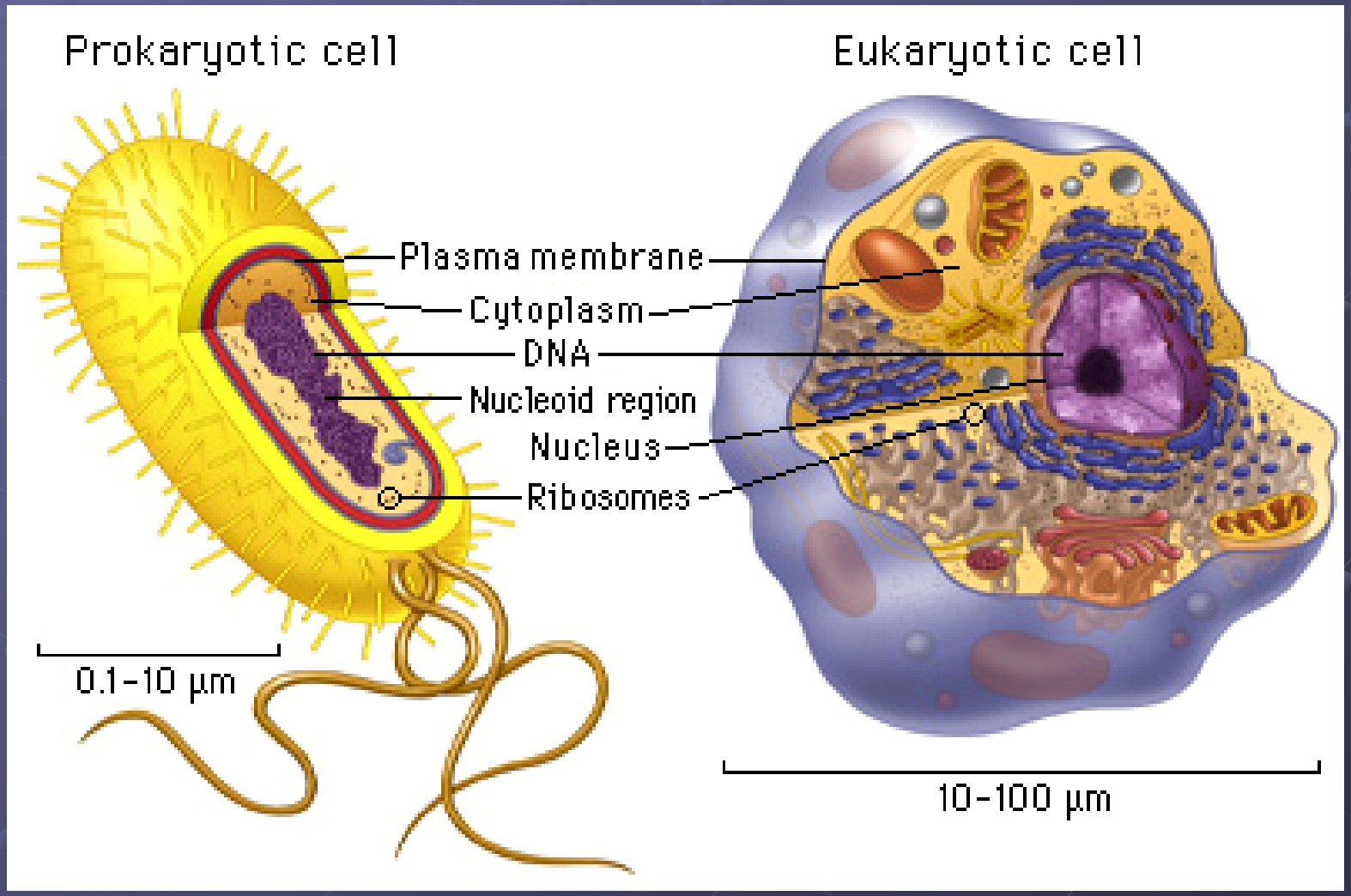
CHEMICAL SYNTHESIS OF BIOPOLYMERS

Introduction



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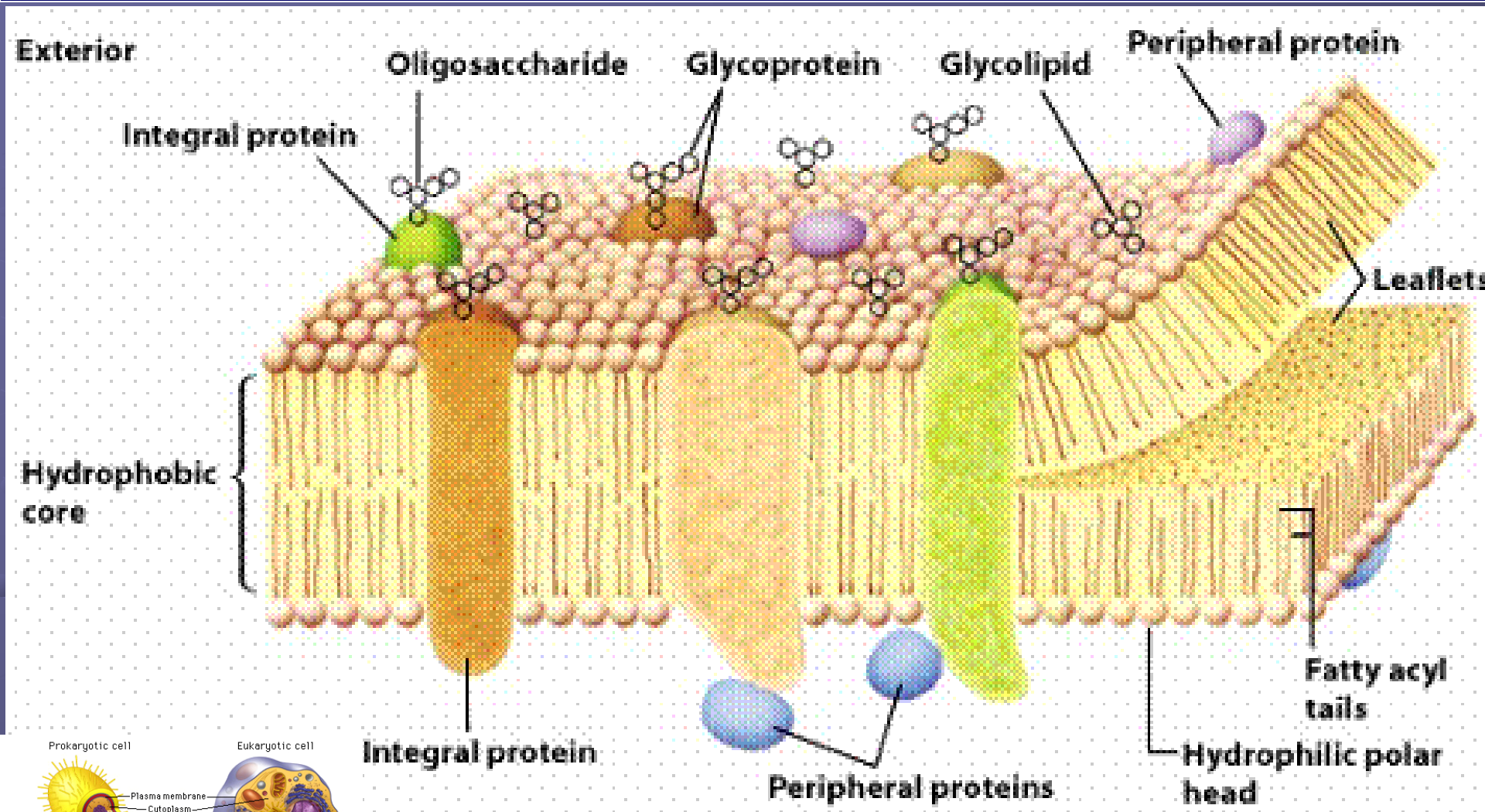

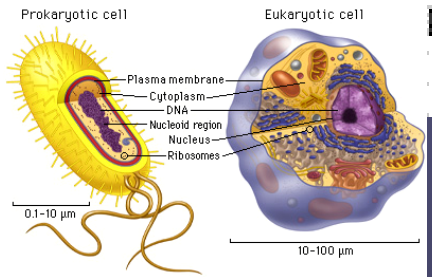

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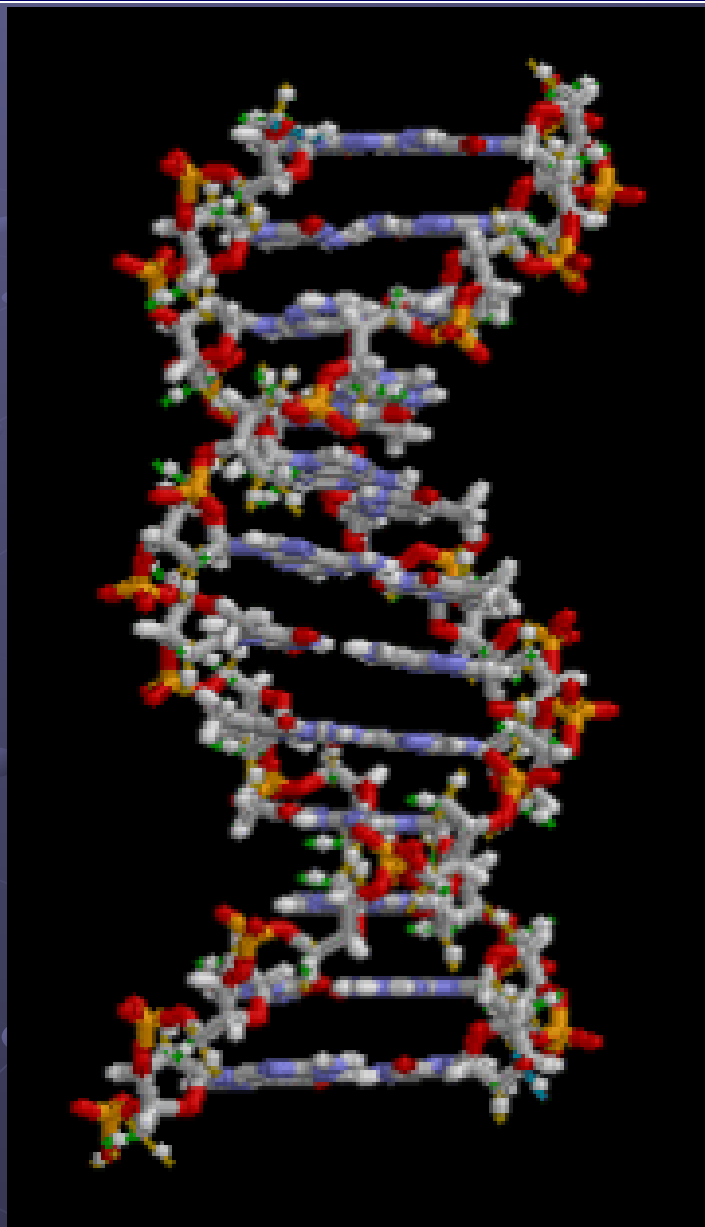
Genomics

Genomics is the study of an **organism's genome**, or genetic material. The genome contains the coded instructions necessary for the organism to build and maintain itself. In most organisms, the genome consists of deoxyribonucleic acid, commonly known as **DNA**.



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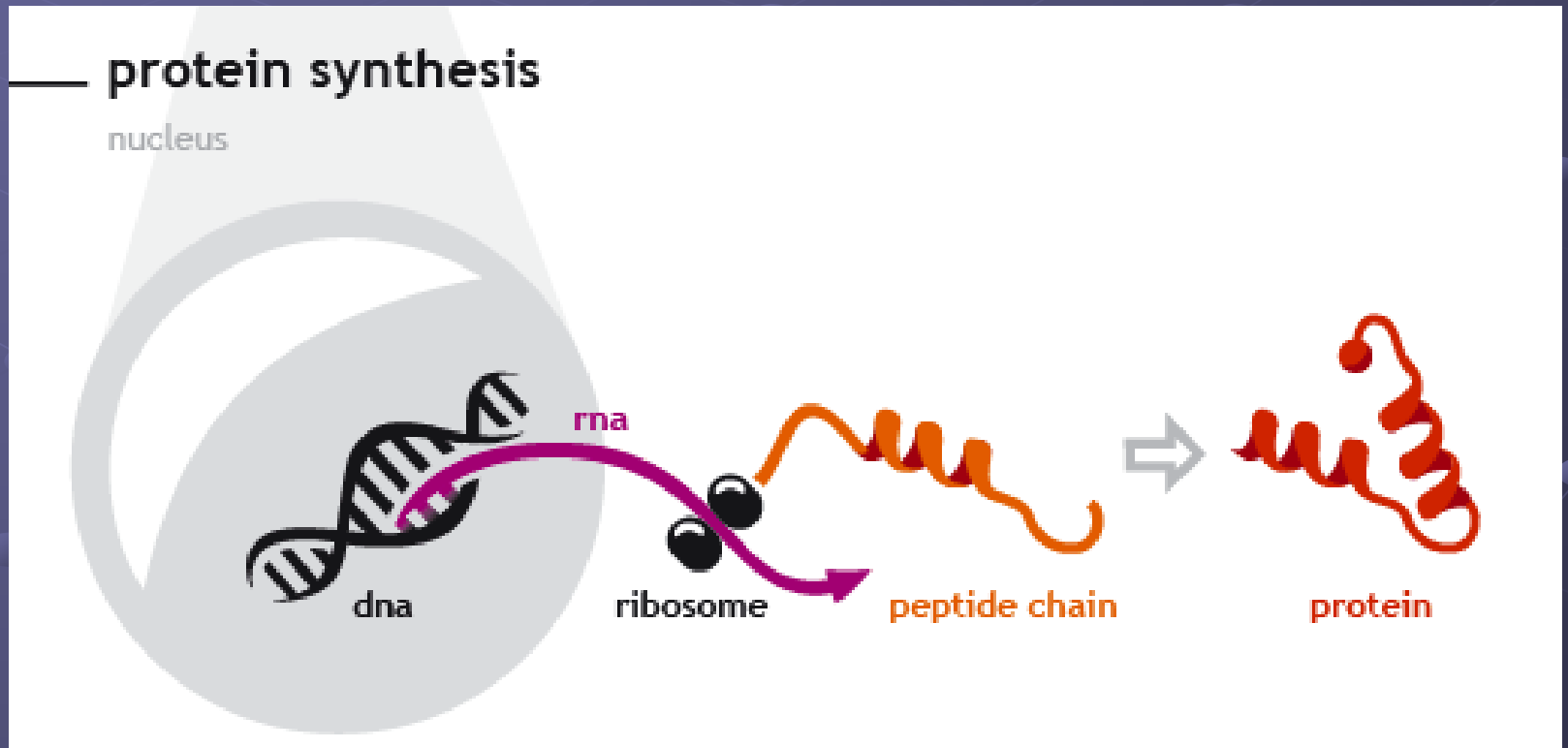
Proteomics

Proteomics is the application of evolving technologies to analyze gene products, i.e. proteins, on a large scale. This concerns **protein expression profiles**, **protein modifications** and **protein networks** in relation to **cell function** and biological processes e.g. **development**, **health** and **disease**.



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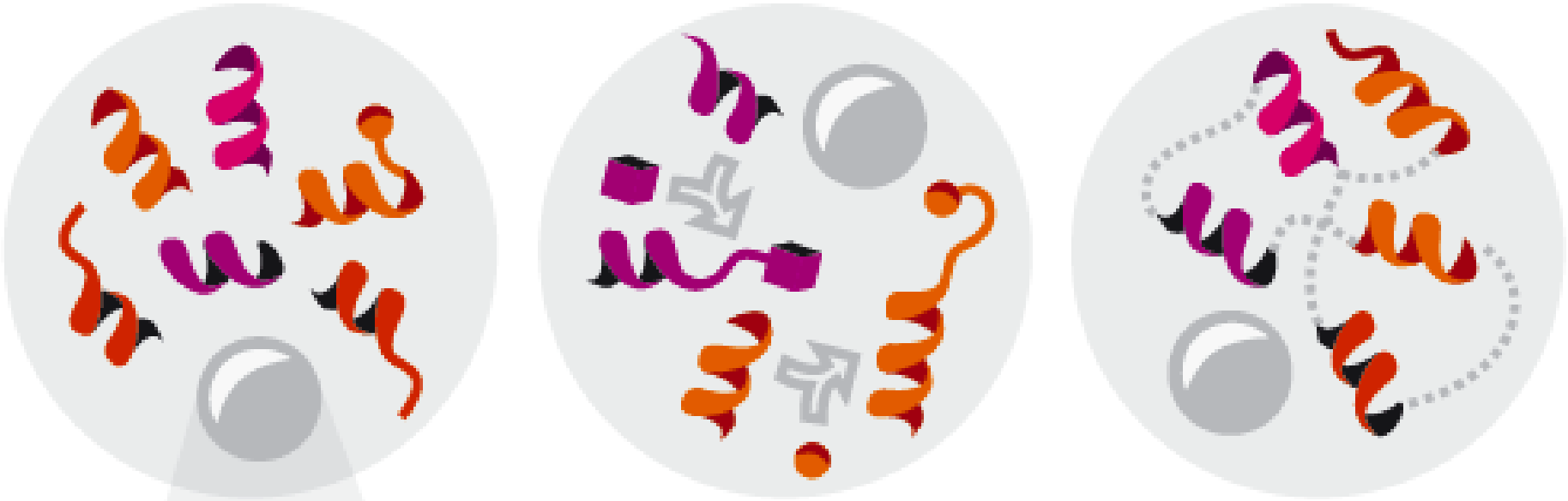
proteomics research

kind & quantity of proteins | post-translational modifications | protein-protein interactions

cell



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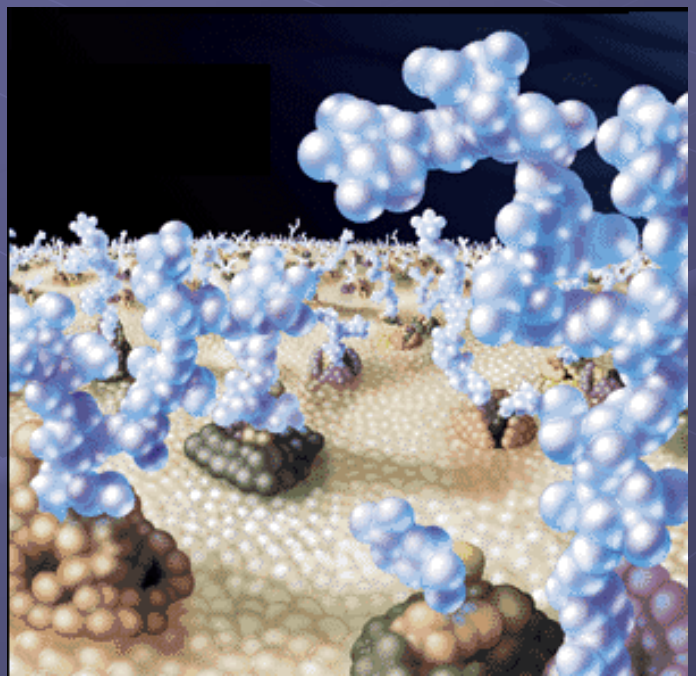
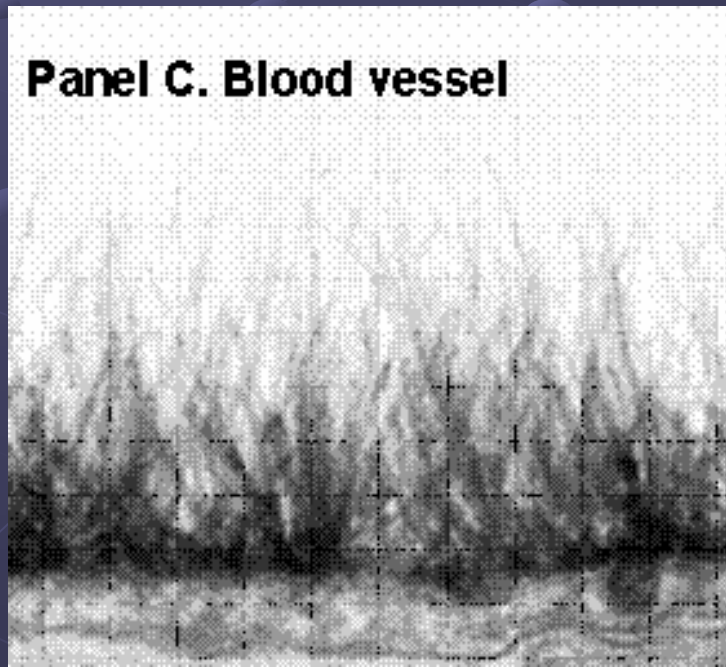
Glycomics

Glycans are involved in **cell-to-cell interactions**, **infectious disease**, **immune functions**, **protein function** and **regulation**.
At least half of the proteins in the human body cannot function properly without carbohydrates, and the sugars that are attached to therapeutic proteins can profoundly affect their pharmacological properties.



Glycocalyx



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Blutgruppe A

α-D-GalNAc (1 → 3) β-D-Gal (1 → 4) D-GlcNAc------

2

α-L-Fuc 1

Blutgruppe B

α-D-Gal (1 → 3) β-D-Gal (1 → 4) D-GlcNAc------

2

α-L-Fuc 1

Blutgruppe 0

β-D-Gal (1 → 4) D-GlcNAc------

2

α-L-Fuc 1

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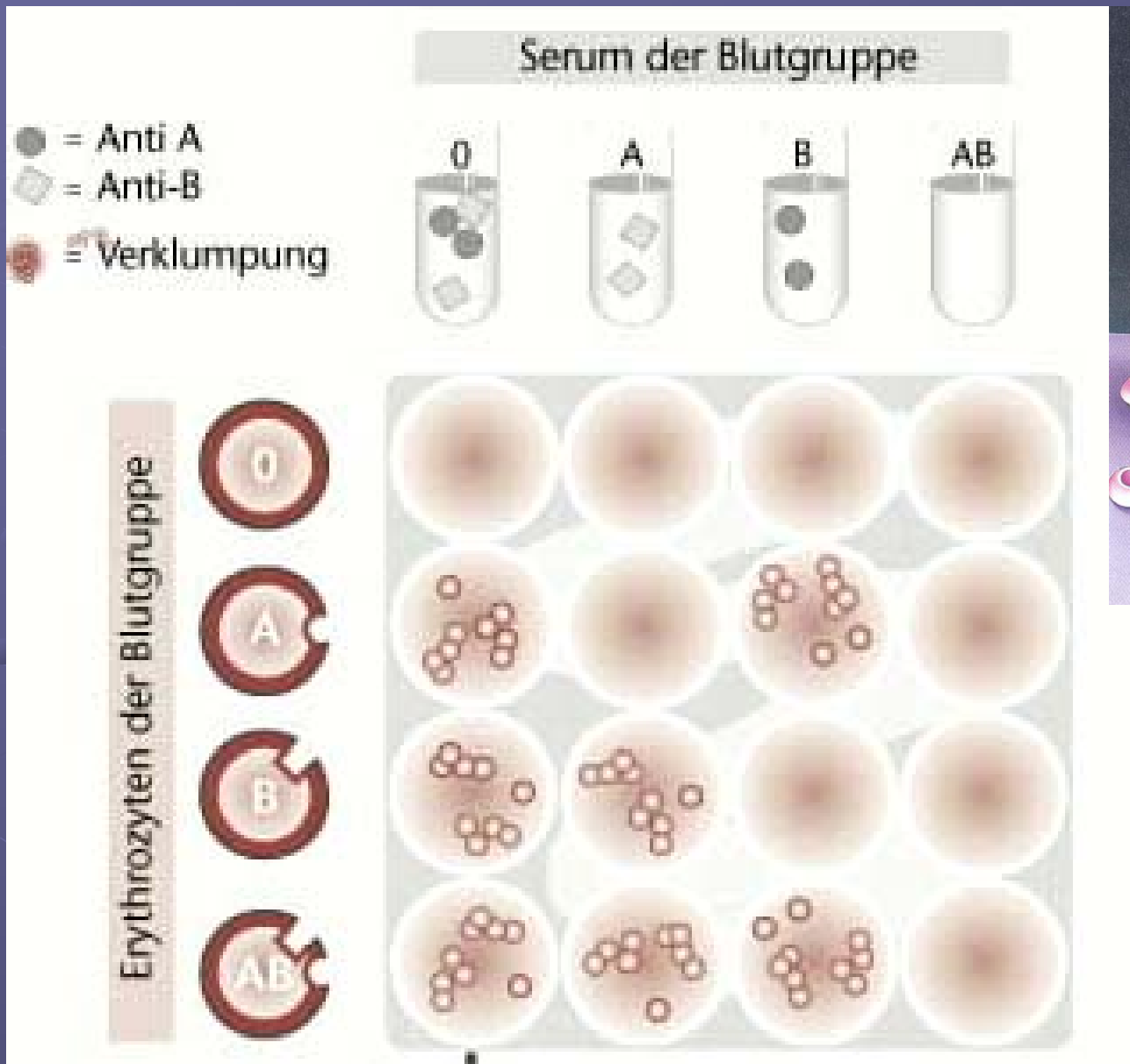

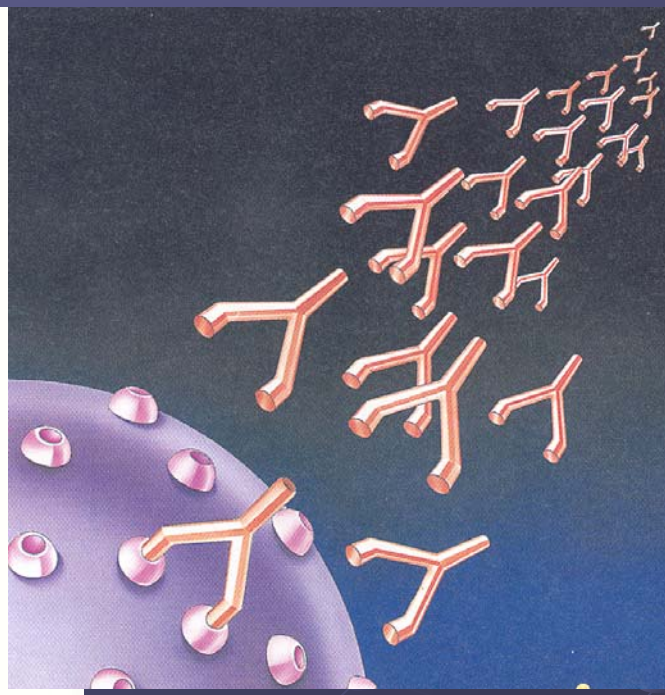

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Why this Lecture?

The **chemical synthesis** of **oligonucleotides**, **oligopeptides** and **oligosaccharides** is a **valuable resource for biological research**.

- These synthesized oligomers are used for **structural investigation**.
- They are used for the examination of **structure – biological activity relationships**.
- Modified nucleotides, peptides and saccharides and their mimics are the basement of **new *anti*-bacterial, *anti*-viral, *anti*-inflammatory** and ***anti*-cancer drugs**.