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Albumin

- Most abundant serum protein; extensively synthesized in liver & released into blood
- Maintains osmotic pressure in blood
- Transports lipophilic molecules
- Binds & Transports Ca^{2+} ions in blood

↑ **Albumin:** Severe Dehydration

↓ **Albumin:** Liver Damage, Nephrotic Syndrome, Severe Protein Malnutrition, & Acute Phase Response

β Globulin

Transferrin	- Transports Fe^{3+} between the intestine, liver, spleen & bone marrow - Saturation level indicates iron level in pt (i.e. low=iron deficiency, high=iron overload)
Hemopexin	- Binds free heme when Hp is overloaded - Prevents Fe^{3+} from partaking in the Fenton Reaction (oxidative damage) - Prevents microbes from using iron pathogenically
LDL (β Lipoprotein)	- Transfers cholesterol from Liver to peripheral tissues

↑ **β Globulin:** Hypercholesterolemia, Prolonged Inflammation

↓ **β Globulin:** Nephrotic Syndrome

γ Globulin

Antibodies **IgG, IgA, IgM, IgE, IgD**

↑ **γ Globulin:** Inflammatory Diseases, Acute Infections, Liver Cirrhosis, Multiple Myeloma, Lymphoma

↓ **γ Globulin:** Hypogammaglobulinemia

α₁ Globulin

α₁ Antitrypsin (A₁-AT)	- Inhibits elastase released from neutrophils present in the lung - Deficiency → Emphysema (elastase destroys lung tissue)
α Fetoprotein (AFP)	- Abundant in fetal plasma (similar role to albumin) - AFP levels are low in healthy adults; ↑ levels may be a marker for cancer - Levels in amniotic fluid may indicate fetal abnormalities - High: Neural tube defect (e.g. spina bifida, morocephaly) - Low: Trisomy 21
Transcortin	- Main transport protein for Cortisol
Retinol Binding Protein (RBP)	- Transports Retinol (vit. A) from Liver to peripheral tissues

↑ **α₁ Globulin:** Inflammatory Diseases, Liver Cancer

↓ **α₁ Globulin:** A₁-AT Deficiency, Nephrotic Syndrome

α₂ Globulin

α₂ Macroglobulin	- Inhibits proteases (e.g. thrombin, plasmin)
Apoceruloplasm	- Binds to Cu^{+2} in the liver → Ceruloplasm - Ceruloplasm transports Cu^{+2} in the blood - Ceruloplasm converts Fe^{+2} → Fe^{+3} allowing transport via Transferrin
Haptoglobin (Hp)	- Binds free Hb dimers in the blood - Hp-Hb complex prevents loss of Hb (complex can't be excreted by Kidney) - Acute Hemolysis → complexes take up by MO → ↓ serum Hb levels

↑ **α₂ Globulin:** Inflammatory Diseases, Nephrotic Syndrome

↓ **α₂ Globulin:** Wilson's Disease