

合成サーファクタントの開発と肺胞II型上皮細胞に対する保護作用の検討

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2004 Fiscal Year Final Research Report Summary

Development of synthetic surfactant and its protective effect on alveolar type II cell

Research Project

Project/Area Number

15591621

Research Category

Grant-in-Aid for Scientific Research (C)

Allocation Type

Single-year Grants

Section

一般

Research Field

Anesthesiology/Resuscitation studies

Research Institution

Kanazawa University

Principal Investigator

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Project Period (FY)

2003 - 2004

Keywords

surfactant protein / E.coli / alveolar type II cell / surfactant inhibition / ischemia reperfusion injury / inflammation / nicotine amide / alveoli

Research Abstract

(1)Development of a synthetic surfactant protein. A synthetic peptide mimicking surfactant protein-C (Sp-C) was expressed in E.coli, by using pET80 vector and synthetic DNA. However, the yield of synthetic peptide was extremely low. Next, we tried to express the synthetic peptide as fusion proteins fused with DHPP protein using pQE40 vector and with tluoredoxin using pET32a. However, the yields were low in both cases. The low yield is thought to be because of high toxicity of the synthetic peptide to E.coli. So, we could not succeed in expressing synthetic peptide.

(2)Protective of effect of hypercapnia. High concentration of carbon dioxide (suppressed the increase of TNF released from alveolar type II cell stimulated by IL-1 under cell culture. The levels of mRNA for inflammatory cytokine were not elevated. So, high concentration of carbon dioxide inhibits TNF release at the post-transcription level.

(3)Effect of nicotine amide of lung ischemia rperfuusion injury. The left lung of adult rats was reperfrised after 90 min of ischemia. The arterial oxygen pressure of rats given nicotinamide was 290 ± 80 (SD) mmHg and was significantly higher than that of the control rat (about 100 mmHg). Nicotine amide significantly reduced the lung ischemia reperfusion injury.

(4)Analysis of the lung expansion after surfactant impairment. Mechanical ventilation of immature newborn rabbits treated with surfactant mixed with serum causes the

collapse of small alveoli and the overexpansion of large alveoli. However, this surfactant increased the tidal volume to the same extent as normal surfactant. Normal tidal volume dose not necessarily mean normal surfactant function and may lead to overlooking impaired surfactant function.

Research Products (10 results)

All 2004 2003

All Journal Article

[Journal Article] 血清で希釈されたサーファクタントによる肺胞の過伸展と虚脱

2004 ▼

[Journal Article] Lung volumes and alveolar expansion pattern in immature rabbits treated with serum-diluted surfactant.

2004 ▼

[Journal Article] Over-distension and collapse of alveoli induced by serum-diluted surfactant (in Japanese)

2004 ▼

[Journal Article] Lung volumes and alveolar expansion pattern in immature rabbits treated with serum-diluted surfactant.

2004 ▼

[Journal Article] Aerosolized surfactant and dextran for experimental acute respiratory distress syndrome caused by acidified milk in rats

2003 ▼

[Journal Article] Modified protocols for surfactant therapy in experimental meconium aspiration syndrome

2003 ▼

[Journal Article] Effects of various forms of surfactant protein C on tidal volume in ventilated immature newborn rabbits

2003 ▼

[Journal Article] デキストランは合成サーファクタントの活性を改善する

2003 ▼

[Journal Article] Effects of various forms of surfactant protein C on tidal volume in ventilated immature newborn rabbits

2003 ▼

[Journal Article] Dextran improves function of syntheteic surfactant (in Japanese)

2003 ▼

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-15591621/155916212004kenkyu_seika_hokoku

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