Chemistry of the Hypermodified Base from Mammalian Phenylalanine Transfer Ribonucleic Acids

1987 Fiscal Year Final Research Report Summary

Chemistry of the Hypermodified Base from Mammalian Phenylalanine Transfer Ribonucleic Acids

Research Project

Project/Area Number

61570998

Research Category

Grant-in-Aid for General Scientific Research (C)

Allocation Type

Single-year Grants

Research Field

Chemical pharmacy

Research Institution

Kanazawa University

Principal Investigator

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Project Period (FY)

1986 – 1987

Keywords

Hypermodified fluorescent base / Condensed tricyclic nucleic base / Wittig reaction / Heck reaction / Chiral synthesis / Optically active <beta>,<gamma>-unsaturated amino acid / Cyclic diester of Carbonic acid / 選択的脱オキシ化反応

Research Abstract

1. The synthesis of a model compound for the title fluorescent base has been established by a series of the reactions: the Witting reaction between 1-benzy1-7-(triphenylphosphoniomethyl)wye and isobutyraldehyde, oxidation with OsO_4, cyclic carbonate formation by treatment with (COCL)_2, and catalytic hydrogenolysis over Pd-C.
2. The Heck reaction of 1-benzy1-7-iodowye with (S)-N-(methoxycarbonyl)vinylglycine followed by methylation has provided an improved method for the synthesis of'(S)-(E)-1-benzy1-7-[3-methoxycarbonyl-3-(methoxycarbonyl)amino-1-butenyl]wye, the key intermediate for the synthesis of the target compounds. Oxidation of the intermediate with OsO_4 gave a pair of the diastereomers of the diols and the (S,S,S) configurations were assigned to the major product by means of X-ray analysis. According to the model experiments mentioned above, the diols were transformed into [R-(R^*,S^*)]- and [S-(R^*,R^*)]-hydroxywybutine, two alternatives for the title base.
3. Investigation of the chemical properties of the isomers of hydroxywybutine and isolation of the base from natural sources are in progress.

Research Products (6 results)

All | Other

All | Publications (6 results)

[Publications] Taisuke Itaya: Tetrahedron Lett.27. 4043-4046 (1986)

[Publications] 板谷泰助: 有機合成化学協会誌. 45. 431-444 (1987)

[Publications] 板谷泰助: 薬学雑誌.

[Publications] Taisuke Itaya: "Synthesis of Optically Active Forms of Hydroxy-Y Base, the Minor Component of Rat Liver Phenylalanine Transfer Ribonucleic Acid" Tetrahedron Lett.27. 4043-4046 (1986)

[Publications] Taisuke Itaya: "The Modified Components of Transfer Ribonucleic Acids" Yuki Gosei Kagaku Kyokai Shi. 45. 431-444 (1987)

[Publications] Taisuke Itaya: "Studies on the Synthesis of the Minor Components of Transfer Ribonucleic Acids" Yakugaku Zasshi.

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Published: 1989-03-29