

**From:** [Rebecca Fuoco](#)  
**To:** [Biomonitoring California](#)  
**Subject:** Public Comment: Request to Add Chloroxylenol to Designated Chemicals List  
**Date:** Wednesday, March 4, 2026 12:56:48 PM

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EXTERNAL:

Dear Members of the Biomonitoring California Scientific Guidance Panel,

The Green Science Policy Institute recommends that chloroxylenol be added to the Biomonitoring California program's designated chemicals list. This widely used antimicrobial has recently been detected in human breast milk, and animal studies link it to endocrine disruption, reproductive toxicity, cancer, neurotoxicity, cardiovascular toxicity, and skin harm. Emerging evidence also suggests it can contribute to antimicrobial resistance. Chloroxylenol use is expected to grow as other antimicrobial active ingredients face regulatory scrutiny in California. Our formal request is provided below, and we welcome any questions.

Rebecca Fuoco, MPH  
Director of Science Communications  
Green Science Policy Institute

### **Request to Add Chloroxylenol to Designated Chemicals List**

The Green Science Policy Institute respectfully requests that the Office of Environmental Health Hazard Assessment (OEHHA) designate chloroxylenol (PCMX) for inclusion in the Biomonitoring California program.

Chloroxylenol is a high-production-volume antimicrobial used in antibacterial hand soaps, dishwashing liquids, hand sanitizers, disinfectants, and as a preservative in cosmetics. Over the past decade, it has become a primary substitute for triclosan (TCS) and triclocarban (TCC)—chemicals already identified by California as priority or designated chemicals. Other common substitutes include quaternary ammonium compounds (QACs), now under regulatory scrutiny by the California Department of Toxic Substances Control. With QACs likely to be phased out of certain uses, PCMX use is expected to expand. At the same time, the COVID-19 pandemic drove a sustained increase in antimicrobial product use, further elevating population-level exposure to PCMX.

Recent biomonitoring data demonstrate that significant exposure is already occurring and that it reaches vulnerable populations. PCMX was recently detected in human breast milk samples in Canada and South Africa. In China, mean urinary concentrations in children and pregnant women exceeded levels reported for TCS and TCC in the same populations. Despite its widespread use, there are currently no U.S. population biomonitoring data for

PCMX.

A growing body of peer-reviewed literature raises concerns relevant to OEHHA's designation criteria (see studies below). Animal studies link PCMX to endocrine and reproductive harm, including reduced testosterone and estradiol levels and testicular tissue damage in rats. Results from a study in mice suggest PCMX may exacerbate inflammatory bowel disease and increase the risk of related colon cancer. Developmental studies in aquatic models report disruption of endocrine, metabolic, neurological, and cardiovascular systems. Finally, emerging evidence suggests that chloroxylenol may contribute to antimicrobial resistance, an issue of increasing public health importance.

Given its structural similarity in use profile to monitored and regulated antimicrobials, documented presence in human biological samples, and expanding use as a replacement chemical, PCMX meets multiple criteria for biomonitoring consideration. Designating chloroxylenol would allow California to generate essential exposure data, identify potentially disproportionate exposures, track trends over time, and inform evidence-based decision-making regarding antimicrobial use in consumer products.

Thank you for your consideration of this request and for OEHHA's continued leadership in protecting public health. We would be happy to schedule a meeting or provide additional information in writing.

Sincerely,

Rebecca Fuoco, MPH  
Director of Science Communications  
Green Science Policy Institute  
[Rebecca@GreenSciencePolicy.org](mailto:Rebecca@GreenSciencePolicy.org)

### **Relevant Peer-Reviewed Studies on PCMX**

#### **Human Exposure**

- PCMX was detected in human breast milk samples from Canada and South Africa. ([Chi et al. 2026](#))
- Mean concentrations of urinary PCMX in children and pregnant women in China were 21.6 and 31.9  $\mu\text{g}\cdot\text{L}^{-1}$ , respectively, which were much higher than TCS and TCC. ([Tan et al. 2021](#)).

#### **Endocrine Disruption and Reproductive Toxicity**

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Rats exposed to PCMX had significant dose-dependent reduction in testosterone and estradiol levels with marked histopathological alterations affecting testicular tissues. ([El-Naggar et al. 2022](#))

- PCMX disrupted key endocrine, reproductive, and metabolic pathways in early-life stage rainbow trout, leading to significant developmental abnormalities and mortality. ([Amekor et al. 2025](#))

## Cancer

- In mice, low doses of PCMX increased colonic inflammation and colon tumorigenesis. The authors conclude “that these widely used antimicrobial compounds could exaggerate disease development of inflammatory bowel disease and associated colon cancer.” ([Sanidad et al. 2018](#))

## Neurological and Cardiovascular Toxicity

- In zebrafish, PCMX exposure dramatically impacted nervous system development. “Scrutinizing PCMX toxicity is important as the incidence of human exposure to CHX has increased in post-pandemic years. Importantly, PCMX exposure during pregnancy could impact neural development,” the authors warn. ([Rerkamnuaychoke et al. 2025](#))
- In zebrafish, PCMX exposure induced cardiovascular toxicity and neurobehavioural disorders by causing mitochondrial dysfunction, increasing oxidative stress, and triggering apoptosis via the mitochondrial pathway. “Given the prolonged human exposure to PCMX-containing environments, further investigation into its potential role in cardiovascular diseases and neurobehavioral disorders is warranted,” the authors concluded. ([Man et al. 2025](#))
- PCMX induced neurotoxicity, hatching delay or inhibition, mortality, and morphological malformations in zebrafish embryos. ([Sreevidya et al. 2018](#))
- PCMX disrupted formation of cardiovascular systems in zebrafish larva as well as other developmental abnormalities. ([An et al. 2023](#))

## Skin Harm

- Case reports have described skin depigmentation in individuals using Dettol (a chloroxyleneol disinfectant) on the skin. ([Malakar and Panda 2001](#), [Verma et al. 2011](#))
- Case reports have described allergic contact dermatitis in individuals using

chloroxylenol-based disinfecting products. ([Jin et al. 2025](#), [Berthelot and Zirwas 2006](#))

### **Antimicrobial Resistance**

- PCMX was “proved to promote the dissemination” of antibiotic resistance genes between *E. coli* and *Pseudomonas* at environmental concentrations. The authors conclude that “the presence of PCMX in the environment will promote the conjugative transfer of ARGs, which will cause serious ecological security problems around the world.” ([Guo et al. 2022](#))
- PCMX increased both the abundances and diversity of antibiotic resistance genes, particularly for multidrug-resistance genes, in sludge. ([Du et al. 2022](#))

### **Rebecca Fuoco, MPH**

Director of Science Communications  
Green Science Policy Institute

(818) 688-2988  [www.greensciencepolicy.org](http://www.greensciencepolicy.org)

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