

Cancer stem cells killed by ClO₂?

“Chlorine dioxide (ClO₂) has shown potential in inducing apoptosis in certain cancer cell lines, including small-cell lung cancer (SCLC) cells, with minimal toxicity to normal cells. In a study on SCLC cells (DMS114), **ClO₂ treatment significantly increased apoptotic cell death**, with rates reaching **49.6% at 5 mg/L** after 48 hours, accompanied by nuclear blebbing and vacuolar formation. The mechanism involves **oxidative stress, reactive oxygen species (ROS) generation, and DNA damage**, leading to cell cycle arrest (G2/M phase) and apoptosis. However, the effect was less pronounced in normal human umbilical vein endothelial cells (HUVEC), suggesting a selective toxicity toward cancer cells.

While these findings indicate **ClO₂ can kill cancer cells**, including those with stem-like properties, **direct evidence that ClO₂ specifically targets and eliminates cancer stem cells (CSCs) is currently lacking** in the provided context. The research focuses on bulk cancer cell death rather than CSC-specific eradication. Furthermore, the use of ClO₂ in metastatic or incurable cancers remains **controversial and not clinically established**, requiring further *in vivo* and clinical investigation.

Key mechanisms of ClO₂ action:

- *Induces oxidative stress and ROS production.*
- *Oxidizes proteins, DNA, and polyamines.*
- *Triggers apoptosis via mitochondrial and DNA damage pathways.*
- *Causes G2/M cell cycle arrest in cancer cells.*

In summary, ClO₂ shows anticancer activity in vitro, but its ability to specifically kill cancer stem cells remains unproven based on current evidence.”

AI-generated answer. Please verify critical facts.

Response from Brave Search .
