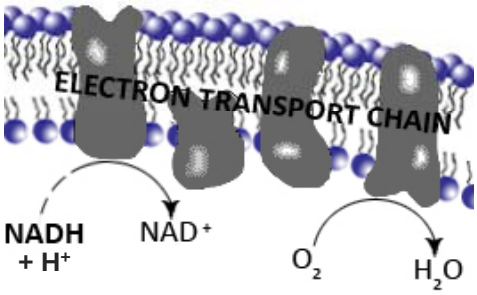
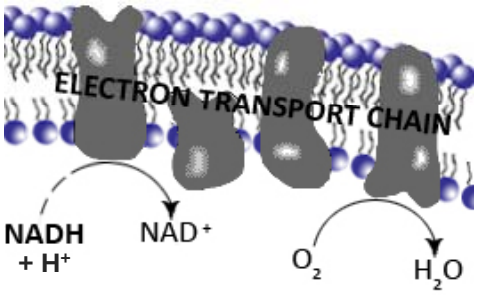
Generation of ATP

The reoxidation of NADH to NAD^+ occurs by transfer of 2H to the carriers of the cytochrome chain.



Generation of ATP



The pair of H atoms are then transferred to O_2 to form H_2O

The process results in the synthesis of 3 ATP from 3ADP and $3P_i$

Energy yields of TCA cycle

- 3 enzyme reactions produce NADH and H^+
- 1 enzyme reaction produces $FADH_2$
- 1 enzyme reaction produces GTP
- ATP yields =

	old numbers	new numbers
	3 x 3 ATP	3 x 2.5
	1 x 2 ATP	1 x 1.5
	1 GTP	1 x GTP
Total	12 ATP	10 ATP

Irreversibility of key stages

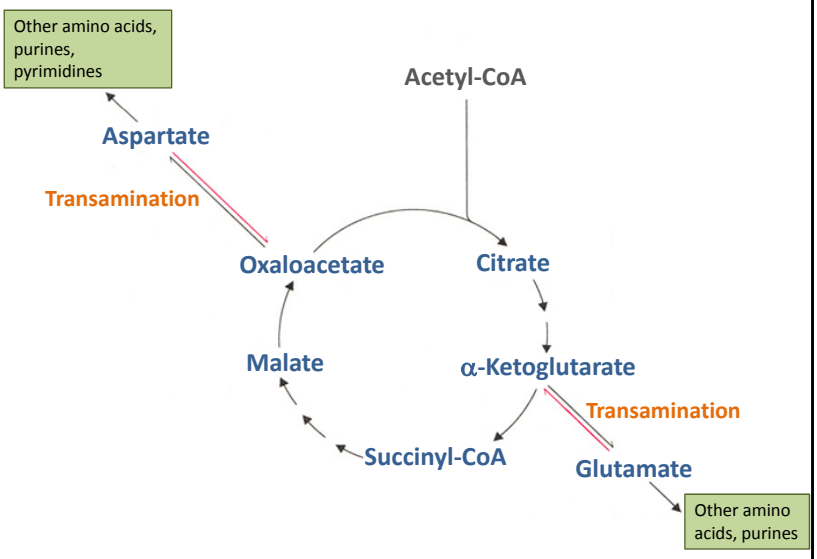
3 enzyme steps are highly exergonic & irreversible:

- citrate synthetase
- isocitrate dehydrogenase
- ketoglutarate dehydrogenase

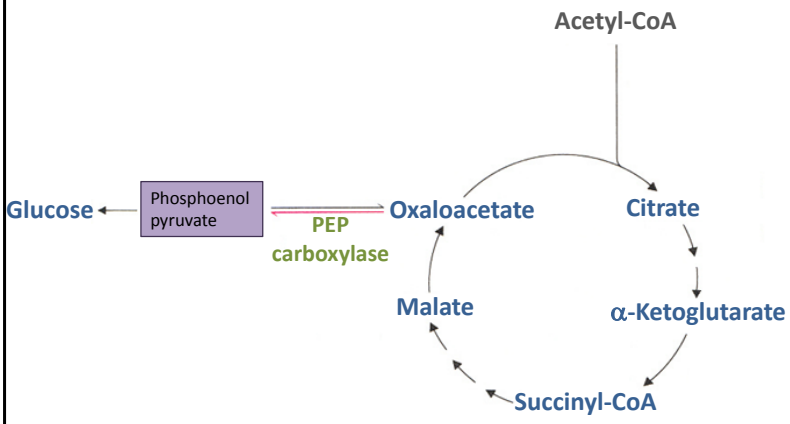
Rate of TCA cycle regulated by feedback inhibition of key enzymes

• isocitrate dehydrogenase	ADP	*activates*
	NADH	*inhibits*
• ketoglutarate dehydrogenase	NADH	*inhibits*
	succinyl CoA	*inhibits*
• citrate synthetase	NADH	*inhibits*
	succinyl CoA	*inhibits*

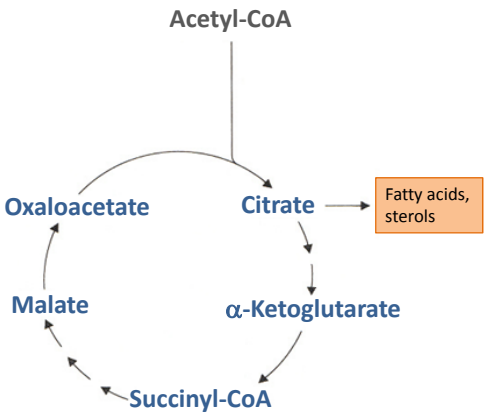
Biosynthetic role of TCA cycle



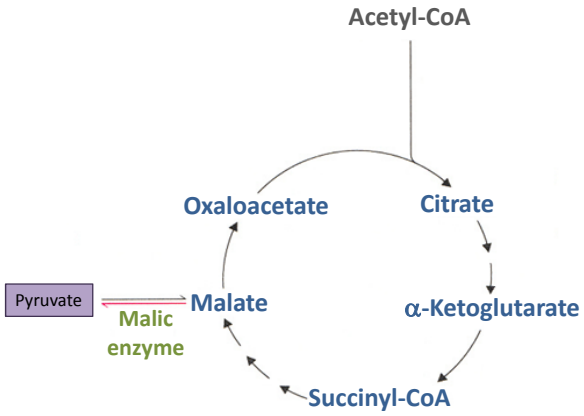
Biosynthetic role of TCA cycle



Biosynthetic role of TCA cycle



Biosynthetic role of TCA cycle



Biosynthetic role of TCA cycle