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[\[PDF \(531K\)\]](#) [\[References\]](#)**Photocatalytic bactericidal action of fluorescent light in a titanium dioxide particle mixture: an in vitro study**[Hironobu Koseki](#)¹⁾, [Koutaro Shiraishi](#)¹⁾, [Tomohiko Asahara](#)¹⁾, [Toshiyuki Tsurumoto](#)¹⁾,
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ABSTRACT

Traditional titanium dioxide (TiO₂) has photocatalytic bactericidal properties only under ultraviolet (UV) irradiation, which restricts its use in clinical treatment regimens. In this study, we evaluated the photocatalytic bactericidal effects of an aqueous system of TiO₂ particles irradiated by fluorescent light (FL) on *Staphylococcus aureus*. A TiO₂ particle mixture containing 19 ppm (0.019 mg/mL) of TiO₂ was prepared. A bacterial solution of 1 × 10⁵ CFU/mL was added one drop at a time to the TiO₂ mixture. The resulting product was then irradiated with FL. The bacterial survival rate decreased steadily in the TiO₂ mixture group, reaching 76.7% after 30 min of FL irradiation and 10.9% after 60 min. After 60 to 180 min, the bacterial survival ratio of the TiO₂ mixture group was significantly lower than that of the control group (*P* < 0.05). The present study indicates that treating the surfaces of surgical devices and the surgical field with a TiO₂ particle mixture can create a nearly sterile environment that can be maintained throughout surgery, even at low luminous intensities.

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