Elucidation of internal generation of new nitrogen dioxide-like species and its defense mechanisms.

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2001 Fiscal Year Final Research Report Summary

Elucidation of internal generation of new nitrogen dioxide-like species and its defense mechanisms.

Research Project

Project/Area Number
11307006
Research Category
Grant-in-Aid for Scientific Research (A)
Allocation Type
Single-year Grants
Section
一般
Research Field
Hygiene
Research Institution
Kanazawa University
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Project Period (FY)
1999 – 2001
Keywords
eosinophil / peroxidase / nitrotyrosine / immunohistochemistry / NC / Nga mouse / Eol-1 / reactive nitrogen species / heme
Research Abstract

The pathophysiological significance of free-tyrosine or protein-bound tyrosine nitration by the generation of reactive nitrogen species via eosinophil peroxidase was investigated with eosinophils, eosinophil-derived leukemia cells or atopic dermatitis- like-NC/Nga mice. Regarding the immunohistochemical staining method, artifact were

occasionally observed in sections containing eosinophils. As a result of this research, an increase in the immunostaining cells for nitrotyrosine in eosinophils of atopic dermatitis-like lesions in NC/Nga mice and the susceptibility of nitrotyrosine staining in eosinophils by reactive nitrogen species derived from adjacent cells were demonstrated. Therefore, it was speculated that eosinophils have a role in the scavenging of reactive nitrogen species. We demonstrated that the expression of myeloperoxidase in human eosinophilic leukemia cell line (Eol-1) occurred when the cells were degenerated by butyric acid and when the ability of nitrotyrosine formation was detected after cytospin preparations of the cells with H_20_2 and NO_2 contrary to the expectation of eosinophil peroxidase expression. Moreover, in further investigations into the localization of peroxidase responsible for the nitration of tyrosine in rat organs, two peroxidases were recognized. One is eosinophil peroxidase found in the gastrointestinal tract and the other is an unknown peroxidase -like that found in the lungs, spleen and heart. In the heart, an unknown peroxidase-like enzymes or the heme protein contributed for the nitration of tyrosine was localized in myocytes.

Research Products (15 results)

All Ot	ther
All Publicati	ions
[Publications] Nakamura H, Nagase H, Ogino K, Hatta K, Matsuzaki I: "Uteroplacental circulation disturbance mediated by prostaglandin f2alpha in rat exposed to microwaves"Reprod Toxicol. 14. 235-240 (2001)	~
[Publications] Ogino K, Kodama N, Nakajima M, Yamada A, Nakamura H, Nagase H, Sadamitsu D, Maekawa T: "Catalse catalyzes nitrotyrosine formation from sodium azide and hydrogen peroxide"Free Radic Res. 35. 735-747 (2001)	~
[Publications] Nakamura H, Ogawa Y, Nagase H, Nakajima M, Kodama N, Ogino K, Oshita Y: "Natural killer cell activity and its related psychological factor, sense of coherence in male smokers."J Occup Health. 43. 191-198 (2001)	~
[Publications] Nakajima M, Takeuchi T, Ogino K, Morimoto K: "Lack of direct involvement of 8-hydroxy-2'-deoxyguanine in hypoxanthine-guanine phosphoribosyltransferase mutagenesis in V79 cells treated with N, N'-bis(2-hydroxypeoxy-2-methoxyethyl)-1,4,5,8-naphthalenetetracarboxylicidimide(NP-III) or riboflavin"Jpn J Cancer Res. 93. 247-252 (2002)	~
[Publications] Ogino K, Nakajima M, Kubao M, Kimura S, Nagase H, Nakamura H: "Immunohistochemical artifact for nitrotyrosine in human eosiophilis or eosinophil containing tissue"Free Radic Res. 36. 1163-1170 (2002)	~
[Publications] Kodama N, Kambayashi Y, Kubo M, Kimura S, Nakamura H, Ogino K: "Induction of myeloperoxidase and nitrotyrosine in human eosinophilic leukemia cell line, Eol-1"Cell Biochem Funct. (in press).	~
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[Publications] Nakamura H, Nagase H, Ogino K, Hatta K, and Matsuzaki I: "Involvement of central, but not placental corticotrpopin releasing hormone (CRH) in heat stress- induced immunosuppression during pregnancy"Brain Behav Immun. 15. 43-53 (2001)	~
[Publications] Ogino K, Kodama N, Nakajima M, Yamada A, Nakamura H, Nagase H, Sadamitsu D, Maekawa T: "Catalase catalyzes nitrotyrosine formation from sodium azide and hydrogen peroxide."Free Radic Res. 35. 735-747 (2001)	~
[Publications] Nakamura H, Ogawa Y, Nagase H, Nakajima M, Kodama N, Ogino K, Ooshita Y: "Natural killer cell activity and its related psychological factor, sense of coherence in male smokers."J Occup Health. 43. 191-198 (2001)	~
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