

# Cell Wall Synthesis Inhibitors:

- Inhibit Peptidogly cross linking
- $\beta$ -lactams
  1. Penicillins
  2. Cephalosporins
  3. Carbapenems
  4. Monobactams



- $\beta$ -lactams:
- Inhibit transpeptidase &
  - Interfere w/ last step in CW synth.
  - Inactive against
    1. Mycobacteria
    2. Protozoa
    3. Fungi
    4. Viruses
  - Bacteriocidal

- Penicillins:
- widely effect, low toxicity w/ major being hypersensitivity
  - mainly  $G^+$ :
    - streptococcal
    - pneumococcal
    - listeriosis
    - meningitis
    - syphilis
  - naturals:
    1. PCN G: Doc syphilis
      - only IM depot
      - sus to penicillinase
    2. PCN V:
      - oral admin, similar to G

- Antistaphylococcal: penicillinase-resistant
  1. Methicillin: nephritis

- Inhibit peptidogly polymerization
- Vancomycin
- bacitracin
- mupirocin (Bactroban)



- Vancomycin (IV)
- Bacteriocidal,
  - Effective against MRSA, MRSE
  - sepsis, endocarditis
  - restricted to life-threatening staph infections when allergic to  $\beta$ -lac.
  - adverse effects:
    1. Fevers, chills
    2. Ototoxicity if administered w/ renal failure
    3. Red neck or man syndrome

## Bacitracin

- Gram +
  - topical only (nephrotoxic)
- Fosomycin
- Gram - & +
  - uncomplicated UTI's.
  - safe 4 pregnancy
  - adverse effects
    1. Dizziness, back pain
    2. C. Diff
    3. Toxic megacolon

- drugs that disrupt cell membrane
- polymixin



## Daptomycin:

- alternative to linezolid for  $G^+$  MRSA & VRE
- complicated skin infections & bacteremia.
- inactivated by surfactant
- adverse effects:
  1. myalgia
  2. Liver monitor

## Polymixin B

- cationic detergent
- resistant  $G^-$ 
  - ↳ Pseudomonas in CF
- topical: ophthalmic
- extreme nephro/neurotoxicity when given paraenteral.

(discontinued)

2. Nafcillin: Injected

3. Oxacillin, dicloxacillin:

- Oral: chronic infections
- parenteral: serious Staph infections

- Extended Spectrum PCN's

• Ampicillin & amoxicillin

- community-acquired pneumonia (+ macrolide or tetracycline)

- amp: Doc listeria monocytogenes (PO/IM/IV)

- amoxicillin: Lyme disease (PO)

- not active against

1. Pseudomonas
2. Klebsiella

• can be formulated w/ a penicillinase-inhibitor

1. amoxicillin-clavulanate: augmentin (PO)

2. ampicillin-sulbactam: Unasyn (IM/IV)

- synergism: w/ aminoglycosides

↳ both -cidal, never place in same infusion fluid.

-  $\beta$ -lactamase inhibitors:

expand spectrum

1. clavulanic acid

2. sulbactam

3. tazobactam

- excreted by kidney, probenecid inhibits

- adverse effects:

1. ampicillin: maculopapular rash.

\* Safest during pregnancy

Cephalosporins

- semisynthetic  $\beta$ -lactam

- 1st gen: Cefazolin (IM/IV): PECK

• severe infections

• bones

- 2nd gen: Cefoxitin (IM/IV)

adverse effects:  
seizures @ levels

- anaerobic
- HEN PECK
- cefaclor: discontinued:
- 3rd gen:
  - serratia, anaerobes, ↑ G<sup>-</sup>
  - cefixime: PO
  - cefotaxime: IM/IV
    1. Doc: meningitis
  - ceftriaxone
    1. Doc: gonorrheal inf
    2. meningitis
- 4th gen:
  - cefepime (IV)
  - aerobic G<sup>-</sup>
- 5th generation
  - ceftaroline fosamil (teflaro) IV
    1. MRSA

↳ vancomycin resistant strains

} pene  
CSF

- poorly absorbed, most IV/IM

- Adverse effects:

1. Bleeding
2. Superinfections → thrombophlebitis
3. ↑ aminoglycoside toxicity

### Carbapenams

- cilastatin: nephrotoxic
- newer: meropenem, ertapenem, doripenem
- Broadest spectrum available
- adverse effects
  1. nausea, vomiting, diarrhea
  2. High levels: seizures

### monobactams

- very narrow spectrum: G<sup>-</sup> rods only (pseudomonas)
- safe in pregnancy
- expensive