Welcome

to the

Ozone SeminarCongress

Munich

May 23 – 25, 2003

European Cooperation of

Ozone SeminarCongress

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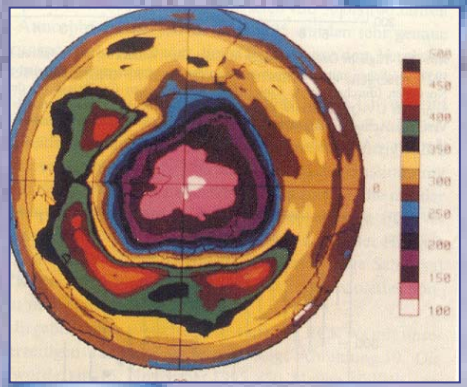
The Janus-headed Ozone

OZONE – the Janus-headed Molecule



Ozone – as a molecule!!??

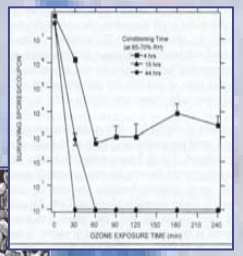
Bio

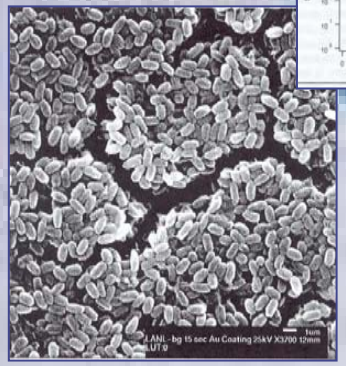
Evidence for Antibody-Catalyzed Ozone Formation in Bacterial Killing and Inflammation

Paul Wentworth Jr.,[1] Jonathan E. McDunn,[1] Anita D. Wentworth,[1] Cindy Takeuchi,[2] Jorge Nieva,[3] Teresa Jones,[1] Cristina Bautista,[1] Julie M. Ruedi,[3] Abel Gutierrez,[3] Kim D. Janda,[1] Bernard M. Babior,[3] Albert Eschenmoser[1,4] Richard A. Lerner[1]

Recently, we showed that antibodies catalyze the generation of hydrogen peroxide (H_2O_2) from singlet molecular oxygen ($^1O_2$*) and water. Here, we show that this process can lead to efficient killing of bacteria, regardless of the antigen specificity of the antibody. H_2O_2 production by antibodies alone was found to be not sufficient for bacterial killing. Our studies suggested that the antibody-catalyzed water-oxidation pathway produced an additional molecular species with a chemical signature similar to that of ozone. This species is also generated during the oxidative burst of activated human neutrophils and during inflammation. These observations suggest that alternative pathways may exist for biological killing of bacteria that are mediated by potent oxidants previously unknown to biology.

Ozone gap





Ozon für Queen Mum

Die britische Königinmutter „Queen Mum“ (100) hält sich mit regelmäßigen Ozonspritzen fit. Wie eine englische Zeitung berichtet, ist die alte Dame überzeugt, dass die Injektionen von verflüssigtem Ozon für ihren guten Gesundheitszustand mitverantwortlich sind. Die Behandlung ist allerdings umstritten: Im staatlichen britischen Gesundheitsdienst bekommt man die Spritzen nicht, wohl aber bei Ärzten, die sich der alternativen Medizin verschrieben haben. Es wird vermutet, dass **Prinz Charles**, der auch öffentlich schon Zweifel an der Schulmedizin angemeldet hat, seine Großmutter auf den Gedanken gebracht hat. (dpa)

OZON – as a Biomolecule

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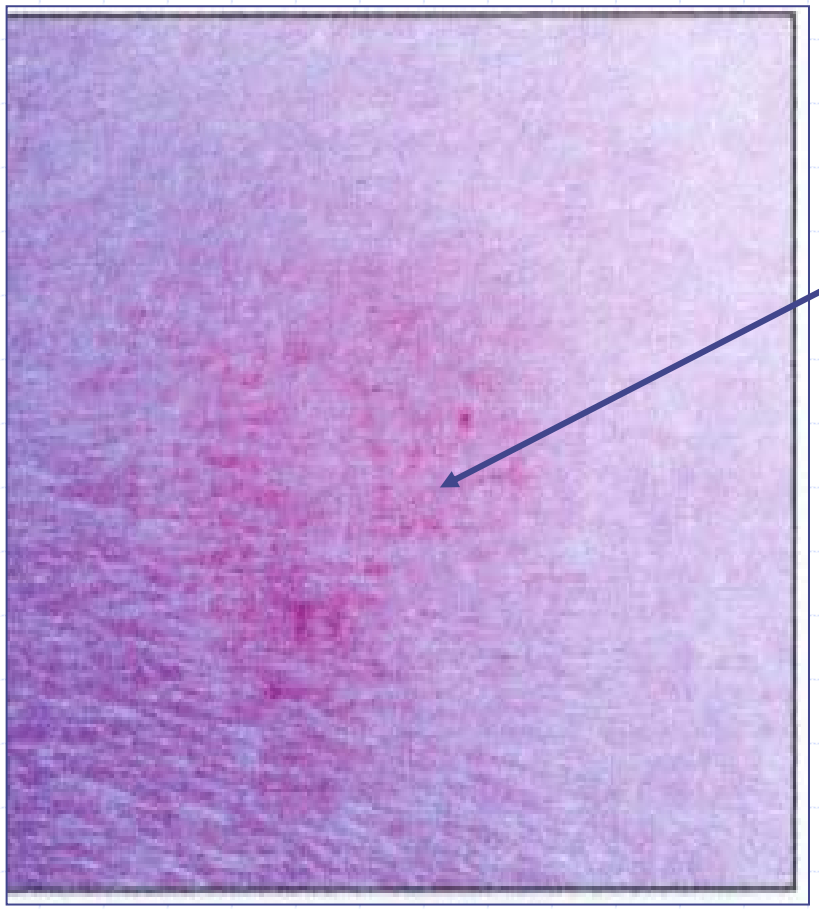
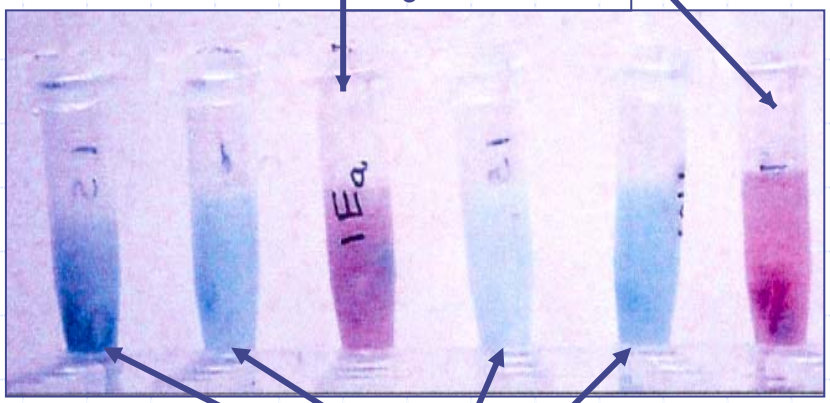
Ozone – as a Biomolecule

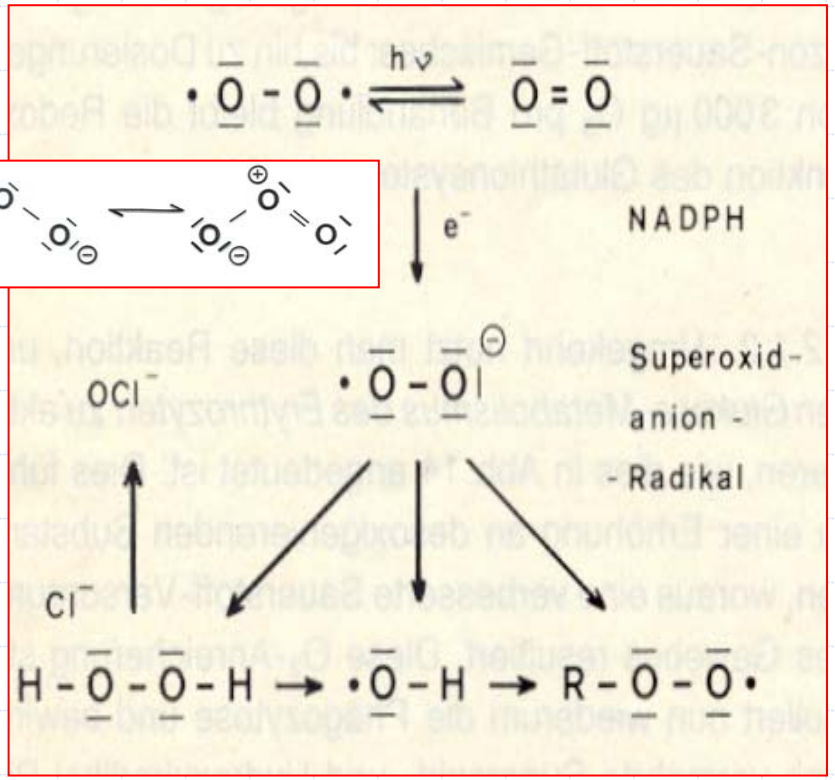
Wentworth et al. Science, December 13, 2002

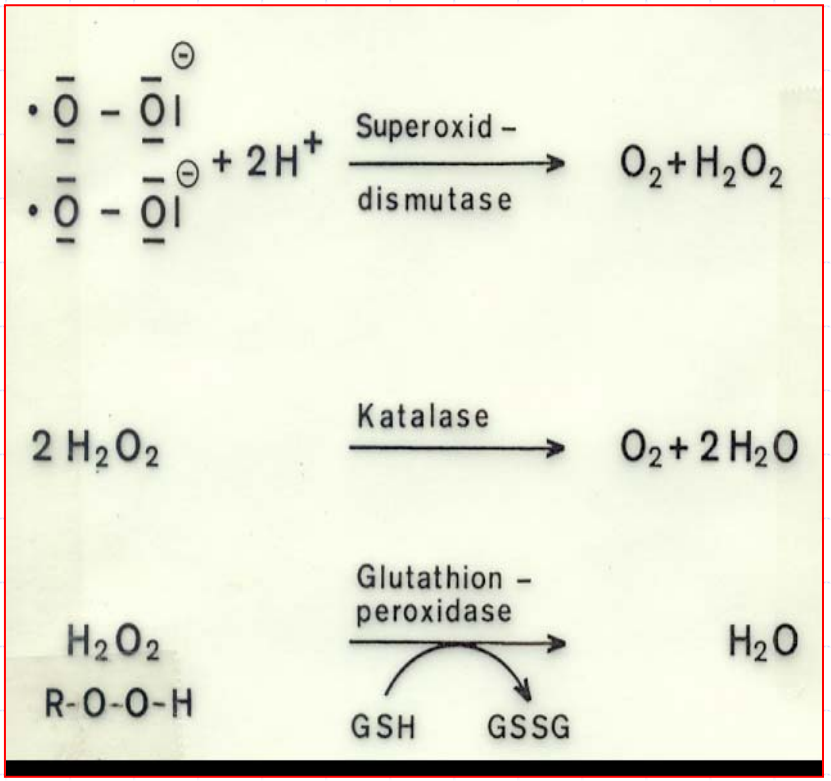


Physiological Ozone production as response of the biological system to an inflammation ?

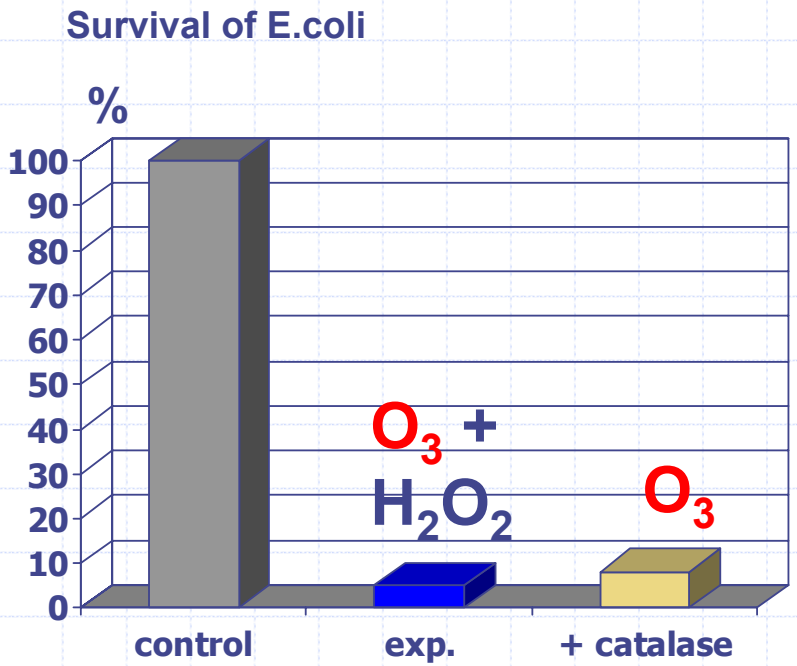


Reactive Oxygen Spezies ROS in the biological System

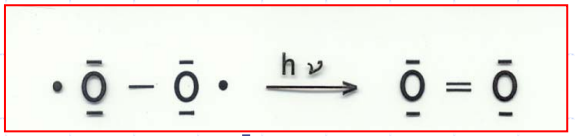




Biological ozone formation catalyzed by antibodies. Bactericidal activity (Wentworth et al. 2002):



The high bactericidal activity without and with catalase is explained by Ozone as intermediate



+ H_2O

+

specific E.Coli antibodies

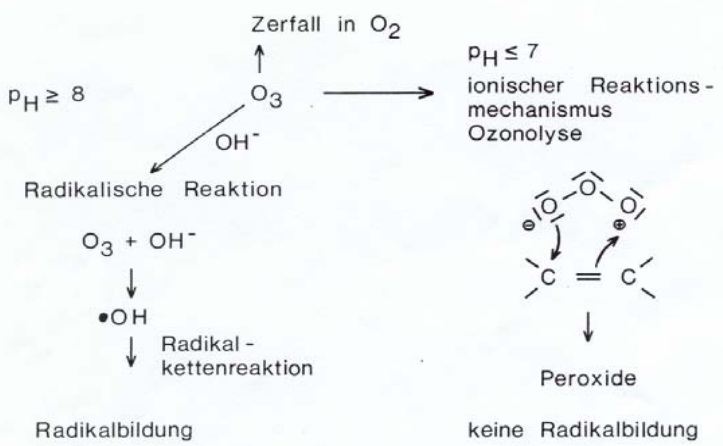
$O_3 + H_2O_2$

Water oxidation pathway of specific antibodies in the biological system

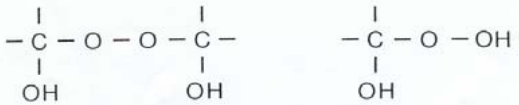
Reaction Mechanisms of Ozone

a.

b.



c.



a. Molecular structure

b. Reaction mechanisms of ozone

c. „Ozone peroxides“