**Vitamin K3 Inhibits Hepatic Cystogenesis In Vitro and In Vivo: A New Therapeutic Approach for Treatment of Polycystic Liver Diseases**

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**Background**

- In Polycystic Liver Diseases (PCLDs), by pre-proliferation of cholangiocytes plays a prominent role in hepatic cystogenesis.
- We have shown that in the PCK rat, an animal model of one of the PCLDs, ARPKD, growth of liver cysts is associated with increased expression of Cdc25A - a cell cycle regulator and is involved in the G1/S and G2/M transitions.
- Cdc25A suppression decreases cholangiocyte proliferation and hepatic disease progression as reflected by a reduction in cyst volume.

**Hypothesis**

- Cdc25A suppression decreases cholangiocyte proliferation and inhibit hepatic cyst growth.

**Aims**

- To assess the effect of Vitamin K3 on hepatic and renal disease progression in vivo in the PCK rat.
- To evaluate the effect of VK3 on hepatic and renal disease progression in vitro in the PCK rat.
- To evaluate the effect of VK3 on hepatic and renal disease progression in vivo in the PCK rat.

**Experimental Models and Approaches**

- In vivo, changes in areas of PCK cystic bile ducts grown in 3-D culture were assessed. VK3 was administered in the presence/absence of VK3, and cell proliferation was assessed. VK3 treatment significantly reduced cyst volume and hepatic fibrosis.
- In vitro, cell proliferation was assessed in the presence/absence of VK3, and cell proliferation was assessed. VK3 treatment significantly reduced cyst volume and hepatic fibrosis.

**Results**

- VK3 treatment significantly decreased cholangiocyte proliferation and hepatic cyst growth.
- VK3 treatment significantly decreased cholangiocyte proliferation and hepatic cyst growth.

**Conclusions**

- In vitro, VK3 suppresses hepatic cyst growth.
- In vivo, VK3 treatment:
  - decreases liver and kidney size.
  - suppresses hepatic and renal cyst volume.
  - inhibits hepatic and renal fibrosis.
- VK3 treatment significantly reduces hepatic and renal fibrosis.
- VK3 treatment significantly reduces hepatic and renal fibrosis.

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