

**Inactivation and degradation of antibiotic-resistant bacteria and its gene by Cu (II)/H<sub>2</sub>O<sub>2</sub> system**

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This study deals with the degradation and/or removal of antibiotic resistant bacteria (ARB) and antibiotic resistant gene (ARG) using Cu(II)/H<sub>2</sub>O<sub>2</sub>. The removal of ARB using Cu(II) was achieved, however, the inactivation capability was considerably improved when supplement with H<sub>2</sub>O<sub>2</sub>. The improved ARB inactivation was confirmed by: (1) Addition of copper chelating agents, EDTA (for Cu(II)) and DMP (for Cu(I)) to block Cu(II)/Cu(I) redox cycle, (2) Addition of radical scavenger t-BuOH proving that ARB is mainly inactivated by Cu(III), and (3) Addition of H<sub>2</sub>O<sub>2</sub> to produce Cu(I) and Cu(III). To investigate the cell destruction, PI staining was applied to check cell membrane integrity, and cell-permeability test to identify intra- and extra-cellular oxidative damage. In case of ARG inactivation, the efficiency was up to 5.5% when Cu(II) was treated alone, then it was improved up to 85% within 20 min when supplement with H<sub>2</sub>O<sub>2</sub> in the reaction. Therefore, it is concluding that Cu (II)/H<sub>2</sub>O<sub>2</sub> system is not only potential for inactivation of ARB but also inactivation of ARG under neutral pH condition.

**Biography**

Byung-Taek Oh is an Environmental Scientist, Author and Educator, who developed a new strategy in toxic pollutant remediation field. His expertise and contextual evaluation model based on responsive constructivists creates a new pathway for improving environmental pollution removal. He has framed a network in research to create a model to remediate microbes and toxic pollutant from environment has added a feather to his cap. He has built this model after years of experience in research, evaluation, teaching and administration both in laboratory and education institutions. The research foundation is based on his American carrier with network development and his excellence in environmental research by measurement, description and judgment. He has awarded with excellence in several aspects of research by his university and in several research occasions.

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