



**Mühendislik Fakültesi**

**Kimya Mühendisliği Bölümü**

***KMB256-Polimer Giriş***

***Dr. Öğr. Üyesi, İsa DEĞİRMENCI***

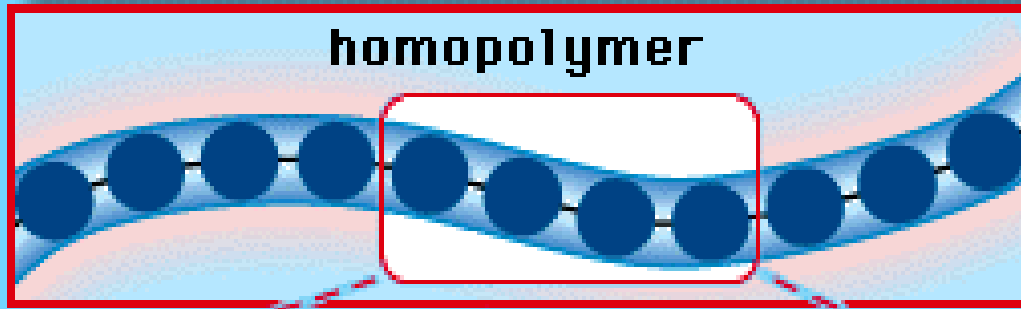
# Polimerlerin Orijinlerine Göre Sınıflandırılması

***KMB256-Polimer Giriş***

*Hafta-2*

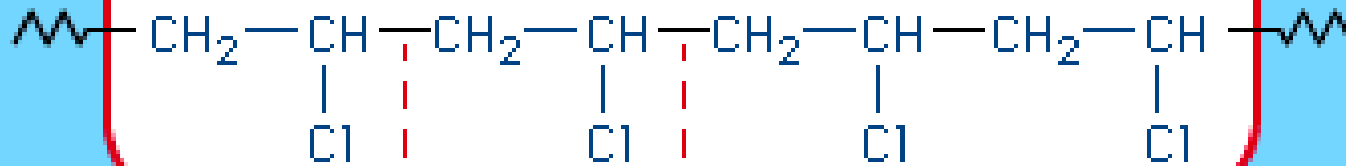


## homopolymer

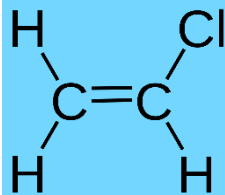
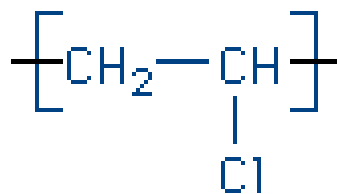


polyvinyl chloride

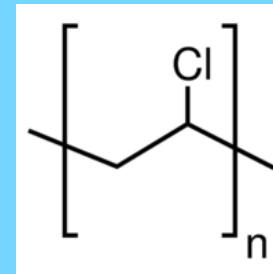
chemical structure



repeating unit



vinyl chloride unit

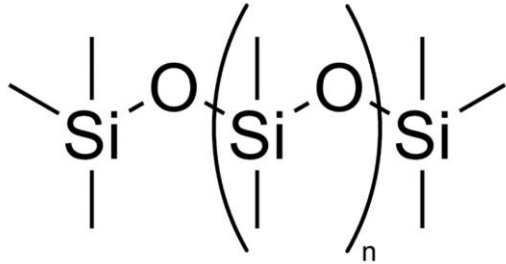


©1997 Encyclopaedia Britannica, Inc.

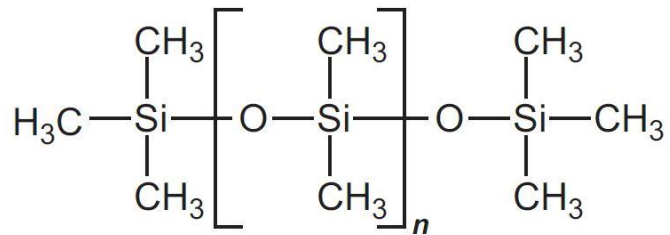


# 1-) Orijinlerine Göre

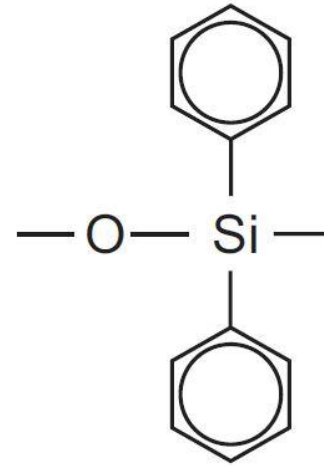
## A-) İnorganik Polimerler



Silikon  
kauçuk

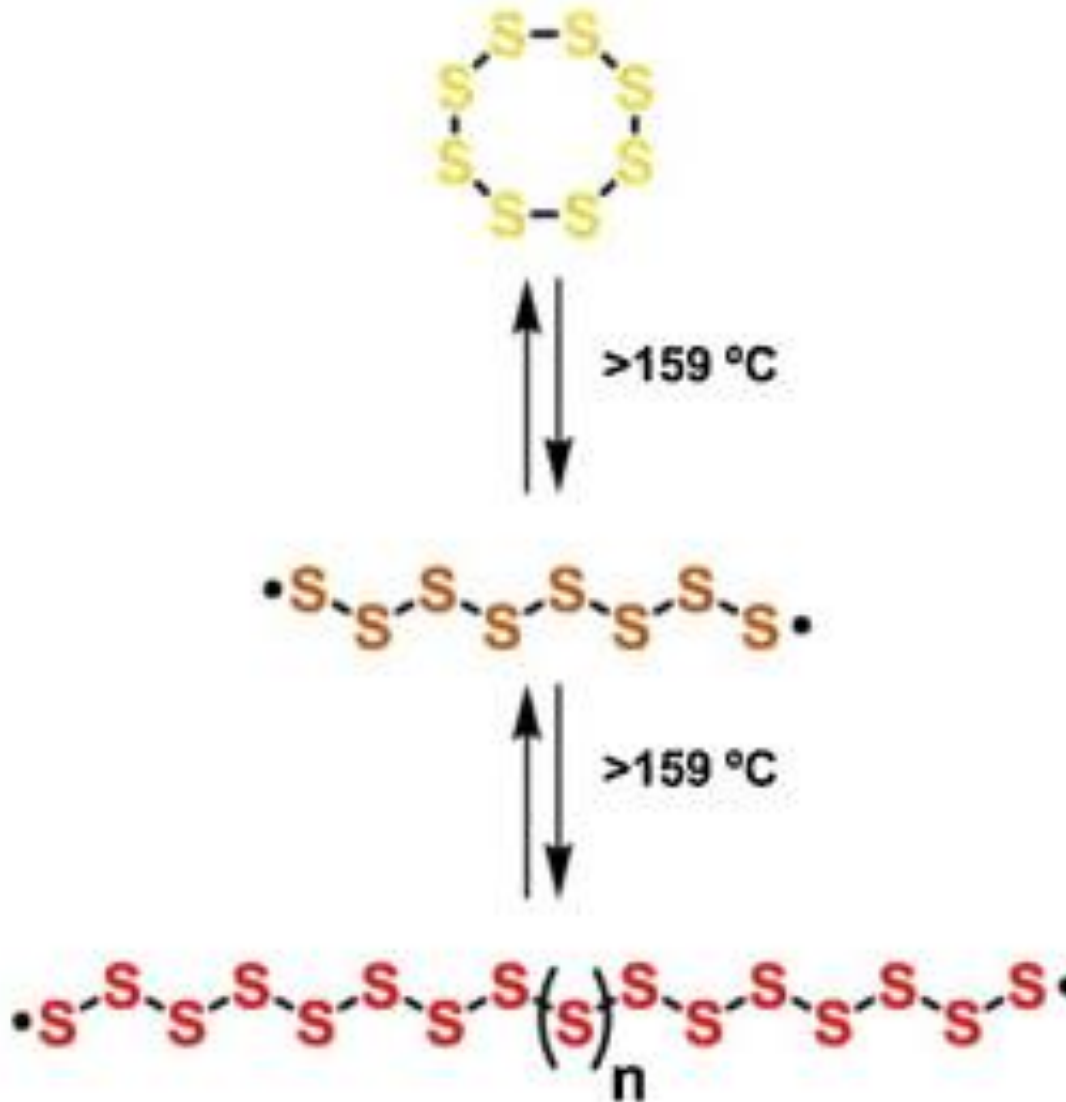


poly(dimethyl)siloxane



Poli difenil  
siloksan

# Poli sülfür



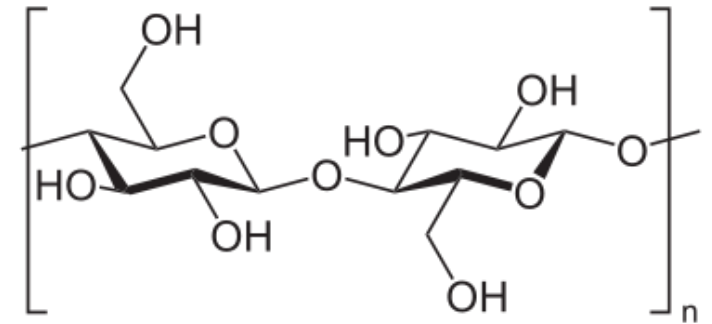
# 1-) Orijinlerine Göre

## **B-) Organik Polimerler**

- Doğal Polimerler
- Yarı-sentetik Polimerler
- Sentetik Polimerler



# Doğal Polimerler

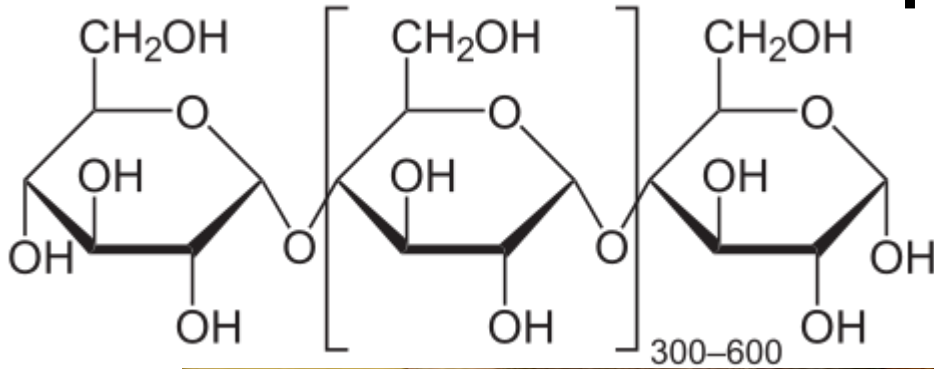


# Selüloz

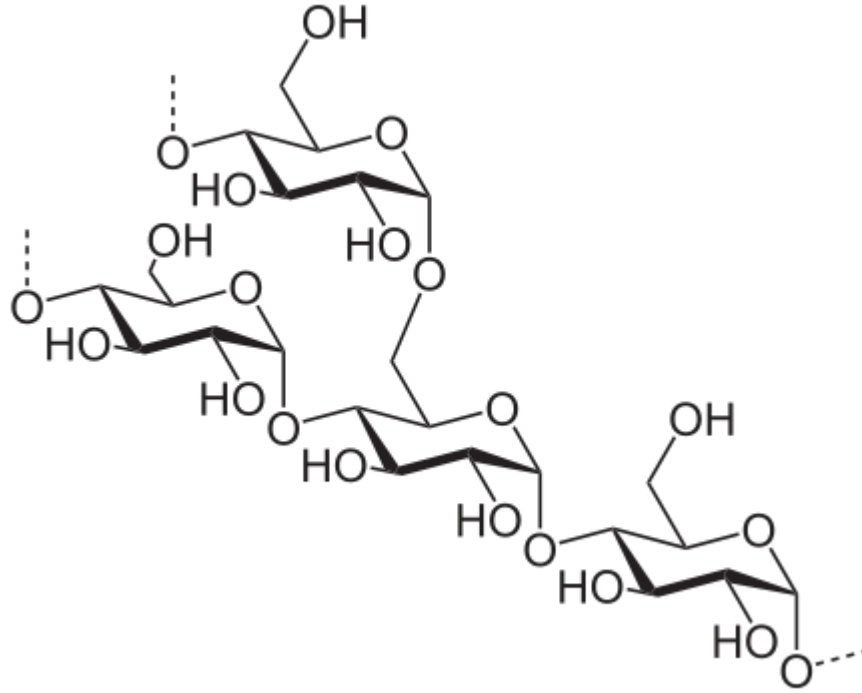
Pamuk %90 oranında selülozdan oluşmaktadır.

# Niřasta (Starch)

Glikopiranoz zinciri



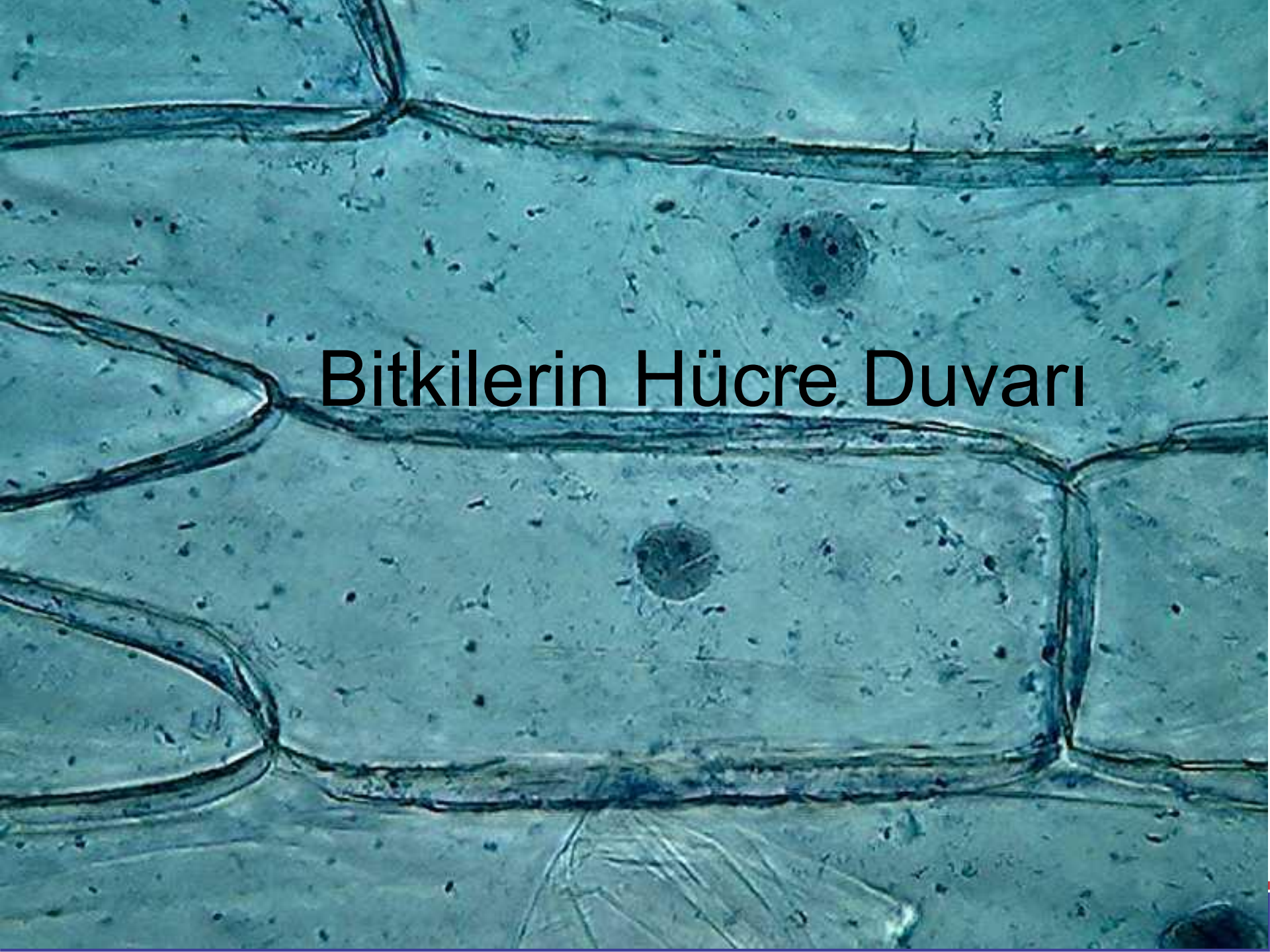




Amilopektin (nişastanın suda çözünmeyen kısmı)



# Bitkilerin Hücre Duvarı



## Wood



$\frac{1}{1000}$

Logging and  
chipping

## Wood chips



$\frac{1}{1000}$

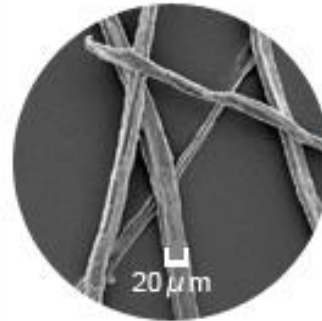
Pulping Obtaining  
wood fibers

## Wood fibers(pulp)

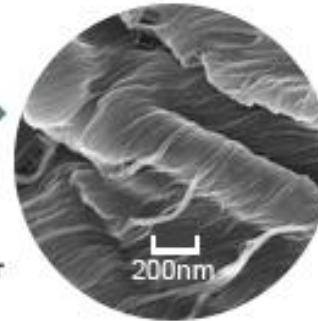


$\frac{1}{1000}$

Nanofibrillation  
(miniaturization)  
Fibrillation of a bundle  
of wood fibers



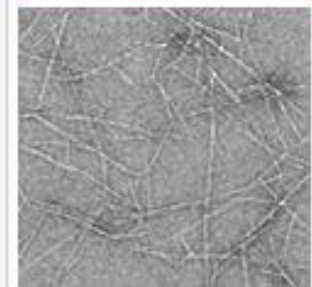
Magnify the  
image of  
the surface  
of wood fiber



A wood fiber is  
approximately 20μm wide.

Magnify the surface of a wood  
fiber and you will find that it  
consists of a bundle of  
countless nanofibers

## Cellulose nanofibers



$\frac{1}{1000}$   
20nm

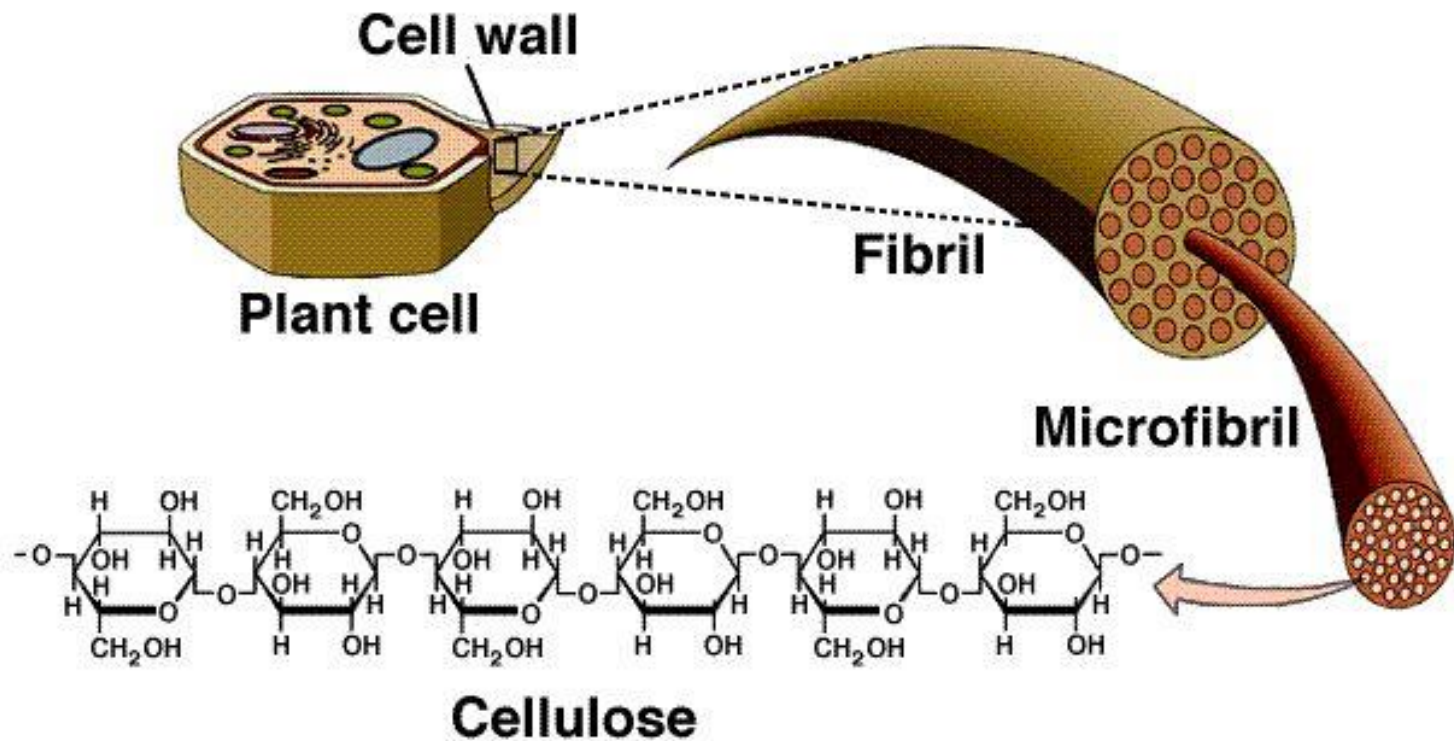
Büyümekte olan bir bitkinin **birincil hücre duvarı** ana olarak selüloz, hemiselüloz ve pektinden oluşmaktadır.

Büyümekte olan bir bitkinin **ikincil hücre duvarı** ise **%30-50 oranında selüloz**, **%20-35 oranında xylan** (bi çeşit hemiselüloz) ve **%10-25 oranında lignin** içermektedir.





# Arrangement of Fibrils, Microfibrils, and Cellulose in Cell Walls

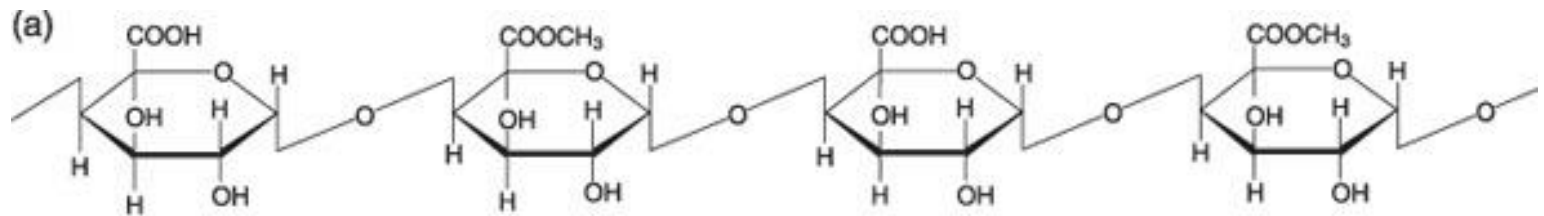


A growing cell produces the typical, external **primary cell wall**, separated from other plant cells by the pectin layer known as the **middle lamella**. Actively dividing cells and those that are metabolically very active (photosynthetic cells, secretory cells, etc.) typically have only that primary cell wall.



# Hücre duvarının ana malzemeleri

## pektin



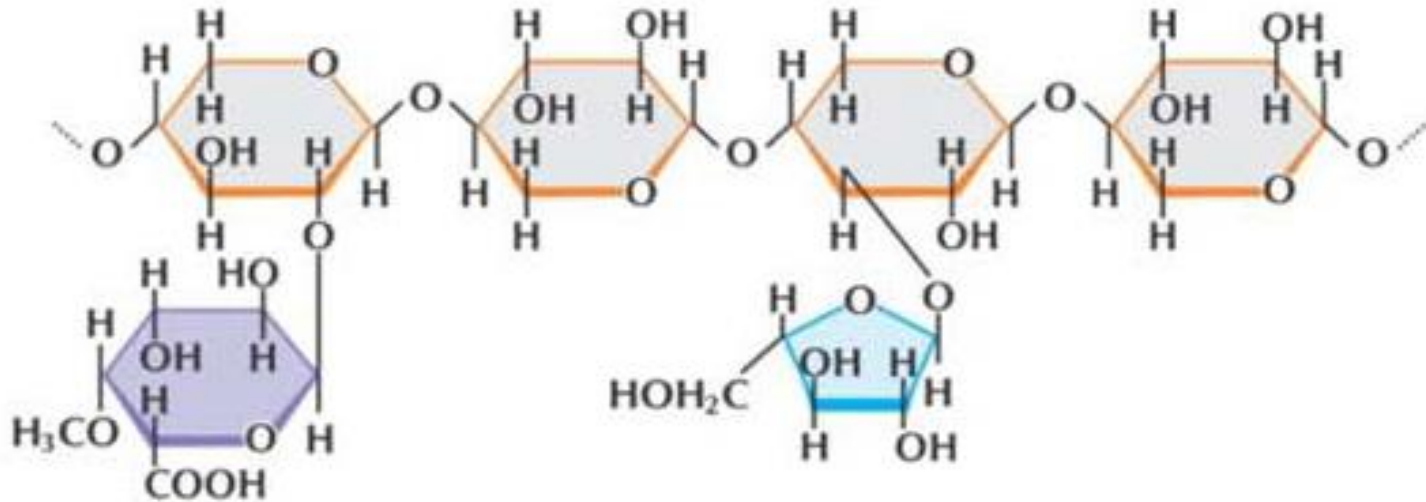
Pectins These are water-soluble, highly hydrophilic polysaccharides that form gels in solution. Because pectins attract so much water, they are responsible for the spongy, flexible nature of growing plant cells (the walls of which may be more than 65% water!)

The pectin backbone is usually an unbranched chain of D-galacturonic acid units. Other carbohydrates (mostly simple sugars) may be linked to the backbone, and affect the pectin's particular properties.

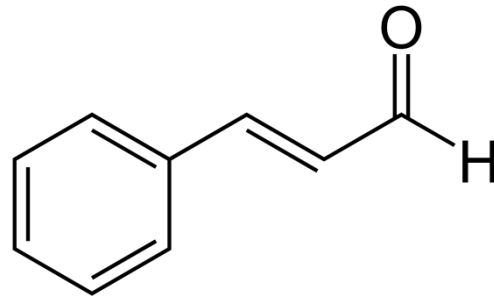
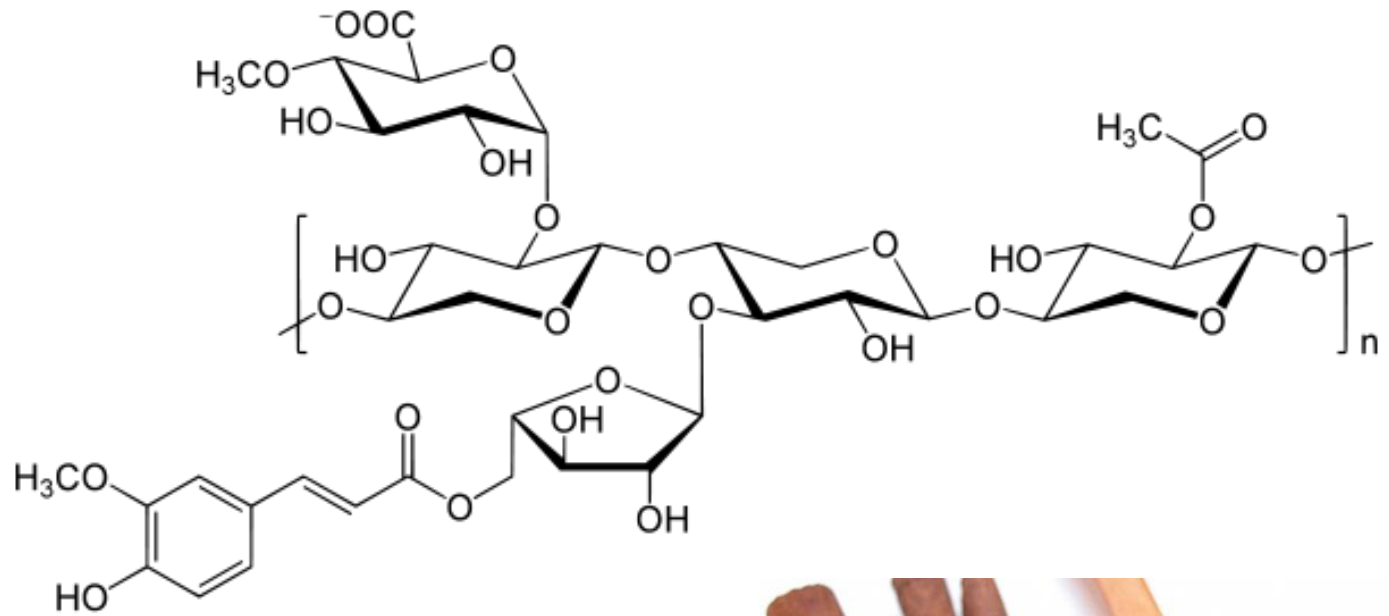
Pectins form part of the primary cell wall of plants and most of the middle lamella between adjacent cells. They're sort of a gooey cellular glue.



# Hemiselüloz



# Xylan



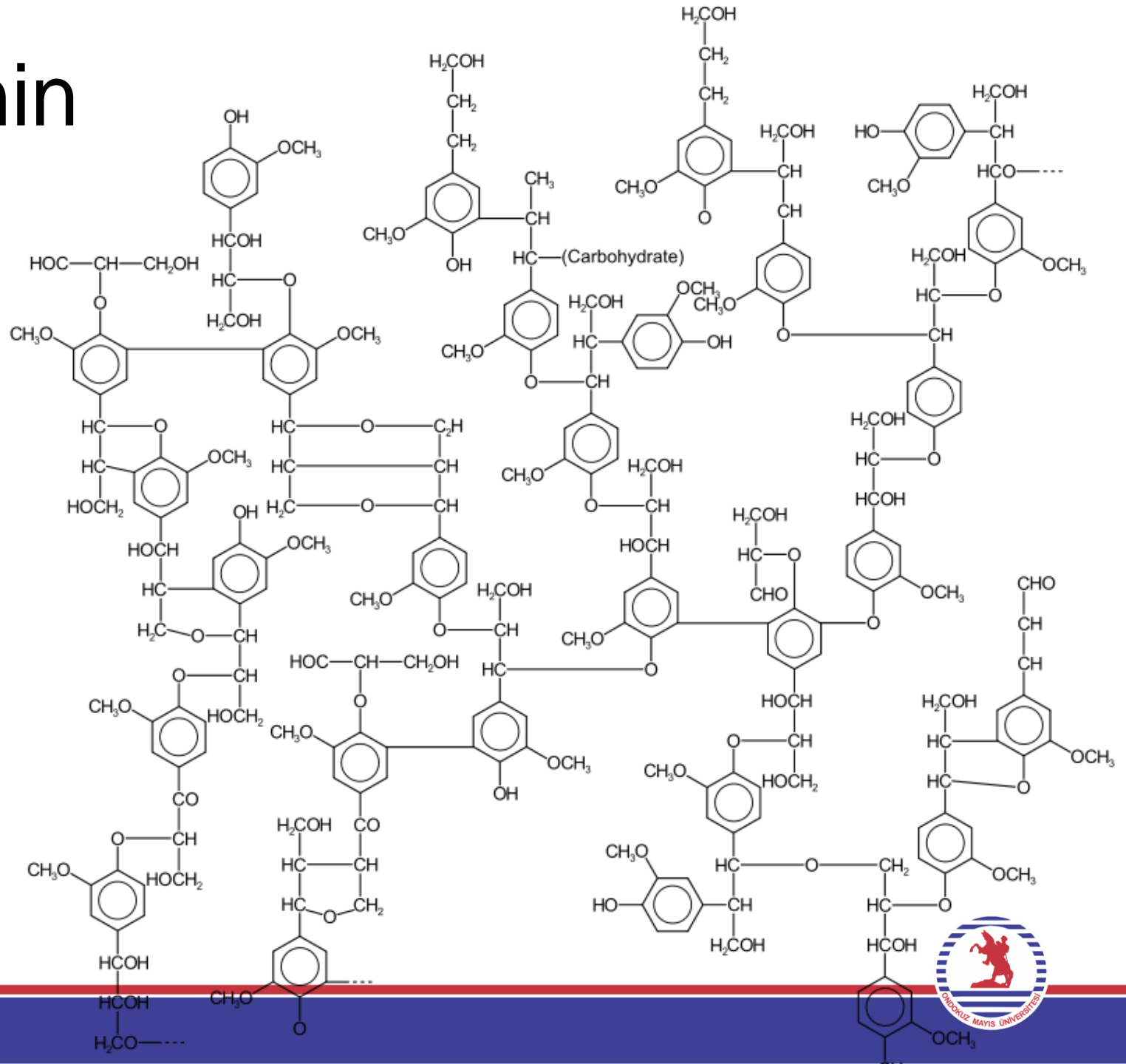
Sinnem  
aldehid



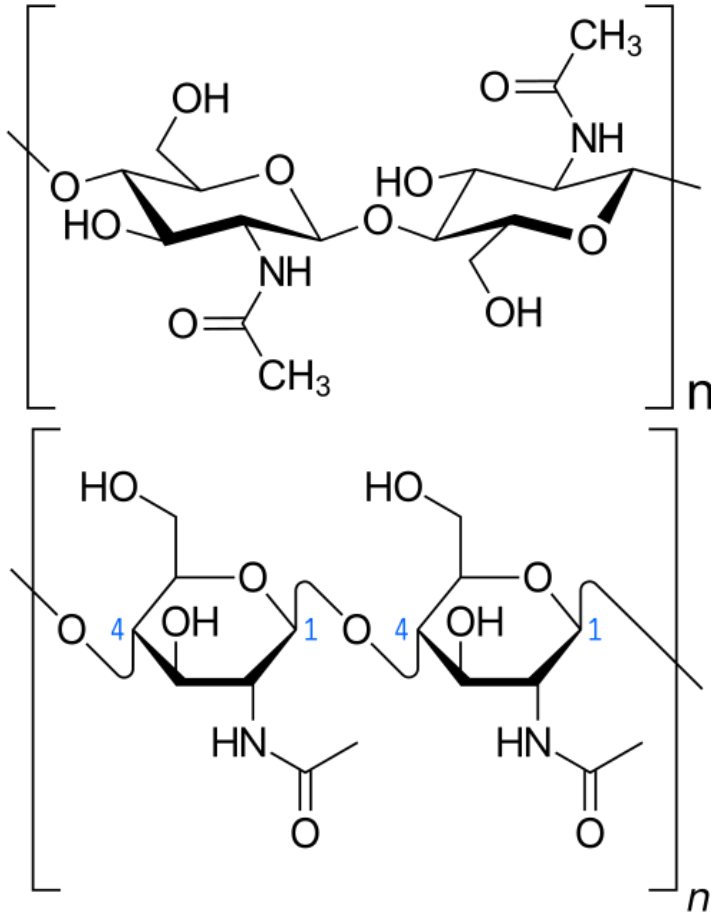
Tarçın



# Lignin

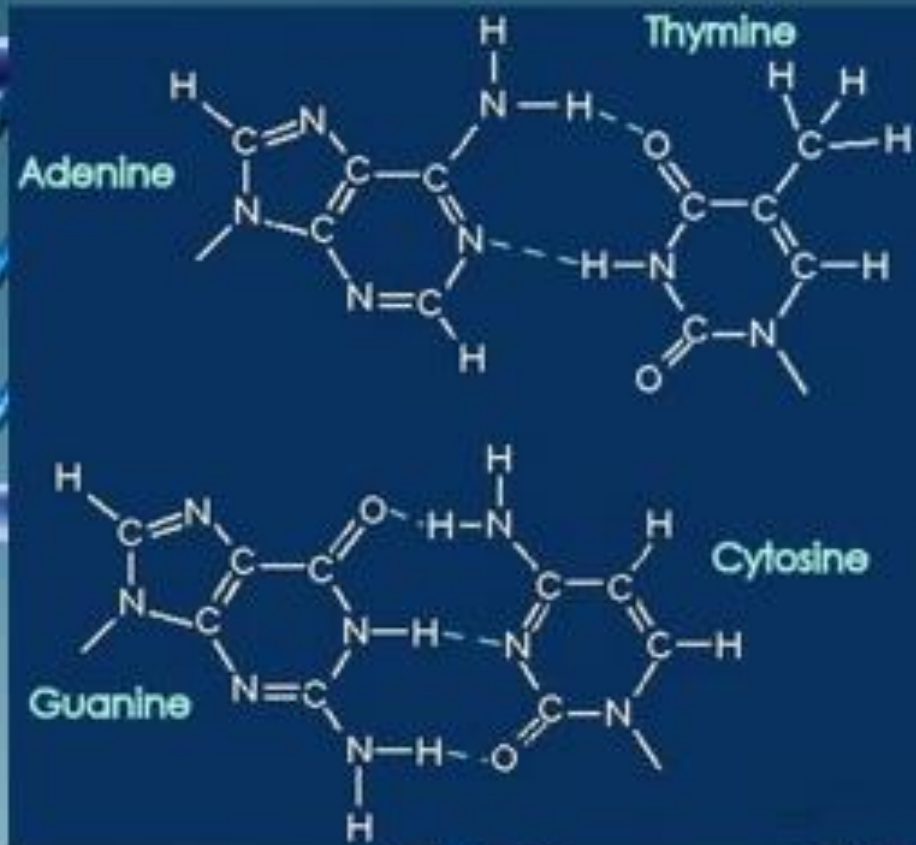


# Kitin (Chitin)

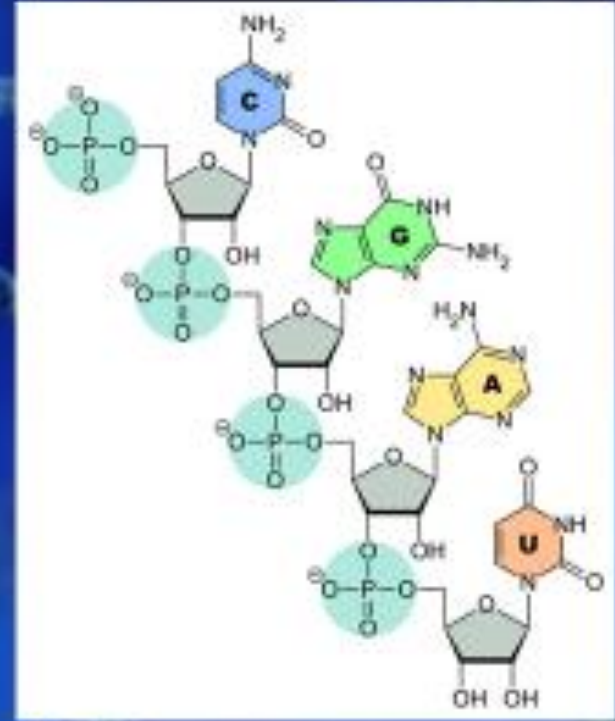
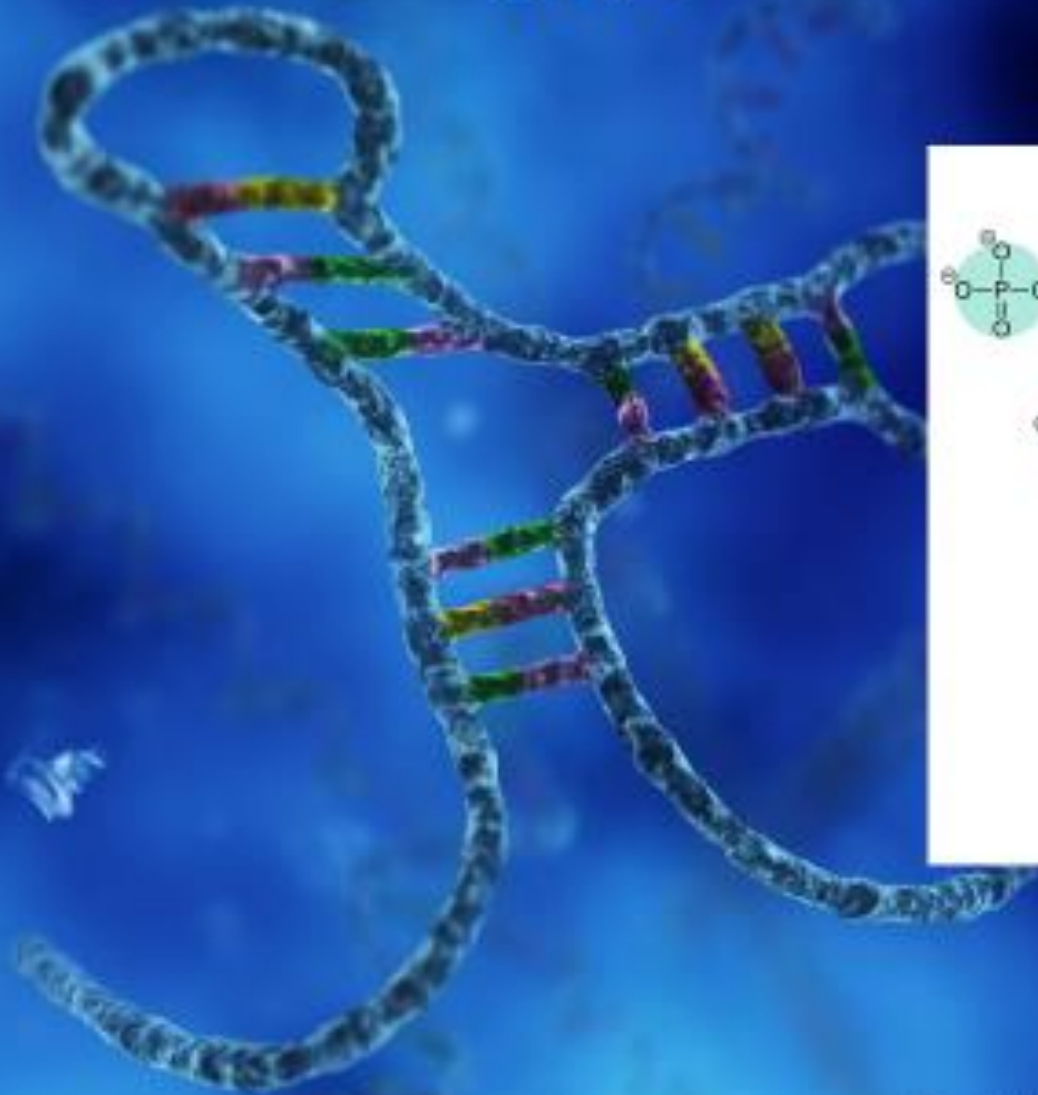


Böcekgillerin kabukları yüksek oranda kitin içermektedir

# DNA

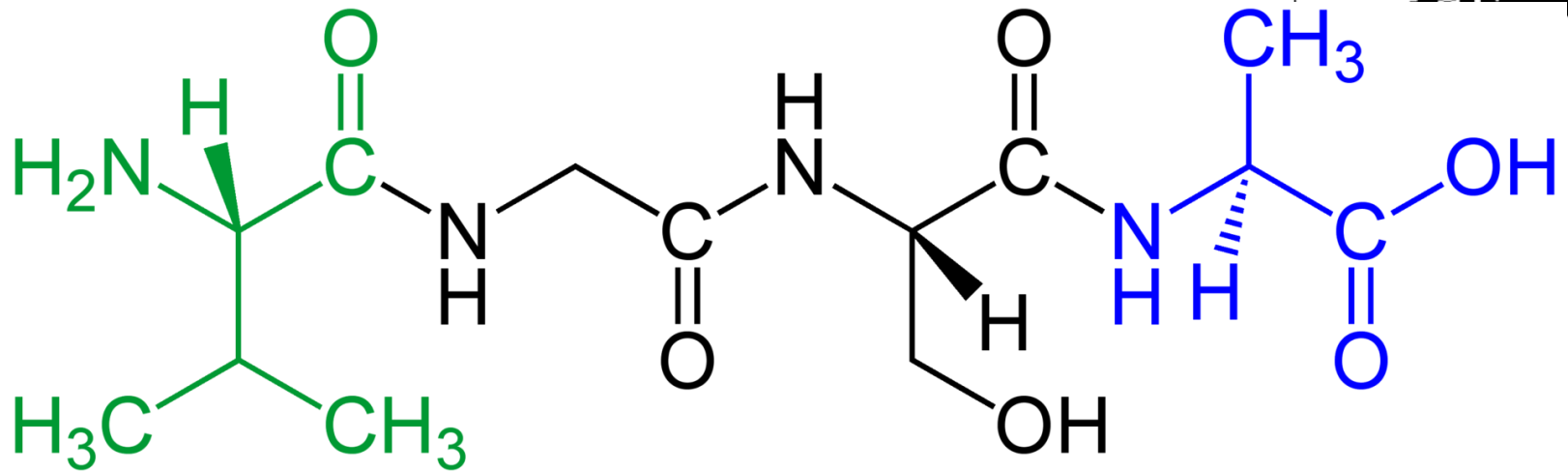
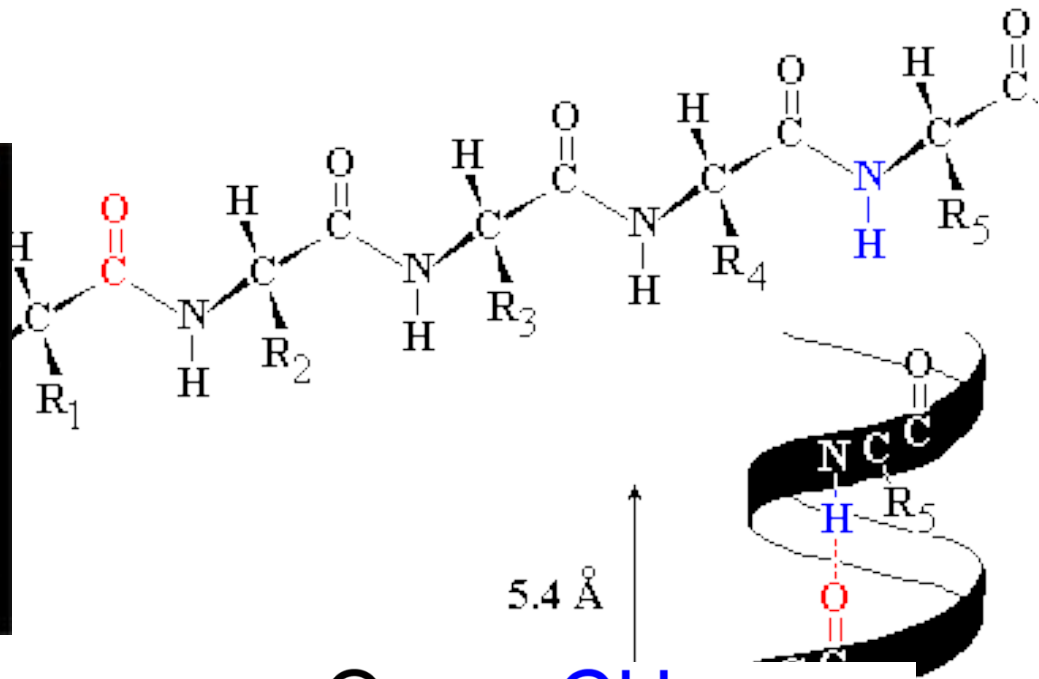


# RNA

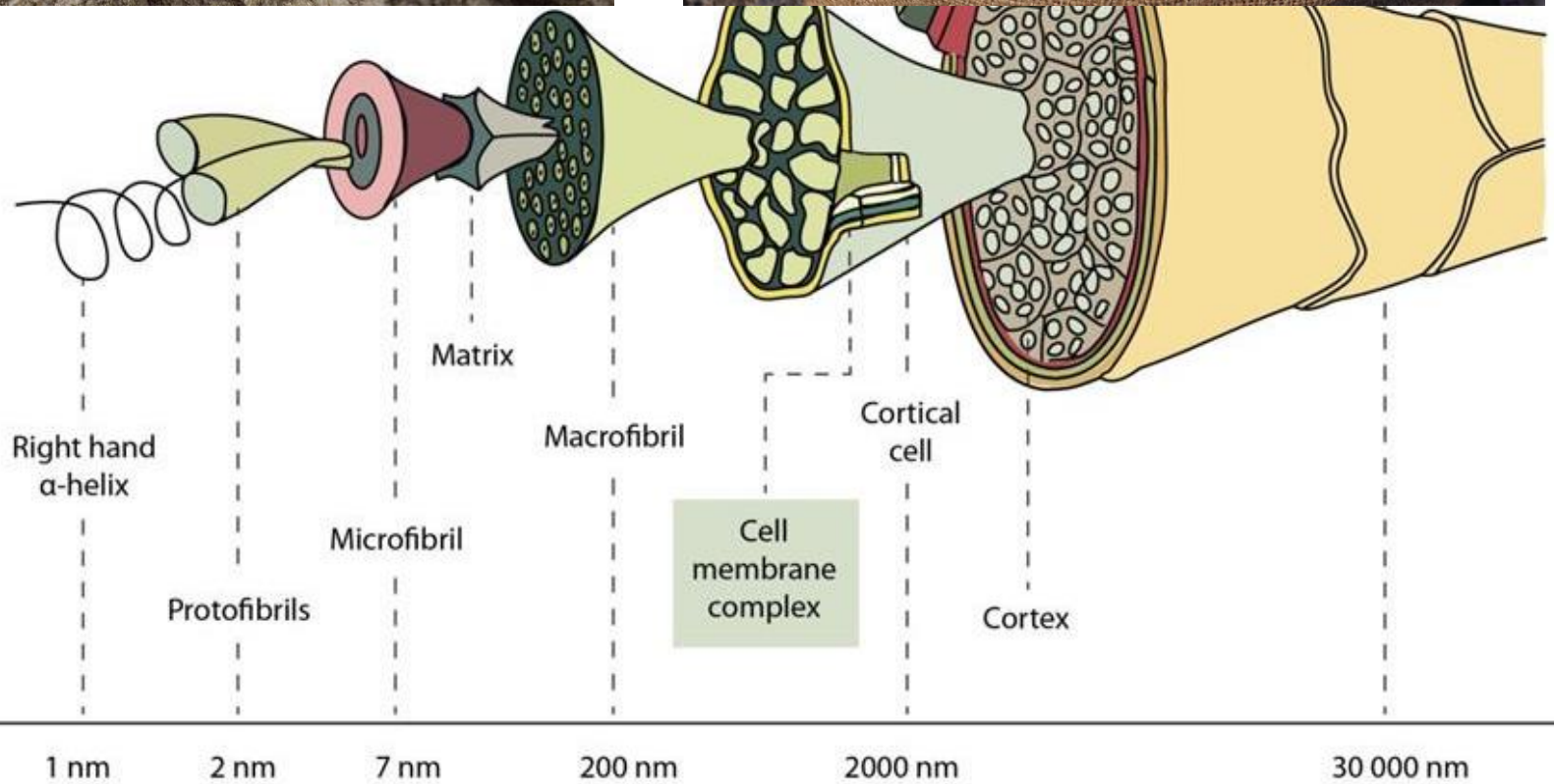




# Protein



A tetrapeptide (example Val-Gly-Ser-Ala) with **green** marked amino end (**L-Valine**) and **blue** marked carboxyl end (**L-Alanine**)

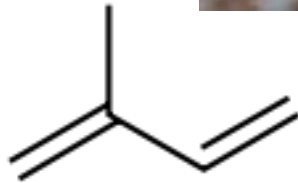




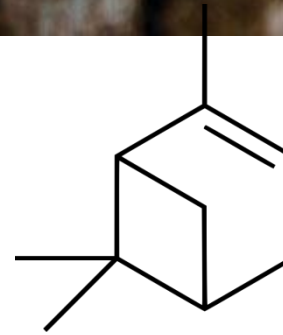
# Kauçuk



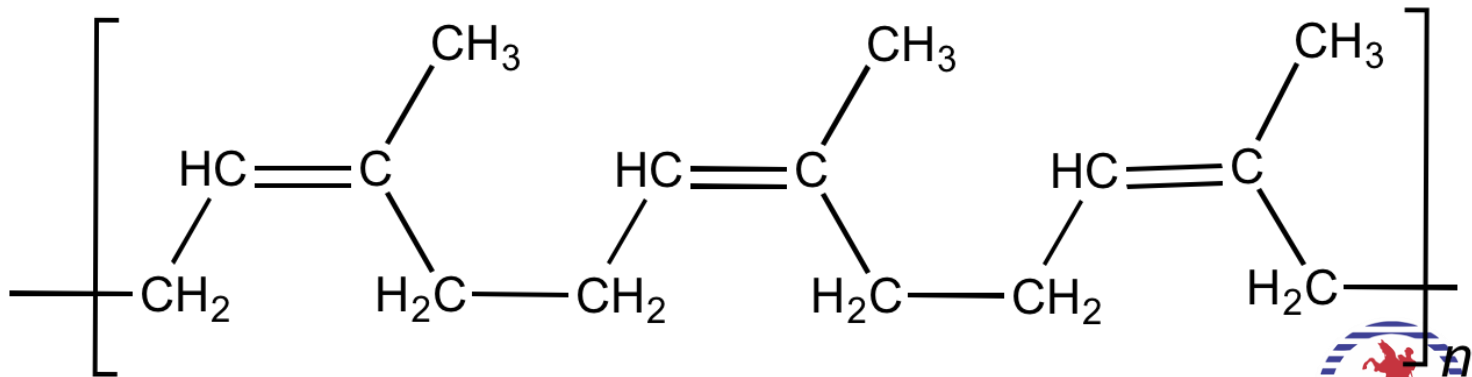
Latex



İzopüren



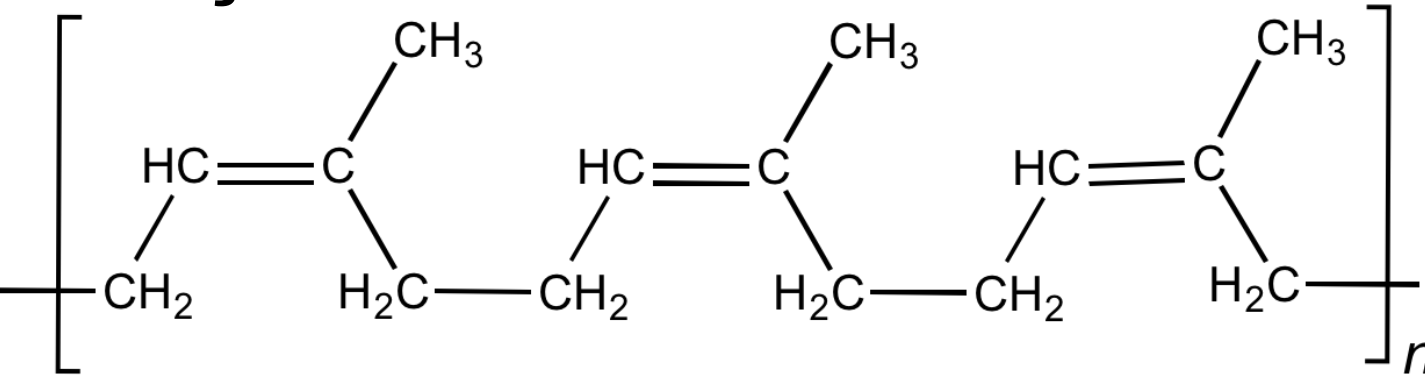
Neft  
(Turbentine)



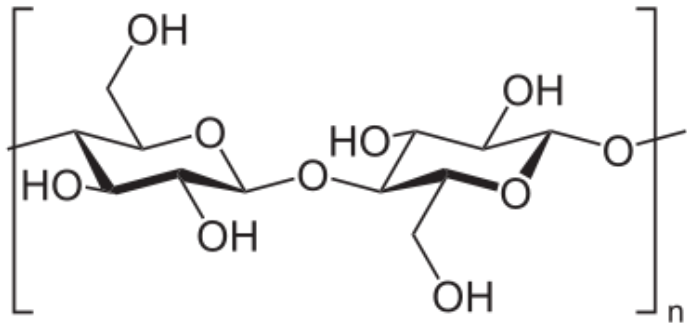


# Doğal Polimerler

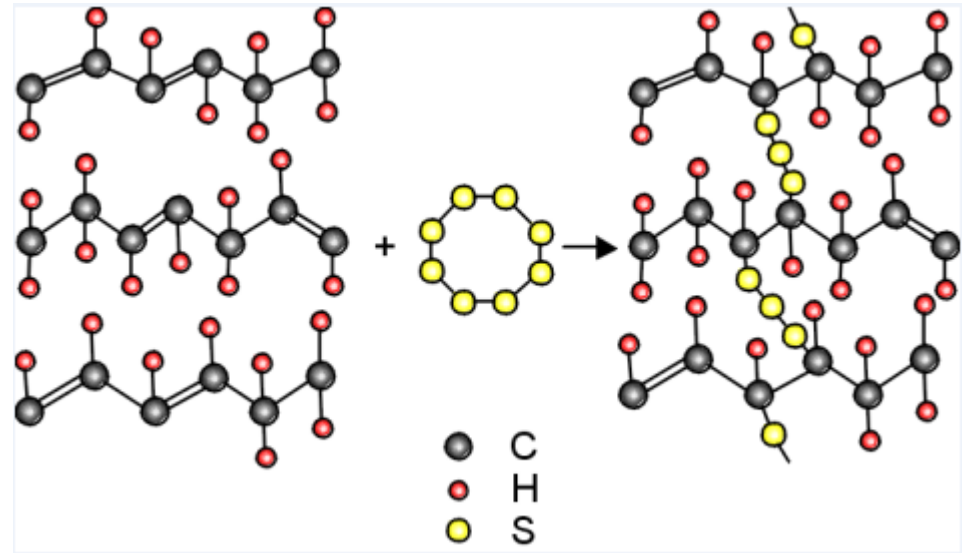
## Kauçuk



# Yarı sentetik Polimerler



Selüloz



Vulkanize Kauçuk

# Sentetik

