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## **Rapid Depletion of Dissolved Oxygen in 96-Well Microtiter Plate *Staphylococcus epidermidis* Biofilm Assays Promotes Biofilm Development and Is Influenced by Inoculum Cell Concentration**

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### **Abstract:**

Biofilm-related research using 96-well microtiter plates involves static incubation of plates indiscriminate of environmental conditions, making oxygen availability an important variable which has not been considered to date. By directly measuring dissolved oxygen concentration over time we report here that dissolved oxygen is rapidly consumed in *Staphylococcus epidermidis* biofilm cultures grown in 96-well plates irrespective of the oxygen concentration in the gaseous environment in which the plates are incubated. These data indicate that depletion of dissolved oxygen during growth of bacterial biofilm cultures in 96-well plates may significantly influence biofilm production. Furthermore higher inoculum cell concentrations are associated with more rapid consumption of dissolved oxygen and higher levels of *S. epidermidis* biofilm production. Our data reveal that oxygen depletion during bacterial growth in 96-well plates may significantly influence biofilm production and should be considered in the interpretation of experimental data using this biofilm model.

Key-words: 96-well plate, biofilm, oxygen, *Staphylococcus epidermidis*