* Salvage – get from outside and then recycled
* Nucleosides = base + ribose sugar (generated from PPP)
* Nucleotides = nucleoside + phosphate – can be mono, bi, or triphosphates
* Start from scratch – de novo synthesis
* Can use nucleotides and nucleosides – pathways
* Parasites lack de novo pathways – use nucleotides from host – can disrupt their uptake to control
* Ribo vs deoxynucleotides – sugars
* Cells need to produce ribonucleotides first
* PRPP – 5 phosphate – sugar can react with nucleobases to generate nucleotides
* Nucleotides – need ribose sugar and then nucleobases
* For purine biosynthesis de novo – need PRPP that is linked to a base and form IMP – IMP is the base to generate GMP
* Purinosome – complex that generates purine – multicomplex subunits
* If start with IMP – can be AMP or GMP – IMP to GMP need glutamine and ATP – need aspartate and GTP to go to AMP from IMP
* Branching point – GMP will inhibit upstream generation of GMP
* Glutamine gives nitrogen to make nucleotides
* Target purine and pyrimidine in cancer research because they are heavily dependent on this pathway
* Azaserine is the analogue of glutamine so they inhibit the cancer cells as they really need purine and pyrimidine – affect normal cells too but less than cancer cells
* Purine salvage pathways – take purine that comes from outside and recycle them and then reuse – use recombination with PRPP by HGPRT
* Uric acid forms crystal – uric acid is insoluble – precipitates – cuz disease – inflammation in the joint – treated by allopurinol
* Alloxanthine – loses both molecule and the enzyme
* SCID – immune cells need nucleotides – cell death of immune cells
* Carbamoyl phosphate is very important for pyrimidine synthesis
* Start with ribonucleotide – ADP to UDP – convert to OH – generate dADP to dUDP – dUPD takes longer to go to Dttp
* Pyrimidine – a single 6 Cs ring