

# Comparison of Selenium Pharmacokinetics after Administration of Inorganic Selenium Compounds to Rats

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## Abstract

Selenium (Se) concentrations in blood and urine from Wistar rats before and after selenate or selenite administration were determined by using PIXE analysis. There were significant differences in pharmacokinetic parameters between the two inorganic compounds. Selenate showed 5-6 times higher absorption rate constant than selenite, which caused significantly higher maximum Se concentration (C<sub>max</sub>) in plasma and faster time of the C<sub>max</sub> (T<sub>max</sub>). The absorption rate constant of selenate was much larger than the elimination rate constant. Therefore different from selenite, flip-flop pharmacokinetics was not observed. This difference by the type of inorganic selenium compound is likely due to the differences in absorption rate in the gastrointestinal tract, i.e., selenate are much easily absorbed than selenite. Apart from the significant differences in plasma Se profile, there was no significant difference in urinary Se excretion. This observation also supports the differences in Se absorption in GI-tract. Together with the absorption rate constant, the fate of Se in the liver may be different between the two compound. However, it is necessary to monitor the quantitative analysis of the chemical forms of selenium compounds in biological samples in order to elucidate our results.