

Molecular explanations for the toxicity of oxygen



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E. coli has been a very productive model system in which to ask fundamental questions about oxidative stress. How rapidly are reactive oxygen species formed inside cells? What biomolecules do they most readily damage? How does the cell defend itself? One can approach these problems directly by using mutant strains of *E. coli* that cannot degrade H_2O_2 . Surprisingly, sub-micromolar H_2O_2 is sufficient to activate H_2O_2 -response systems, which implies that such low doses constitute a hazard. Further, the growth defects of these strains allow one to pinpoint the molecular mechanisms of damage and to identify the rationale for aspects of the stress response. It is likely that these results pertain not only to *E. coli* but to most organisms.

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1008 West Hazelwood Drive
College of Veterinary Medicine



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