

# 担子菌・子嚢菌に由来する神経成長因子プロモーターの探索研究

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# 2000 Fiscal Year Final Research Report Summary

## Investigation of nerve growth factor promotor from fungi

Research Project

### Project/Area Number

11672213

### Research Category

Grant-in-Aid for Scientific Research (C)

### Allocation Type

Single-year Grants

### Section

一般

### Research Field

医薬分子機能学

### Research Institution

Kanazawa University

### Principal Investigator

**OHTA Tomihisa** Faculty of Pharmaceutical Sci. professor, 薬学部, 教授 (50108560)

### Project Period (FY)

1999 - 2000

### Keywords

nerve growth factor / NGF / neurotrophic gactor / Basidiomycetes / PC-12 / Sarcodon scabrosus / scabronine / diterpenoid

### Research Abstract

Novel cyathane-type diterpenoids, scabronine A-F, were isolated from the fruit body of the mushroom, *Sarcodon scabrosus* (Fr.) Karst. The stereostructures of those were elucidated on the basis of the spectroscopic analysis. Among these compounds, scabronines A, B, C and E exhibit inductive activity of the nerve growth factor synthesis. Further investigation yielded three more congeners, scabronine G, H and I.

When rat pheochromocytoma cells (PC-12) were cultivated with the conditioned medium of human astrocytoma cells (1321NI) incubated with the new diterpenoids, scabronines A and G, isolated from *Sarcodon scabrosus*, they changed their morphology and there was neurite outgrowth. The scabronines increased the expression of nRNA for nerve growth factor (NGF), and the secretion of NGF from 1321NI cells in a concentration-dependent manner. However, the enhanced neurite outgrowth produced by the conditioned media was slightly inhibited by NGF neutralizing antibody, and the concentration of NGF released in response to the scabronines was insufficient to cause differentiation.

In conclusion, the new diterpenoids scabronines A and G potently stimulate the secretion of neurotrophic factors, including NGF. They are useful drugs to clarify the mechanism of synthesis and secretion of neurotrophic factors.

# Research Products (13 results)

All Other  
All Publications

- [Publications] Y.Obara,T.Ohta 他: "Scabronine G-Methylester Enhances Secretion of Neurotrophic Factors Mediated by an Activation of Protein Kinase C- $\zeta$ ."Mol.Pharm.. 59. 1-11 (2001) ▼
- [Publications] S.Hosoi,T.Ohta 他: "Synthesis of Four Possible Stereoisomers of 1,2-Epoxy-3-hydroxyerythrinans : Total Synthesis of an Alkenoid-Type Erythrinan Alkaloid, ( $\pm$ )-Erythratidine".J.Chem.Soc.Perkin Trans 1. 1505-1511 (2000) ▼
- [Publications] K.Yoshikawa,T.Ohta 他: "Polyhydroxylated Sterols from the Octocoral *Dendronephthya gigantea*".J.Nat.Prod.. 63. 670-672 (2000) ▼
- [Publications] A.Segawa,T.Ohta 他: "Studies of *Didymocarpus leucocalyx* C.B.CLARKE (Gesneriaceae)".Chem.Pharm.Bull. 47. 1404-1411 (1999) ▼
- [Publications] T.Ohta,K.Uwai 他: "Absolute Stereochemistry of Cicutoxin and Related Toxic Polyacetylenic Alcohols from *Cicuta virosa*".Tetrahedron. 55. 12087-12098 (1999) ▼
- [Publications] Y.Obara,T.Ohta 他: "Stimulation of neurotrophic factor secretion from 1321N1 human astrocytoma cells by novel diterpenoids, scabronines A and G".European Journal of Pharmacology. 370. 79-84 (1999) ▼
- [Publications] Y.Obara, H.Kobayashi, T.Ohta, Y.Ohizumi, and N.Nakahata: "Scabronine G-Methylester Enhances Secretion of Neurotrophic Factors Mediated by an Activation of Protein Kinase C- $\zeta$ ."Mol.Pharm.. 59. 1-11 (2001) ▼
- [Publications] K.Yoshikawa, S.Kanekuni, M.Hanahusa, S.Arihara, T.Ohta: "Polyhydroxylated Sterols from the Octocoral *Dendronephthya gigantea*".J.Nat.Prod.. 63. 670-672 (2000) ▼
- [Publications] S.Hosoi, M.Nagao, Y.Tsuda, K.Isobe, T.Sano, T.Ohta: "Synthesis of Four Possible Stereoisomers of 1,2-Epoxy-3-hydroxyerythrinans : Total Synthesis of an Alkenoid-Type Erythrinan Alkaloid, ( $\pm$ )-Erythratidine."J.Chem.Soc.Perkin Trans 1. 1505-1511 (2000) ▼
- [Publications] A.Segawa, Y.Miyaichi, T.Tomimori, F.Kiuchi, T.Ohta: "Studies of *Didymocarpus leucocalyx* C.B.CLARKE (Gesneriaceae)".Chem.Pharm.Bull.. 47. 1404-1411 (1999) ▼
- [Publications] T.Ohta, K.Uwai, R.Kikuchi, S.Nozone, Y.Oshima, K.Sasaki, and F.Yoshizaki: "Absolute Stereochemistry of Cicutoxin and Related Toxic Polyacetylenic Alcohols from *Cicuta virosa*".Tetrahedron. 55. 12087-12098 (1999) ▼
- [Publications] K.Uwai, Y.Oshima, T.Sugihara, and T.Ohta: "Syntheses and Stereochemical Assignment of Toxic C17-Polyacetylenic Alcohols, Virol A, B, and C, Isolated from Water Hemlock (*Cicuta virosa*)".Tetrahedron. 55. 9469-9480 (1999) ▼
- [Publications] Y.Obara, N.Nakahata, T.Kita, Y.Takaya, H.Kobayashi, S.Hosoi, F.Kiuchi, T.Ohta, Y.Oshima, and Y.Ohizumi: "Stimulation of neurotrophic factor secretion from 1321N1 human astrocytoma cells by novel diterpenoids, scabronines A and G."European J.Pharmacol.. 370. 79-84 (1999) ▼

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