**Learning obj 10:** explain the action of reversible, competitive inhibitors that are used therapeutically.

- **Sulfonamides** – attack bacteria bc they make folic acid via PABA. Sulfonamide mimics PABA, competitively inhibiting dihydropteroate synthetase (enzyme)... inhibiting the necessary folic acid for cell replication.
  Abx!

- **Methotrexate** – inhibits the activation of consumed folic acid in humans → activated $TH_4$ ... cannot synthesize nucleotides... MTX mimics folic acid & competitively inhibits enzyme dihydrofolate reductase.
  → Kills both healthy & cancer cells.
  chemo!
  (Folate antagonist)

- **warfarin = coumadin** – inhibits the activation of Vit K (fat soluble) needed for activating clotting factors. Coumadin mimics Vit K Quinone & competitively inhibits Vit K epoxide reductase (enzyme)
  Anticoagulant!

- **Statins** – inhibit the RL step of cholesterol synthesis by mimicing HMG CoA & competitively inhibiting HMG CoA reductase (enzyme) (e.g. lovastatin)
  antihyperlipidemics!

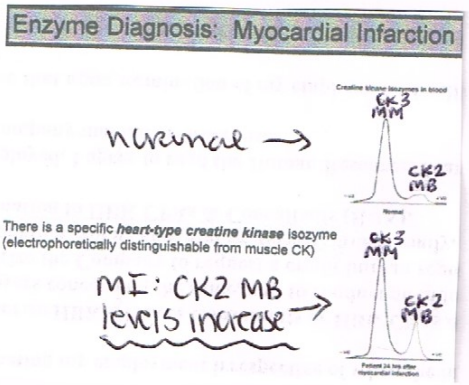
- **Viagra = sildenafil** – inhibits cGMP breakdown so that ↑NO => ↑cGMP => erection. Sildenafil mimics cGMP & competitively inhibits cGMP phosphodiesterase type V.
  ED.

- **ACE inhibitors** – inhibits Angiotensin I $\xrightarrow{ACE}$ Angiotensin II (↑BP)
  ACE inhibitors captopril & enalopril mimic Angiotensin I & competitively inhibit Angiotensin converting enzyme
  antihypertensives (captopril & enalapril)

- **Ibuprofen & Acetaminophen** – Ø Binding of arachidonic acid ∈ cyclooxygenase but they don't mimic... they block Cyclooxygenase active site so arachidonic acid Ø get in => Ø prostaglandins, Ø thromboxane Ø inflammation.
  analgesics!
  NSAID

**Learning obj 11:** outline the role of enzymology in clinical diagnosis & specific examples

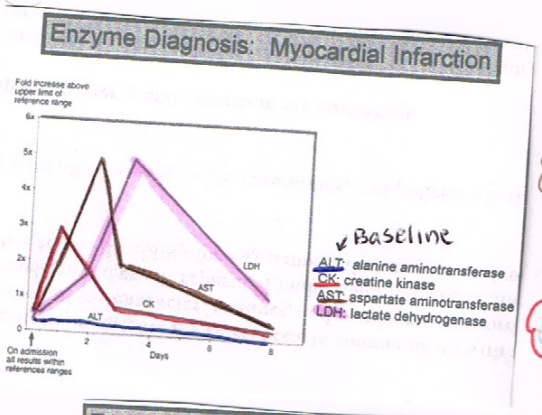
* enzymes leak out of damaged tissue
  - ↳ level of enzymes depends on severity of damage.
  - ↳ some enzymes ⇒ tissue specific. (maybe in isoenzyme form)
  - ↳ ∃ pattern of enzyme release that indicates tissue or organ of origin.
  - ↳ give up to date picture b/c levels return to normal when recovering




dimeric - 2 subunits

Different creatine kinase isozymes →
- CK-1 Brain 2 same subunits BB
- CK-2 heart 2 diff subunits MB
- CK-3 muscle 2 same subunits MM

← But if pt doing strenous exercise, MM CK-3 is released in larger amounts so MB CK-2 can be elevated but 100K dwarfed ... miss MI dx?!




**ALT**: liver enzyme. ALT > AST → viral hepatitis

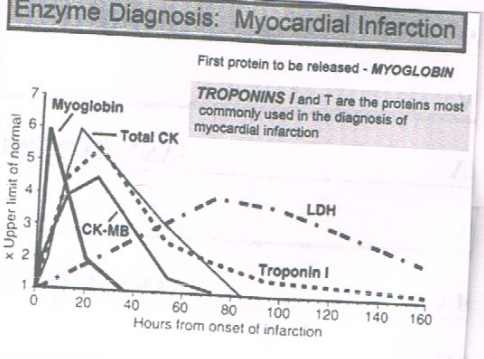
**AST**: liver enzyme. AST > ALT → alcoholic hep. MI! indicate

Alkaline phosphatase - osteoblastic bone dz

amylase - acute pancreatitis, mumps (parotitis)

**CK**: MI (CKMB) or Duchenne muscular dystrophy (CKMM

GGT: obstructive liver dz.




**LDH**: MI!

lipase acute pancreatitis (more specific than amylase)

1st protein to be released during MI - myoglobin
↳ NON specific don't use to dx

main protein to dx MI: Troponin I & T