

Immunomodulators







unwanted responses

- 1 anaphylaxis
 - histamine
- 2 antibody dependent
- 3 complex mediated
- 4 cell mediated



immune mediated disease

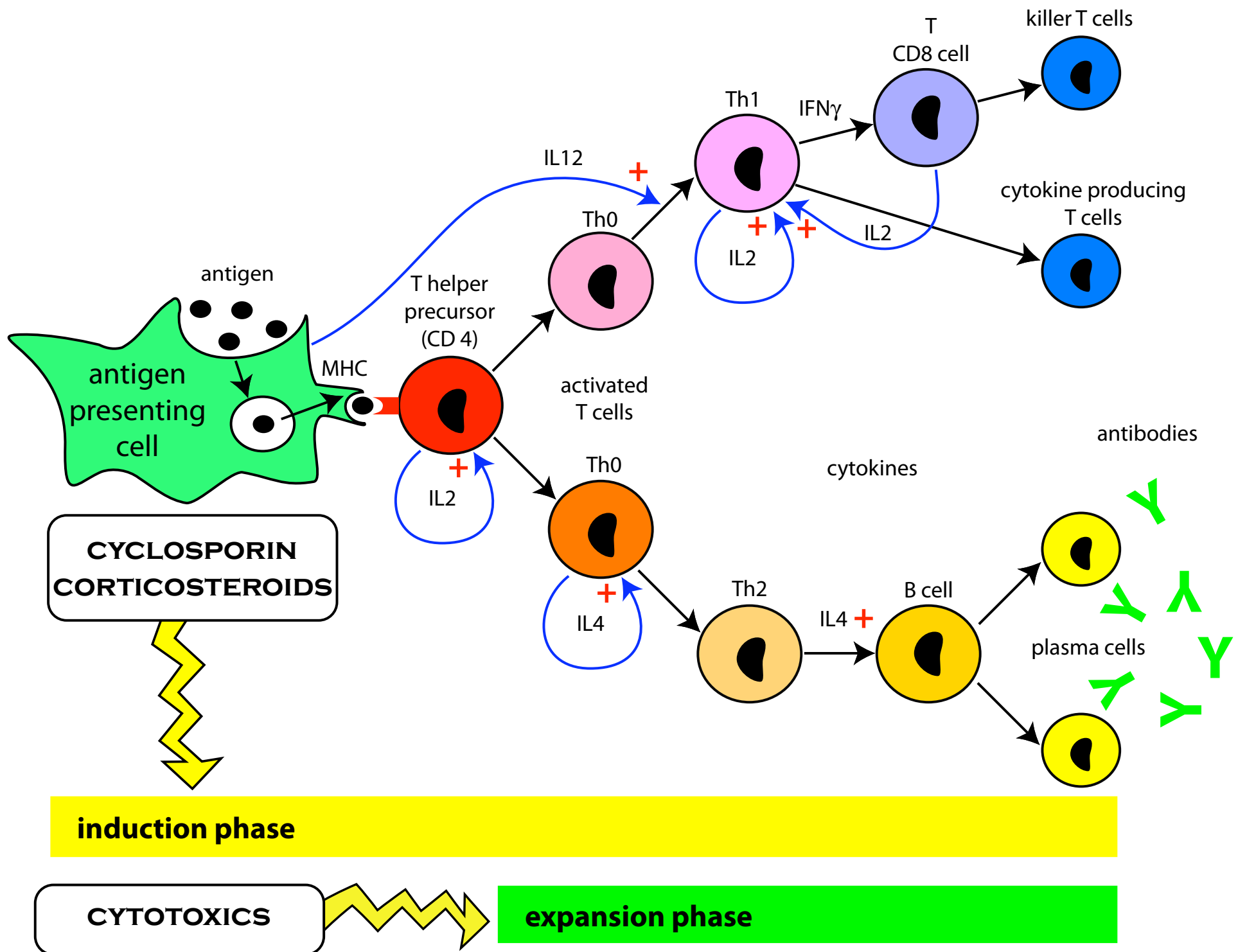
- allergic skin diseases
- autoimmune skin diseases
- inflammatory bowel disease
- autoimmune haemolytic anaemia
- allergic rhinitis
- graft / transplant rejection



immunosuppressive drugs

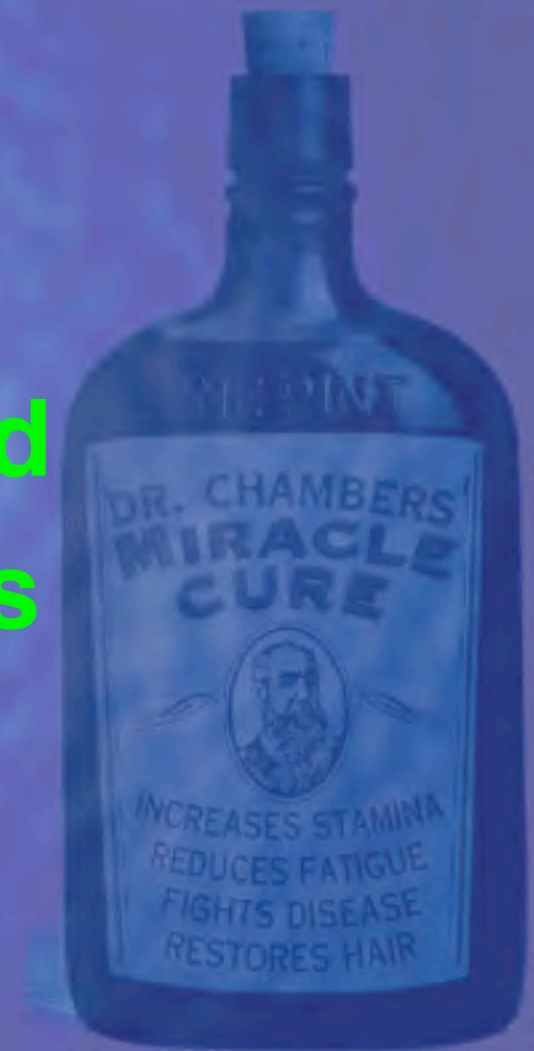
- corticosteroids
- antihistamines
- azathioprine
- cyclosporin
- anticancer drugs





corticosteroids

- same drugs as for anti-inflammatory effect
- much higher doses used
- more severe side effects



side effects

- Cushing's syndrome



Cushing's syndrome

- thin skin
- alopecia
- muscle wasting
- pyoderma / calcification
- bruising
- liver dysfunction



mast cells

- **activated by**
 - IGE
 - complement
- **release**
 - histamine
 - heparin
 - prostaglandins
 - 5HT, PAF, LTs, ILs, etc., etc.



histamine

- gastric secretion
- smooth muscle contraction
- vasodilatation
- vascular permeability
- pruritus



H1 blockers

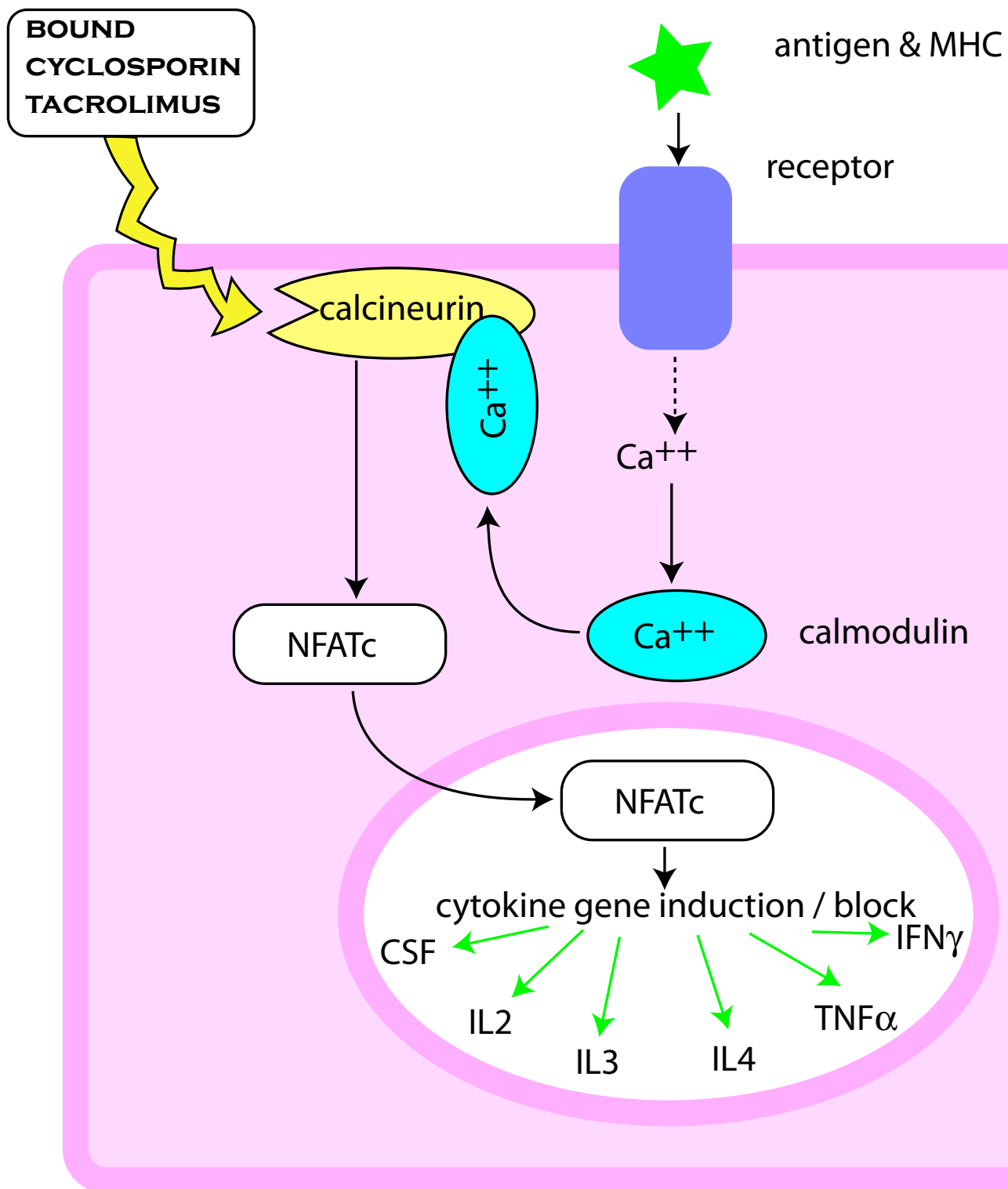
- **acepromazine**
 - promethazine
 - trimeprazine
- **chlorpheniramine**
- **tripelennamine**
- **loratadine, terfenadine, astemizole**



cyclosporin

- fungal peptide selective for T lymphocytes
- acts at induction stage
- expensive





cyclosporin indications

- keratoconjunctivitis sicca
- anal furunculosis
- adjunct to other immunosuppressors
- (transplants)



side effects

- kidney failure in man – not dogs & cats
- hair growth
- rarely lymphomata



similar drugs

- tacrolimus (FK506)
- sirolimus (rapamycin)
- mycophenolate
- leflunomide
- IL2 antibodies
 - basiliximab
 - daclizimab



azathioprine

- metabolised to mercaptopurine (antimetabolite)
- kills dividing cells
- more in cytotoxic drugs lecture



gold

- reduces phagocytosis
- knocks out platelets
- expensive
- lots of side effects (30% man)



gold

- sodium aurothiomalate
- aurothioglucose
- auranofin



gold

- **sometimes used for**
 - pemphigus
 - plasmacytic stomatitis in cats
 - rheumatoid arthritis in man
- **contraindication**
 - SLE



oxpentifylline

- PDE4 inhibitor
- useful effects???



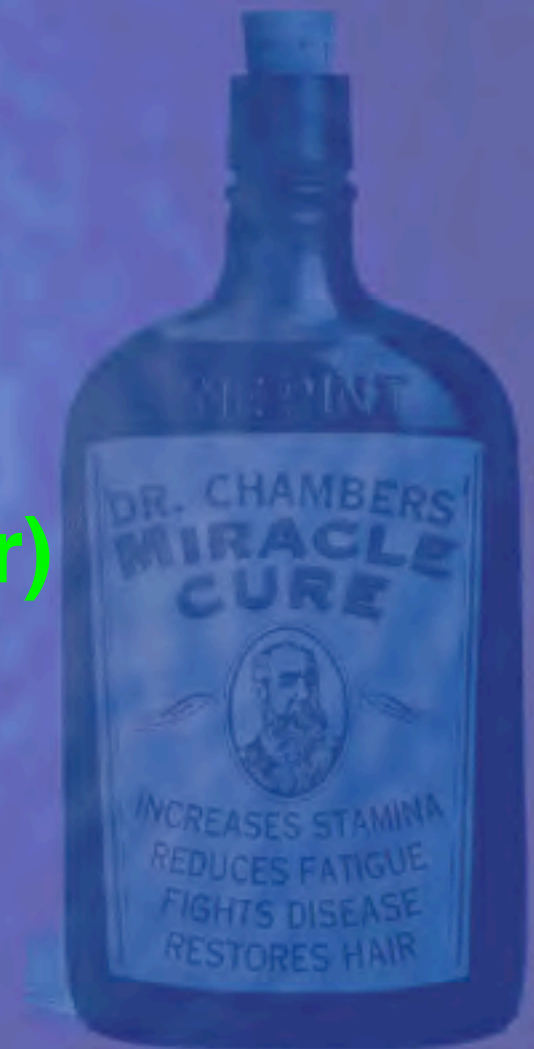
others

- **various anticancer drugs**
 - cyclophosphamide
 - chlorambucil
 - nasty drugs of last resort
- **anabolic steroids?**
 - danazol



immunostimulants

- levamisole?
- colony stimulating factors
- interleukins 3 & 6
- ampligen (interferon inducer)
- all extremely expensive
- BCG
 - cheap and nasty



TB testing

- relies on type 4 reaction





problems?

- tissue damage
- infection
- pain



treatment?

- excise necrotic tissue
- cyclosporin
- antibiotics?



immunosuppressive drugs

- glucocorticoids most effective
- cytotoxics sometimes added
- use as small a dose as possible
- taper off
- a variety of other drugs have been used but no clear indications yet

