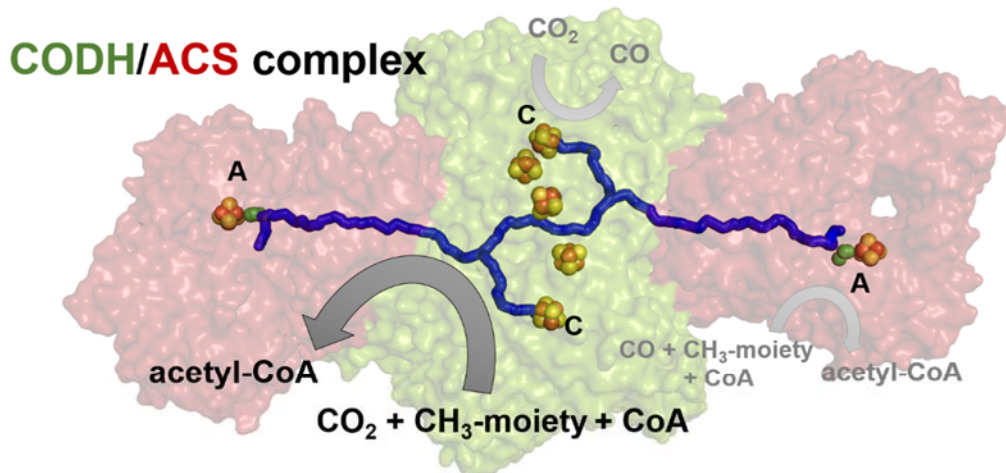
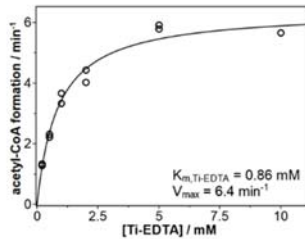


Investigations on the catalytic coupling of the CODH/ACS complex

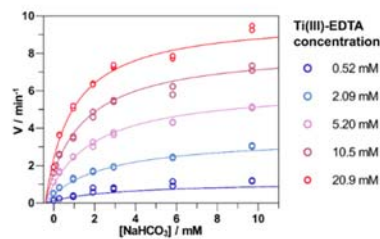
Jakob Ruickoldt – WS18 batch –
Supervisor: Holger Dobbek (HU Berlin)



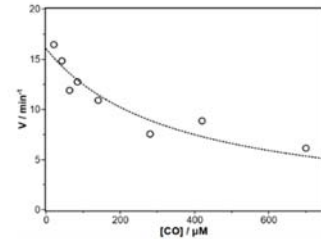
Full reaction



CO_2 -reduction



Condensation reaction



The CO-dehydrogenase/acetyl-CoA-synthase (CODH/ACS) complex catalyzes the formation of acetyl-CoA from CO_2 , CoA and a methyl moiety. CO_2 is reduced to CO at cluster C of the CODH subunit and travels around 7 nm through an internal protein tunnel to the ACS subunit, where it finally reacts at the cluster A to acetyl-CoA. How these two subunits communicate to synchronize their activity is not clear. To investigate the coupling I characterized the CO_2 to CO reduction kinetics and compared it to the kinetics of the acetyl-CoA formation from CO_2 and from CO. Surprisingly, the coupling of the reactions seems to lead to decreased activity but an increased affinity for the substrates. Furthermore, we are currently manipulating the tunnel that connects the two active sites to see, if it is the communication line between them.