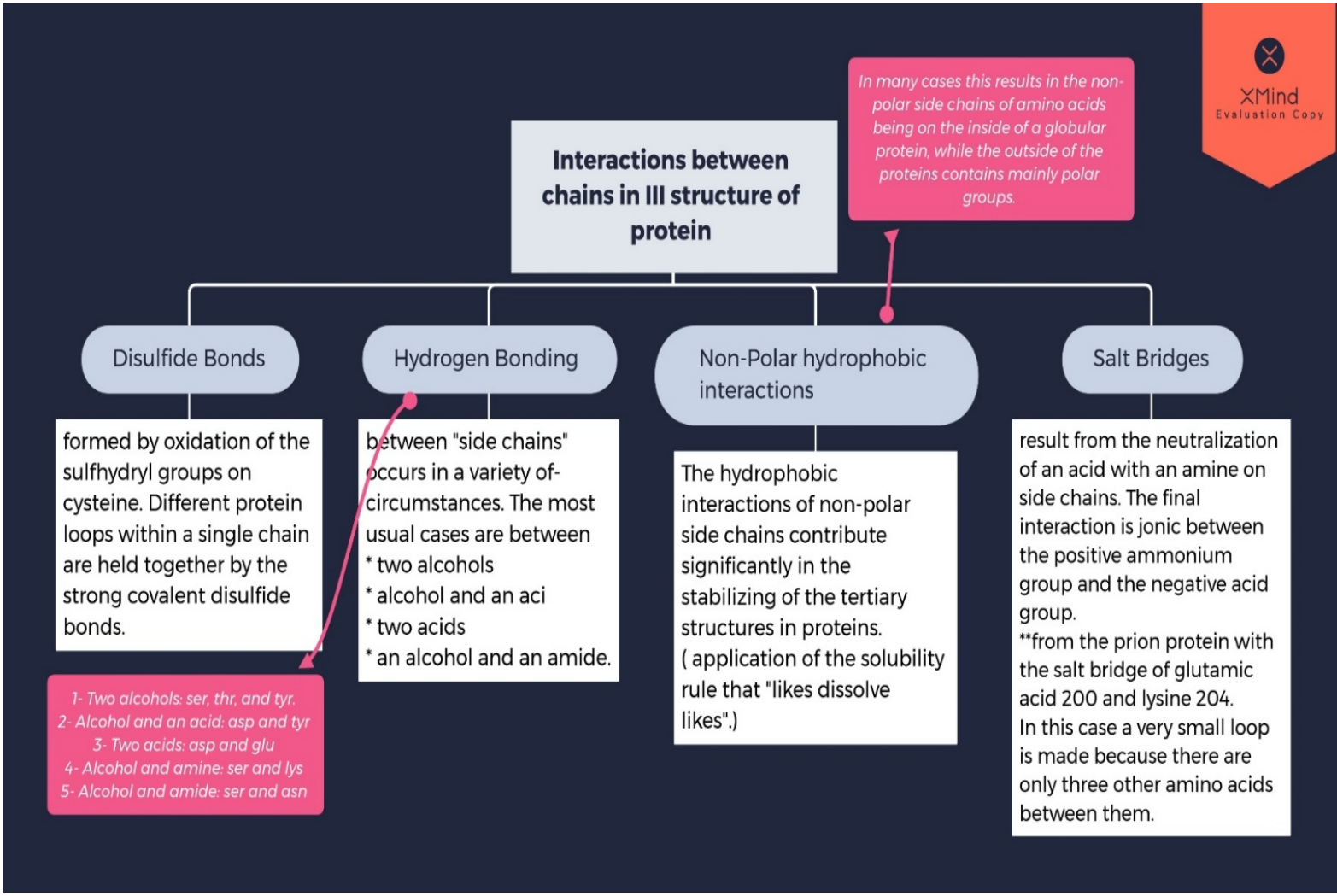
METABOLIC DISEASES IN BONES	SYMPTOMS,	CAUSES
OSTEOPOROSIS	Increased risk of fracture , BMD is reduced , microarchitecture deteriorates, amount and variety of proteins in bone are altered. Classified as : *primary type 1 is common in women (postmenopausal osteoporosis) *(Primary type 2 osteoporosis /senile) occurs after age 75 and is seen in both females and males at a ratio of 2:1	1.Insufficient amount of Ca & V.D 2. A drop in estrogen in women at the time of menopause and a drop in testosterone in men is a leading of bone loss. 3.Lysosomal proteases present in ostecolasts deteriorate bone in order to stimulate resorption of calcium from bone to increase Ca concentration in blood 4. Low blood calcium stimulates parathyroid gland to release PTH. PTH promotes bone resorption leading to bone loss. 5. amount of vitamin D3
PAGET DISEASE	*Symptoms are confused with those of arthritis include bone pain. *It is disorder of osteoblasts and osteoclasts so bones become thickened, entarged but also brittle due to abnormal structural development.	1.VIRAL 2.GENETIC
OSTEOGENESIS IMPERFECTA (OI)	SLIDE 19 *according to the type	DEFECT in collagen production ;collagen type-I deficiency due to : Substitution of glycine to bulkier A.A in collagen triple helix structure
BONE CANCERS	BONE PAIN 1-EWING'S: *4-15 Y.O *most aggressive *middle of long bones 2-CHONDRO: *over 40 *2nd most common *(very aggressive or slow) *can potentially spread to the lungs and lymph nodes *males>females *pelvis & hips 3-OSTEOSARCOMA: *10-25 y.o *long bones/areas of rapid growth: around shoulders and knees of children	Majority : metastatic disease from other remote cancers (2ndry) 1ry much rarer
RICKETS	Softening of bones in CHILDREN ,fractures and deformity, *SLIDE 23	deficiency or impaired metabolism D, phosphorus or calcium. *The primary cause of rickets is a vitamin D deficiency. Vitamin D is required for proper calcium absorption from the gut. * Sunlight, (UV) , lets human skin cells convert Vitamin D from an inactive to active state.
OSTEOMALACIA	IN ADULTS Weakened bones & abnormal formation	(1) insufficient Ca absorption from the intestine because of lack of dietary Ca or a deficiency of or resistance to the action of v.D

		(2) phosphate deficiency caused by increased renal losses.
ACROMEGALY	Overgrown bones in the face,hands ,and feet	Excess G.H production by the body , benign tumor of the pituitary gland in the brain

FIBROUS DYSPLASIA	Normal bone is replaced with fibrous tissues Mostly in : skull,pelvis,shin,ribs,thigh,upper arm	Gene mutation
HYPOCALCAEMIA	*low serum calcium levels in the blood In the blood, about half of all calcium is bound to proteins such as serum albumin, but it is the unbound, or ionized, calcium that the body regulates * Numbness in hands, feet, around mouth and lips.	PTH deficiency /malfunction V.D deficiency
OSTEOMYELITIS	Bone pain Fever , ill-feeling , local swelling redness	Bone infection (bacteria , fungi,germs) After bone surgery or from another organ
HYPOPHOSPHATASIA	Condition which disrupts mineralization process *hypophosphatasia weakens , softens of bones , causing skeletal abnormalities similar to rickets	MUTATION of ALPL gene **this gene make enzyme (alkaline phosphatase) that plays essential role in mineralization of sk. &teeth

غير مطلوب


Interactions between chains in III structure of protein
In many cases this results in the non-polar side chains of amino acids being on the inside of a globular protein, while the outside of the proteins contains mainly polar groups.
XMind
Evaluation Copy
Disulfide Bonds
Hydrogen Bonding
Non-Polar hydrophobic interactions
Salt Bridges
formed by oxidation of the sulfhydryl groups on cysteine. Different protein loops within a single chain are held together by the strong covalent disulfide bonds.
between "side chains" occurs in a variety of- circumstances. The most usual cases are between
* two alcohols
* alcohol and an aci
* two acids
* an alcohol and an amide.
1- Two alcohols: ser, thr, and tyr.
2- Alcohol and an acid: asp and tyr
3- Two acids: asp and glu
4- Alcohol and amine: ser and lys
5- Alcohol and amide: ser and asn
The hydrophobic interactions of non-polar side chains contribute significantly in the stabilizing of the tertiary structures in proteins.
(application of the solubility rule that "likes dissolve likes".)
result from the neutralization of an acid with an amine on side chains. The final interaction is jonic between the positive ammonium group and the negative acid group.
**from the prion protein with the salt bridge of glutamic acid 200 and lysine 204.
In this case a very small loop is made because there are only three other amino acids between them.