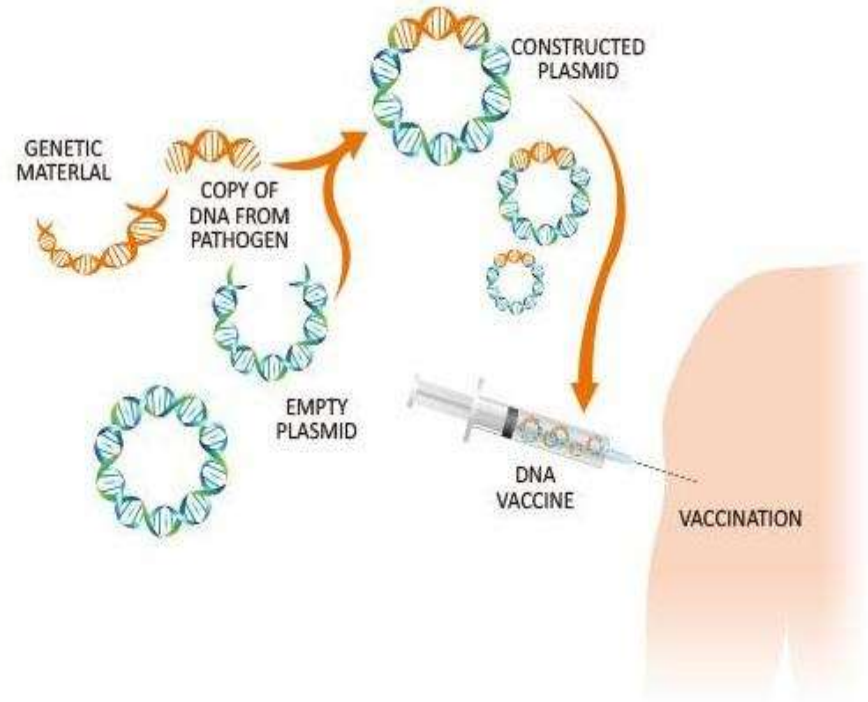


Nucleic Acid Vaccine

MVSc Programme VMC-607
Lecture - 5

Dr. Pankaj Kumar
Assistant Professor
Veterinary Microbiology

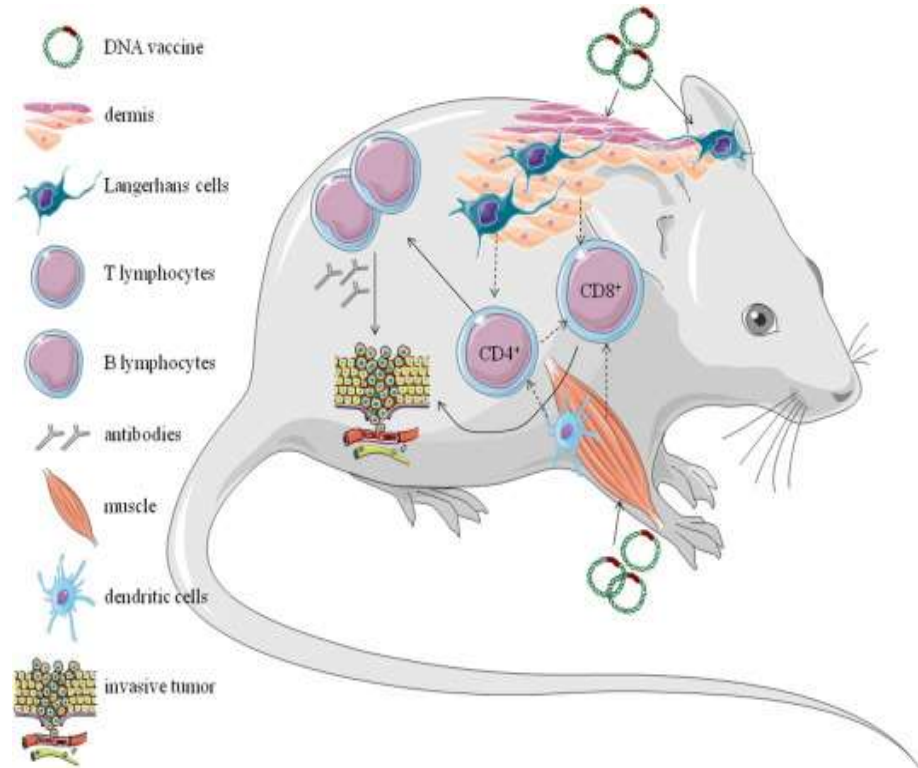


History:

- DNA vaccines came into limelight in the early 1990s
- **Tang and Johnston** – attempting delivery of *human growth hormone* DNA into the mice skin (gene gun),
- The technique can also be used to generate antibody responses
 - against any specific transgene products

Margaret Liu and her colleagues – Merk- 1992

- Reported injecting 'naked' plasmids intramuscularly
- Deliver immunogens
- Generate immune responses against influenza virus antigens in mice



<https://www.google.com/search?q=dna+vaccines+mice&tbm>

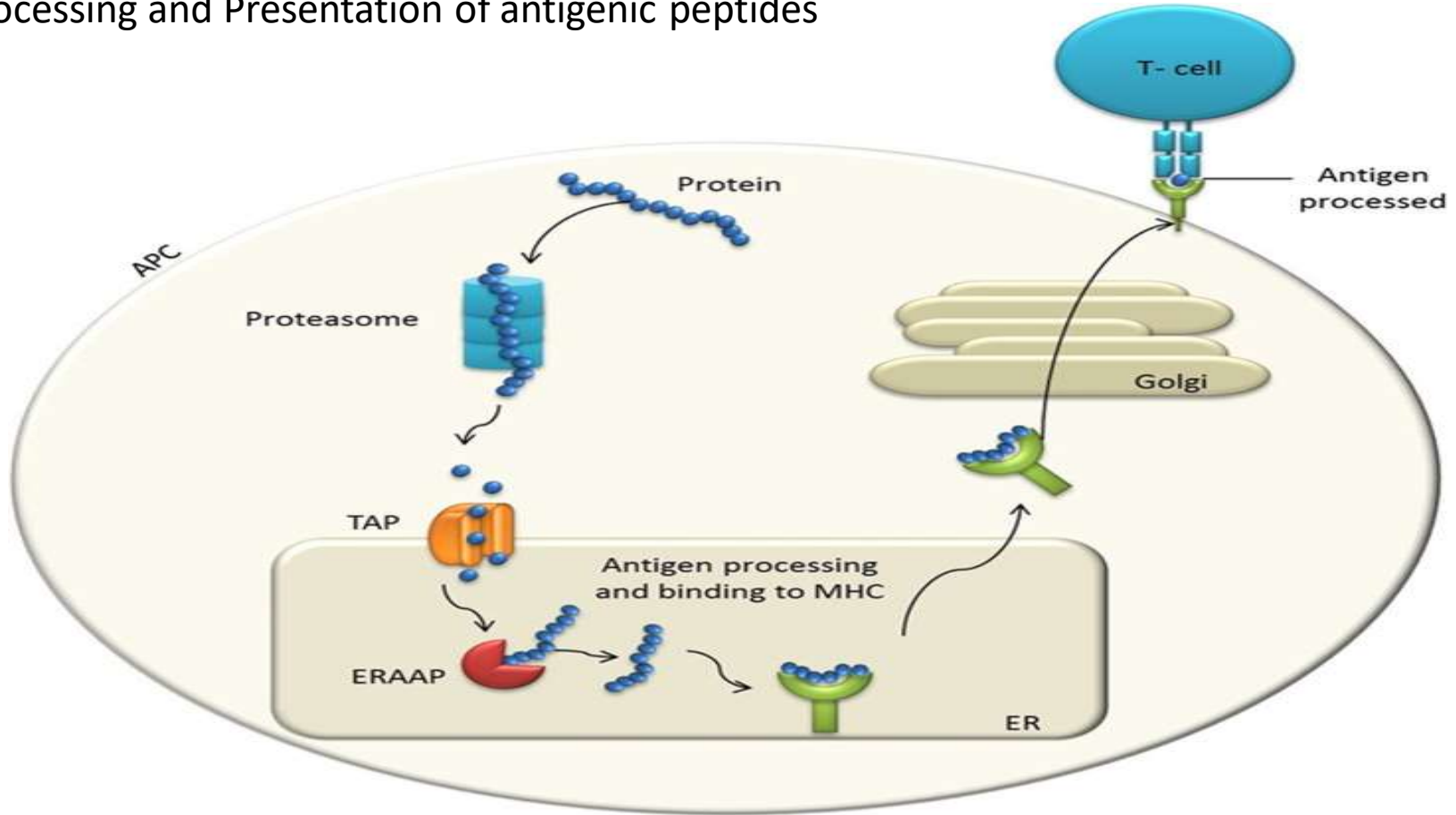
B cell epitopes:

- **Epitope or Antigenic Determinants:** Part of antigen molecule which binds to products of immune system (antibody or B cell receptor or T cell receptor).
- In general antigenic determinates are made up of 3-8 residues
- **B cell epitope:** Epitopes recognized by B-cell receptors or antibody molecules. B cell epitopes are usually made up of 3-7 residues.

T cell epitopes:

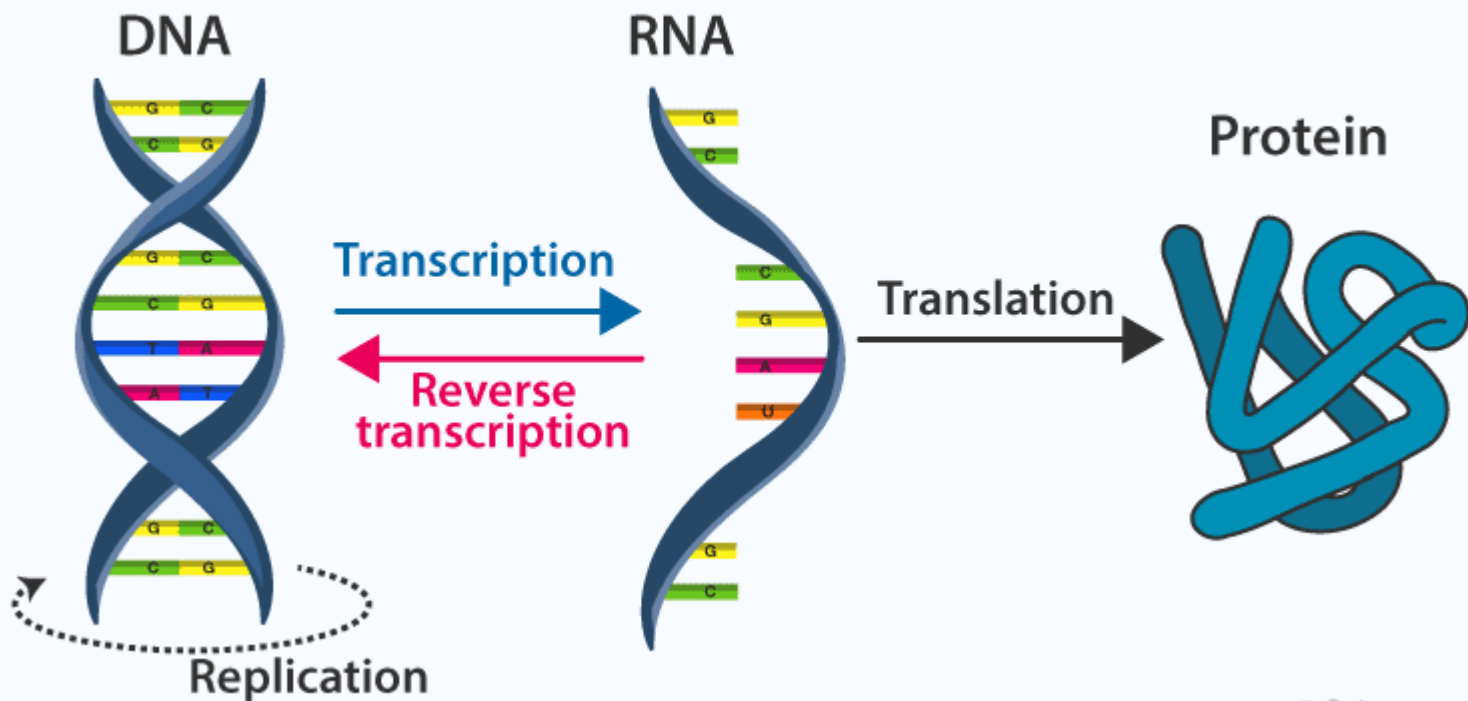
- **T cell epitope:** Epitopes which are recognized by T cells in association with MHC molecule.
- After processing of Immunogens by Antigen presenting cells (APCs), various T cell epitopes are loaded on the MHC molecules and presented to T cells.

Processing and Presentation of antigenic peptides

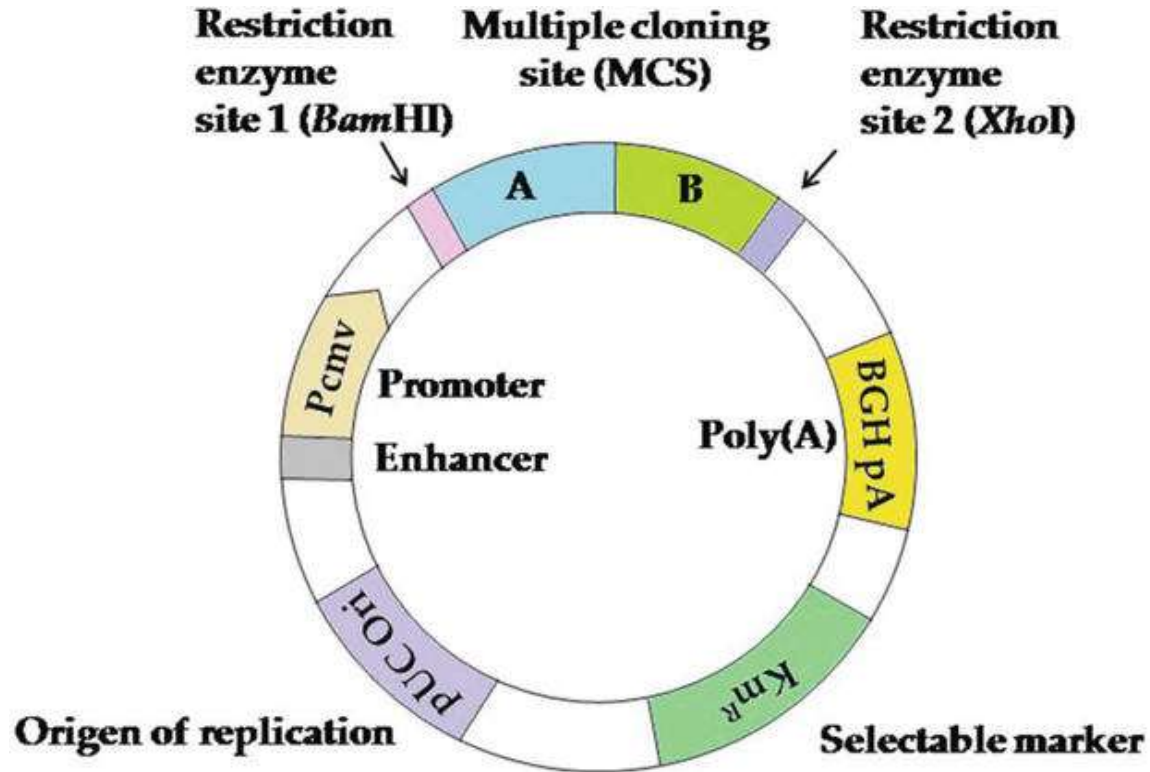


<https://www.google.com/search?q=Processing+of+antigens&tbm>

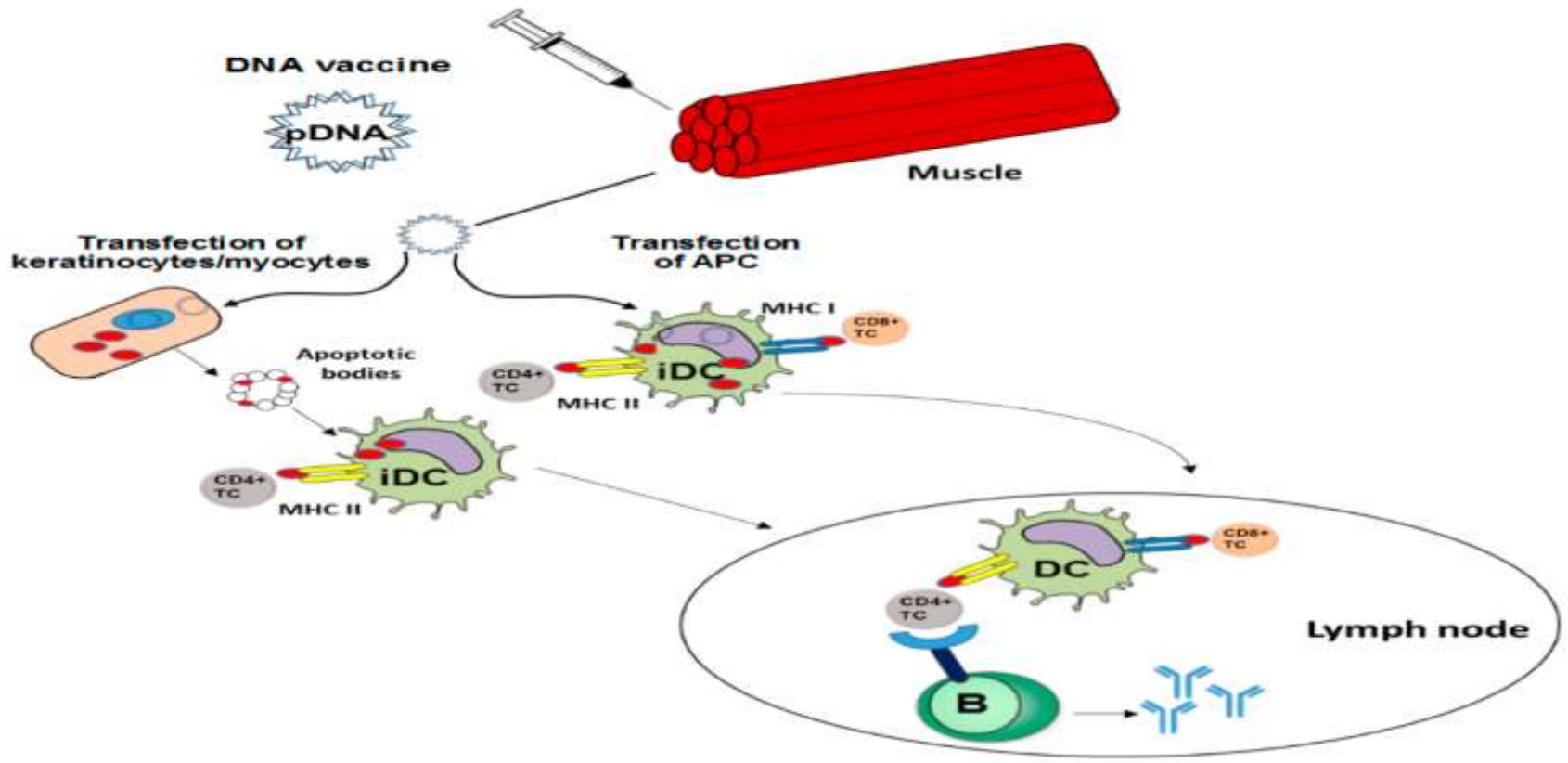
CENTRAL DOGMA : DNA TO RNA TO PROTEIN



Construct- DNA vaccine:



DNA vaccine: Direct injection of suitable plasmid having the gene of interest coding for the protective antigen



THE END

The images for slides are taken from resources available on internet and used for the purpose of teaching students