Morphologic Evidence that Hexavalent Chromium Targets the Epithelium of Duodenal Villi But Not Crypts

Normal Duodenum

Villus Damage Resulting in Crypt Epithelial Hyperplasia

Intestinal Epithelial Neoplasia

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NTP 2-Year Drinking Water Study in Mice (516 mg/L)

Southern Research 90-day Drinking Water Study in Mice (520 mg/L)

Same Findings

• Blunting and thickening of villi
• Histiocytic cells in lamina propria of villus tips
• Elongation of crypts
• Regenerative epithelial hyperplasia
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Morphologic indications of villus damage

• Lack of treatment-related effects in crypts

• Lack of DNA damage in crypts

• Chromium localized to villi

• Lack of aberrant foci
Supplemental Information

Karyorrhectic Nuclei
(individual cell necrosis)

Micronuclei
(chromosome breakage)

Mitotic Figures
(enterocyte renewal)

Apoptotic Nuclei
(physiologic cell loss, or damage to dividing cells)