immuno Stimulant (immuno Modulator)

The agent Enhance the Immunogenicity and nonspecific defence. Such agent may act by

1. ↑ the humoral antibody responces.
2. Enhancing the phagolytic activity of macrophage
3. Modifying the cell mediate immune responce.

Thymosin → Hormone obtain from Bovin thymus extract
use → Lupus erythimatus, Rheu Arth., cancer.

Enterferon / (interferon inducer) → use:- Myloma, Lymphoma.

Enterleukin-II → Under trial in AIDS.

immunoglobulins → use in thrombocytopenia, Hepatitis

Livamysole (L-tetramysole) → it is anthelmentic drug also posses immunotropic.

MoA → it act by modulating, cell mediated immune Responce. it Enhance t-cell mediated immunity.

⇒ it alter intracellular C-AMP or GAMP ratio.

⇒ it Restore cutinous delayed type hypersensitivity rxn. in Allergic (State of immunologic deficiency) patients & cancer. like BCG and clofazimine

use → use only levo. form.
Rhe Arth, Hodgkin's dis.,

Thalidomyde → chemically related to Barbiturates.
(Anti-Angeogenesis) used as a hypnotic and anti-emetic,
immuno-modulators.

MoA → inhibit production of TNF-α
(Tumor Necrosis Factor)
and interferon, has stimulatory effects on IGF-1
(insulin like Growth Factor)
and IL-6. It also inhibits the induction of COX-2.
and biosynthesis of Prostaglanain E_2., needed for
Angeogenesis (Ani

Use → needed for Angeogenesis

* It reduces phagocytosis by neutrophils
and Enhances CMI (cell mediated immunity)
by interfering T T-cell. Thus exerting anti-inflamatory,
immunomodulator and anti-angeogenesis.

Adverse effects → Teratogenic, Peripheral neuropathy
Hypothyroidism.

Transfer-Factor → Small RNA molecule derived
(TFR) from Human lymphoid cell.

TFR immunological specific for given antigen,

use → Muco-cutaneous canal-diatis, Leprosy

BCG vaccine → It is attenuated strains
of Bovine tubercul bacilli.
Employed as non-specific immuno stimulant. (adjuvent)
in cancer therapy.)

Glatiramey acetate → it is synthetic co-polymer
& some immunological similarity
to myline basic protien, which is used in Seleroisis. act as a
immuno-modulator.

Immuno-Suppressant

Classification →

1. Specific T-cell inhibitors →

(a) Calcineurin inhi → Tacrolimus, cyclosporine
Sirolimus → Sirolimus (Rapamycin)
→ (Macrolide antibiotic)

2. Cytotoxic drug → Anti proliferative rate drug:
Azathioprin, cyclophosphamide
Methotrexate, chlorambucil
Mycophenolate mofetil (MF)

3. Gluco-corticoid → Prednisolone
4. Antibodies → Muromonab CD3, Antithymocyte-Globulin (ATG)
Rho immuno-globulin

Cyclosporine → cyclic polypeptide obtain from fungus 'Tolypocladium inflatum'.
Contain 11 amino acid residue, 9 carbon amino acid in position 1.

MoA → inhibit T-cell activation by binding to cytosolic protein 'cyclophilin'.

The drug-cyclophilin complex stably associate & calcineurine and inhibit serine OR threonine phosphatase Enz. Activity of this Ca^{++} dependent Enz thus inhibiting activation of lymphokin expression.

Toxicity -> Myelo suppression, Nephrotoxic

Tacrolimus -> * Soil micro-org., Streptomyces tsukubaensis

Tacrolimus was previously known as FK_{506}, inhibit T-cell activation by binding to cytosolic protein FBKP-506 binding protein. The drug-FBKP complex associates & calcineurin with the inhibition thetionine or serine phosphatase enz, so the activation of lymphokine expression is not takeplace thus Apoptosis and de-granulation observed.

Adverse -> GIT (dyspepsia), cardiomyopathy, Nephrotoxicity, Hepatic dysfunction, Neurotoxic.

Sirolimus (Rapamycin) -> Macrolide antibiotic, obtain from Streptomyces hygroscopicus, it has synergistic effect & cyclosporin

Azathioprine -> Purin anti metabolite a prodrug of 6-MP. cleved to 6-MP by action of nucleophile as (Glutathione), converted to TMP nucleotide.

inhibit (Denovo protein syn) or anabolyse to thio-IMP, thio-imp converted to thio-gmp, get incorporated in to DNA. it inhibit (guanine) Delate hypersensitive (cell mediated immunity)

Metabolism -> Partially metabolised in the body by Xanthin oxidase if allopurinol is prescribed an equivalent dose Reduction is Required.

(xanthine inhibitor)

Adverse effect → Myelosuppression

use → transplant-rejection, Auto-Immune and Collegen dis.

cyclophosphamide → nitrogen mustured alkaying agent.

MOA → A prodrug cyclophosphamide give active drug than alkylate DNA in proliferating as well as non proliferating cells, affected B-cells predominantly and T-cell less significant.

Adverse effect → Myelosuppression, Alopecia, Sterility in man (azospermia).

Mycofenalate mofhatile → 2-morpholino ethyl ester of mycofenolic acid.

MOA → this prodrug give micofenolic acid in vivo it inhibit innocin monophosphate dehydrogenase (an Enzy essential for Denovo sy. of purine) so supression lymphocyte proliferation and anti-body formation by B-cell, deplet leucocyte guanin nucleotide hence inhibit recruitment leucocyte to inflamatory cell or cyte. inhibit glycoprotein glycosilation of lymphocyte glycoprotein involved in adhesion to Endothelial cell.

Anti-bodies → Anti-body reagent like anti thymocyte globulin / muramonab (CD3, Rho(D) immun globulin, bind to lymphocyte or thiocyte.

Gluco-corticoid → Adreno-corticoticel steroids such as prednisolone inhibition of t-cell proliferation, t-cell dependent immunity and the expression of gene encoding cytokines (especially transcription of interleukin-2 gene) also act as a anti inflamatory anti-adhesion.

Methoxsalen, Thalidogenic → Mitogenious

Thalidomide → Sedative and teritogenic effect- during pregnancy used in Erythema nodosum leprosum, bone marrow transplant

MoA → it changes the pattern of t-cell response to antigen and Mitogen.

Antilymphocyte-globuline → Anti-lymphocyte Globuein

After iv, ALG become attached to lymphocyte and disappear from circular within 6 hrs.

Adverse eff → Serum sickness, Anaphylactic hypotension

Auto-immune diso

1. Addison's diso → Destruction of adrenal gland's cell that produces corticoid haormons.

2. Auto immune haemolyte anemia → Synthesis of antibody against R.B.C

3. insulin dependent diabetis mellitus → Destruction of Pancreatic islet's cells that Produce harmone and insulin.

4. Grave's diso → Binding of Antibodies to Receptor for thyroid stimulate Harmone lead to binding over activity of thyroid activity.

5. Myasthenia gravis → Blockage of Acetyl choline receptor prevents transmission of nerve signals.

6. Rheumatoid Arthritis → Inflamation of joints due to deposition of Complexes of I_g and auti-immuno globin-G.

7. Rheumatic feaver → Antibodies produce against streptococal infection are also capable of Reacting C antigenic determinants site on their heart muscle cell.

8. Systemic lupus erythmatus → Antigen-antibody complexes (including auti body against RNA, Immunoglobin-G, Red.B.C, Platelets, triggering inflamation and chromosome) are deposed in many location

Complexes, containing antibody to DNA are often deposited in kidney.

9. idiopathic thrombocytopenia purpuria → Destruction of Platelets.

10. Good Pasture syndrome → damage to basement membrane but most symptoms result from attack on glomeruli of kidney.

Note → The body is normally able to distinguish its own Antigen (self) from all other (non self) and doesn't mount an immunological attack against them, this phenomina is called as Tolerence.
Some times the body loses its ability to distinguish b/w self and non self antigen, this autoimmunity is a response by antibody or sensitize-T cell against a person on tissue antigen.