# 赤外線脳酸素モニタ装置による嗅覚中枢の活動測定の他覚的嗅覚検査への応用


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| | 作成者: 石丸, 正, Ishimaru, Tadashi |
| | メールアドレス: |
| | 所属: |
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# 2001 Fiscal Year Final Research Report Summary

## NEAR INFRARED SCOPY OF THE HUMAN OLFACTORY CORTEX AS OBJECTIVE OLFACTO METRY

Research Project

### Project/Area Number

12470353

### Research Category

Grant-in-Aid for Scientific Research (B)

### Allocation Type

Single-year Grants

### Section

一般

### Research Field

Otorhinolaryngology

### Research Institution

Kanazawa University

### Principal Investigator

**ISHIMARU Tadashi** KANAZAWA UNIVERSITY, HOSPITAL, ASSISTANT PROFESSOR, 医学部・附属病院, 助手 (10272965)

### Co-Investigator(Kenkyū-buntansha)

MIWA Takaki KANAZAWA UNIVERSITY, GRADUATE SCHOOL OF MEDICINE, ASSOCIATE PROFESSOR, 大学院・医学系研究科, 助教授 (20229909)
FURUKAWA Mitsuru KANAZAWA UNIVERSITY, GRADUATE SCHOOL OF MEDICINE, PROFESSOR, 大学院・医学系研究科, 教授 (40092803)

### Project Period (FY)

**2000 – 2001**

### Keywords

Near infrared spectroscopy / Olfaction / Human / Orbit frontal cortex / Olfactmetry / Oxy hemoglobin / 還元ヘモグロビン / 脳血流

### Research Abstract

Near infrared spectroscopy (NIRS) is a non-invasive measuring method for brain activity using the difference of absorption between oxy-hemoglobin and de-oxy-hemoglobin in the cortex. We tried NIRS for measuring the human olfactory response from the orbitofrontal cortex and investigated the possibility of NIRS for objective olfaction test. Near infrared emitters and detectors were set on the both sides of a frontal scalp near orbitofrontal cortex and recorded the response elicited by olfactory stimulation. Two odorants, β-Phenyl ethyl alcohol (A) and Isovaleric acid c were chosen from 5 odorants of T＆T olfactometer for stimulants. Healthy subjects were examined and odorant elicited NIRS responses were detectable from 50% subjects. Increasings of the concentration of oxy-hemoglobin were observed after 10 seconds

stimulation of odorant A or C. Placebo stimulation did not elicit oxy-hemoglobin concentration changing. Difference of oxy-hemoglobin concentration increasing between odorous and placebo stimulation was significant. NIRS technique was thought of the new powerful method to investigate human olfaction.

## Research Products (10 results)

All Other

All Publications

[Publications] 堀川久美子: "近赤外分光法によるヒト嗅覚中枢の測定"日本味と匂学会誌. 7. 435-438 (2000)

[Publications] 石丸 正: "近赤外分光法によるヒト嗅覚中枢の測定"頭頸部自律神経. 15. 44-46 (2001)

[Publications] 石丸 正: "T&Tオルファクトメータ刺激時の嗅皮質の近赤外分光応答"日本味と匂学会誌. 8. 363-366 (2001)

[Publications] 石丸 正: "小児の嗅覚障害とその検査における課題"小児耳鼻咽喉科. 22. 48-52 (2001)

[Publications] 石丸 正: "嗅覚中枢測定を目的とした近赤外分光装置の改良"頭頸部自律神経. 16. 9-12 (2002)

[Publications] K. HORIKAWA, T. ISHIMARU, S. HATANAKA et al: "Assessment of the olfactorycortex by near-infrared spectroscopy"Jpn. J.Taste Smell Res. 7. 435-438 (2000)

[Publications] T. ISHIMARU, K. HORIKAWA, S. HATANAKA et al: "Near infrared spectroscopy of the human olfactory cortex"Tokebu Jiritsu Shinkei. 15. 44-46 (2001)

[Publications] T. ISHIMARU, K. YATA, S. HATANAKA et al: "Near infrared spectroscopic response of the human olfactory cortex activated by the T&T olfactometer"Jpn. J.Taste Smell Res. 8. 363-366 (2001)

[Publications] T. ISHIMARU, T. MIWA, M. FURUKAWA: "Pediatric olfactory dysfunction and case reports of congenital anosmia"Jpn. J.Ped. Otol. 22. (2001)

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**URL:** https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-12470353/124703532001kenkyu_seika_hokoku_

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