

BioChem final ✨100

- iron : not free , bound mostly to erythrocytes , less in women , absorbed as ferrous +2 , (DMT1) is iron transporter + c-dependent , heme absorbed by (HCP-1) from meat , PPI inhibits iron absorption .
- iron storage in intestine cells as ferritin Fe+3 , (shedding = loss) , iron loss by : gastrectomy , Gi bleeding + hookworms , H. Pylori , celiac, Crohn .
- iron transported as tow Fe+3 in transferrin by ferroxidase (or plasma protein ceruloplasmin) , NTBI binds exceed iron . transferrin receptor prefers saturated transferrin , then endocytosis , then STEAP3 reduce ferric into ferrous to cytosol (c - dependent).
- hepcidin binds to ferroprotein and degrades it , also inhibits (DMT1) , to trap iron in intestinal cells waiting for shedding . (hepcidin ⬆️ in inflammation & high iron levels) .
- normally TFR1 bound to TFE , iron replaces TFE , TFE goes to TFR2 (sensor) to send message to hepcidin .
- bacterial infection ⬆️ inflammation ⬆️ IL-6 = ⬆️ Hepcidin .
- more iron in BM = BMPR is bound to hemojuvelin (HJV) = ⬆️ hepcidin.
- hypoxia + anemia = ⬆️ erythropoietin = ⬆️ X hepcidin .
- iron regulatory element on mRNA (3 or 5 untranslated) , binds to IRP on TFR + DMT-1 to increase absorption //// + decrease storage by IRP 2 binds to IRE on Fpn ⬆️ (ferritin + ALAS)
- HIGH iron level IRP to decrease absorption - increase storage .
- Hereditary hemochromatosis : 1 most common (**HFE-dependent**) , 2A (**HJV-dependent**) , 2B (**hepcidin-dependent**) , 3 (**TfR2-dependent**) , 4 (**ferroprotein-dependent**) .
- type 1 & A2 & B2 & 3 are Autosomal recessive disorders , type 4 is Autosomal dominant disorder.
- 50 gm exceed Iron damage proteins = hemosiderin .
- Juvenile hemochromatosis : type 2 (A&B) , CHILDREN - cause high iron , low hepcidin .
- Iron-deficiency anemia : low iron = hypoxia .
- blood coagulation : first platelets adhesion then aggregation then coagulation . platelets have receptors on surface like : thrombin , thromboxane , GP for collagen + vWB+ other platelets .
- activation of thrombin receptor - activate PLC - B = IP3 + DAG = release of ca+ , release arachidonic from phospholipid by PLA2 , arachidonic releases by **cox** vasoconstrictors like prostaglandins .
- aspirin inhibits cox , and prostacyclin which means : it is vasodilator + anti-inflammatory , risk of bleeding in older people .
- ca+ also activates MLCK altered platelet morphology, induced motility, and release of granules.
- ADP from DAG changes platelets morphology to bind to fibrinogen .
- Non-enzymatic protein cofactors (factors VIII, V, and tissue factor) , all factors are from liver except tissue factor from platelets .
- Gla domain carboxylation with ca+ by reduction of vit K - by quinone reductase (warfarin inhibits the reduction) .
- neonate has vit K deficiency due to its fat solubility not in milk, not in placenta .
- tissue factors are initiators of coagulation after damaged cells , factor 7 extrinsic + factor 12 intrinsic .

- Factor XII is autoactivated by prekallikrein , they also activate HMW kininogen releasing bradykinin (a peptide with potent vasodilator action).
- tenase complexes : factor 7 + tissue factor and factors 8&9 activate factor x . factor 5+8 are co factors not enzyme .
- von Willbrand factor deficiency decrease factor 8 half-life .
- The complex of factor Xa/Va/Ca²⁺ is the “prothrombinase complex”, Thrombin cleaves fibrinogen = "soft clot“ , then into hard clot by (factor 13 , stabilizer)transglutaminase that is activated by thrombin . activation of V, VII, VIII, and XI by thrombin.
- by thrombin binding to thrombomodulin, protein c activated and activates protein S (vit K dependent) , inhibits factors 8+5 .
- Antithrombin III requires Heparin sulfate to inhibits coagulation, Tissue factor pathway inhibitor (TFPI) inhibits the pro-thrombinase complex also accelerates protein S function.
- fibrinolysis : activated protein C = ⬆ tPA = ⬆ plasminogen = ⬆ plasmin . Streptokinase & Urokinase UPA increase plasminogen conversion , (TAFI) removes lysine residues and prevents fibrinolysis.

GOOD LUCK 🙌