Guest lecture

“At the interface of cell respiration and lipid metabolism – mitochondrial fatty acid synthesis”

2 October 2015

12:00 – 13:00 PM in U20

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Abstract:
Among the recently recognized features of mitochondrial functions is their ability to synthesize fatty acids in an acyl carrier protein (ACP)-dependent manner. The dual localization of fatty acid synthesis (FAS) in eukaryotic cells raises the question why eukaryotes have maintained the FAS in the mitochondria in addition to the “classic” cytoplasmic FAS. The mitochondrial FAS (mtFAS) is composed of a discrete set of monofunctional enzymes resembling the bacterial FAS system, in contrast to the eukaryotic cytosolic multifunctional complex. The striking finding is that mtFAS is operational also in mammals, and there is also mounting evidence pointing to indispensable functions of mtFAS for the well-being of mammals. This notion is in line with the observations that disruption of mtFAS results in embryonic lethality in mice. The presentation gives new data and also summarizes the current understanding on mechanisms linking mtFAS, mitochondrial RNA processing and mitochondrial respiration.

Venkatesan, R., et al. (2014) Insight into mitochondrial fatty acid synthesis from the structure of heterotetrameric 3-ketoacyl-ACP reductase/3R-hydorxyacyl-CoA dehydrogenase. Nature Comm. DOI: 10.1038/ncomms5805

Kursu, V.A., et al. (2013) Defects in mitochondrial fatty acid synthesis result in failure of multiple aspects of mitochondrial biogenesis in Saccharomyces cerevisiae. Mol Microbiol. 90, 824-840

Host: Professor Susanne Mandrup, Department of Biochemistry and Molecular Biology, SDU.