

Abstract Submitted
for the GEC13 Meeting of
The American Physical Society

Growth control of budding yeast cells by oxygen-radical treatment TAKAYUKI OHTA, HIROSHI HASHIZUME, MASAFUMI ITO, Meijo University, KEIGO TAKEDA, MASARU HORI, Nagoya University — Microorganisms respond to stimuli or stresses such as chemicals, nutrition, pressure, heat and so on. Those stimuli lead to cell activation, inactivation or cell death, such as apoptosis and necrosis. Reactive oxygen species possibly affect cell growth as well as inactivation depending on stimuli. In this study, we investigated effects of oxygen-radical treatment on not only inactivation but also promoted/repressed cell growth of budding yeast by varying dose of atomic oxygen produced from an atmospheric-pressure oxygen radical source. Dose of atomic oxygen was estimated based on treatment time and oxygen flux. Cell growth was promoted with atomic oxygen between 0 and $2.1 \times 10^{19} \text{ cm}^{-2}$ dose of atomic oxygen. The treated cells were grown about 10 percent more proliferously than the control cells. Moreover, 64 percent of the treated cells to the control ones were inactivated at more than $4.2 \times 10^{20} \text{ cm}^{-2}$. These results, therefore, suggested that atomic-oxygen dose had a potential to control mitotic promotion and repression, and inactivation of yeast cell growth.

Takayuki Ohta
Meijo University

Date submitted: 14 Jun 2013

Electronic form version 1.4