# Amino Acids as Precursors for synthesis of Other Nitrogen Compounds

**Overview of basic derivatives** 



# **Derivatives of Gly**

Heme (bile pigments as degradation products of heme)

Purines (uric acid-egradation product os purine nucleotide)

Glycine conjugates

Creatine

Glutathione

Heme is derivative of succinyl-CoA and Gly



#### Degradation of heme yields bile pigments





**Purine ring** (Asp, Gln, Gly)



Urate (Sodium urate) -degradatin product of purine nucleotides



Glutathione (γ-Glu, Cys, Gly)

$$O = P - O -$$

$$NH$$

$$C = +NH_2$$

$$N - CH_3$$

$$CH_2$$

$$COO -$$

Creatine phosphate (Gly, Arg, Met)



**Creatinine-degradation product of Creatine** 

## **Derivatives of Ser**

## Sphingosine (from Ser and palmitoyl CoA)

Ethanolamine, choline (amino alcohol moiety in phospholipids)



#### Serine derivatives





Derivatives of Glutamate, Histidine and Tryptophan

## **Derivatives of Met and Cys**

## S-adenosyl methionine (Met)

Homocysteine (Met)

#### Ş-adenosyl-methionine



Provides methyl groups for biosynthesis

## Derivatives of Arg (and Ornitine)

Formamidine donor in creatine synthesis

#### NO synthesis

Urea and ornithine (urea cycle)







#### Nitric oxide synthase



# Tryptophane

#### Serotonin-neurotransmitter in brain

## Melatonin (via N-acetylation of serotonin, followed by O-methylation)-

- (sleep inducing molecule,
- involved in regulation of circadian rhythm)

5-methoxytryptamine (methylation of serotonin)



#### Formation of serotonin



### Tyrosine

Melanin (polymers of Tyrcatabolites)

DOPA, epinephrine and norepinephrine

Hormones of thyroid gland



# Biosynthesis of (nor)adrenaline



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# Formation of T3 and T4



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### Derivative of Lys- Carnitine



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