

**2018 Antibody Building (Immunoglobulin IgG1) antigen binding glycoprotein**

Task for practical studies : <http://aris.gusc.lv/06Daugavpils/Research/ImmunoGlobulASmed.doc>

Molecule viewers: ChemScape  RasMol  MAGE  ISIS Draw   FireFox v.3.5.5

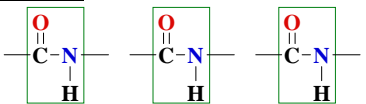
at Display conditions: **Stick** (on Menu Stripe) **Ball & Stick** **Spacefill**

Atom Name	Symbol	Color	Valence Number
Carbon	C	Gray lightly or Black	4
Hydrogen	H	White	1
Oxygen	O	Red	2 (donor acceptor ligand up to 4)
Nitrogen	N	Bluish	3 + 1 (donor acceptor ligand up to 4)
Sulfur	S	Yellow	-2 , +6
Phosphor	P	Yellow Intensive dark	5 ( & 3 )
Sodium ion	Na <sup>+</sup>	Blue	+1 (coordination up to 6)
Magnesium ion	Mg <sup>2+</sup>	Green	+2 (coordination up to 6)
Calcium ion	Ca <sup>2+</sup>	Gray Dark	+2 (coordination up to 6)
Iron ion	Fe <sup>2+</sup>	Yellow Gray	+2 (coordination up to 6)
Iron ion	Fe <sup>3+</sup>	Yellow Gray	+3 (coordination up to 6)

the CPK color scheme 1965

USA patent **Journal** publication of scientists **Corey, Pauling, Koltun** for atomic modeling

Protein Backbone is **Ca trace**



Polypeptide of Amino Acids

Side chains: **Hydrophobic**

**Polar pH=7.36**

**Acidic-COO<sup>-</sup> negative**

**Basic-NH<sub>3</sub><sup>+</sup> positive**

Antigenic determined **A B AB O** blood groups: <http://aris.gusc.lv/06Daugavpils/Research/33BloodGroupABO.doc>

**1. Using HomeWork :** <http://aris.gusc.lv/06Daugavpils/Research/Amineac20LS.doc>

What 20 amino acids make up proteins call them using three letter and one letter Amino Acid abbreviations?

Which are simplest and largest amino acid of 20 write its molar mass g/mol?!

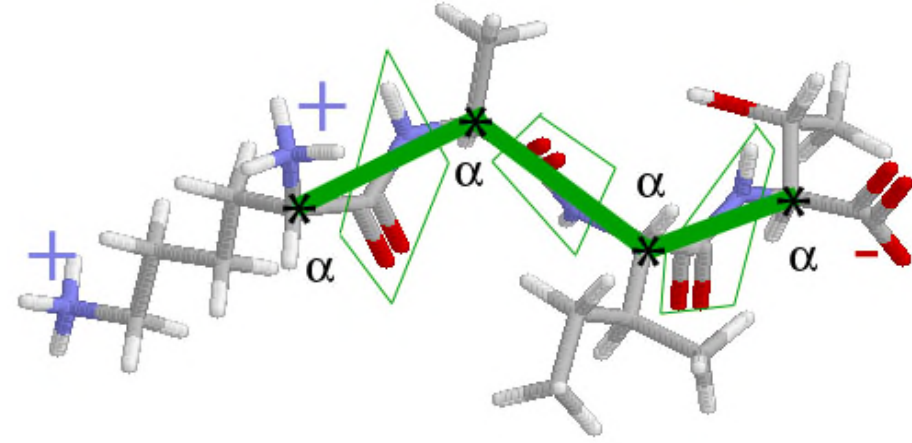
1	Gly - G	5	Ile - I	9	Met- M	13	Gln - Q	17	Phe - F
2	Ala - A	6	Ser - S	10	Asp- D	14	Arg - R	18	Tyr - Y
3	Val - V	7	Thr - T	11	Asn- N	15	Lys - K	19	Trp - W
4	Leu- L	8	Cys- C	12	Glu - E	16	His - H	20	Pro - P

simplest is glycine Gly – G 75,0666 g/mol and tryptophan Trp – W 204,225 g/mol.....

In FireFox3.5.5 <http://aris.gusc.lv/ChemFiles/ChimAntibodyMarz/INDEX.htm> choose of the molecule **AntibodyMarz** home page and investigate **Immunoglobulin** molecule for

**Lysozime binding Anti-Body**

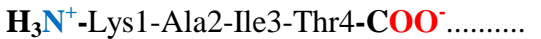
**2.** How are made **backbone** of polypeptide sequence chains and which atom of amino acid is responsible for **backbone** trace formation? Point four **αCarbons** of Amino Acids and draw **Backbone trace** tetra peptide 3D



molecular model picture! Write the tetra Peptide chain sequence using three letter

Amino Acid names

starting from **N-terminus** and finishing with **C-terminus**!

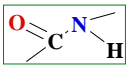


Call terminus

**N-terminus** & **C-terminus** amino acid!

**N-terminus** Amino Acid: Lysine 1

**C-terminus** Amino Acid: Threonine 4



Draw inside frame-boxes three peptide bonds for given tetra peptide molecular model picture!

- What amino acid is **N-terminus** and **C-terminus** on **Light** chains? GLU501....., SER716.....
  - What amino acid is **N-terminus** and **C-terminus** on **Heavy** chains? GLU1....., LEU452.....
  - How many amino acids constitute **Light** and **Heavy** chains? **Light** 216=716-501+1....., **Heavy** 452.....
  - What five intermolecular forces are known in biochemistry of life systems ?
- 1.Hydrogen, 2.Hydrophobic, 3.Salt bridge, 4.Sulfur **-S-S-** disulfide bridge,5.Coordinative donor-acceptor bond ....

