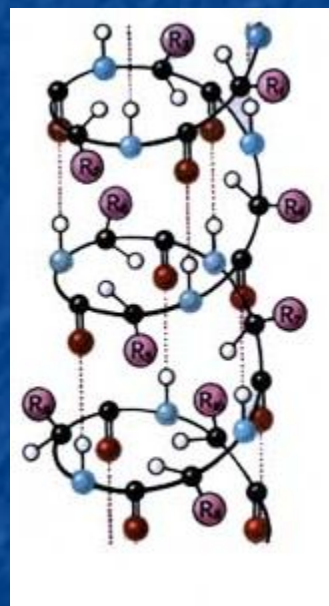


# Aminokislota va oqsillar.

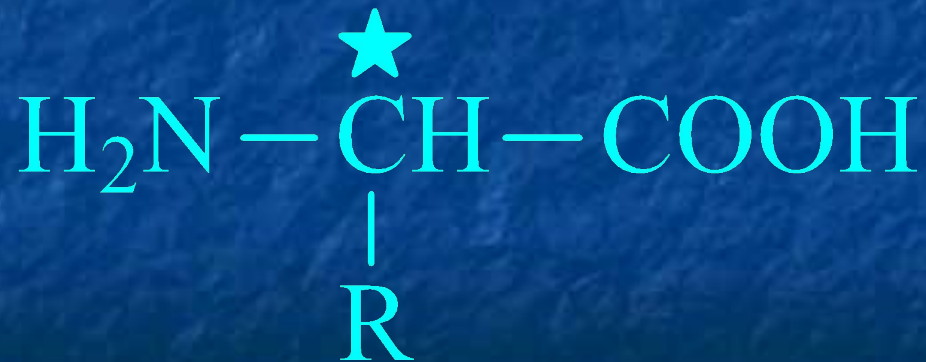
## Tuzilishi va xossalari.



**Spiral makromolekulali oqsillar, nuklein kislotalar va ko'plab sohalarda polisaxaridlar topilgan hatto me'morchilikda.**

# Aminokislotalar

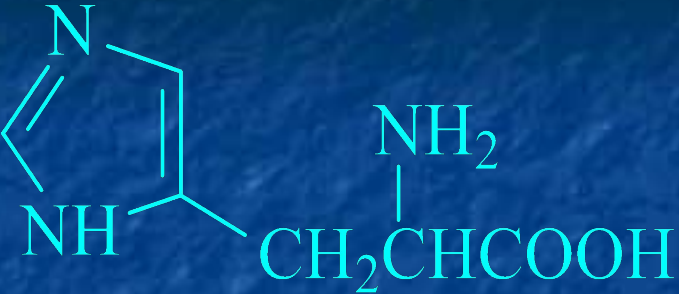
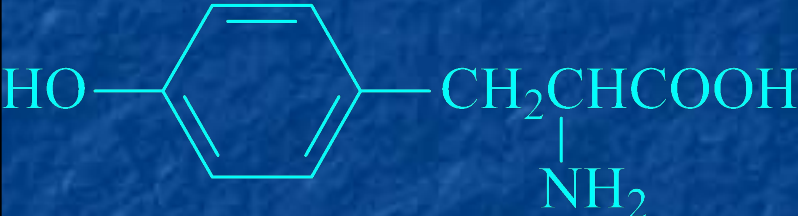
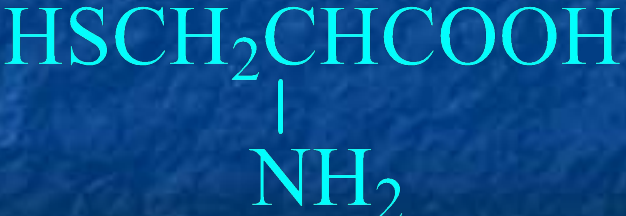
*Kislota xossasini ham olmaydigan va aminoguruh xossasini ham ham o'z ichiga olgan bu aralashma, bu amino kislotalar bo'ladi.*





<b>Nomi</b>	<b>Qisqartmasi</b>	<b>Struktura formulasi</b>	<b>(pH)</b>
<b>Глицин</b>	<b>gly</b>	$\text{H}_2\text{NCH}_2\text{COOH}$	<b>5.97</b>
<b>Аланин</b>	<b>ala</b>	$\begin{array}{c} \text{CH}_3\text{CHCOOH} \\   \\ \text{NH}_2 \end{array}$	<b>6.02</b>
<b>Валин</b>	<b>val</b>	$\begin{array}{c} (\text{CH}_3)_2\text{CHCHCOOH} \\   \\ \text{NH}_2 \end{array}$	<b>5.97</b>
<b>Лейцин</b>	<b>leu</b>	$\begin{array}{c} (\text{CH}_3)_2\text{CHCH}_2\text{CHCOOH} \\   \\ \text{NH}_2 \end{array}$	<b>5.98</b>
<b>Пролин</b>	<b>pro</b>		<b>6.10</b>
<b>Фенилаланин</b>	<b>phe</b>	$\begin{array}{c} \text{C}_6\text{H}_5\text{CH}_2\text{CHCOOH} \\   \\ \text{NH}_2 \end{array}$	<b>5.88</b>
<b>Триптофан</b>	<b>try</b>	$\begin{array}{c} \text{C}_6\text{H}_5\text{CH}_2\text{CHCOOH} \\   \\ \text{NH}_2 \end{array}$	<b>5.88</b>

Nomi	Qisqartmasi	Struktura formulasi	(pH)
Аспарагин	asn	$\text{H}_2\text{N}(\text{O})\text{CCH}_2\underset{\text{NH}_2}{\text{CH}}\text{COOH}$	5.41
Глутаминовая кислота	glu	$\text{HOOCCH}_2\text{CH}_2\underset{\text{NH}_2}{\text{CH}}\text{COOH}$	3.22
Лизин	lys	$\text{H}_2\text{NCH}_2\text{CH}_2\text{CH}_2\underset{\text{NH}_2}{\text{CH}}\text{COOH}$	9.74
Аргинин	arg		10.76

Nomi	Qisqartmasi	Struktura formulasi	(pH)
Гистидин	his	 <chem>NC(Cc1c[nH]cn1)C(=O)O</chem>	7.58
Тирозин	tyr	 <chem>NC(Cc1ccc(O)cc1)C(=O)O</chem>	5.65
Цистеин	cySH	 <chem>NC(CS)C(=O)O</chem>	5.02



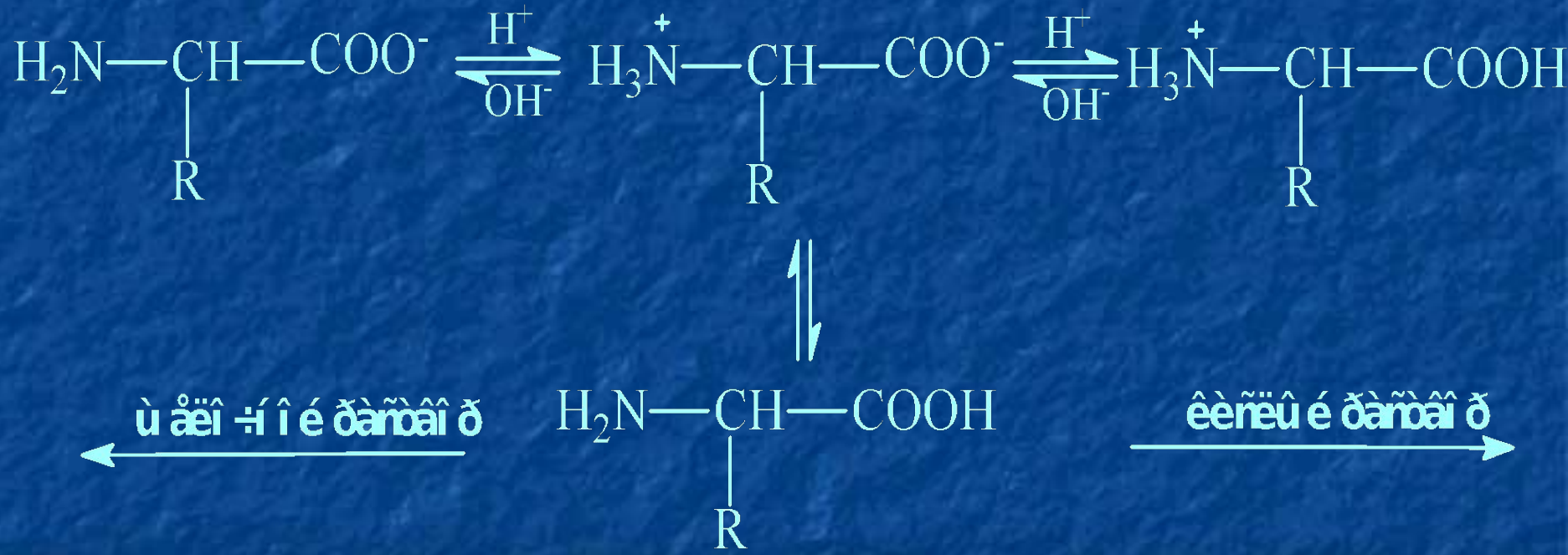
# Almashinmaydigan aminokislotalar

Oqsillar tarkibida uchraydigan aminokislotalar esa ularning fermentativ o'zgarishi natijasida hosil bo'ladi. Ayrim aminokislotalar hayvon va odam organizmidan sintezlanmaydi. Bu almashinmaydigan aminokislotalardir. Odam organizmi uchun 8 (triptofan, fenilalanin, metionin, lizin, valin, treonin, izoleysin va leysin) almashinmaydigan aminokislotalar bor. O'simliklar o'zi uchun zarur bo'lgan barcha azotli birikmalarni sintezlash qobiliyatiga ega. aminokislotalar sintezi jarayonida ammiakli azot organik birikmalarga aylanadi.

# Almashinmaydigan aminokislotalar

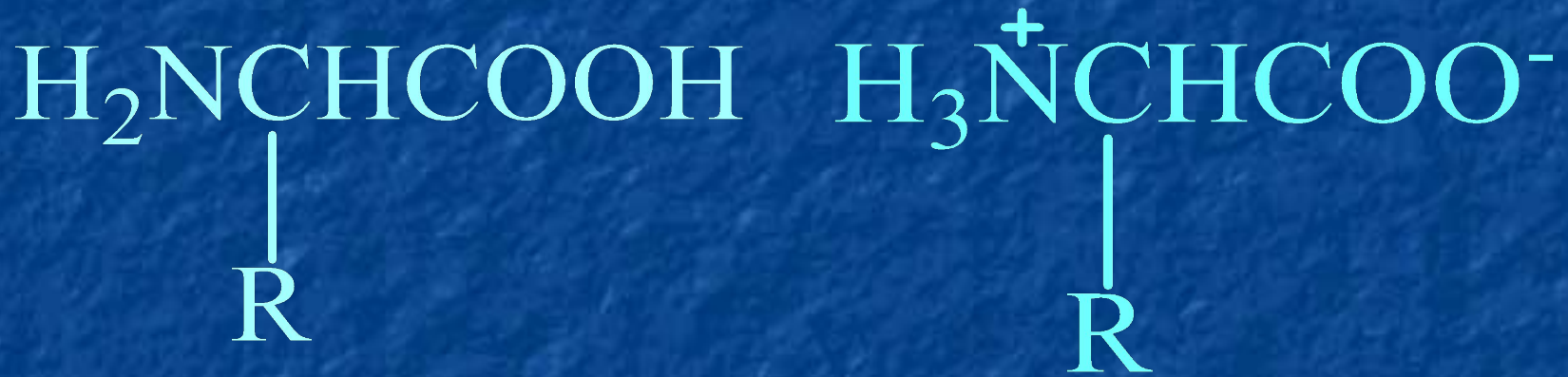
O`simliklarda hosil bo`lgan aminokislotalar uzluksiz almashinib turadi. Ular asosan, oqsillar sintezi uchun sarflana-di, shuningdek, dekarboksillanishi, azot asoslari va boshqa birikmalar sintezi uchun ishlatilishi, aminogruppani aj-ratib yuborishi, to`liq oksidlanishi va organizm uchun energiya manbai bo`lib xizmat qilishi mumkin.

# Kislotali xossalarini namoyon qiladi





## Asosiy xossalari.



Ionlashmagan  
aminokislota holati

Ion holatdagi Sveltir  
ioni (bipolyar ion  
holat)

# Aminokislotalarning klassifikatsiyasi

Kimyoviy tuzulishi bo'yicha aminokislotalar aminkarbon kislotalar bo'lib, ular tarkibida karboksil — COOH va amino — NH<sub>2</sub> guruhlari mavjud. Amino gruppasi hamda proteinogen aminokislotalarda α-uglerod atomida joylashganligidan, α-aminokislotalar qatorini tashkil qiladilar. Peptidlar Kimyoviy tuzulishi bo'yicha aminokislotalar aminkarbon kislotalar bo'lib, ular tarkibida karboksil — COOH va amino — NH<sub>2</sub> guruhlari mavjud. Amino gruppasi hamda proteinogen aminokislotalarda α-uglerod atomida joylashganligidan, α-aminokislotalar qatorini tashkil qiladilar. Peptidlar va,

# Aminokilotalarning olinish usullari

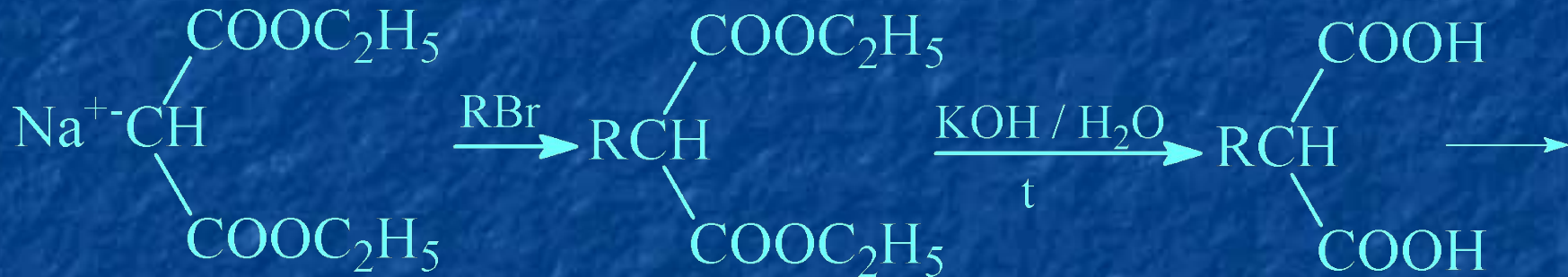
*aminlangan  $\alpha$ - galogen birikmalardan*



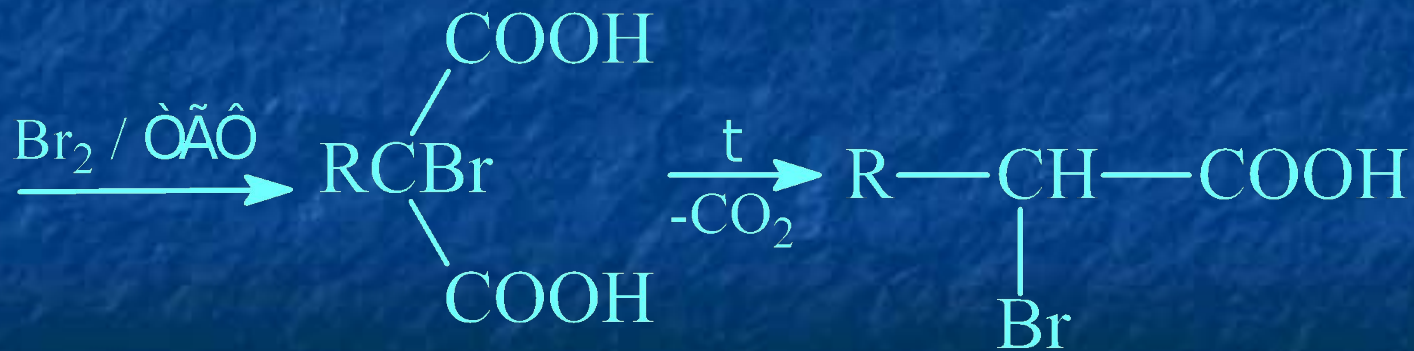


# Aminokislotalarning olinish usullari

*Malon kislotaning bromlanishi natijasida.*

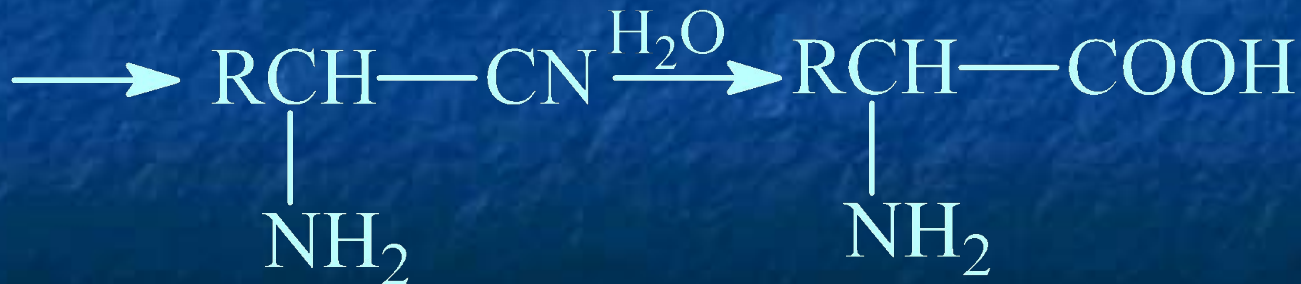
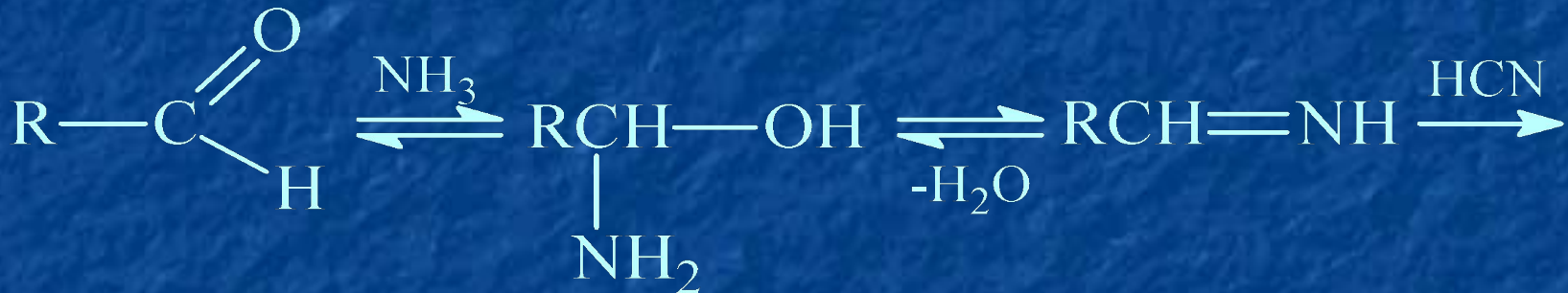


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# Aminokislotalarning olinish usullari

## *Shtekker – Zelinskiy sintezi.*



$\alpha$ -amino kislota

$\alpha$ -amino kislota

# Aminokislotalarning olinish usullari

- N tutgan Aminomalon efirlarning alkilinishi
- $\alpha$  - galogen tutgan efirlarning aminlanishikaliy ftalamid yordamida)



# Aminokislotalarning olinish usullari

Aminokislotalarning biologik olinish xossalari.



Корм с  
добавкой  
рацемической  
смеси  
 $\alpha$ -аминокислот

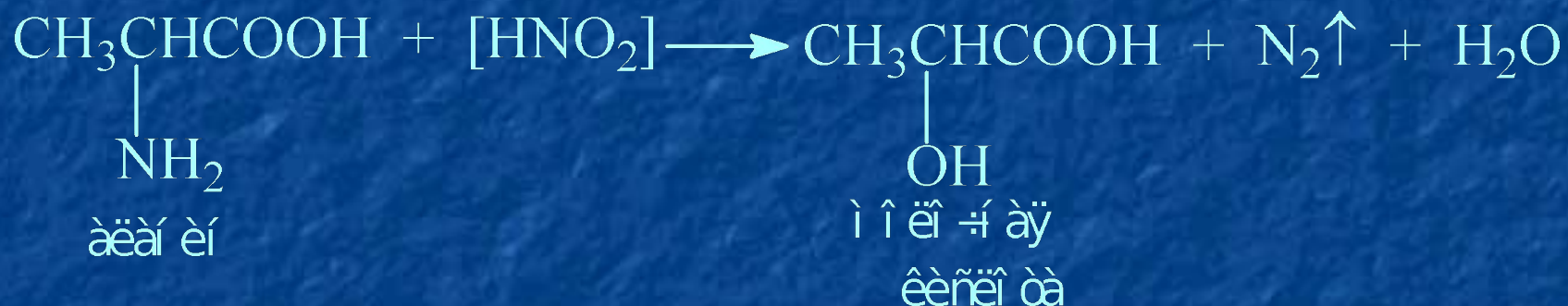
Отходы с  
оптически  
активным  
изомером  
 $\alpha$ -аминокислоты

Очистка

Оптически  
чистый изомер  
 $\alpha$ -аминокислоты

# Aminokislotalarning kimyoviy xossasi

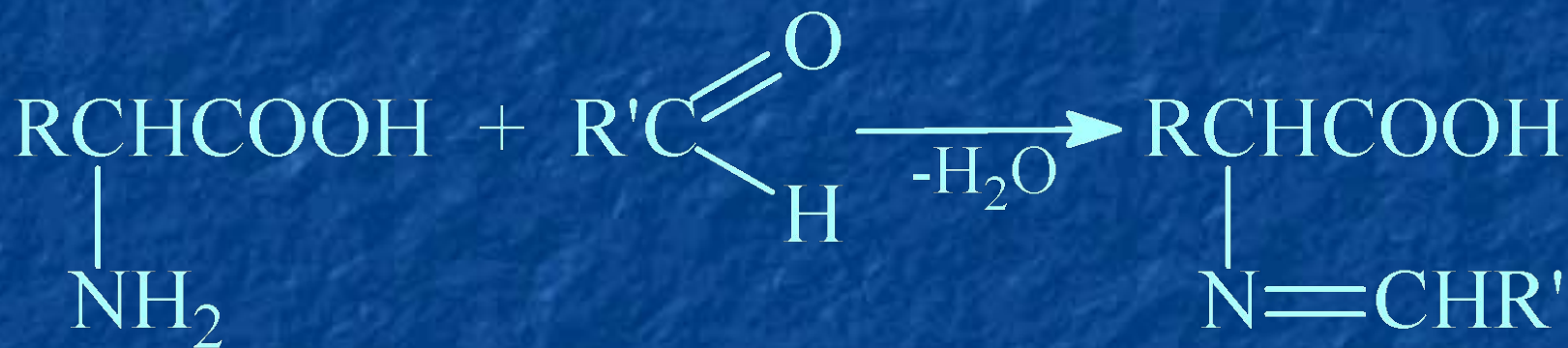
## *Aminoguruh reaksiyasi*



*Van – Slayk metodi*

# Aminokislotalarning kimyoviy xossasi

## *Aminoguruh reaksiyasi*



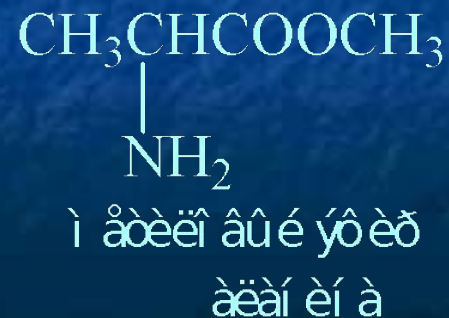
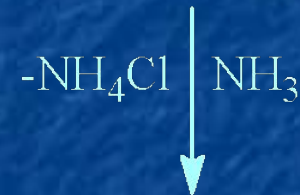
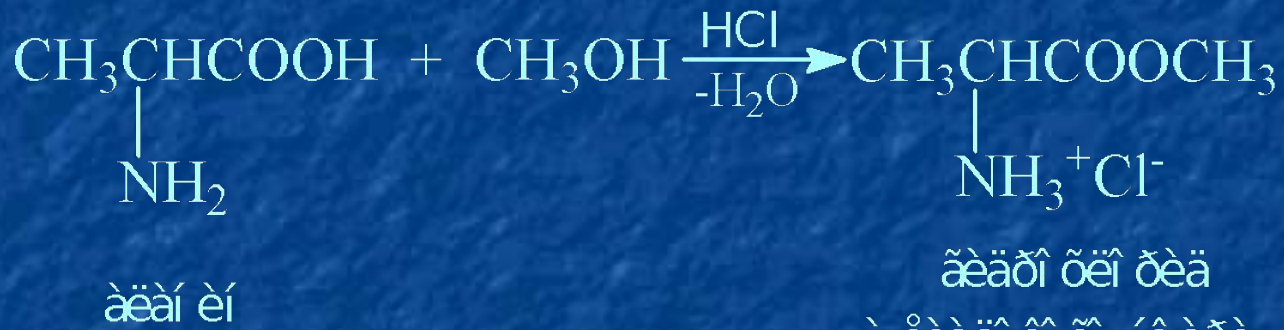
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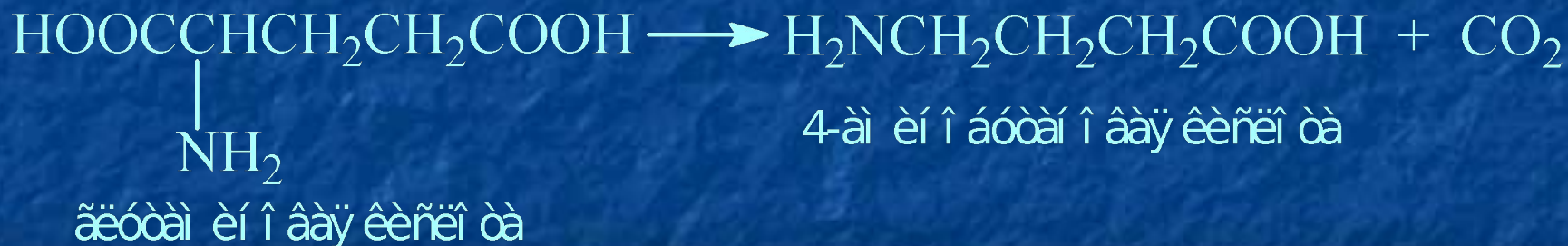
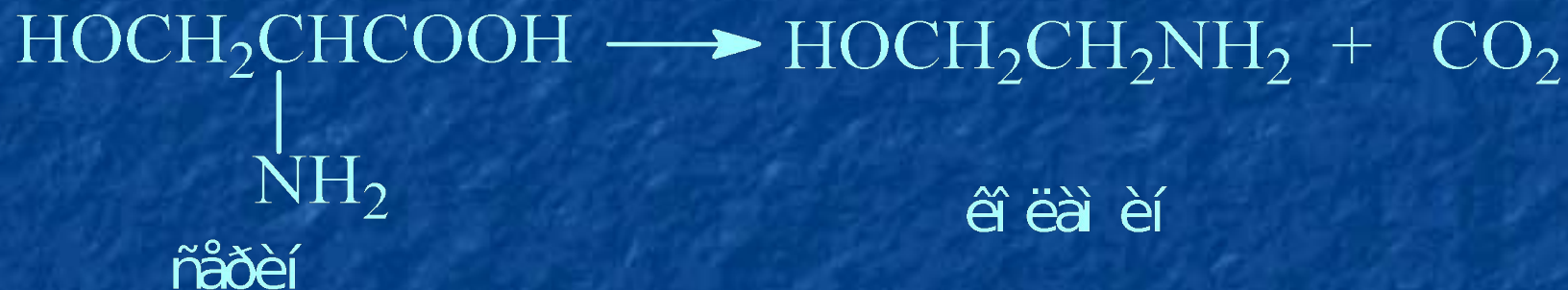
# Aminokislotalarning kimyoviy xossasi

## *Karboksil guruh reaksiyalari*



# Aminokislotalarning kimyoviy xossasi

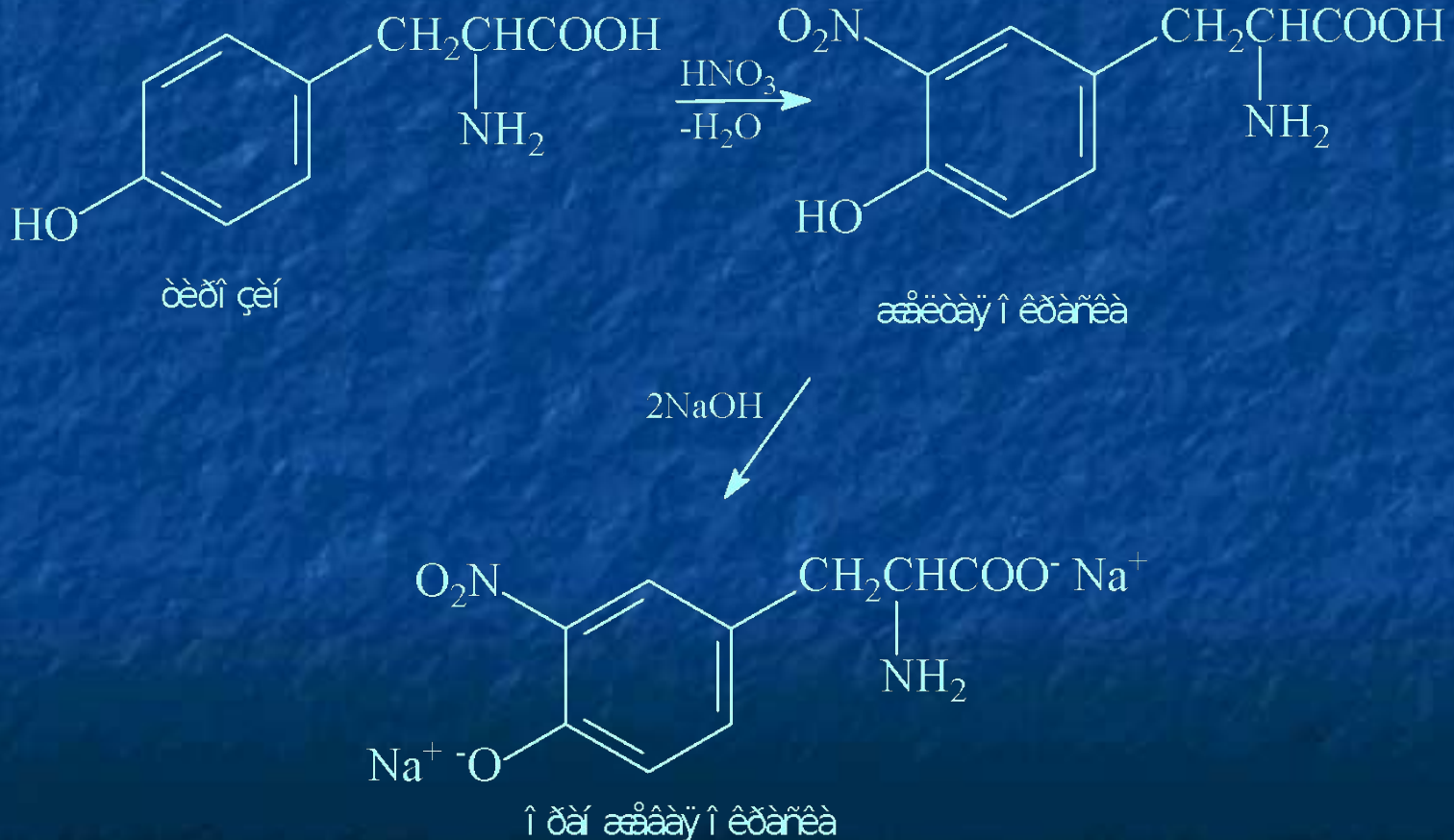
## *Karboksil guruh reaksiyasi*



# Aminokislotalarning kimyoviy xossasi

## *Sifat reaksiyasi*

### Ksantoprotein reaksiyasi

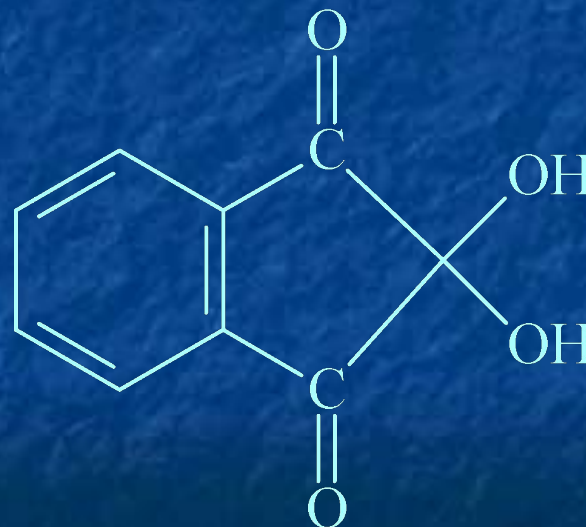




# Aminokislotalarning kimyoviy xossasi

## *Sifat reaksiyasi*

- Biuret reaksiyasi  
( Mis (II) gidroksidi bilan  $\text{Cu}(\text{OH})_2$  )
- Ningidrin reaksiyasi.

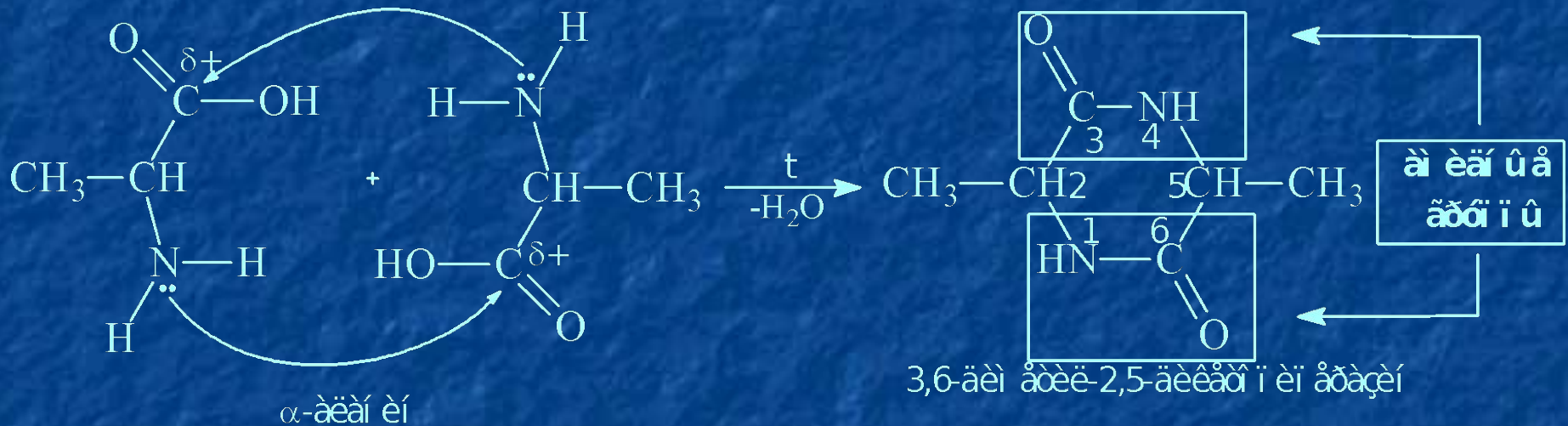


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# Aminokislotalarning kimyoviy xossasi

## $\alpha, \beta, \gamma$ aminokislotalarning spetsifik reaksiyalari

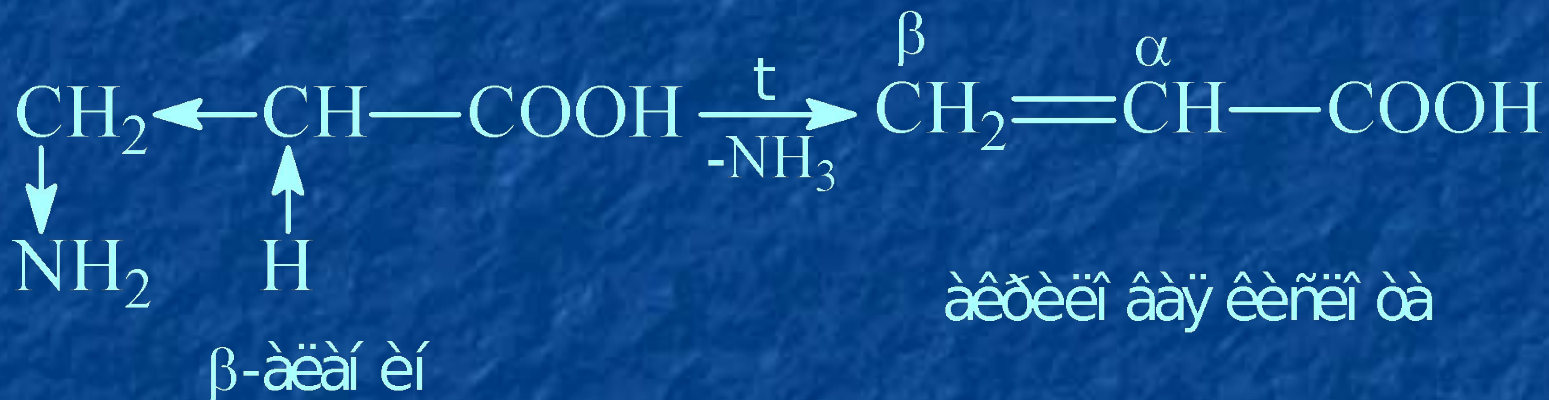
### $\alpha$ -aminokislota reaksiyalari



# Aminokislotalarning kimyoviy xossasi

## $\alpha, \beta, \gamma$ aminokislotalarning spetsifik reaksiyalari

### $\beta$ - aminokislota reaksiyalari

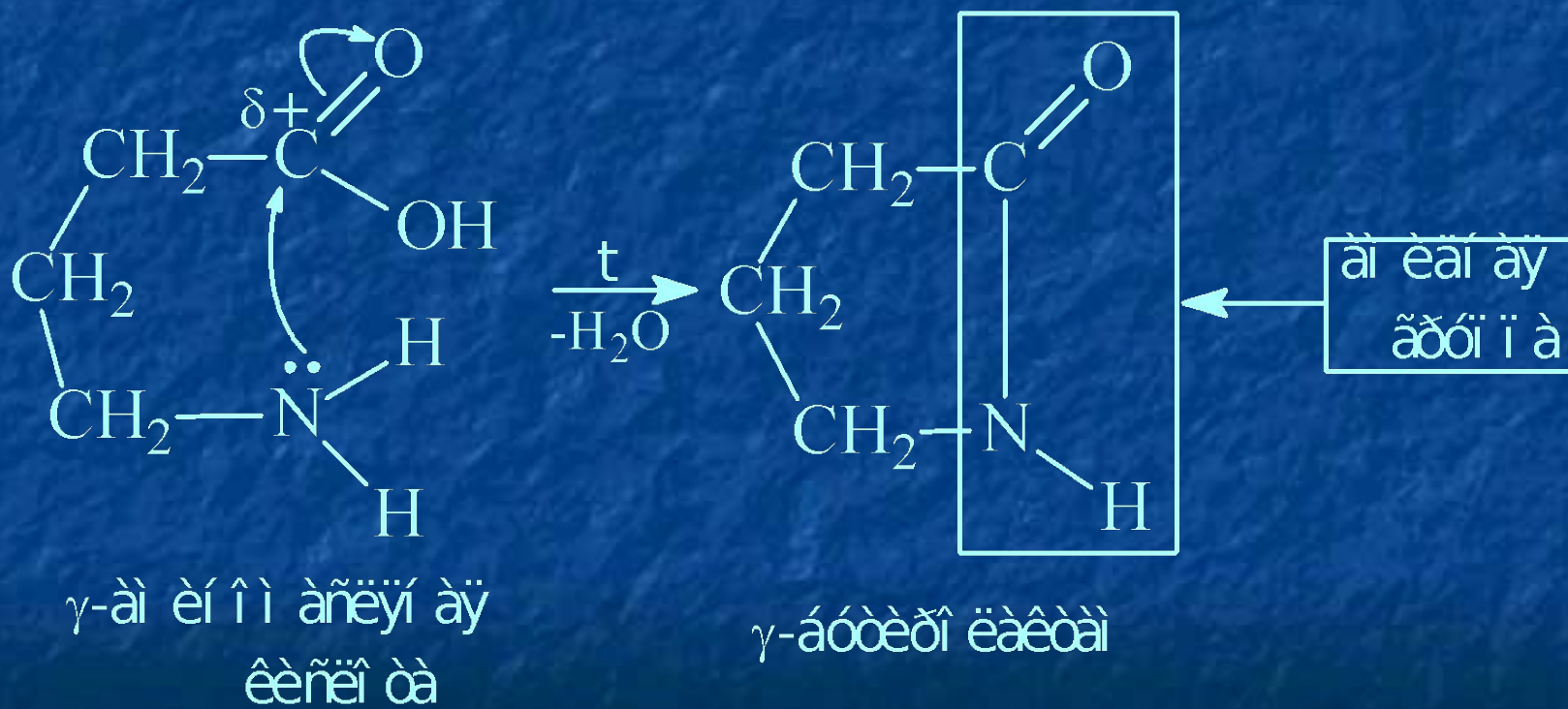




# Aminokislotalarning kimyoviy xossasi

## $\alpha, \beta, \gamma$ aminokislotalarning spetsifik reaksiyalari

### $\gamma$ - aminokislota reaksiyalari

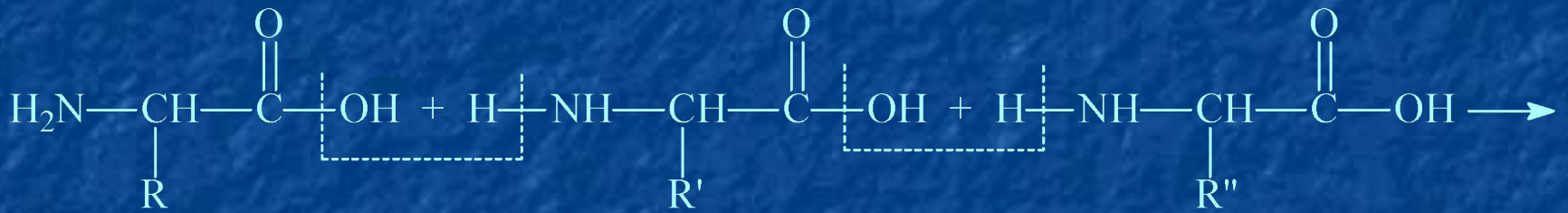


# *Peptid va oqsillar*

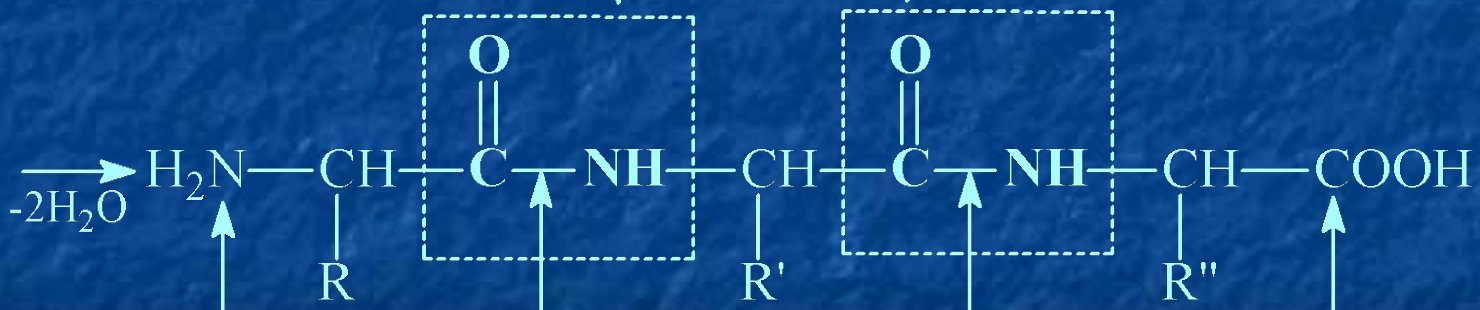
*Peptidlar — bir nechta  $\alpha$   
aminokislotalarning qo'shilishidan*



# Peptidlar va oqsillar.



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-2H<sub>2</sub>O

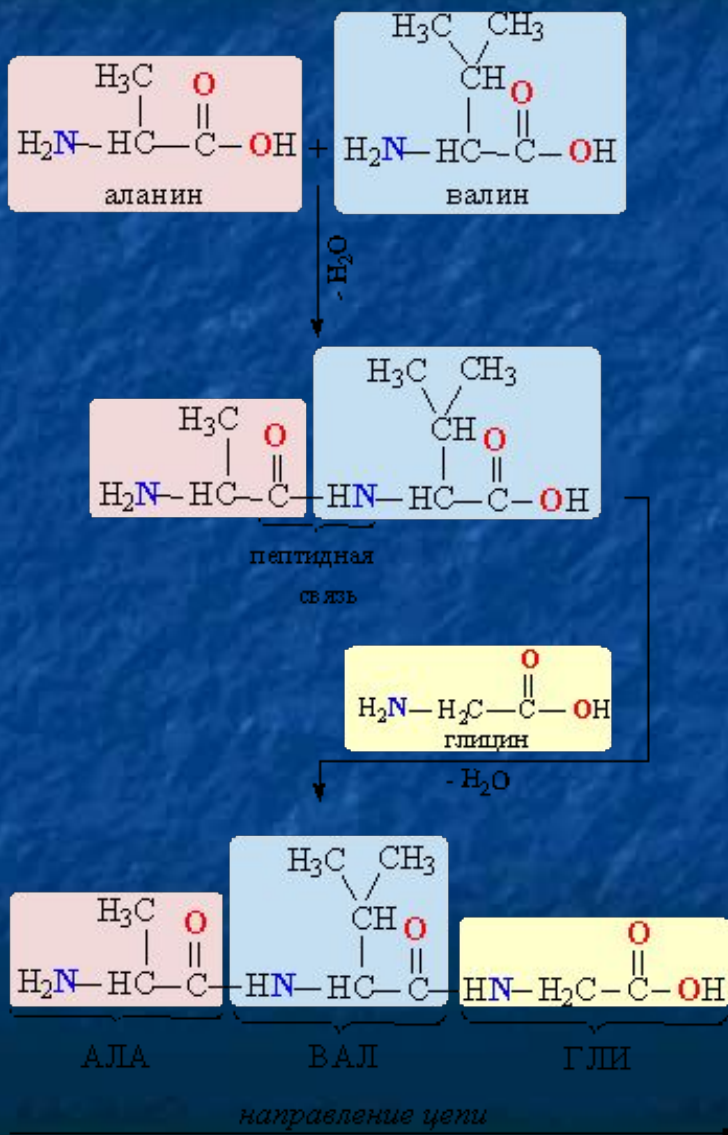
N-êî í ãö

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C-êî í ãö



# Peptidlar va oqsillar

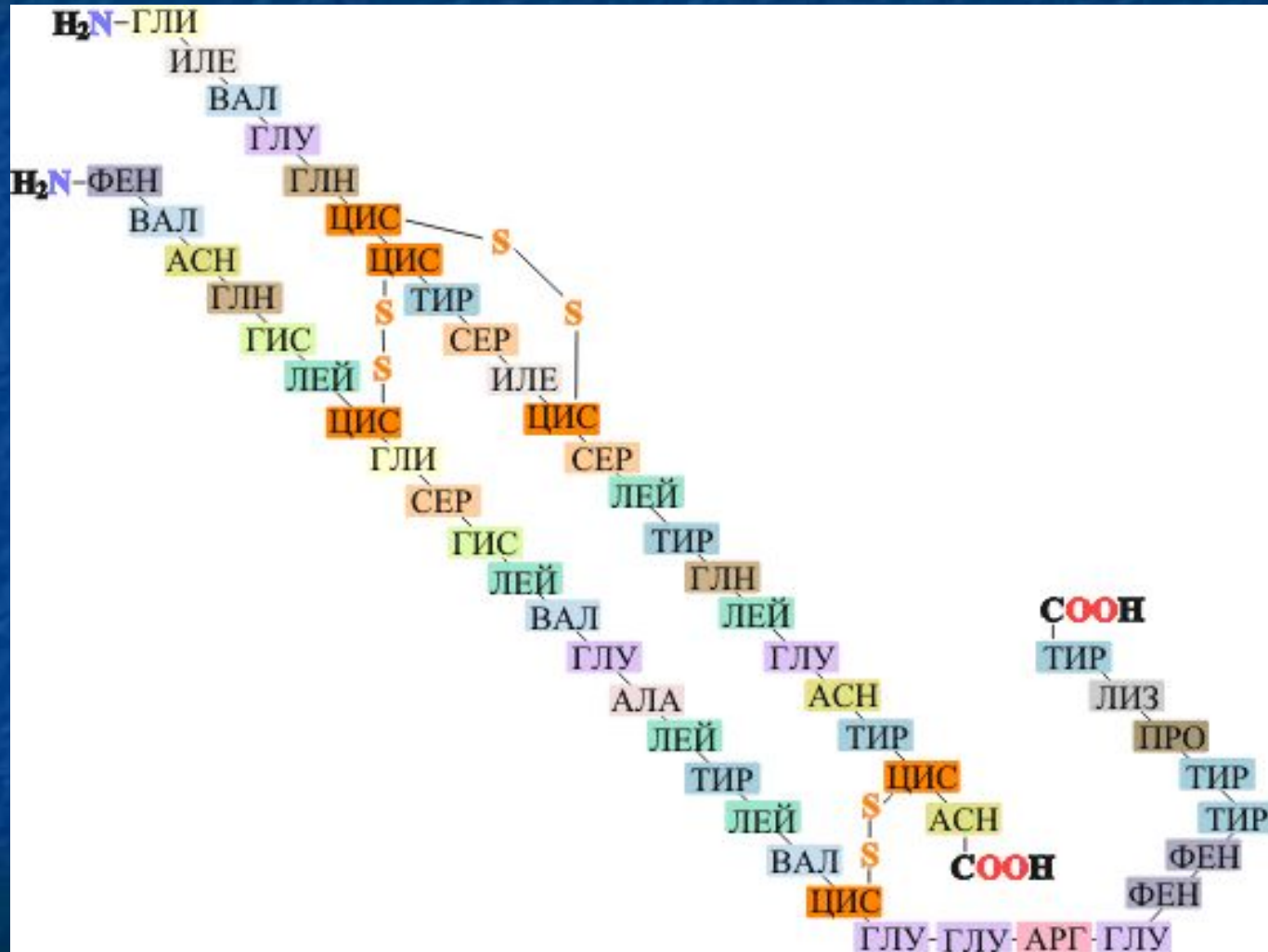


**Aminokislotalarning  
ketma – ket aloqasi**

# Peptidlar va oqsillar



# Peptidlar va oqsillar



Insulin oqsilining birlamchi strukturasi



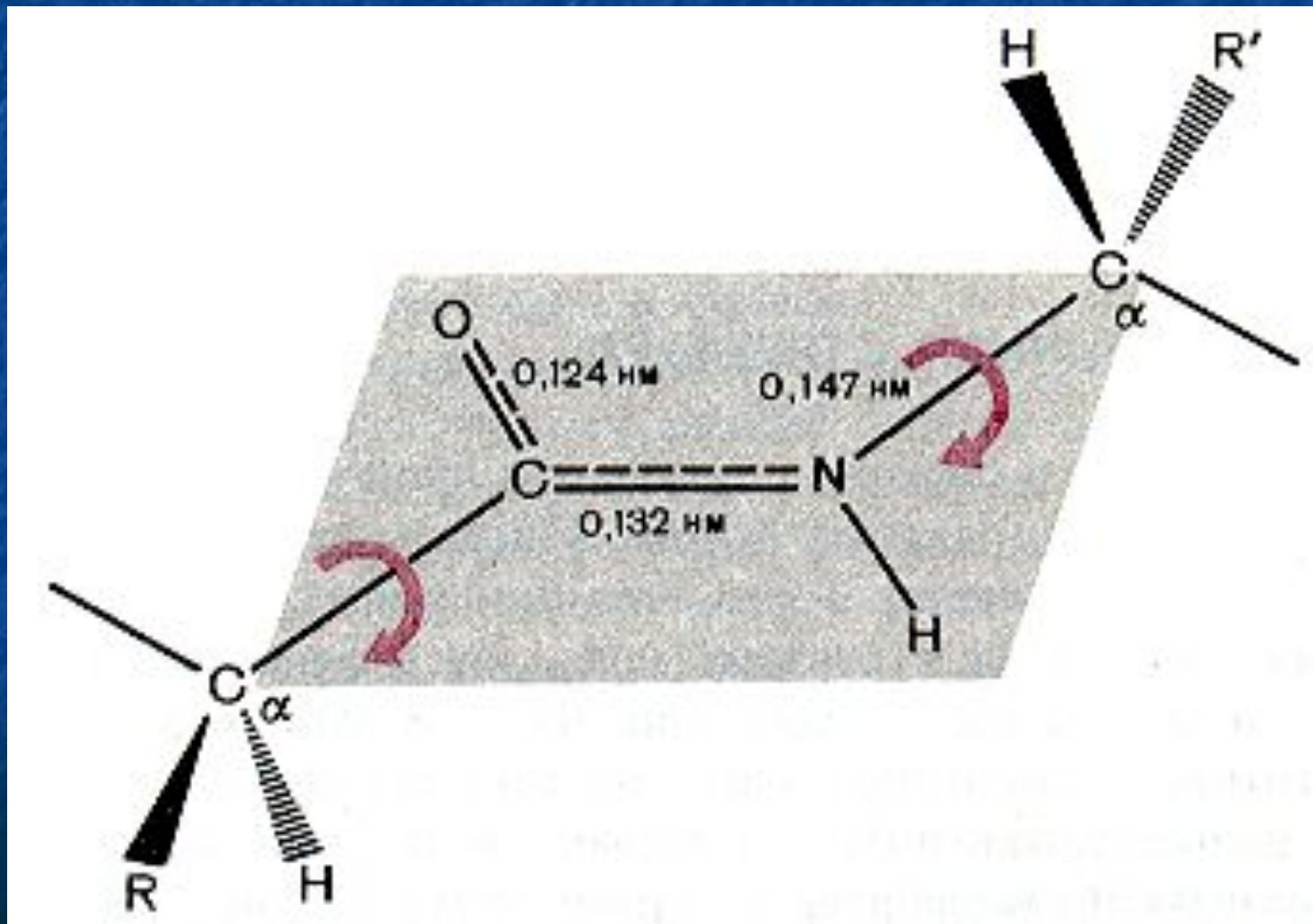
# Peptid va oqsilar

## *Oqsillar tuzilishi*

***Первичная структура пептидов и белков  
— это последовательность  
аминокислотных остатков в  
полипептидной цепи.***

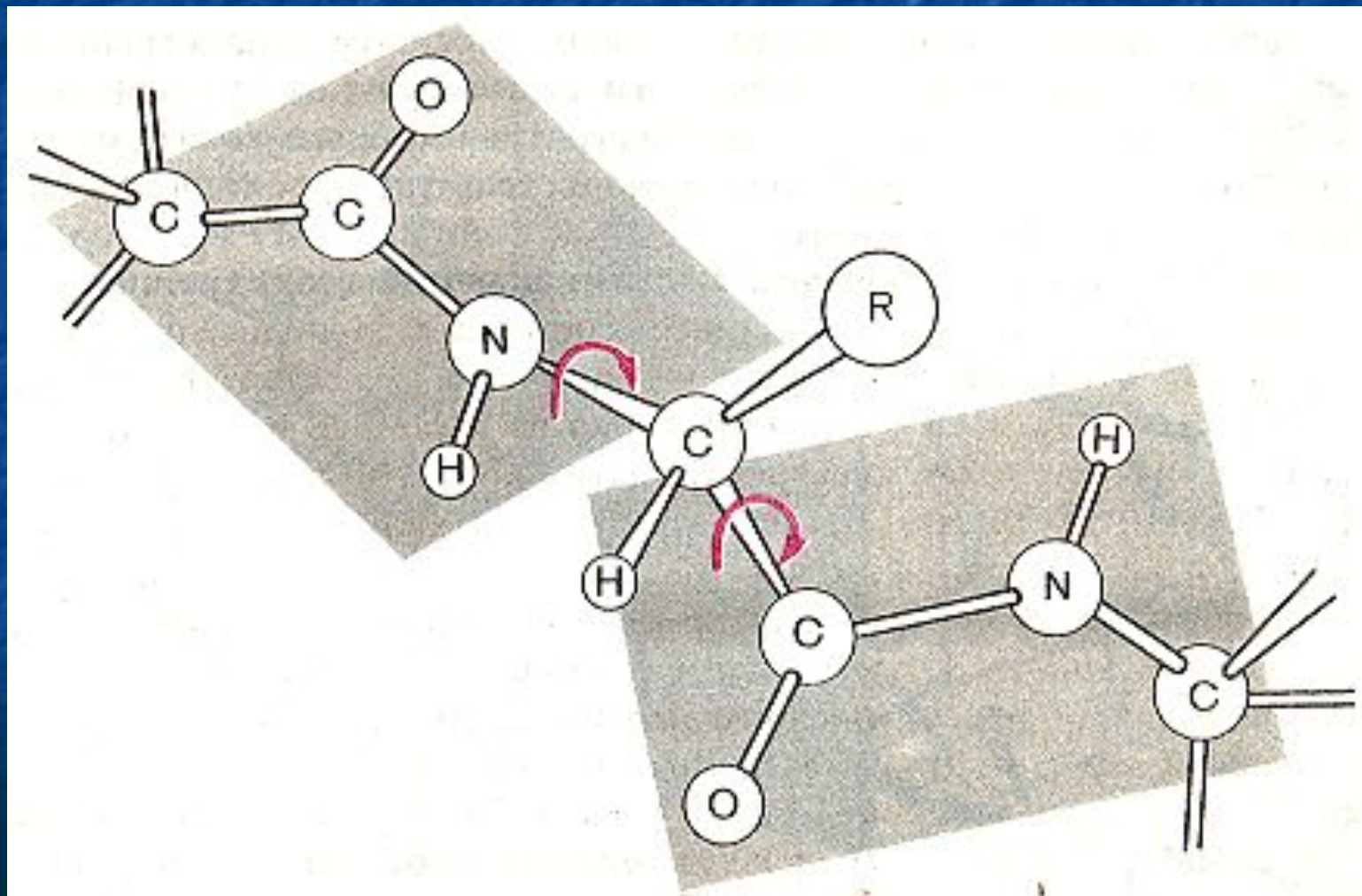
# Oqsillar va peptidlar

## *Oqsillarning ikkilamchi strukturasi*



# Oqsillar va peptidlar

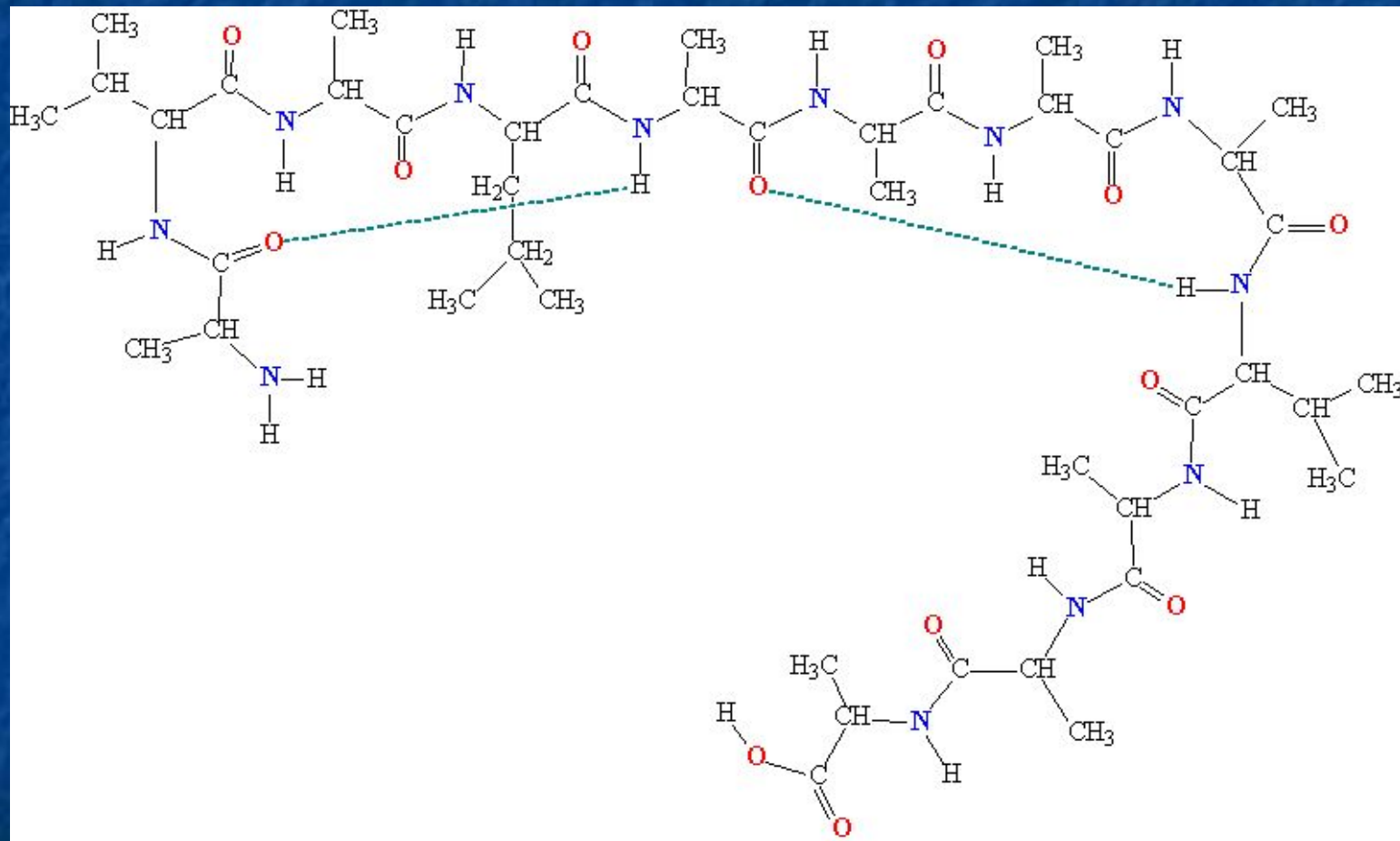
## *Oqsillarning ikkilamchi strukturasi*





# Oqsillar va peptidlar

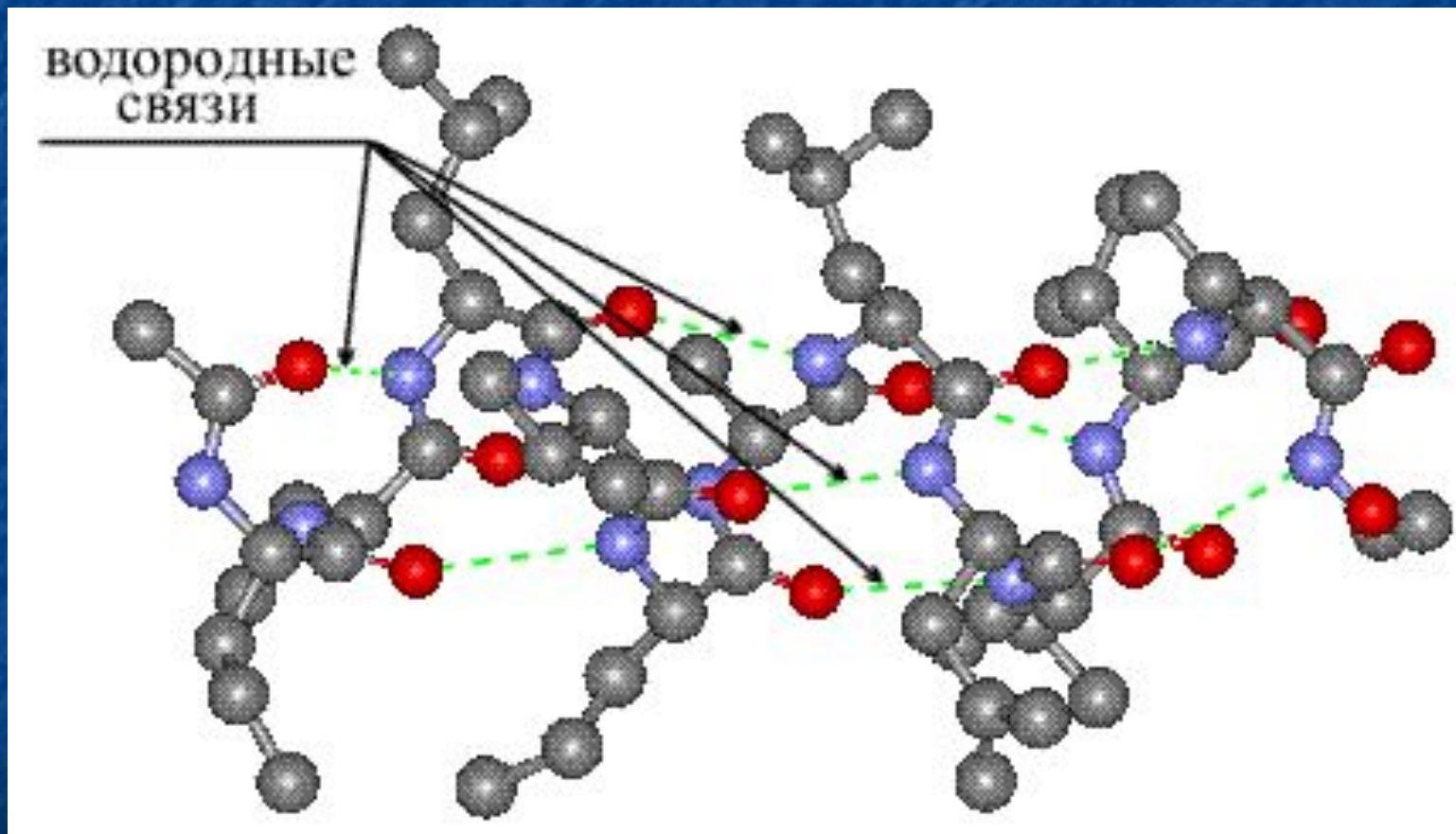
## *Oqsillarning ikkilamchi strukturasi*



**Ichki vodorod bog'lanish**

# Oqsillar va peptidlar

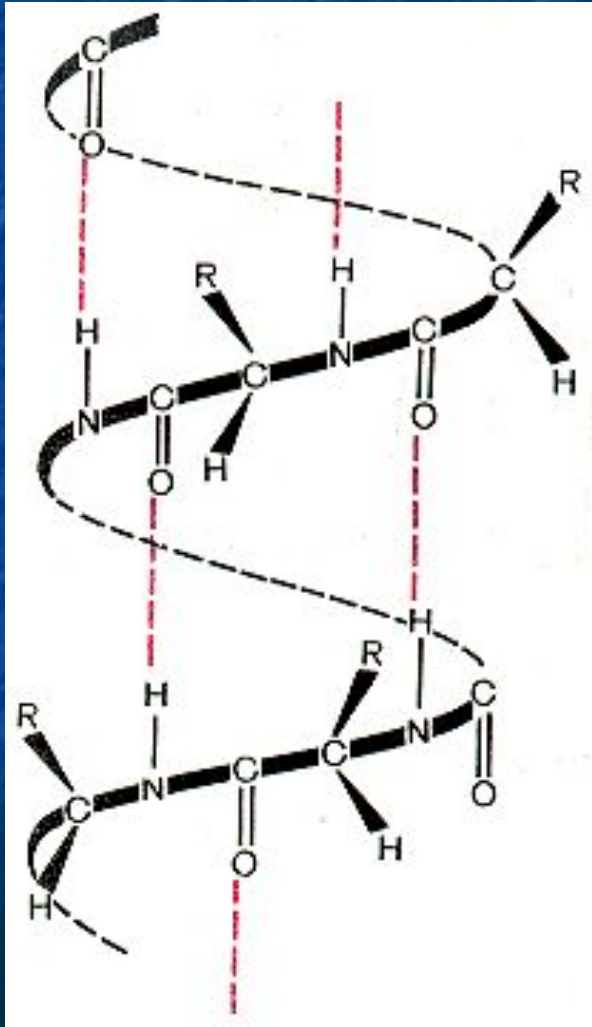
## *Oqsillarning ikkilamchi strukturasi*



$\alpha$ -aminokislotalarning struktura modeli.(yashil chiziqlar vodorod bog'lanishni ifoda etadi)

# Oqsillar va peptidlar

## *Oqsillarning ikkilamchi strukturasi*

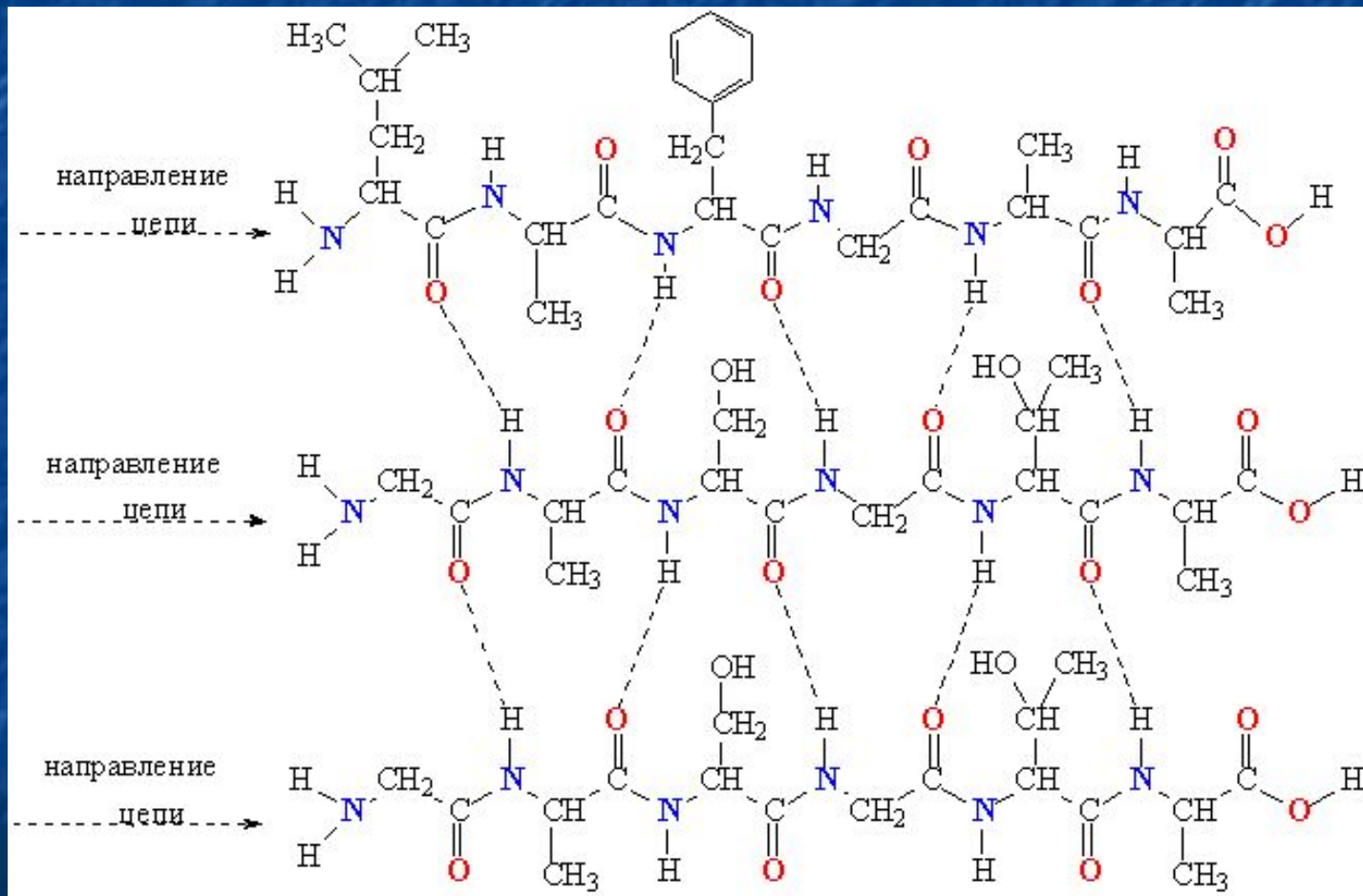


oqsilning  $\alpha$ - spiral  
molekulasi



# Oqsillar va peptidlar

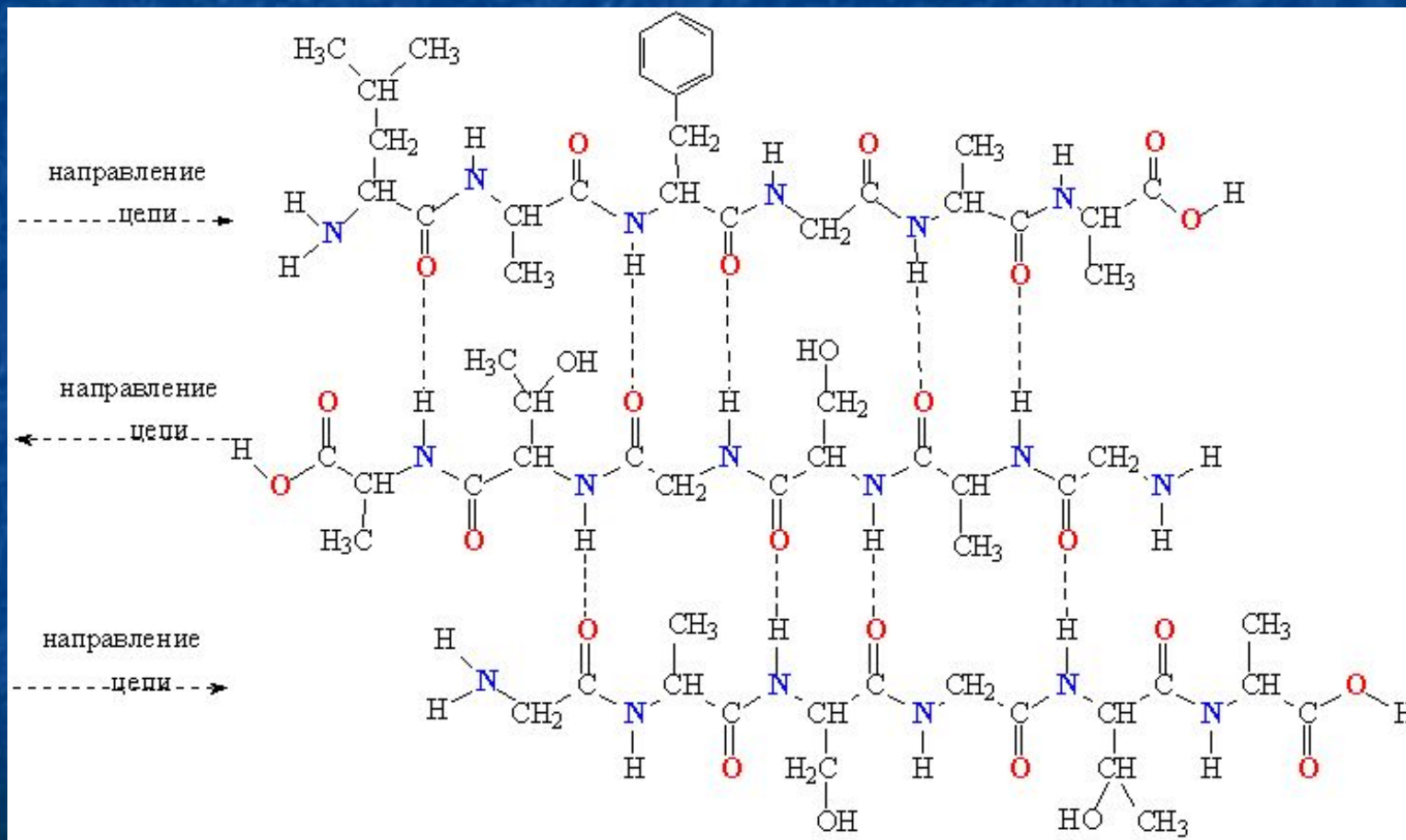
## *Oqsillarning ikkilamchi strukturasi*



**Uch xil polipeptid molekulasining parallel  $\beta$ - holati**

# Oqsillar va peptidlar

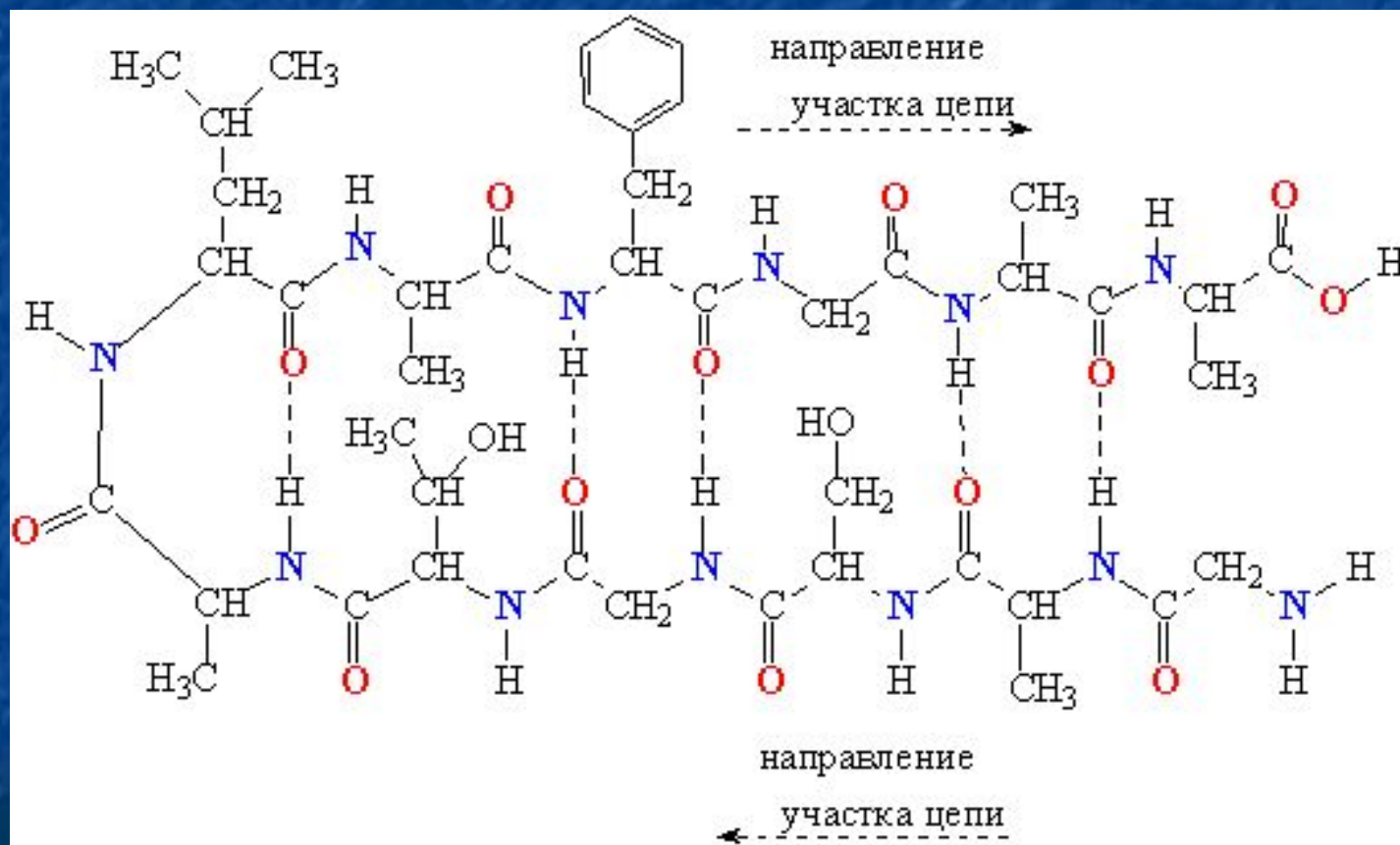
## *Oqsillarning ikkilamchi strukturasi*



**Uch xil oqsil molekulasining antiparallel  $\beta$  - holati**

# Oqsillar va peptidlar

## *Oqsillarning ikkilamchi strukturasi*

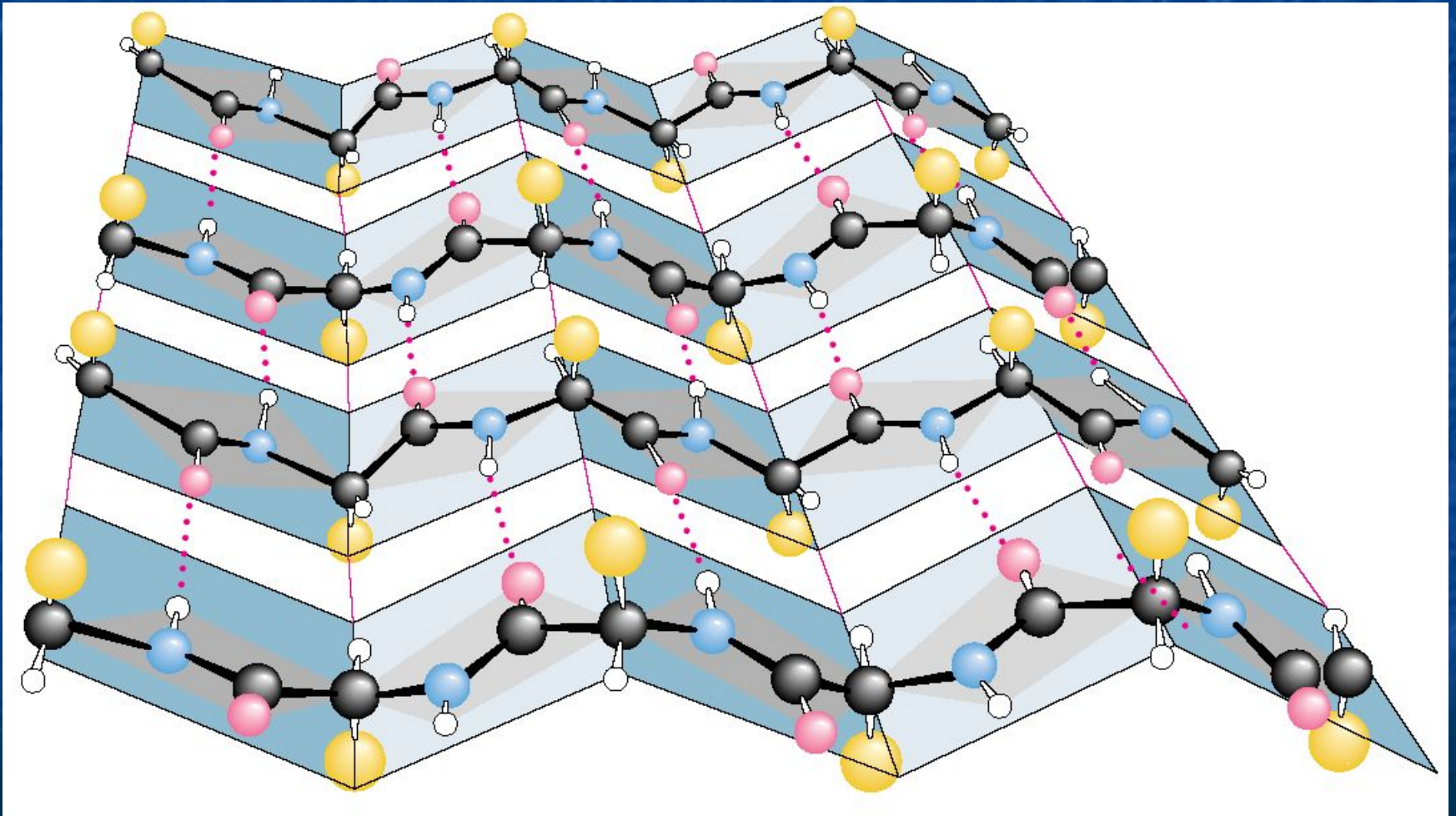


**Bitta polipeptid halqaning oqsil molekulası.**



# Oqsillar va peptidlar

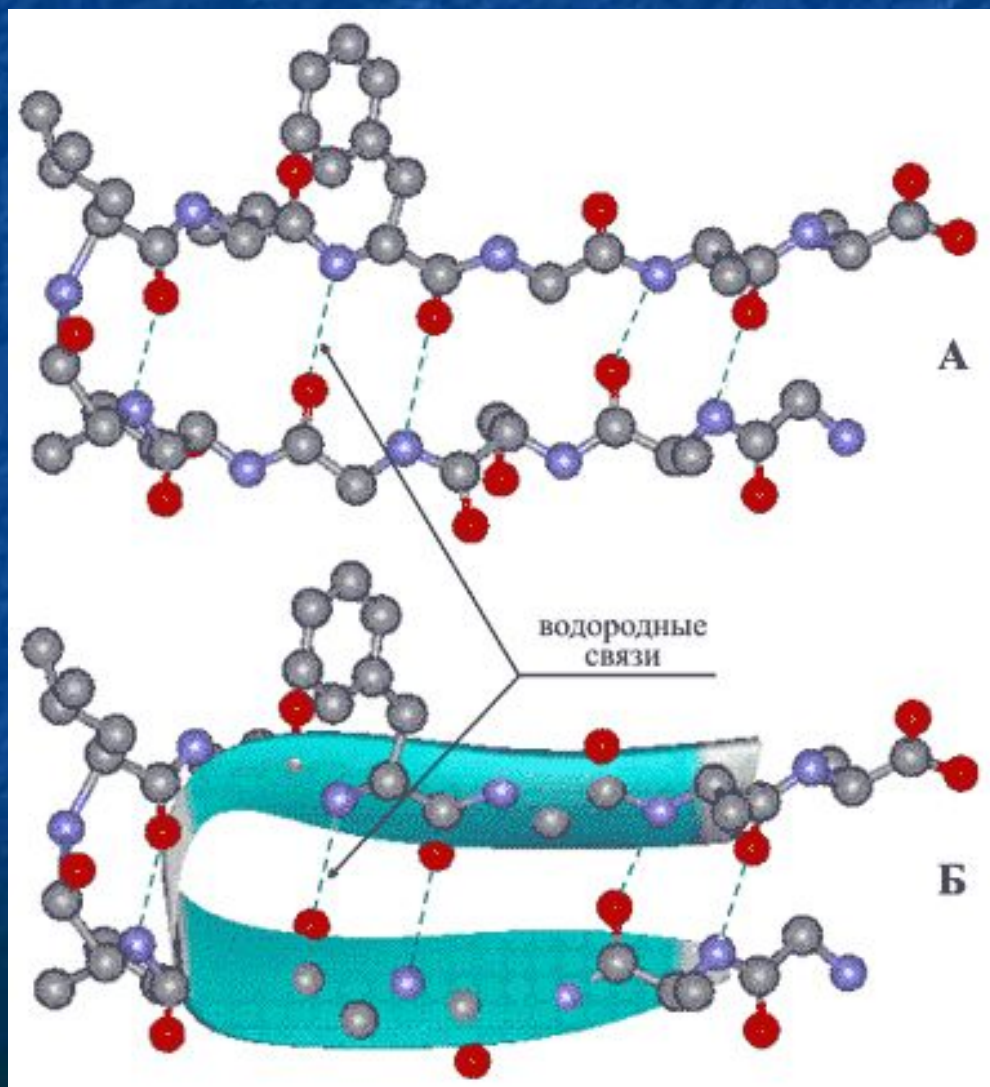
## *Oqsillarning ikkilamchi strukturasi*



Oqsilning  $\beta$  -holati

# Oqsillar va peptidlar

## *Oqsillarning ikkilamchi strukturasi*



A - vodorod bog'lari bilan bog'langan polipeptid zanjiri qismi, (yashil chiziqlar nuqta).  
B - polimer zanjir atomlar orqali cho'zilgan bir tekis kamar shaklida sxematik b-qurilish (vodorod atomlari ko'rsatilmagan).



# Oqsillar va peptidlar

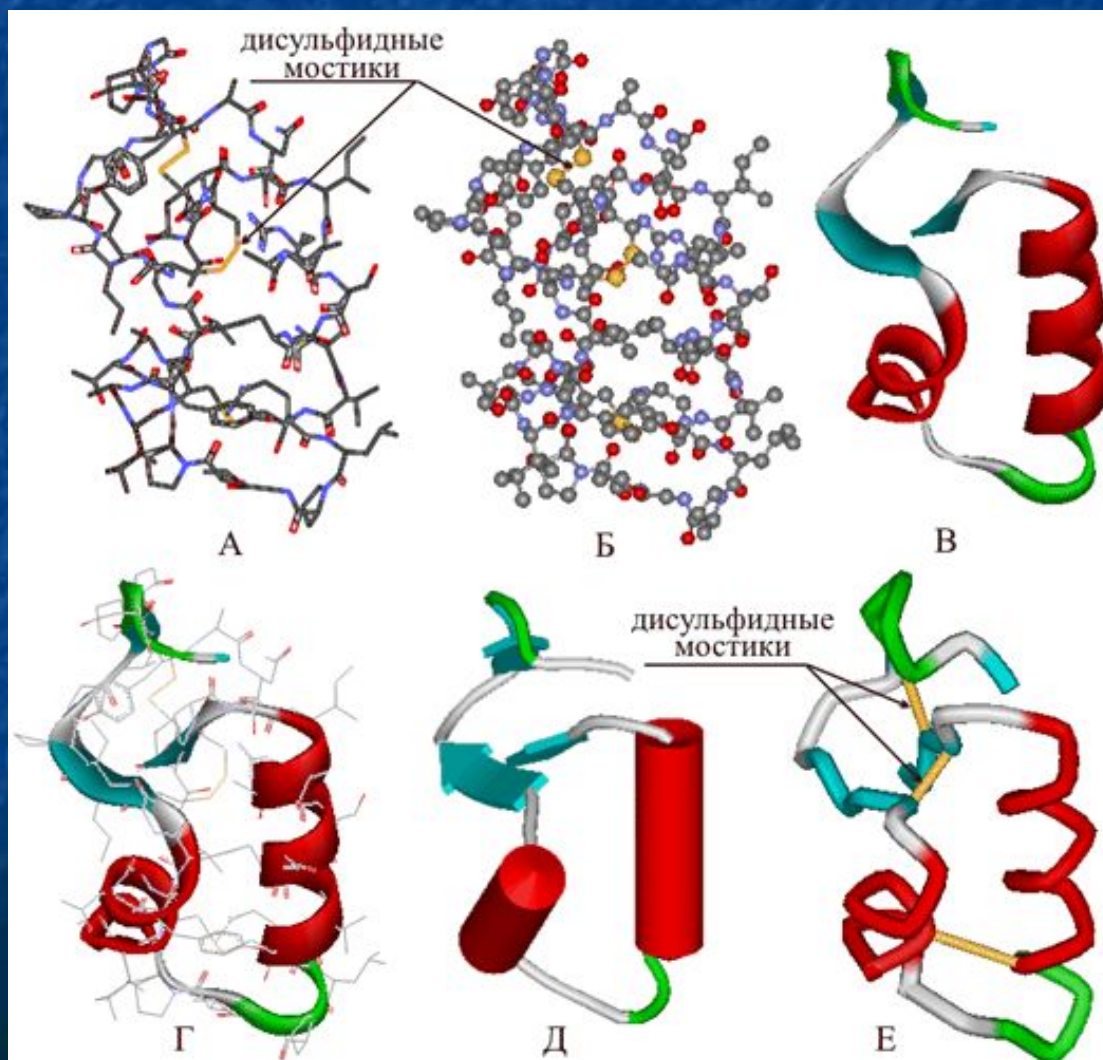
## *Oqsillarning ikkilamchi strukturasi*

Oqsil ikkilamchi tuzilishi - tarkibiy tashkilotning yuqori darajasi bo'lgan majburiy tuzilishli peptid guruhlar o'rtasida vodorod aloqasi tufaylidir



# Oqsillar va peptidlar

## *Oqsilning uchlamchi strukturasi*



Turli xil imkoniyatlari Krabina proteinining tuzilishi ko'ring. Bir fazoviy Vahiyning bir tarkibiy formula.

B - bir hajmi modeli shaklida tuzilishi.

B - molekulaning oliy tuzilishi.

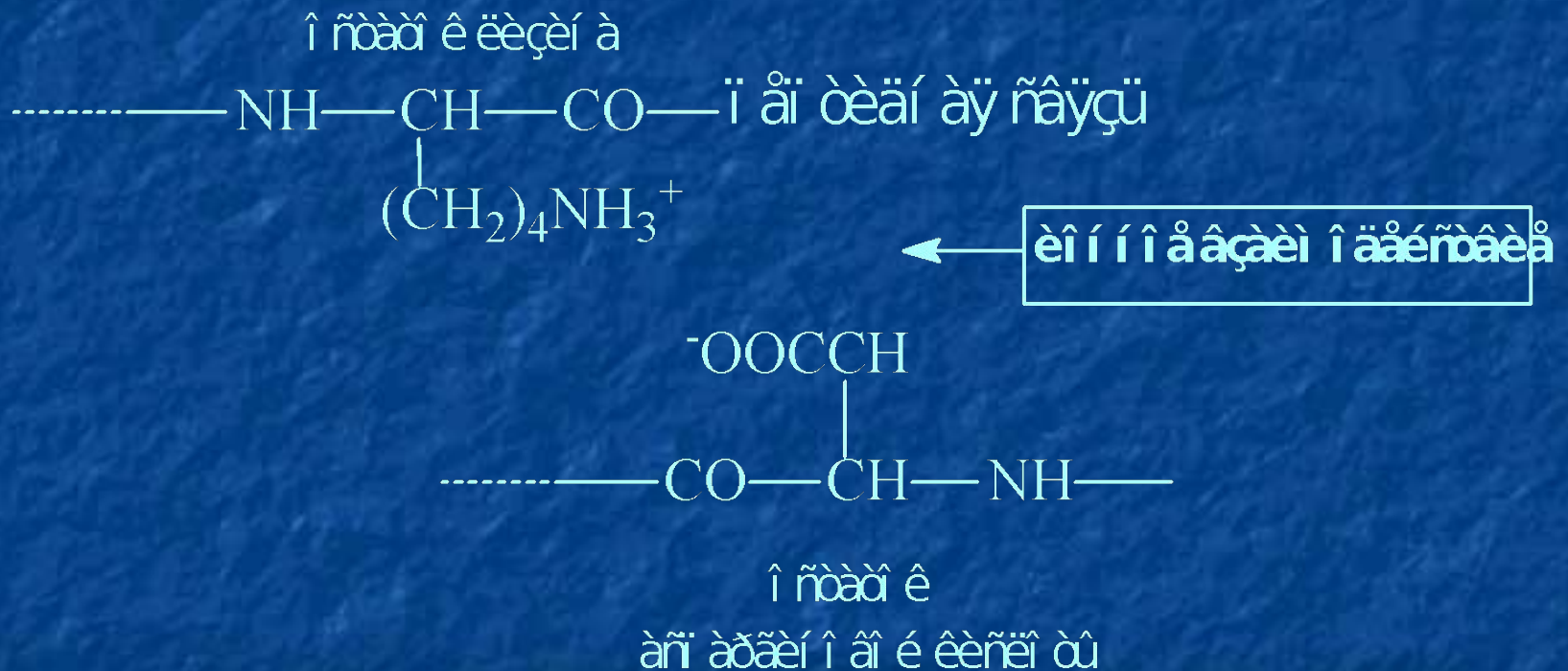
D - imkoniyatlari A va B birikmasi

D - oliy tuzilishi soddalashtirilgan vakillik.

E - disulfid ko'priki bilan oliy tuzilishi.

# Osillar va peptidlar

*OQsillarninf ion bog'lanishi.*



# Oqsillar va peptidlar.

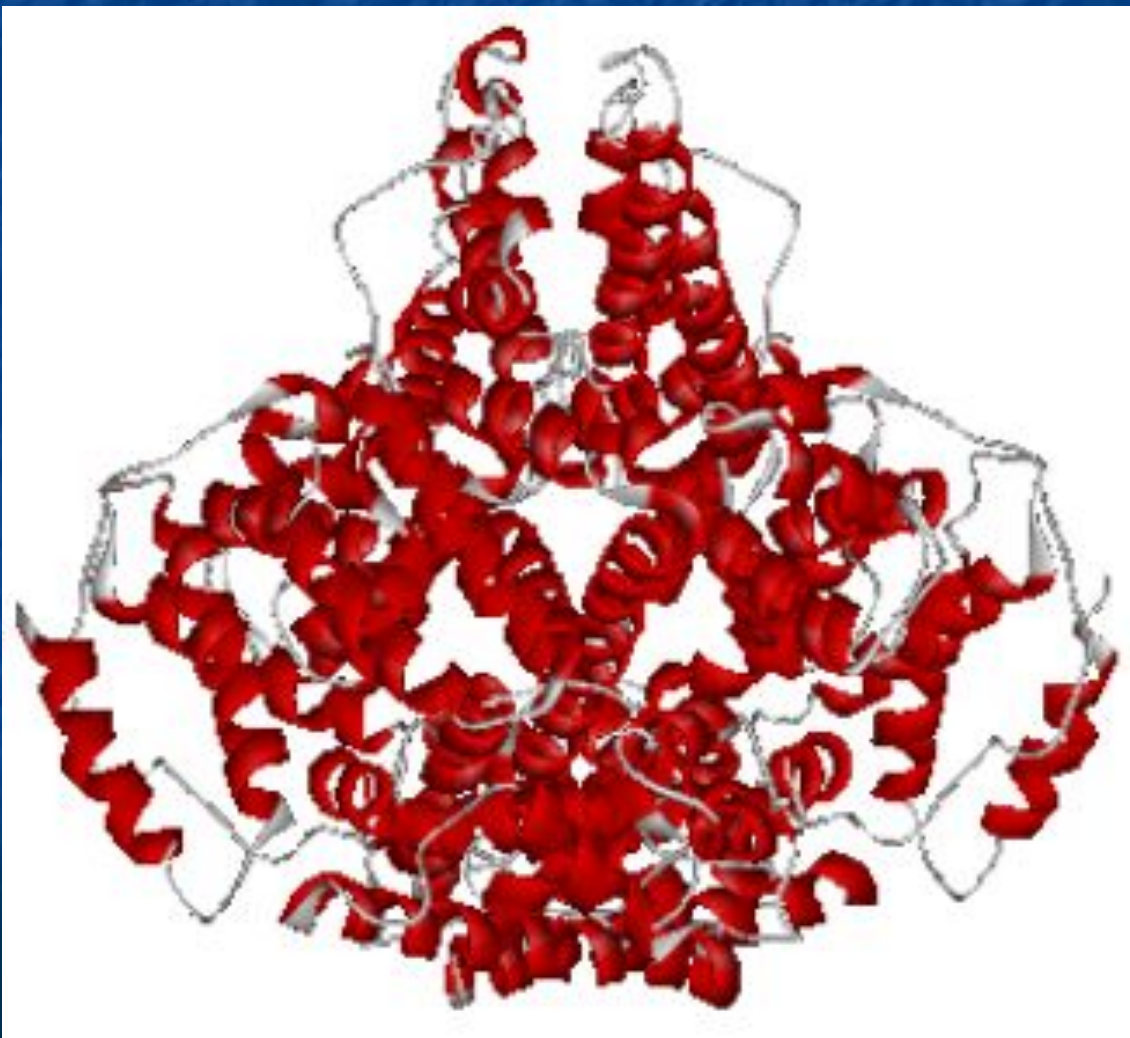
*Oqsildagi disulfid bog'lanish*





# Oqsillar va peptidlar.

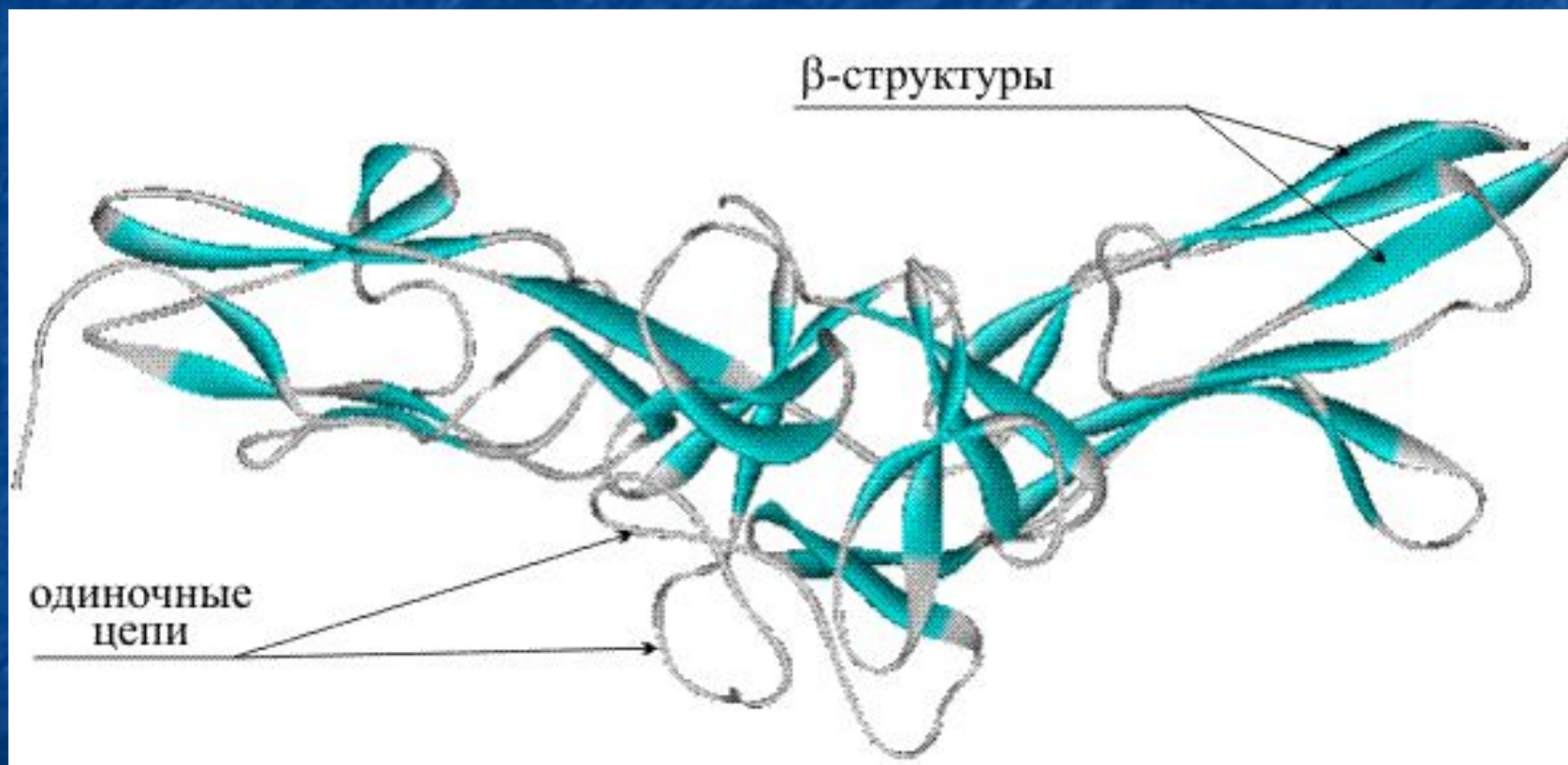
## *Globulin oqsili*



Yumaloq tuzilishi albumin (tuxum oqsili). Chirigan tuxum hidi manbai - protein tanazzuli jarayonida tez vodorod sülfidin hosil tizim bo'yicha disülfid ko'prik hozirgi sulfgidridnye bepul HS-guruhlar, tarkibida qo'shimcha ravishda. Disülfid ko'prik ko'p yanada barqaror va oqsil kengaytirish vodorod sülfidin hosil emas

# Оқсillar va peptidlar

## *Fibrilyar oqsillar*

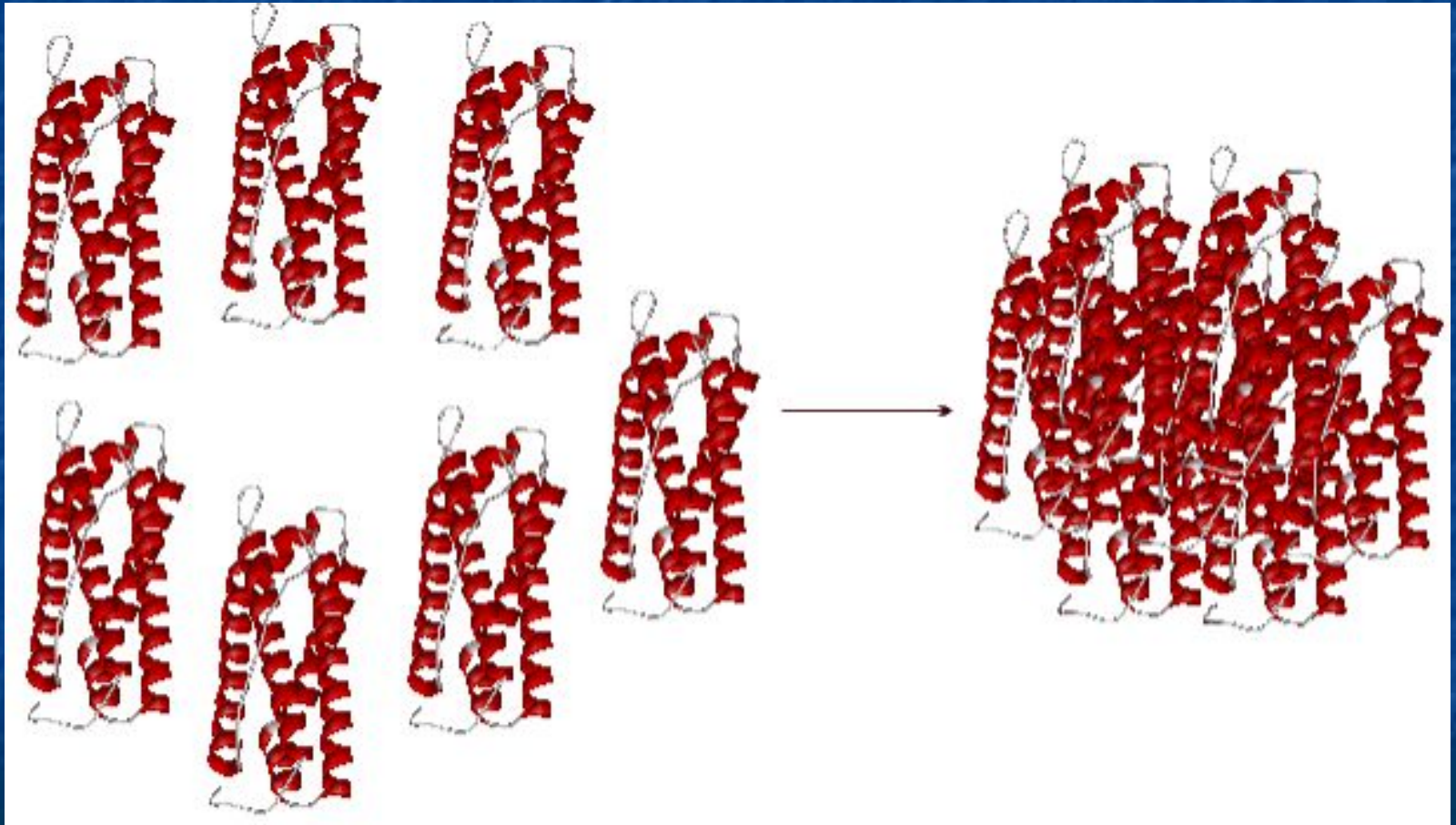


**Fibrioning fibrilyar oqsili**



# Peptidlar va oqsillar

## *Oqsilning to'rtlamchi strukturasi*

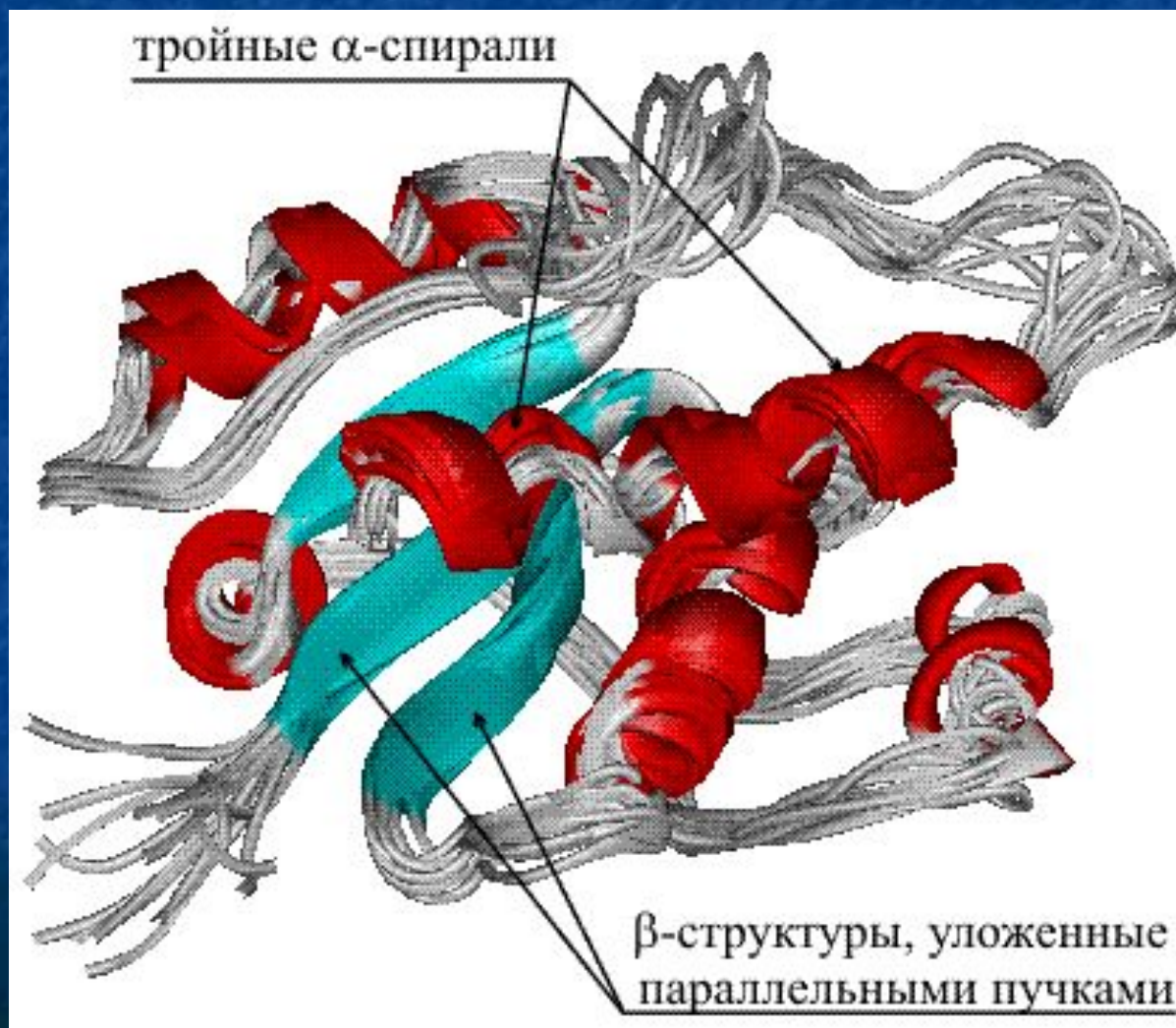


**Globulin oqsilining to'rtlamchi strukturasi**



# Peptidlar va oqsillar

## *Oqsilning to'rtlamchi strukturasi*

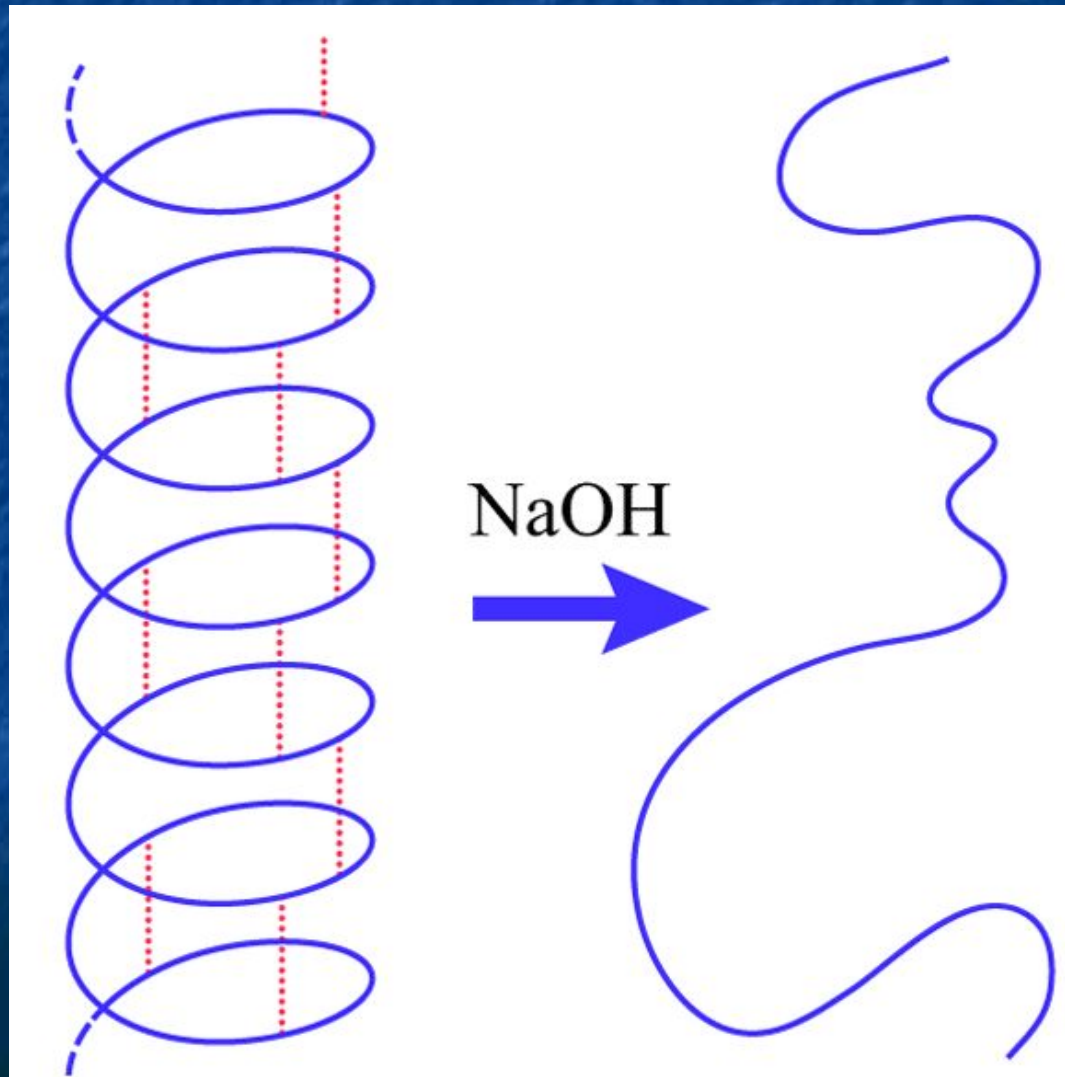


Fibrilyar kollagen oqsil Supramolekulalari. Kollagen misolida fibrilyar oqsillarni yaratish sifatida ishtirok etishi mumkin, deb ko'rish mumkin. A-spiral va b-qurilish. Dumaloq oqsillarni uchun bir xil, ular oliy tuzilmalar ikki turdagi bo'lishi mumkin

# Peptidlar va oqsillar

## *Oqsillar denaturatsiyasi*

Yuqorituzilishdagi tuzilmalar fizik va kimyoviy omillar (yuqori harorat, kislota, ishqor va b.) ta'sirida quyi tuzilishdagi shakllarga qaytadi (bu hodisa Oqsillar denaturatsiyasi deb ataladi), natijada ular o'z biologik faolligini yo'qotadi.



# Peptidlar va oqsillar.

