

Development of Analysis of Neurosteroids and Its Application to Investigation of Brain Function

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1997 Fiscal Year Final Research Report Summary

Development of Analysis of Neurosteroids and Its Application to Investigation of Brain Function

Research Project

Project/Area Number

08457594

Research Category

Grant-in-Aid for Scientific Research (B)

Allocation Type

Single-year Grants

Section

一般

Research Field

Physical pharmacy

Research Institution

Kanazawa University

Principal Investigator

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Project Period (FY)

1996 - 1997

Keywords

Brain / Neurosteroid / Oxosteroid / Free / Conjugate / LC / MS / Derivatization / HPLC

Research Abstract

The term neurosteroids applies to those steroids that are both synthesized in the nervous system, either de novo from cholesterol or from steroid hormone precursors, and that accumulate in the nervous system to levels that are at least in part independent of steroidogenic gland secretion rates. Neurosteroids consist of 17- or 20-oxosteroids and accumulate in the brain as unconjugated form and their sulfates, fatty acid esters and sulfolipid conjugates.

The separation and characterization of pregnenolone, dehydroepiandrosterone and their 3-fatty acid esters (stearate, palmitate) in the brain are carried out using liquid chromatography/atmospheric pressure chemical ionization mass spectrometry (LC/APCI-MS) operating in the positive ion mode. These obtained from rat brains were identified in comparison with their chromatographic behavior with authentic samples during LC/APCI-MS. Pregnenolone 3-sulfate in rat brains was also identified as above.

The quantitative determination of pregnenolone in rat brains was done using HPLC with fluorescence detection. The method was applied to the determination of pregnenolone in rat brains, most of which showed lower amounts than that previously reported.

Research Products (10 results)

All Other

All Publications (10 results)

- [Publications] Kazutake SHIMADA: "Studies on neurosteroids IV. Quantitative determination of pregnenolone in rat brains using high-performance liquid chromatography." *J. Liq. Chromatogr. Relat. Technol.*, 19, 2593-2602 (1996) ▼

- [Publications] Kazutake SHIMADA: "Studies on neurosteroids V. Separation and characterization of pregnenolone 3-stearate in rat brains using high-performance liquid chromatography." *J. Chromatogr. Sci.*, 35, 71-74 (1997) ▼

- [Publications] Kazutake SHIMADA: "Studies on neurosteroids VI. Characterization of fatty acid esters of pregnenolone and dehydroepiandrosterone in rat brains using liquid chromatography-mass spectrometry." *Anal. Commun.*, 34, 145-146 (1997) ▼

- [Publications] 島田 和武: "脳内ステロイドホルモンの分析" *薬誌*, 117, 681-689 (1997) ▼

- [Publications] Kazutake SHIMADA: "Studies on neurosteroids VII. Characterization of pregnenolone, its sulfate, and dehydroepiandrosterone in rat brains using liquid chromatography/mass spectrometry." *J. Liq. Chromatogr. Relat. Technol.*, (in press). ▼

- [Publications] K. Shimada et al.: "Studies on neurosteroids IV. Quantitative determination of pregnenolone in rat brains using high-performance liquid chromatography." *J. Liq. Chromatogr. Relat. Technol.* 19 (16), 2593-2602 (1996) ▼

- [Publications] K. Shimada et al.: "Studies on neurosteroids V. Separation and characterization of pregnenolone 3-stearate in rat brains using high-performance liquid chromatography." *J. Chromatogr. Sci.* 35 (2), 71-74 (1997) ▼

- [Publications] K. Shimada et al.: "Studies on neurosteroids VI. Characterization of fatty acid esters of pregnenolone and dehydroepiandrosterone in rat brains using liquid chromatography-mass spectrometry." *Anal. Commun.* 34 (5), 145-146 (1997) ▼

- [Publications] K. Shimada: "Analysis of Neurosteroids" *Yakugaku Zasshi*, 117 (10-11), 681-689 (1997) ▼

- [Publications] K. Shimada et al.: "Studies on neurosteroids VII. Characterization of pregnenolone, its sulfate, and dehydroepiandrosterone in rat brains using liquid chromatography/mass spectrometry." *J. Liq. Chromatogr. Relat. Technol.* (in press). ▼

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