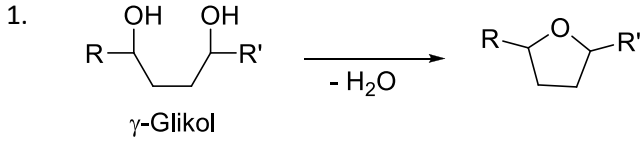


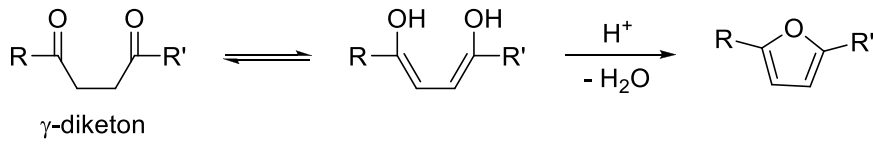
# HETEROHALKALI BİLEŞİKLER-III

## BAZI HETEROHALKALARIN SENTEZİ

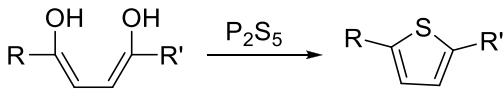
### 5 ÜYELİ HALKALAR



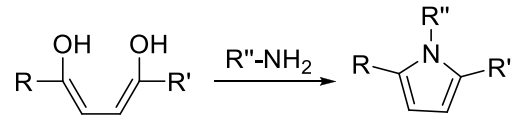
### 2. Paal-Knorr Furan sentezi



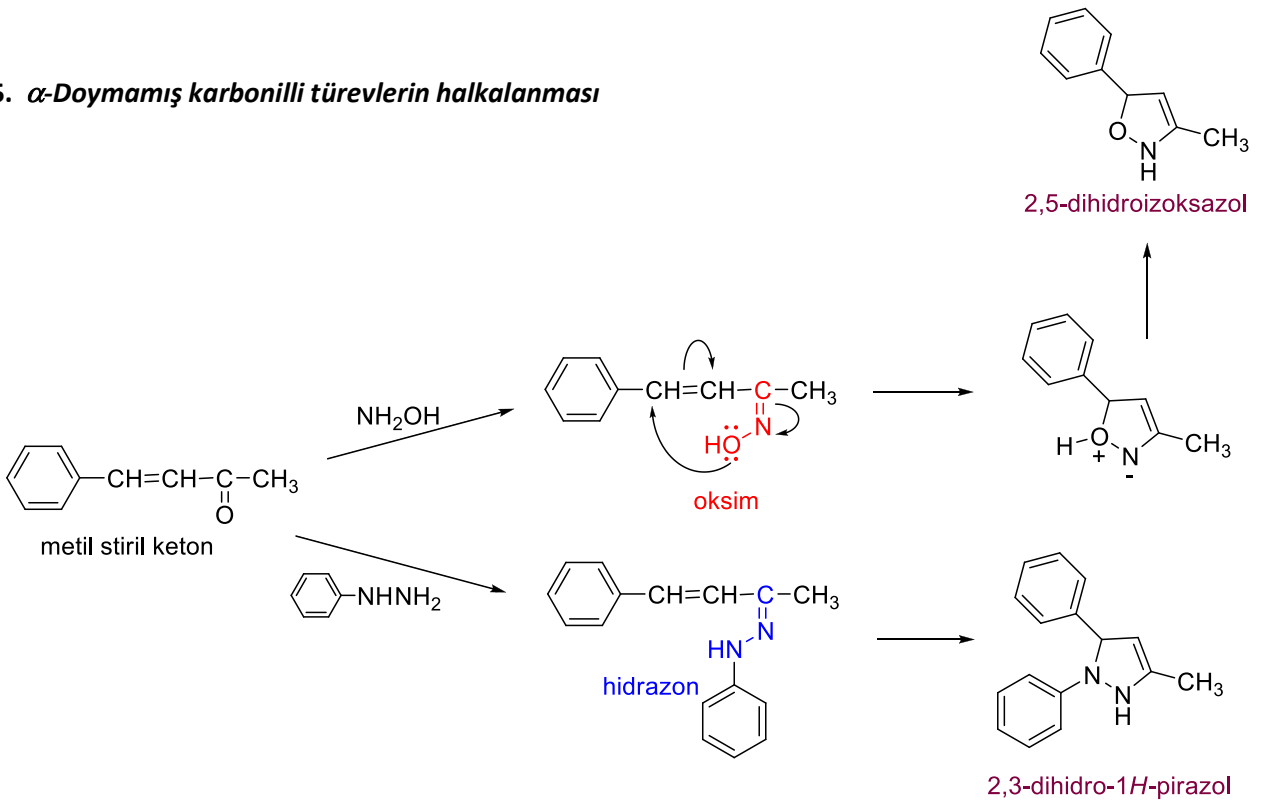
### 3. Paal-Knorr Tiyofen sentezi



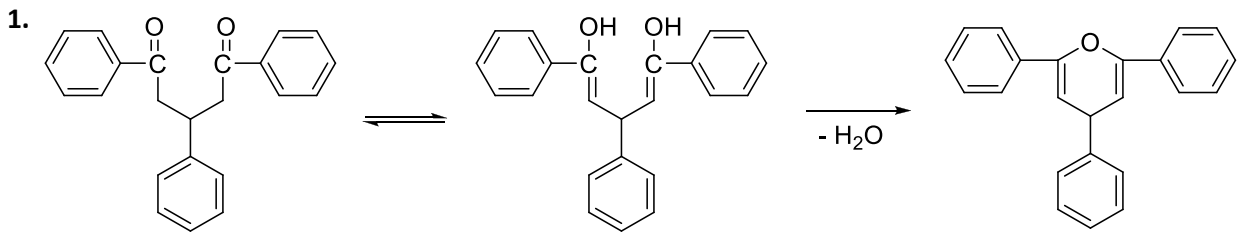
### 4. Paal-Knorr Pirrol sentezi



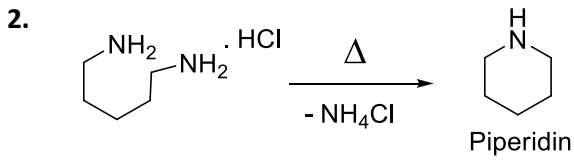
### 5. $\alpha$ -Doymamış karbonilli türevlerin halkalanması



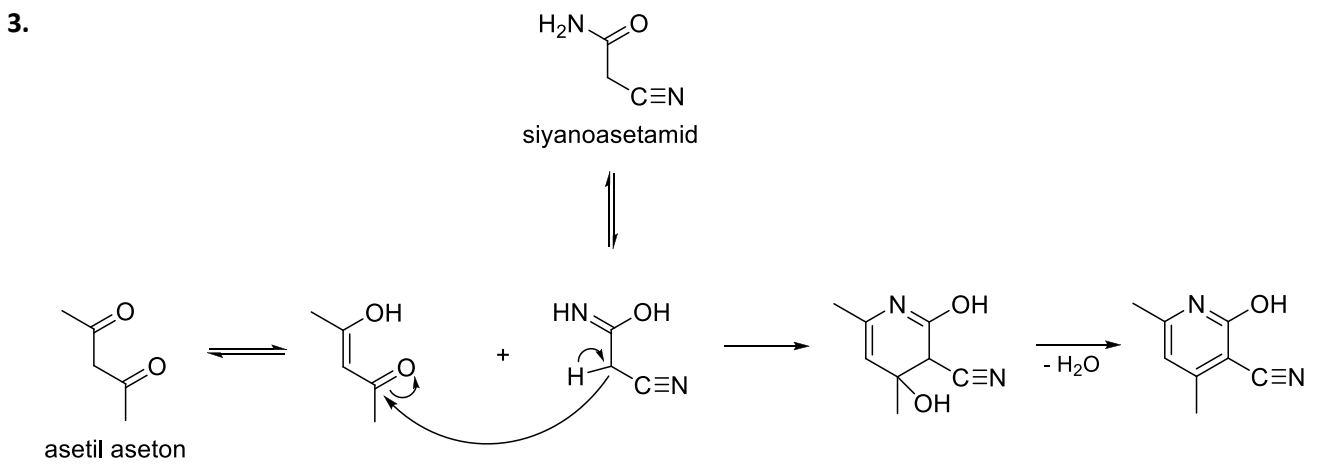
## 6 ÜYELİ HALKALAR



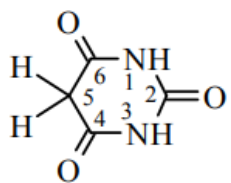
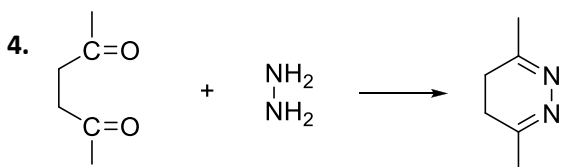
2,4,6-Trifenil-4H-piran



Piperidin



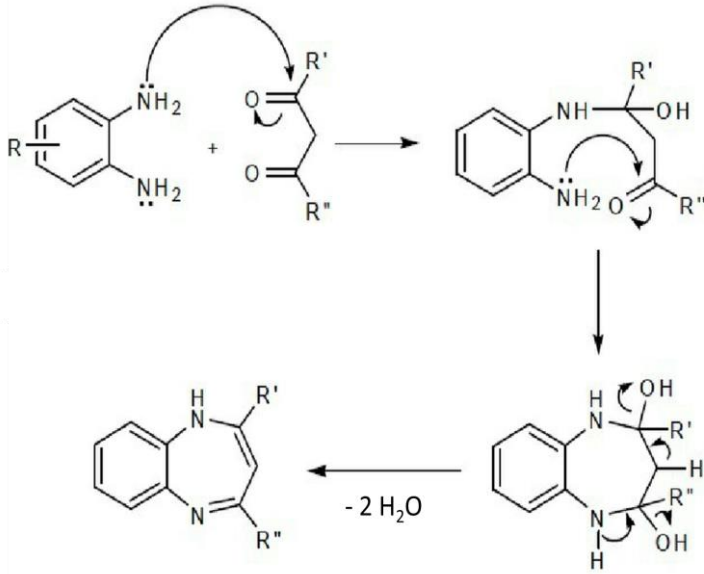
asetil aseton



Barbitürük asit

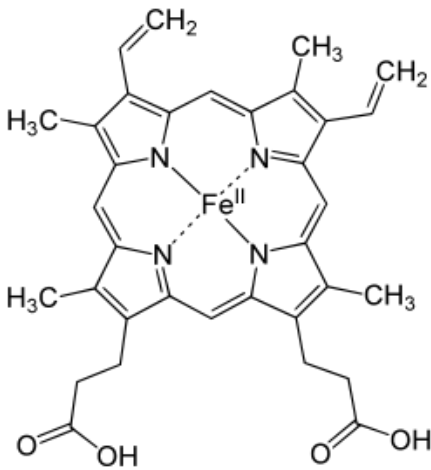
2,4,6- (1H, 3H, 5H) pirimidintron

## 7 ÜYELİ HALKALAR



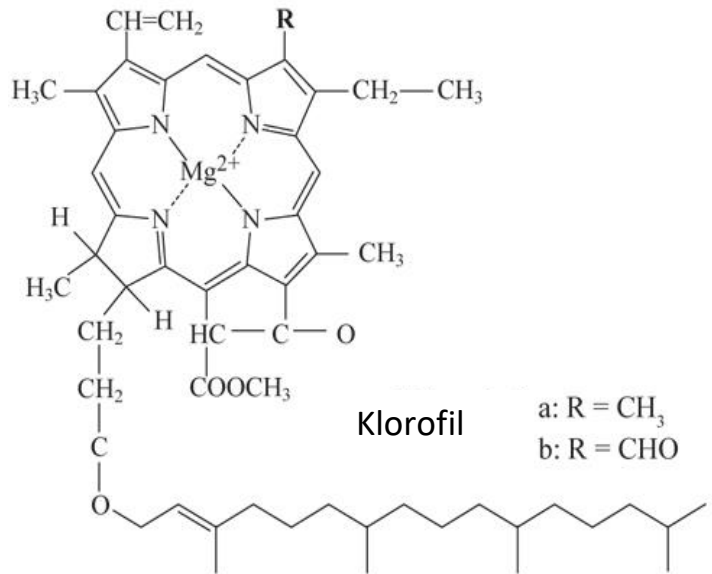
1,5-benzodiazepin

## HETEROHALKA İÇEREN ÖRNEK MOLEKÜLLER



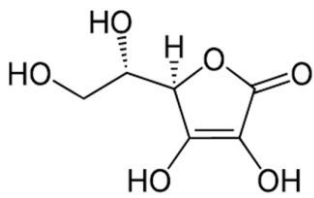
**Hem**

Demir-porfirin kompleksi



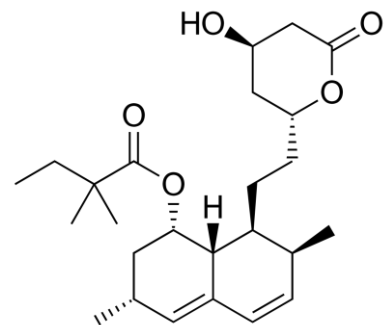
**Klorofil**

a: R = CH<sub>3</sub>  
b: R = CHO

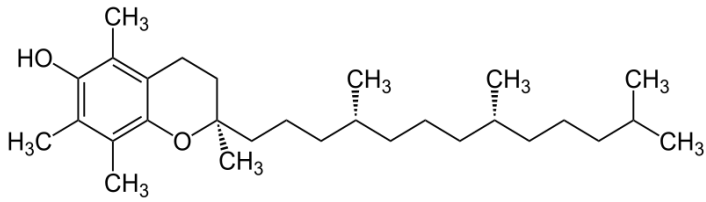


**C Vitamini (Askorbik asit)**

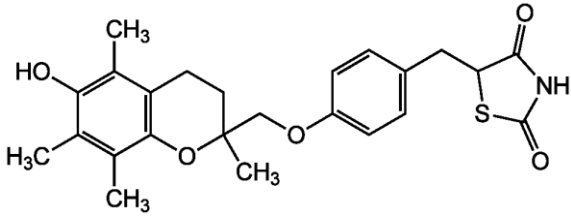
(R)-3,4-Dihidroksi-5-((S)-1,2-dihidroksietil)furan-2(5H)-on



**Simvastatin**

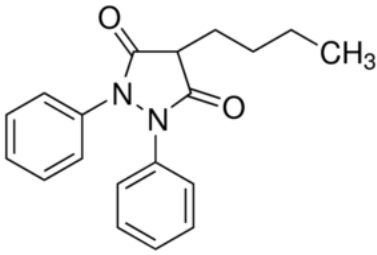


**E Vitamini ( $\alpha$ -Tokoferol)**



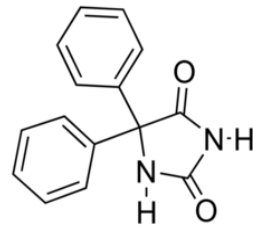
**Troglitazon**

5-[[4-[(6-Hidroksi-2,5,7,8-tetrametil-3,4-dihidro**kromen**-2-il)metoksi] fenil]metil]-1,3-**tiyazolidin**-2,4-dion



**Fenilbutazon**

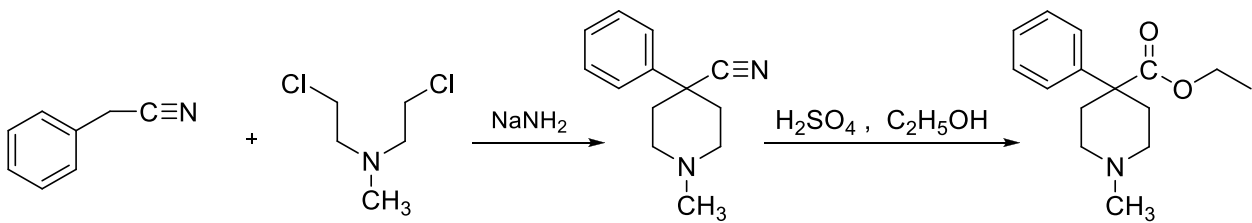
4-*n*-Butil-1,2-difenil**pirazolidin**-3,5-dion



**Fenitoin**

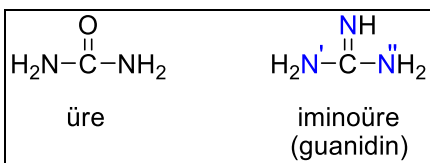
5,5-Difenil**imidazolidin**-2,4-dion

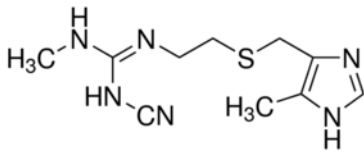
5,5-Difenilhidantoin



**Meperidin**

Etil 1-metil-4-fenil**piperezidin**-4-karboksilat

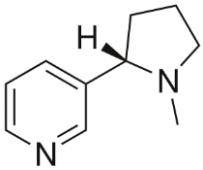




**Simetidin**

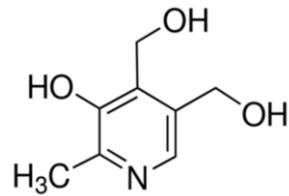
*N*-Siyano-*N'*-metil-*N'*-[2-[(5-metil-1*H*-imidazol-4-il)metiltiyol]etil]guanidin

1-Siyano-2-metil-3-[2-[(5-metil-1*H*-imidazol-4-il)metilsulfanil]etil]guanidin



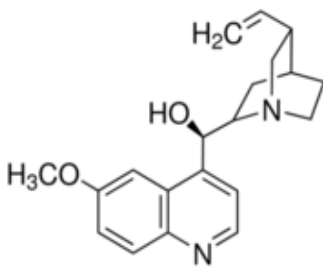
**Nikotin**

3-(1-metilpirrolidin-2-il)piridin



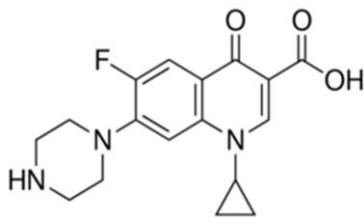
**B<sub>6</sub> Vitamini (Piridoksin)**

4,5-Bis(hidroksimetil)-2-metilpiridin-3-ol



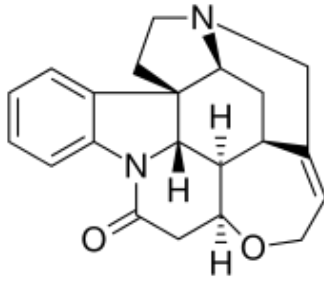
**Kinin**

(*R*)-[(2*S*,4*S*,5*R*)-5-etenil-1-azabisiklo[2.2.2]oktan-2-il]-(6-metoksikinolin-4-il)metanol

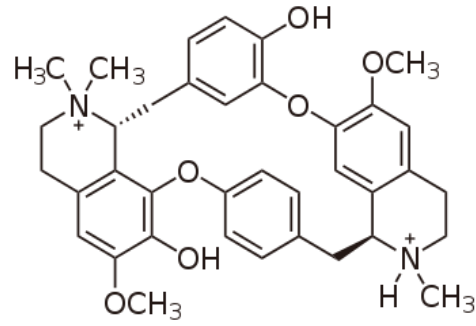


**Siprofloksasin**

1-siklopropil-6-fluoro-4-okso-7-piperazin-1-il kinolin-3-karboksilik asit

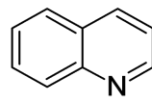


**Striknin**

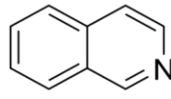


**d-Tubokürarin**

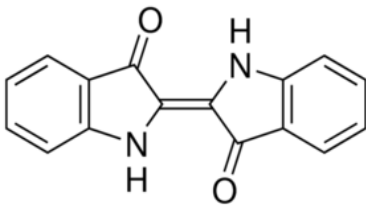
indol  
oksepin  
kinolin  
pirrol



kinolin

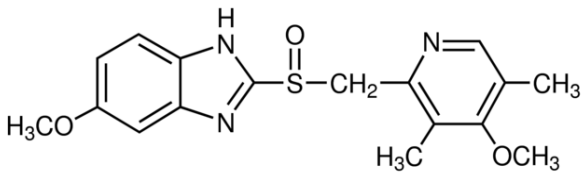


izokinolin



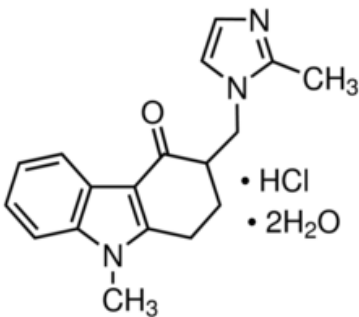
**indigo**

(2*E*)-2-(3-okso-1*H*-indol-2-iliden)-1*H*-indol-3-on



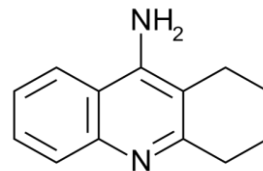
**Omeprazol**

5-Metoksi-2-[[[4-metoksi-3,5-dimetilpiridin-2-il)metil] sülfinil]-1*H*-benzimidazol



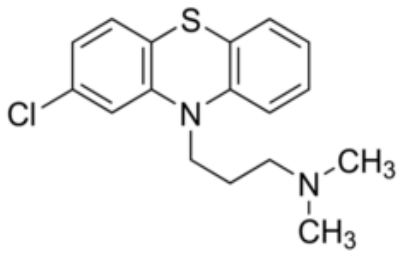
**Ondansetron**

9-Metil-3-[(2-metil-1*H*-imidazol-1-il)metil]-2,3-dihidro-1*H*-karbazol-4-on



**Takrin**

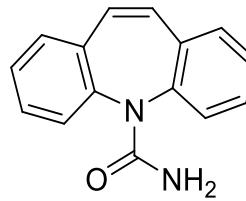
1,2,3,4-Tetrahidroakridin-9-amin



**Klorpromazin**

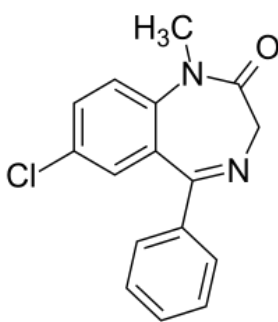
3-(2-klorofenotiyazin-10-il)-*N,N*-dimetilpropan-1-amin

*N*-(3-Dimetilaminopropil)-3-klorofenotiyazin



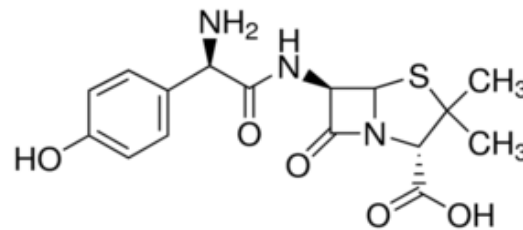
**Karbamazepin**

5*H*-Dibenzo[b,f]azepin-5-karboksamid



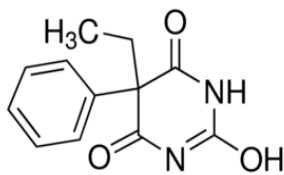
**Diazepam**

7-Kloro-1,3-dihidro-1-metil-5-fenil-2*H*-1,4-benzodiazepin-2-on



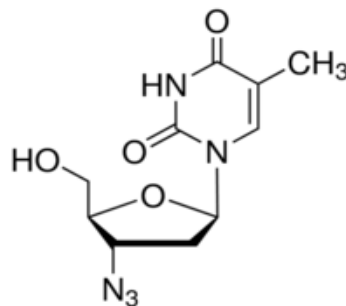
**Amoksisilin**

(2*S*,5*R*,6*R*)- 6-[[*(2R)*-2-amino- 2-(4-hidroksifenil)- asetil]amino]- 3,3-dimetil- 7-okso- 4-tiya-1-azabisiklo[3.2.0]heptan-2-karboksilik asit



**Fenobarbital**

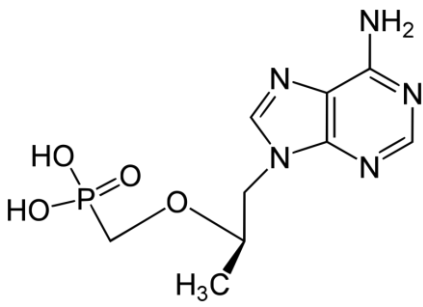
5-Etil-5-fenil-pirimidin-2,4,6-trion



**Zidovudin (Azidotimidin)**

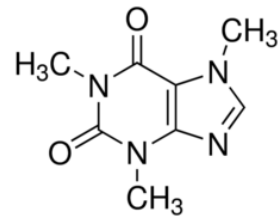
3'-Azido-3'-deoksitimidin

1-[[*(2R,4S,5S)*-4-azido-5-(hidroksimetil)oksolan-2-il]-5-metilpirimidin-2,4-dion

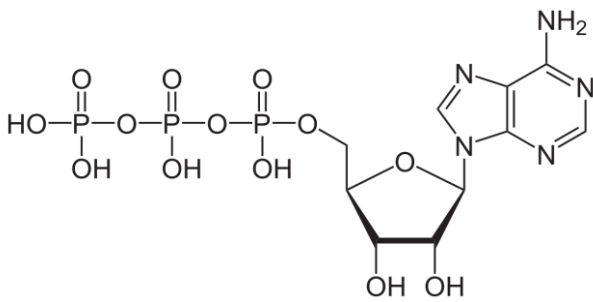


**Tenofovir**

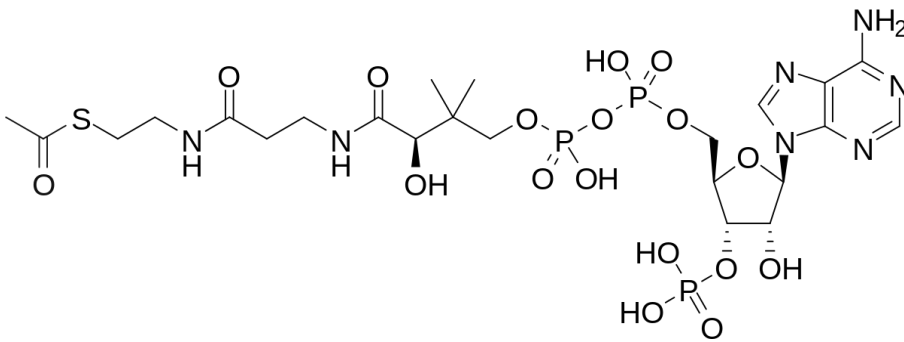
[(2*R*)-1-(6-aminopurin-9-yl)propan-2-yl]  
oksümetilfosfonik asit



**Kafein**



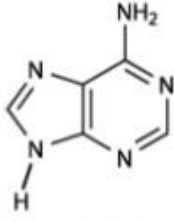
**ATP**



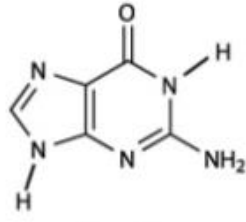
**Asetil CoA**



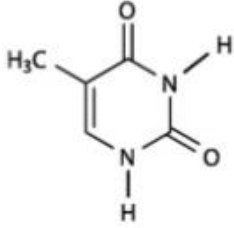
## DNA/RNA Bazları



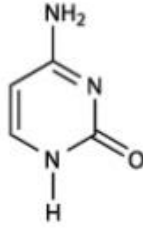
Adenin



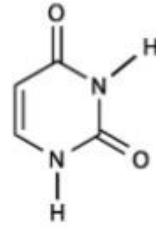
Guanin



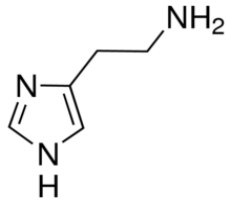
Timin



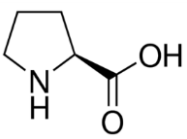
Sitozin



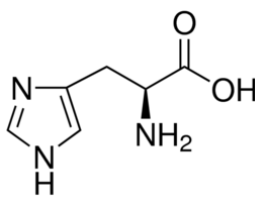
Urasil



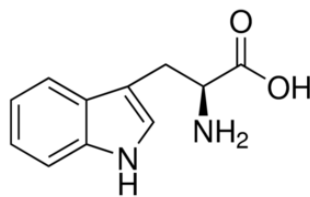
Histamin



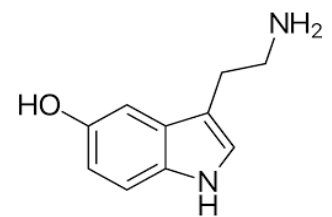
Prolin



Histidin



Triptofan



Serotonin

## KAYNAKLAR

- Organik Kimya, Celal Tüzün, Palme Yayıncılık, 8. Baskı, 1999.
- *Bir Bakışta Heterosiklik Kimya*, J.A.Joule – K. Mills, 2. Basımdan çeviri, Gazi Kitabevi, 2017.