



For Science Issue 2
Samuel Cohen

Precautions in Literature Review (1/2)

- Analytical methods
- Arsenic form:
 - AsIII vs. AsV
 - Inorganic vs. methylated vs. other organics
- Concentrations (in vitro) and doses (in vivo):
 - Environmental drinking water concentration of 10 $\mu\text{g/L}$ (0.2 μM) is not systemic or tissue concentration
 - Many claim in vitro studies are at “environmentally relevant concentrations of 10 $\mu\text{g/L}$ ”
 - Concentrations of trivalents $> 10 \mu\text{M}$ in vitro are meaningless; lethal dose

Precautions in Literature Review (2/2)

- Cell types:
 - Must use epithelial cells
 - Lung fibroblasts do not represent cell of origin for lung cancer
 - Malignant cell lines (e.g., osteosarcoma) have limited value without corroboration
- Primary cell vs. established cell lines:
 - Established cell lines have multiple differences compared to normal, especially p53
- In vitro vs. in vivo:
 - Trivalent arsenicals bound to rat hemoglobin (Lu et al., 2004; 2007)
 - Oxidative stress in vitro (Gentry et al., 2010)
 - No oxidative stress in vivo (Clewell et al., 2011) (Suzuki et al., 2009)

Relevance to Humans

Clinical Manifestations and Arsenic Methylation After a Rare Subacute Arsenic Poisoning Accident

Y. Xu, Y. Wang, Q. Zheng, B. Li, X. Li, Y. Jin, X. Lv, G. Qu, and G. Sun.

Toxicol. Sciences, 10: 278-284, 2008.

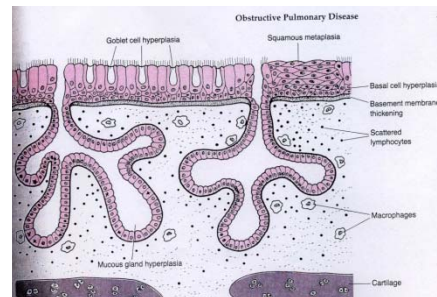
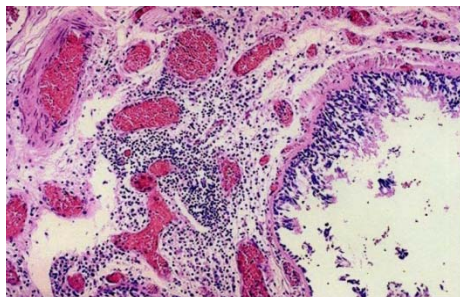
Observations

High exposure

DMA^V & TMAO in urine

Hematuria in 1/3 of exposed group

HUMAN CHRONIC BRONCHITIS



SKIN: ACTINIC KERATOSIS

