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**Molybdenum hydroxylase super family shows circadian activity fluctuation in mice liver: Emphasis on aldehyde hydroxylase and xanthine oxidase**

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**Abstract**

Non-CYP oxidase enzymes are important system in biotransformation of drugs and environmental pollutants. Molybdenum containing oxidase enzymes such as aldehyde oxidase and xanthine oxidase are constitutive tissue enzymes that metabolize several drug moieties. Herein, we evaluated the circadian rhythm of these two enzymes in mice liver using different substrate/oxygen donor couples. Aldehyde oxidase showed typical rhythmic fluctuation with peak activity at night cycle and minimum activity at light cycle using pthalazine/ferricyanide and 3-methylisoquinoline/ferricyanide substrates. On the other hand, xanthine oxidase showed interrupted diurnal rhythm, however peak and minimum enzyme activities were similar to aldehyde oxidase circadian rhythm. In conclusion, diurnal rhythm of both molybdenum hydroxylase enzymes was confirmed and validated in mice liver tissue that might provide further insights in the experimental evaluation of phase-I pharmacokinetics for new drugs.

**Author Keywords**

Aldehyde oxidase; Diurnal rhythm; Molybdenum hydroxylase; Xanthine oxidase

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