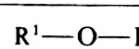
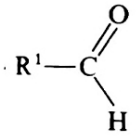
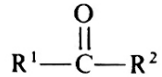
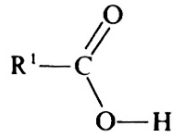
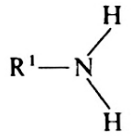
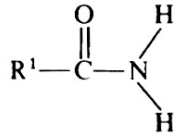
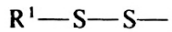
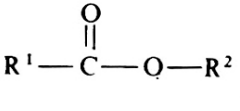
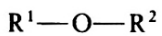
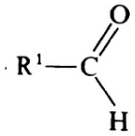
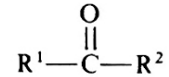
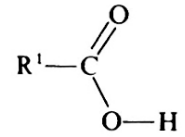
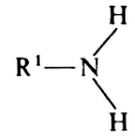
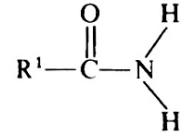
FUNKCIONĀLĀS GRUPAS AUGU OGANISKAJĀS MOLEKULĀS

Functional group	Structure*	Notation	Examples
Hydroxyl		—OH	Alcohols (e.g. sugars)
Aldehyde		—CHO	Aldehydes (e.g. open chain forms of aldo-sugars)
Carbonyl		—CO—	Ketones (e.g. open chain forms of keto-sugars)
Carboxyl		—COOH	Carboxylic acids (e.g. fatty acids, amino acids, dicarboxylic acids)
Amino		—NH_2	Amines (e.g. amino acids)
Amido		—CO—NH_2 (*or* —CO.NH_2)	Amides (e.g. asparagine)
Thiol		—SH	Thiols (e.g. cysteine)
Disulphide		—S—S— (*or* —S.S—)	Disulphides (e.g. cystine)
Ester		—CO—O— (*or* —CO.O—)	Esters (e.g. lipids)
Ethers		—O—	Ethers

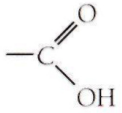
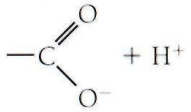
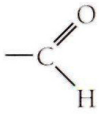
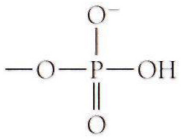
*R^1 and R^2 designate structures to which the functional group is attached.

FUNKCIONĀLĀS GRUPAS AUGU OGANISKAJĀS MOLEKULĀS

Functional group	Structure*	Notation
Hydroxyl	$R^1—O—H$	—OH
Aldehyde		—CHO
Carbonyl		—CO—
Carboxyl		—COOH
Amino		$—NH_2$
Amido		$—CO—NH_2$ (*or* $—CO.NH_2$)
Thiol	$R^1—S—H$	—SH
Disulphide	$R^1—S—S—R^2$	—S—S— (*or* —S.S—)
Ester		—CO—O— (*or* —CO.O—)
Ethers	$R^1—O—R^2$	—O—

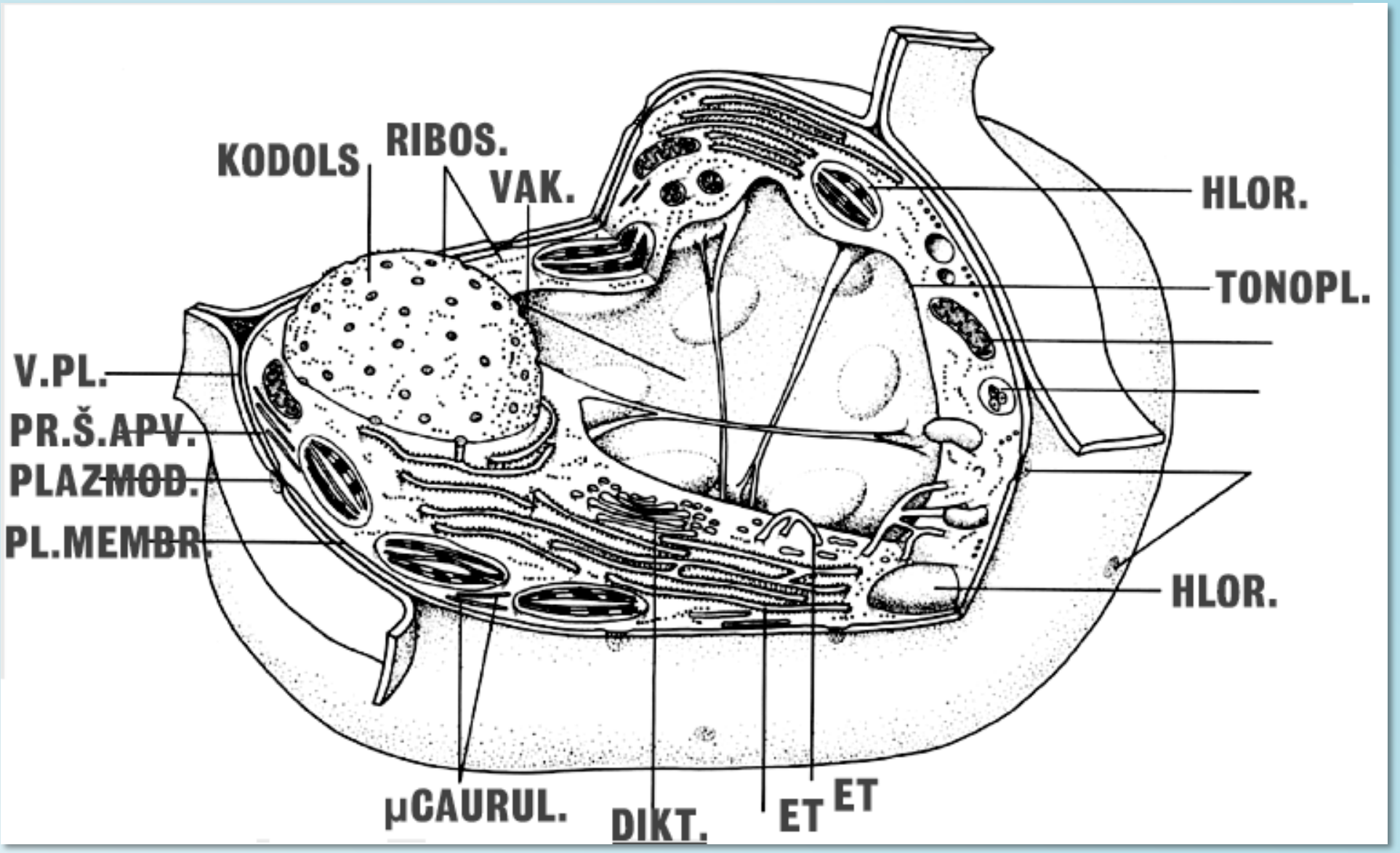
*R^1 and R^2 designate structures to which the functior

TABLE 2.5 *Functional Groups*

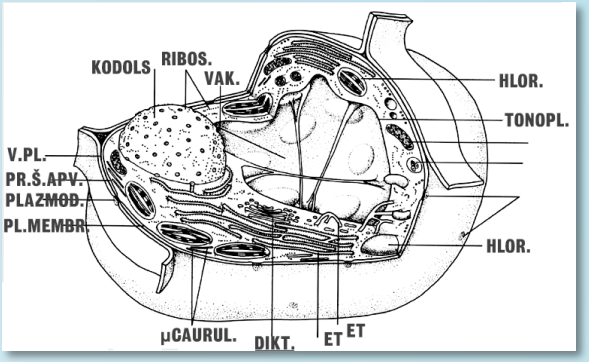
	Name	Characteristics
—H	Hydrogen	Low reactivity; lipid solubility
—OH	Hydroxyl	Alcohol group; hydrogen bondings; water solubility
$—CH_3$	Methyl	Low reactivity; lipid solubility
	Carboxyl	Highly reactive; acidic; in water it acts like an acid, giving off a proton: 
$—NH_2$	Amino	Highly reactive; basic; in water it acts like a base by absorbing protons $—NH_3^+$
	Aldehyde	Moderately reactive; water solubility
	Ketone	Moderately reactive; similar to an aldehyde, but the oxygen is located on an internal carbon rather than a terminal one.
	Phosphate	Highly reactive; when transferred to a compound, that compound usually becomes much more reactive. In water, the hydrogen comes off as a proton, leaving its electron and giving this group a negative charge. It is highly soluble in water.
—SH	Sulfhydryl	Can stabilize the structure of proteins

AUGU BIOĶĪMIJA – II

ŠUNA


KODOLS
RIBOS.
VAK.
HLOR.
TONOPL.
V.PL.
PR.Š.APV.
PLAZMOD.
PL.MEMBR.
HLOR.
µCAURUL.
DIKT.
ET
ET

ŠŪNA



VAKUOLA - mazas molekulas

KODOLS - NS, proteīni

KODOLA APVALKS - lipīdi, proteīni

HROMOSOMAS - NS, proteīni

RIBOSOMAS - proteīni, NS

PLAZMAS MEMBRĀNA - lipīdi, proteīni

GOLDŽI - lipīdi, proteīni, polisaharīdi

CITOZOLS - proteīni, mazas molekulas

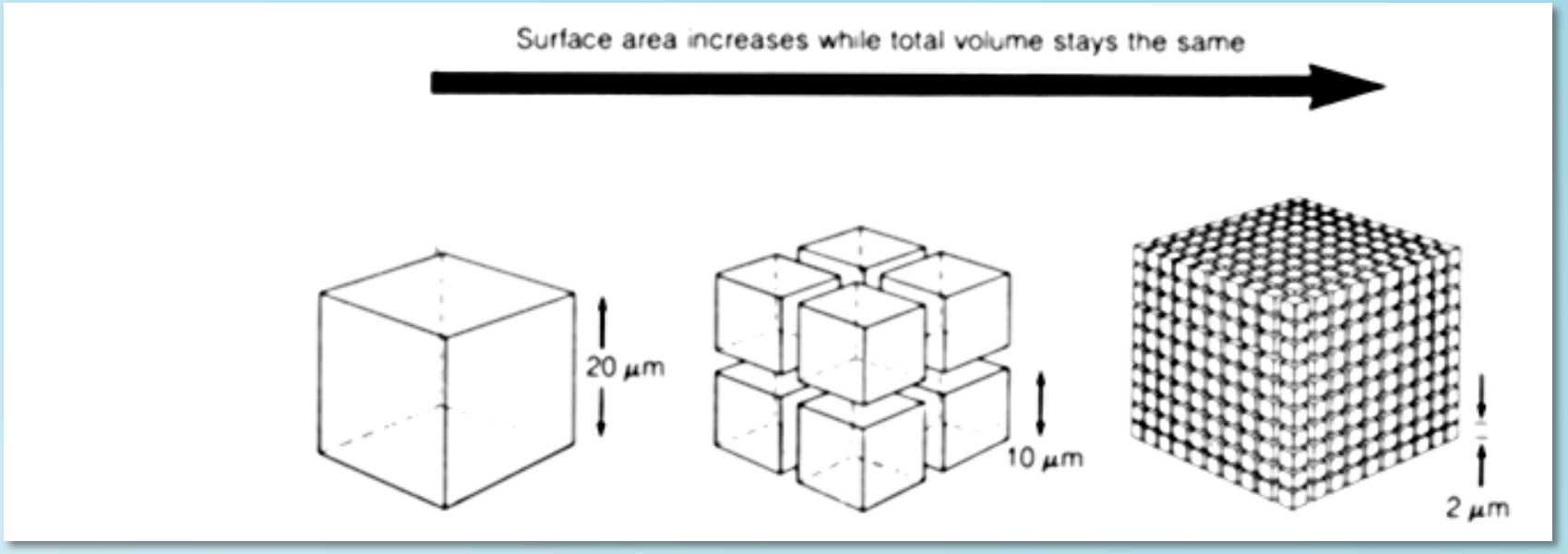
GLUDAIS ET - lipīdi, atsev. proteīni

HLOROPLASTI - lipīdi, proteīni

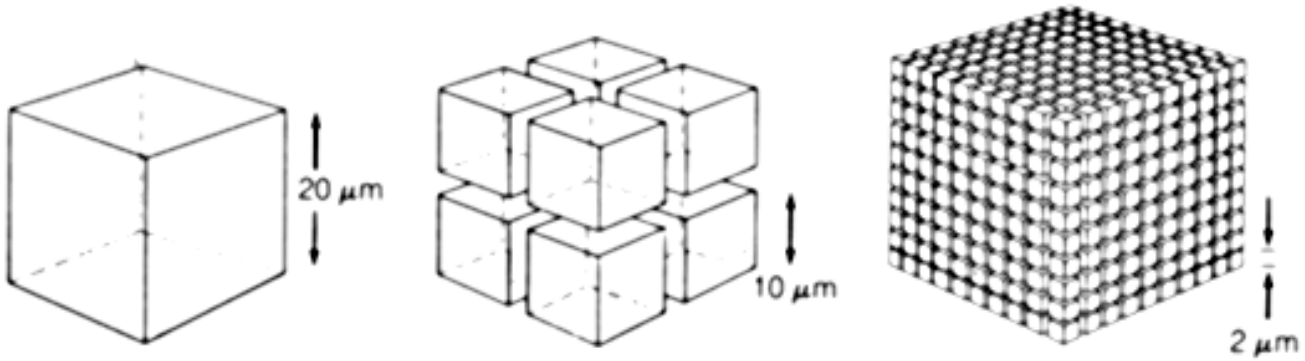
PEROKSISOMAS - lipīdi, proteīni

MITOHONDRIJI - lipīdi, proteīni

ŠŪNAPVALKS - polisaharīdi, proteīni


Surface area increases while total volume stays the same
20 μm
10 μm
2 μm

Surface area increases while total volume stays the same



Length of one side	20 μm	10 μm	2 μm
Total surface area (height × width × number of sides × number of cubes)	2400 μm^2	4800 μm^2	24 000 μm^2
Total volume (length × width × height × number of cubes)	8000 μm^3	8000 μm^3	8000 μm^3
Surface area to volume ratio (surface area ÷ volume)	0 3	0 6	3 0

subšūnas struktūru izdalīšana

– HOMOGENIZĀCIJA:

- audu sagraušana
- šūnas komponentu atbrīvošana

problēmas:

- ciets šūnapvalks
- centrālā vakuola

organiskās molekulas sajaucas ar citoplazmu
var inhibēt enzīmus
sadalīt proteīnus

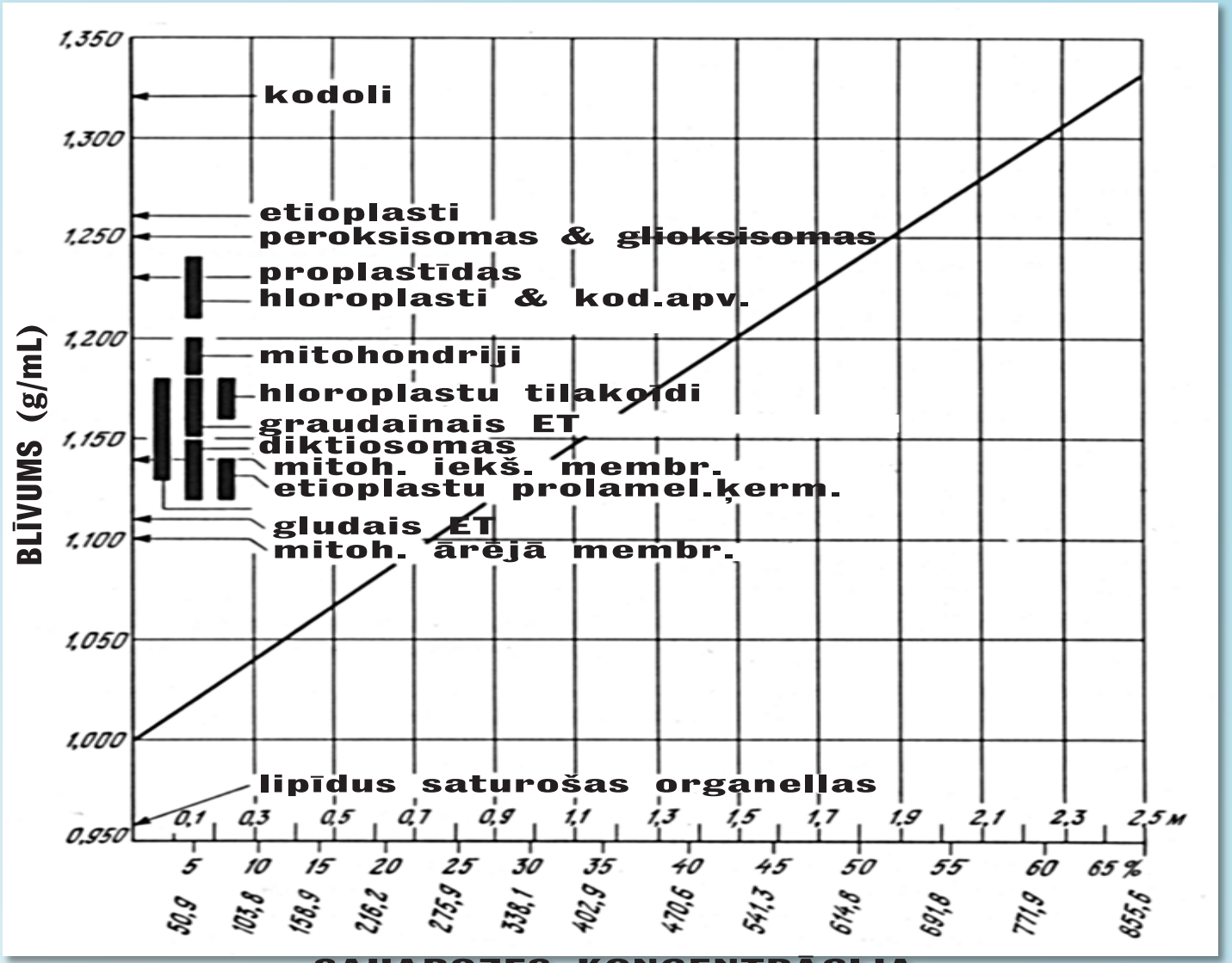
– CENTRIFUGĒŠANA:

sadala individuālos komponentus pēc

- blīvuma
- izmēra
- formas

subšūnas struktūru izdalīšana

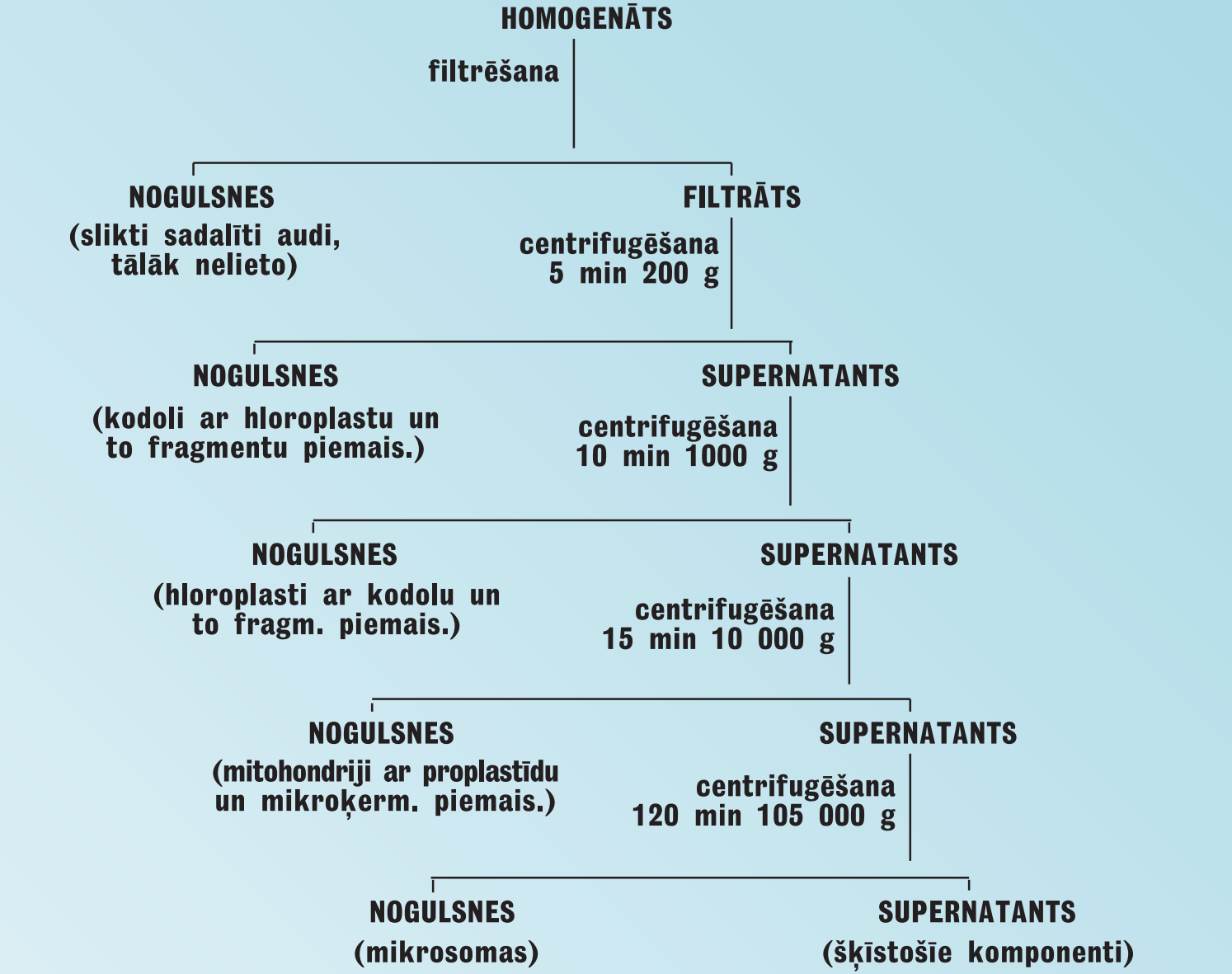
CENTRIFUGĒŠANA SAHAROZES BLĪVUMA GRADIENTĀ



ŠŪNA

subšūnas struktūru izdalīšana

DIFERENCĒTĀ CENTRIFUGĒŠANA

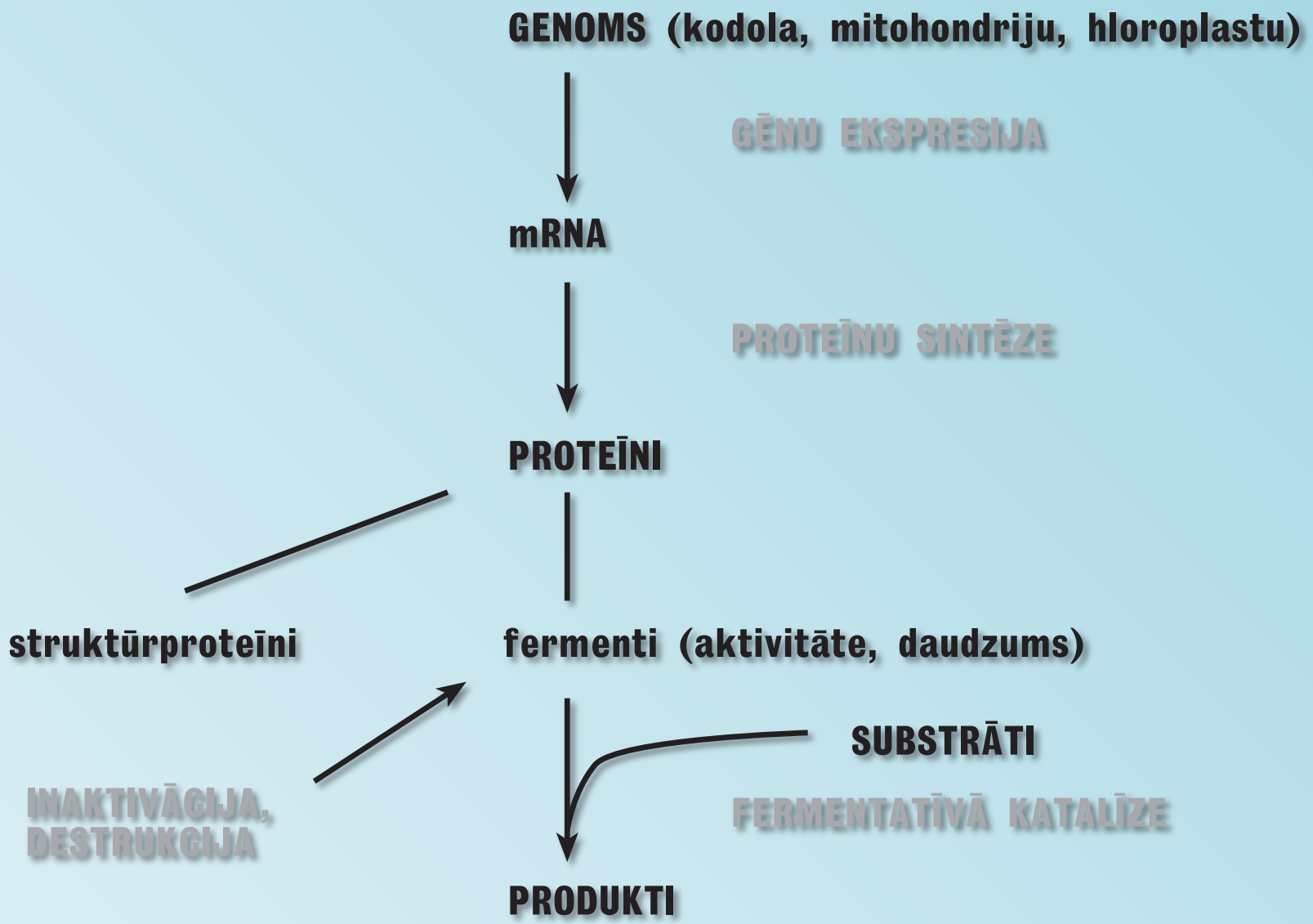


ŠŪNA

ko spēj bioķīmija?

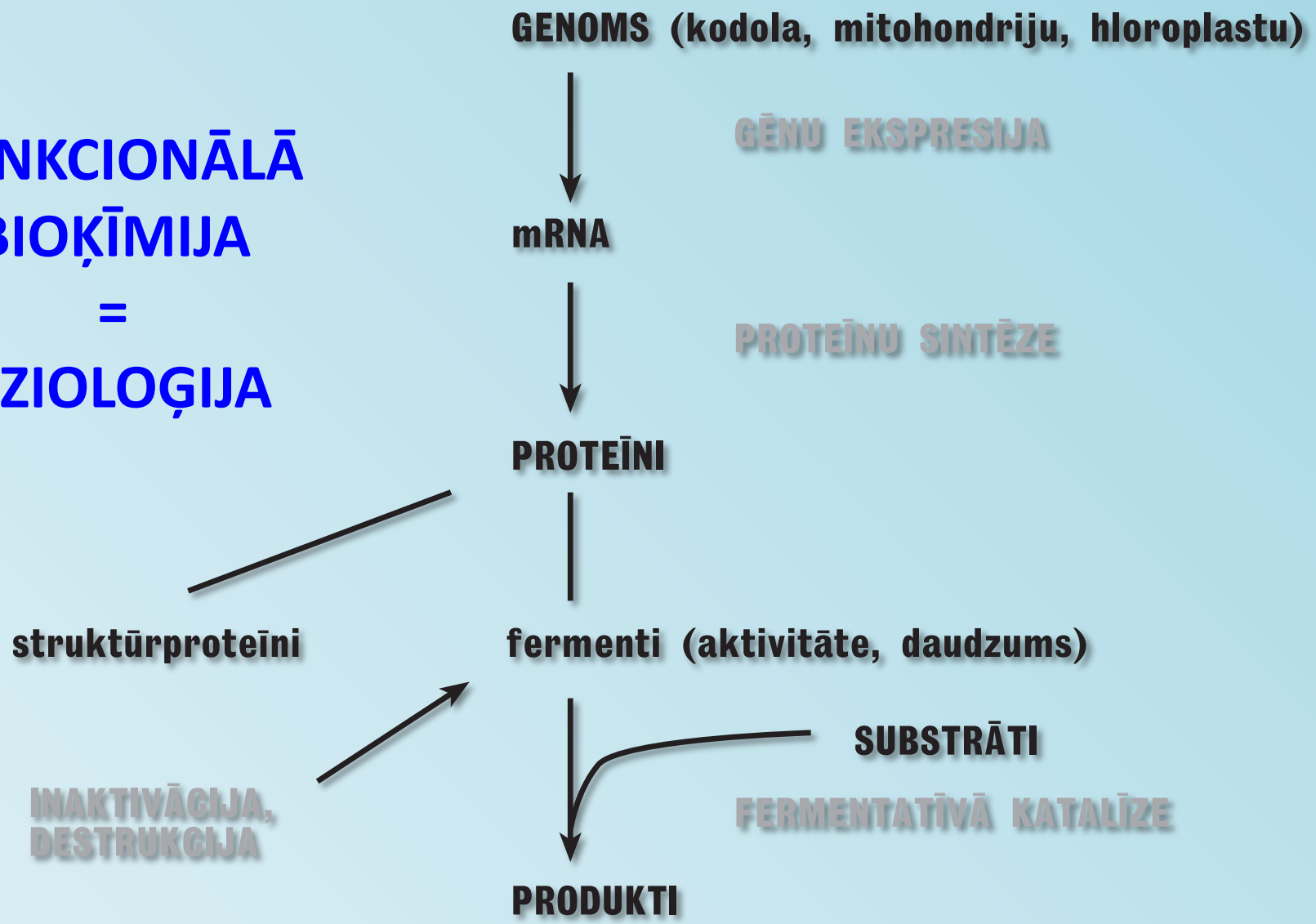
ŠŪNA

ko spēj bioķīmija?



ko spēj bioķīmija?

FUNKCIONĀLĀ BIOĶĪMIJA = FIZIOLOĢIJA



ŠŪNA