|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **monomer****(name & what it looks like)** | **functional group(s)** | **connection between monomers** | **functions & examples** | **miscellaneous** |
| **proteins** | Amino acids(20) | CarboxylAmino(Sulfhydryl on R group of 1 amino acid) | Peptide bond | catalysis – enzymesdefense – antibodiesmovement – contractile proteinssignaling – hormones &  cell receptors structure – keratin  (hair, nails), collagen (beneath skin, ends of bones) | * 4 levels of structure
* denaturation
* molecular chaperones
* folding & function
 |
| **nucleic acids** | Nucleotides | Phosphate | Phosphodiester linkage | DNA – stores genetic information & passes it to next generationRNA – allows DNA to express itself (for proteins to be made based on DNA instructions) | * purines vs. pyrimidines
* DNA vs. RNA
* DNA structure (complementary bases, H bonds, 3’ & 5’, parts of nucleotide)
* DNA function
* ATP
 |
| **carbohydrates** | Monosaccharide | Hydroxyl | Glycosidic linkage | monosaccharides:glucose – energy source + monomer of larger carbsfructose, galactose | * -ose
* isomers
* numbering carbons
* α vs. β bonds (digestibility in humans)
 |
| polysaccharides:starch & glycogen – energy storagecellulose & chitin – structurepeptidoglycan – bacterial cell wall |
| **lipids** | No common monomer but all are…hydrophobic | All are mainly hydrocarbon chains or rings; phospholipids have phosphate groups. | in triglycerides:Ester linkage | triglycerides:saturated fat – main energy storage in animals (+ padding, insulation)unsaturated oil – some energy storage in plants | * isoprene vs. fatty acid
* saturated vs. unsaturated fatty acids (and membrane permeability)
* amphipathic (steroids & phospholipids)
* phospholipid bilayers
* selective permeability
* movement of ions/molecules across membranes
 |
| steroids:cholesterol – cell membrane component, base molecule from which other steroids are madesex hormones – testosterone, estrogen, progesterone |
| phospholipids:main component of plasma (cell) membranes |



