

# **Effect of variable concentrations of a novel tooth-whitening agent on naturally-stained extracted teeth**

**Lauren Gray**

## **Abstract:**

Various concentrations of a novel chlorine dioxide (ClO<sub>2</sub>) solution were shown to whiten/lighten intrinsic stains in extracted teeth subjected to a tea-staining solution. There appeared to be a dose-response relationship with treatment of these teeth, but precise correlations were not determined. The objective of this study was to subject sectioned, naturally-stained (> A3 - Vita Classic) teeth to various concentrations of both liquid and gel proprietary ClO<sub>2</sub> solutions to determine the effects on tooth shade; thereby arriving at a dose-response relationship of tooth shade change for this solution.

Naturally stained (determined visually and through electronic shade determination), extracted molars were sectioned with a diamond saw to remove the root portion and then sectioned into two pieces buccolingually. Dentin surfaces of the teeth were etched with phosphoric acid and immersed in USP water for at least one week prior to treatment. Teeth were either treated by immersion in gel or liquid; or dentin surfaces were sealed with acrylic and then these teeth were subjected to gel treatment. Teeth were assessed for shade change by visual and electronic means immediately, 1 day, and 1 week after treatment. Non-linear and linear statistical analyses were conducted to assess dose-response relationships.

Based on 25 separate experiments at concentrations ranging from 0 - 400 ppm ClO<sub>2</sub>, there was a limited dose-response relationship which was non-linear and peaked around 40 - 50 ppm.

A monotonic dose-response relationship was not evident with respect to stain-reduction in extracted, naturally-stained teeth using variable concentrations of this experimental teeth whitening agent.