Course 2851 Principles of Metabolism
Metabolism and endocrinology programme, Karolinska Institutet

Lecture 16

One-carbon units and methylation

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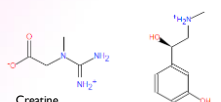
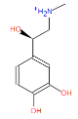
One-carbon unit – the smallest building block

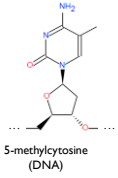
Methyl groups



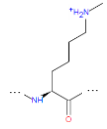
Creatine



Adrenaline



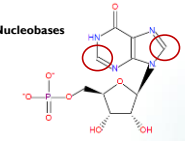
5-methylcytosine
(DNA)



N-methyllysine
(protein)

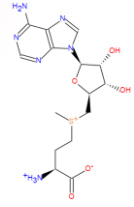
Choline
(phospholipids)

Nucleobases

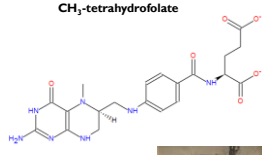


One-carbon carriers: SAM and THF

S-adenosylmethionine (SAM)



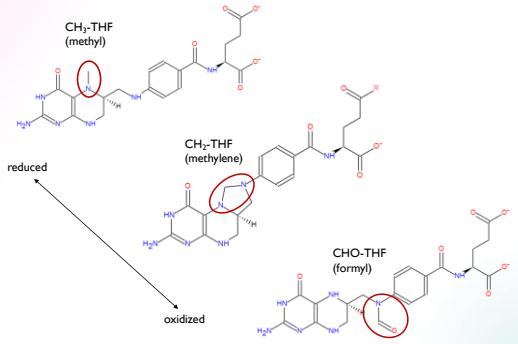
CH_3-tetrahydrofolate



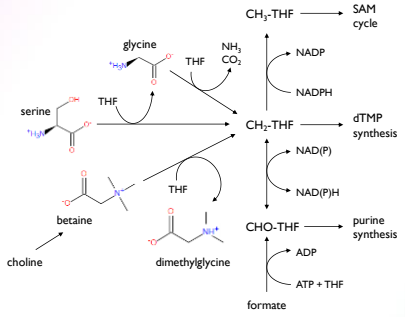
a.k.a.
"Wills' factor"

Lucy Wills, India, ca 1930

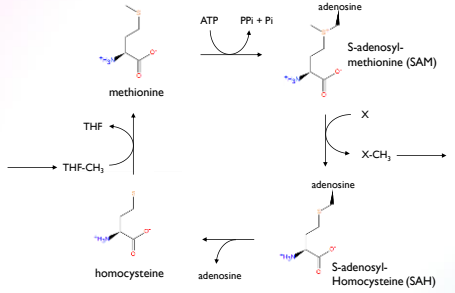
THF carries several forms of one-carbon units



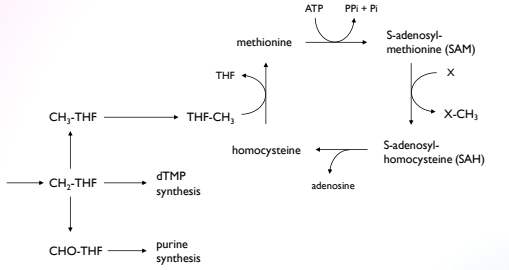
THF metabolism



The S-adenosylmethionine (SAM) cycle



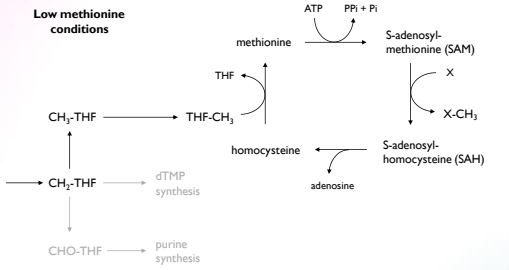
SAM-THF interactions: the "folate trap"



Scott & Weir, *Lancet* 1982

SAM-THF interactions: the "folate trap"

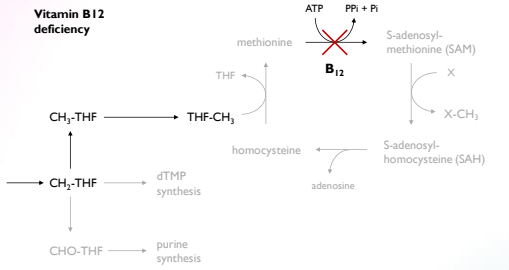
Low methionine conditions



Scott & Weir, *Lancet* 1982

SAM-THF interactions: the "folate trap"

Vitamin B12 deficiency



Scott & Weir, *Lancet* 1982