
Copper

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May 6, 2008

Risk Assessment Challenges

- Narrow boundary between dietary needs and early signs of overload
 - < 10mg/day (adult; IOM, 2001)
- Portal of entry response to bolus dosing vs. systemic responses
 - nutritional and toxicological
- Complex homeostatic regulation
- Increasingly sophisticated techniques for examining toxicokinetic and effects data
 - Chaperones
 - mRNAs for proteins with copper-binding domains
- Data gaps related to sensitive populations
 - Idiopathic toxicoses
 - Wilson's disease heterozygotes,
- Difficult human study logistics
 - Number of subjects
 - Exposure duration
 - Impact of age and sex on needs and potential for excess

Challenges contd.

- Determining precise total exposures (doses) in human studies
 - Daily intake varies based on food selection
 - Correlation of effects with dose
 - What shows the best relationship?
 - Supplement dose
 - Total dose (supplement plus type)
 - Impact of dosing regime
 - Times per day for supplements
 - Vehicle (capsule, tablet, solution, diet)
 - Models with adequate accuracy and precision to establish boundaries between need and excess
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