



IRIS Assessment Plan for Inhalation Exposure to Vanadium and Compounds

(Scoping and Problem Formulation Materials)



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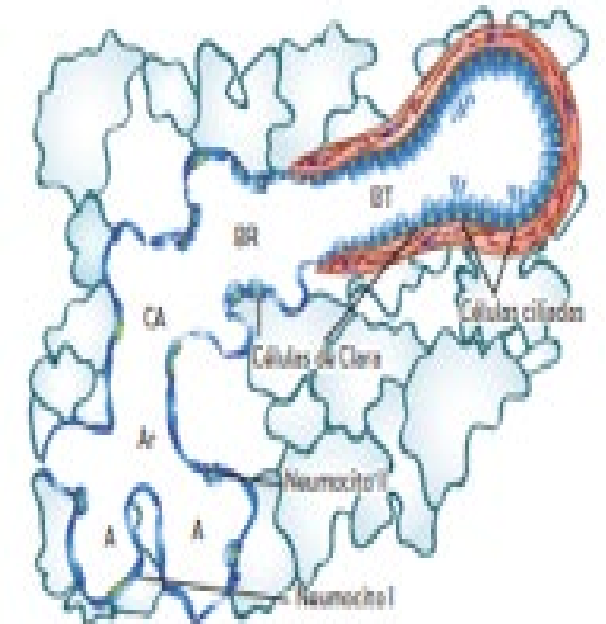
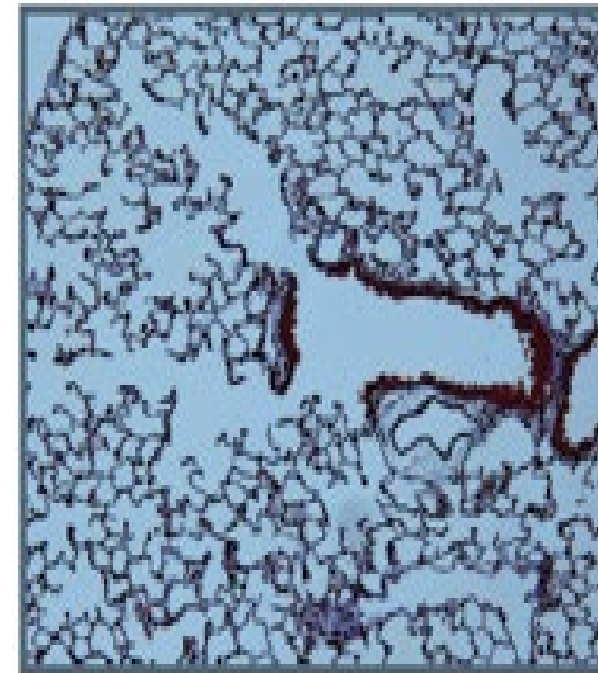
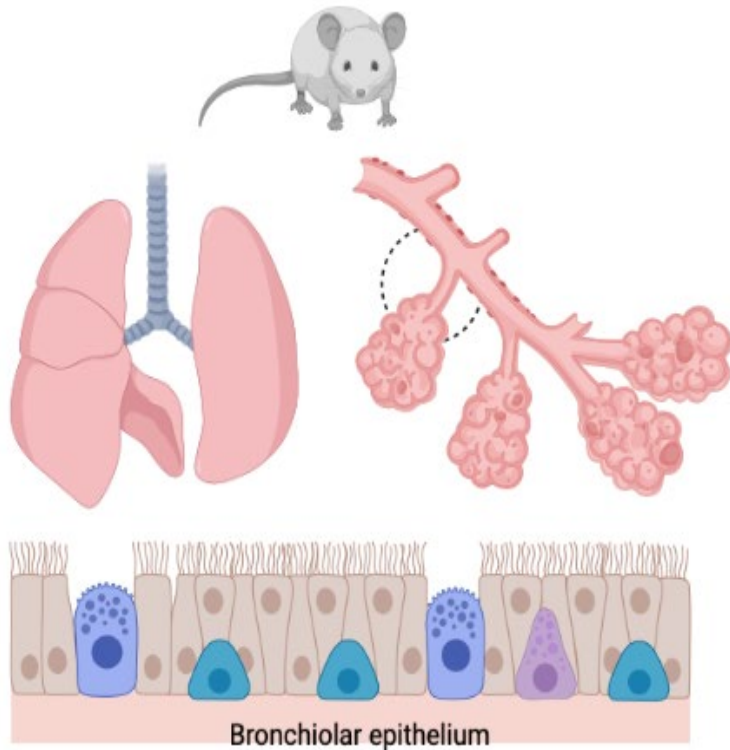
Issue#1: Consideration of vanadium speciation and oxidation state



- In vitro
 - Different concentrations of VO_2^+ or NaVO_3
 - A549 lung cancer cell line
 - The higher the valence the higher the toxicity



Issue#2: Interpreting nonneoplastic lesions in the upper and lower respiratory tract and alveolar/bronchiolar neoplasms in rodents.

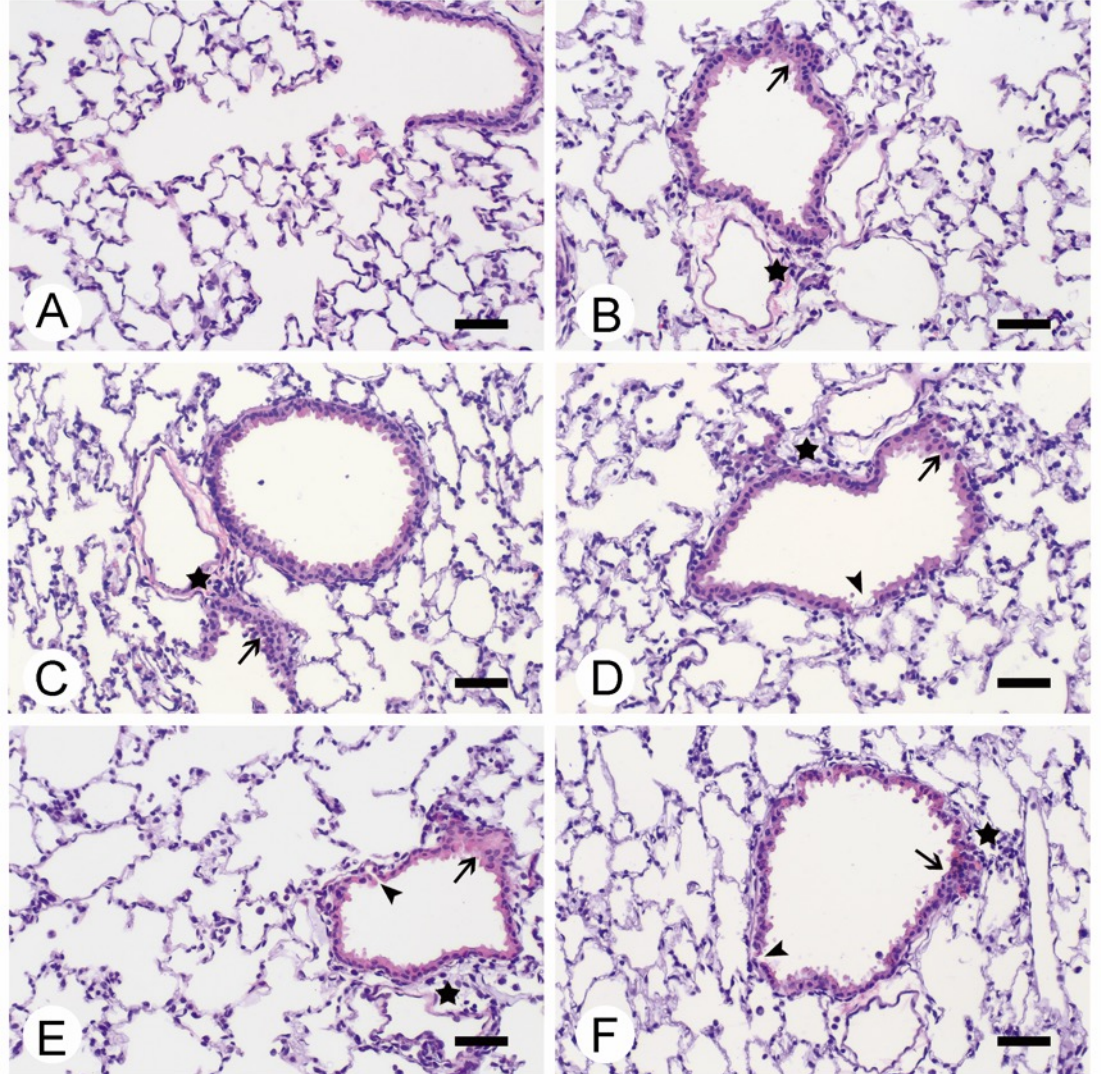




Issue#2: Interpreting nonneoplastic lesions in the upper and lower respiratory tract and alveolar/bronchiolar neoplasms in rodents.



- In our inhalation exposure experiments
 - We made a solution from V_2O_5 .
 - The concentrations in the inhalation chamber were:
 - 1.56 mg/m³
 - 2.57 mg/m³

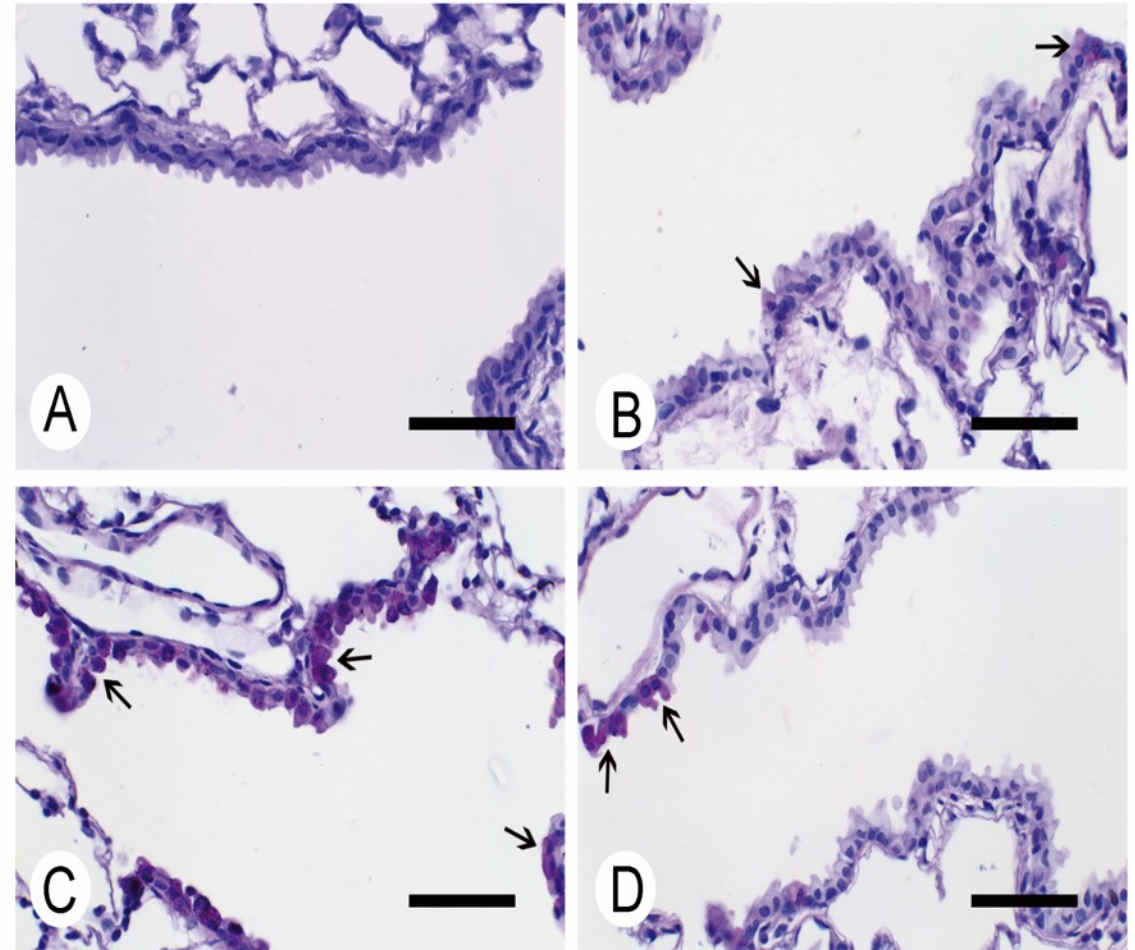




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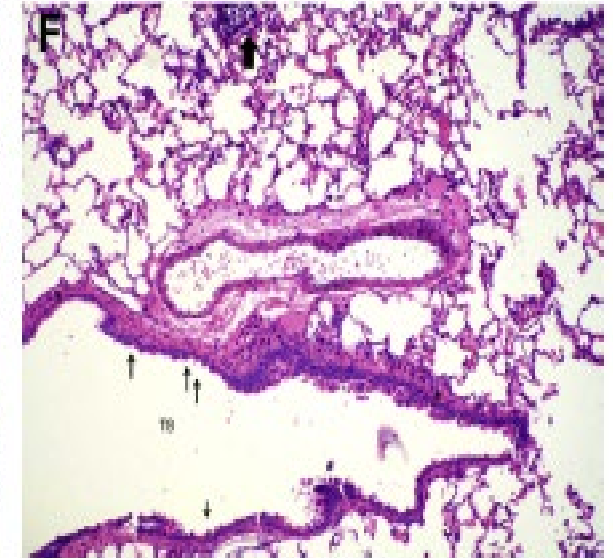
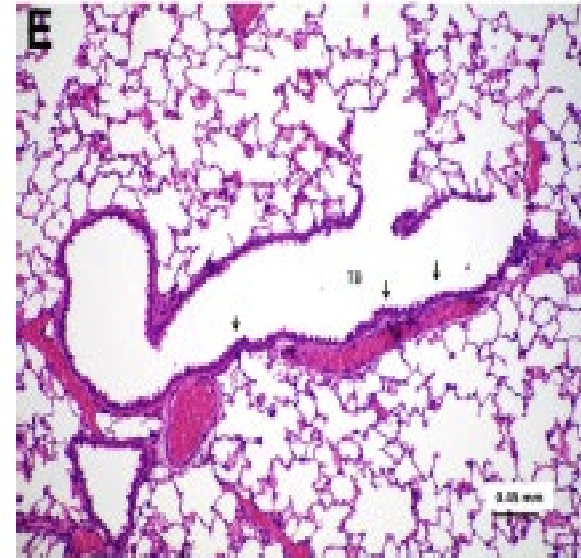
- With the higher concentration in a 12-wk exposure, no changes suggesting dysplasia in lung epithelium were observed, only hyperplasia of the club cell and mucous metaplasia in the bronchioli.





Issue#2: Interpreting nonneoplastic lesions in the upper and lower respiratory tract and alveolar/bronchiolar neoplasms in rodents.

- In male rats (Wistar)
 - After 12-wk exposure, increase in IL-6 and TNF α
 - Peribronchiolar infiltrate
 - Inflammatory foci in the parenchyma
- In a mice model (male and female)(CD-1)
 - Mucous metaplasia
 - Peribronchial and perivascular infiltrate
 - Hyperplasia and sloughing of the club cell (NCBC)
 - Increase of CC16 in the bronchiolar epithelium



Fortoul TI et al., Inhalation of vandium pentoxide and its toxic effects in a mouse model.
Inorganica Chimica Acta 2014;420:8-15.

López-Valdez N et al., The role of the non-ciliated bronchiolar cell in the tolerance to inhaled vanadium of the bronchilar epithelium.
Histology and Histopathol 2020;35:497-508.