Investigation of nerve growth factor promotor from fungi

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

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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 verve 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 (1321Nl) 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 nIRNA for nerve growth factor (NGF), and the secretion of NGF from 1321Nl 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-ζ."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, (±)-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-ζ."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 of1,2-Epoxy-3-hydroxyerythrinans : Total Synthesis of an Alkenoid-Type Erythrinan Alkaloid, (±)-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.Nozoe, 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 Sterechemical 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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