



EINLADUNG

zum

ZIH-SEMINAR

Titel: Cell Cycle Associated Metabolic Regulation during Meiotic Development in Yeast

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Abstract:

The meiotic cell cycle facilitates transformation of vegetative yeast cells into spores that ensure long-term survival, and recombination of the parental DNA to create genetic diversity. Our study focused on the metabolic regulation of meiotic development and incorporated information on expression levels and activities of enzymes in the central metabolism, together with metabolome data of the corresponding pathways. The metabolic make-up of the cells exhibited strong temporal compartmentalisation during meiotic development, thereby satisfying changing energetic and anabolic needs during different cell-cycle stages. Metabolic reprogramming was enabled by meiosis-specific regulation of approximately one third of the 26 monitored enzymatic activities. The inactivation of both, phosphofructokinase and NAD-dependent glutamate dehydrogenase, and glycogen mobilisation were related to cell cycle progression. The correlation between transcript levels and enzymatic activities of most enzymes was poor during meiotic development, and completely lost for the majority of the glycolytic enzymes during the meiotic divisions. In addition, it was shown that functioning of the Amd1/Isn1 system responsible for the homeostasis of energy bearing nucleotides was vital for the execution of meiotic differentiation. Our study demonstrated a tight correlation of metabolic regulation and cell cycle progression, and provided a reference to characterise the impact of metabolic perturbations on meiotic development.

Ort: Informatik-Neubau, Nöthnitzer Str. 46, INF 1096

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gez. Prof. Dr. Wolfgang E. Nagel