

# FLUORIDE

Quarterly Journal of the International Society for Fluoride Research

www.fluorideresearch.org

www.fluorideresearch.com

www.fluorideresearch.net

Owned & published by the INTERNATIONAL SOCIETY FOR FLUORIDE RESEARCH © 2007. All rights reserved.

**Editor:** Prof Emeritus Albert W Burgstahler. Lawrence, KS, USA. E-mail: awburg@ku.edu  
**Associate Editors:** Dr Richard G Foulkes. Abbotsford, BC, Canada.  
 Professor Emeritus Lennart P Krook. Ithaca, NY, USA.  
 Professor Hardy Limeback. Toronto, ON, Canada.  
 Professor Emeritus Gene W Miller. Logan, UT, USA.  
 Professor Emeritus Ming-Ho Yu. Bellingham, WA, USA.  
**Editorial Assistant:** Bill Wilson. North Shore City, New Zealand.  
**Managing Editor:** Dr Bruce Spittle. Dunedin, New Zealand. E-mail: spittle@es.co.nz

## ANNOUNCEMENT

1–3.....SECOND ANNOUNCEMENT: XXVIITH CONFERENCE OF THE INTERNATIONAL SOCIETY FOR FLUORIDE RESEARCH; OCTOBER 9–12, 2007; BEIJING, CHINA.

## EDITORIAL

4–6..... THE PRECAUTIONARY PRINCIPLE AND “EVIDENCE-BASED DENTISTRY”  
 Richard G Foulkes, Abbotsford, BC, Canada.

## RESEARCH REPORTS

- 7–12..... BLACK TEA AMELIORATION OF SODIUM FLUORIDE-INDUCED ALTERATIONS OF DNA, RNA, AND PROTEIN CONTENTS IN THE CEREBRAL HEMISPHERE, CEREBELLUM, AND MEDULLA OBLONGATA REGIONS OF MOUSE BRAIN  
 RJ Verma, MH Trivedi, NJ Chinoy.† Ahmedabad, India.
- 13–18..... QUANTIFICATION OF RIB COL1A2 GENE EXPRESSION IN HEALTHY AND FLUOROSED INNER MONGOLIA CASHMERE GOATS  
 Wentao Li, Lifeng Yang, Yachao Ren, Xiaoyan Yan, Jundong Wang. Shanxi, China.
- 19–23..... FLUORIDE-MEDIATED APOPTOSIS AND DISORDERING OF CELL CYCLE DISTRIBUTIONS DURING *IN VITRO* ORGAN CULTURE OF MOUSE FETAL LONG BONES  
 Kaitai Liu, Liying Ma, Hua Yao, Yongliang Zhang, Lingzhi Li, Gouquan Wang. Shanxi, China.
- 24–30..... FLUORIDE, MAGNESIUM, AND SODIUM IN DENTAL CHEWING STICK PLANTS USED IN BANGLADESH  
 AKM Fazlul Hoque, FM Kamal, FM Mohee, MM Haque, MD Hossain. Dhaka, Bangladesh.
- 31–36..... EFFECT OF FLUORIDE ON EXPRESSION OF PURA GENE AND CaM GENE IN NEWBORN RAT OSTEOBLASTS  
 Qin-qing Tang, Xiao Yang, Gui-lan Tang, Yun-qin Wang, Yan-ni Yu. Guiyang, China.

†Deceased 8 May 2006.

- 37–41..... FLUORIDE-INDUCED BIOCHEMICAL CHANGES IN FRESH WATER CATFISH  
(*CLARIAS BATRACHUS*, LINN.)  
Anand Kumar, Nalini Tripathi, MadhuTripathi. Lucknow, India.
- 42–45..... LIPID PEROXIDATION AND ANTIOXIDANT ENZYME STATUS OF ADULT  
MALES WITH SKELETAL FLUOROSIS IN ANDHRA PRADESH, INDIA  
P Kalyanalakshmi, M Vijayabhaskar, M Dhananjaya Naidu.  
Andhra Pradesh, India.
- 46–50..... TRANSPLACENTAL PASSAGE OF FLUORIDE IN PREGNANT POLISH  
WOMEN ASSESSED ON THE BASIS OF FLUORIDE CONCENTRATIONS IN  
MATERNAL AND CORD BLOOD PLASMA  
J Opydo-Szymaczek, M Borysewicz-Lewicka. Poznan, Poland.
- 51–54..... EFFECT OF FLUORIDE ON CARBONIC ANHYDRASE ACTIVITY AND  
PHOTOSYNTHETIC OXYGEN EVOLUTION OF THE ALGAE  
*CHLAMYDOMONAS REINHARDTII*  
Yanyou Wu, Pingping Li, Xinzheng Zhao. Jiangsu, China.
- 55–61..... FLUORIDE-INDUCED HISTOPATHOLOGICAL CHANGES IN GILL, KIDNEY,  
AND INTESTINE OF FRESH WATER TELEOST, *LABEO ROHITA*  
Chhaya Bhatnagar, Maheep Bhatnagar, Bhag Chand Regar.  
Udaipur, Rajasthan, India.
- 62–66..... INFLUENCE OF EXTENDED EXPOSURE TO SODIUM FLUORIDE AND  
CAFFEINE ON THE ACTIVITY OF CARBOHYDRATE METABOLISM ENZYMES  
IN RAT BLOOD SERUM AND LIVER  
Ewa Grucka-Mamczar, Ewa Birkner, Jolanta Zalejska-Fiolka, Zygmunt Machoy,  
Sławomir Kasperczyk, Iwona Błaszczyk. Szczecin, Poland.

## **SYMPOSIUM REPORT**

- 67–68..... CURRENT TRENDS IN FLUORINE RESEARCH  
Zygmunt Machoy, Dariusz Chlubek. Szczecin, Poland.

## **ABSTRACTS**

### **ETHICS**

- 69 WHAT DOES THE PRECAUTIONARY PRINCIPLE MEAN FOR EVIDENCE-BASED  
DENTISTRY?  
Tickner J, Coffin M. Lowell, MA, USA.

### **ENVIRONMENTAL ASSESSMENT**

- 69–70..... A HEALTH RISK ASSESSMENT FOR FLUORIDE IN CENTRAL EUROPE  
Fordyce FM, Vrana K, Zhovinsky E, Povoroznuk V, Toth G, Hope BC, Iljinsky U, Baker J.  
Edinburgh, UK.

### **FLUORIDE IN THE ENVIRONMENT**

- 70 FLUORIDE OCCURRENCE IN PUBLICLY SUPPLIED DRINKING WATER IN ESTONIA  
Karro E, Indermitte E, Saava A, Haemer K, Marandi A. Vanemuise, Tartu, Estonia.

### **DENTAL EFFECTS**

- 70–71..... RELATIONSHIP BETWEEN DENTAL CARIES EXPERIENCE (DMFS) AND DENTAL  
FLUOROSIS IN 12-YEAR-OLD PUERTO RICANS  
Elías-Bonita AR, Psoter W, Elías-Viera AE, Jiménez P, Toro C. San Juan, Puerto Rico.

- 71 ..... CRIES AND FLUOROSIS IN 6- AND 9-YEAR-OLD CHILDREN RESIDING IN THREE COMMUNITIES IN IRAN  
Meyer-Lueckel H, Paris S; Shirkhani B, Hopfenmuller W, Kielbassa A M. Berlin, Germany.

- 71–72 ..... FLUORIDE INTAKE FROM FOOD AND LIQUID IN JAPANESE CHILDREN LIVING IN TWO AREAS WITH DIFFERENT FLUORIDE CONCENTRATIONS IN THE WATER SUPPLY  
Nohno K, Sakuma S, Koga H, Nishimuta M, Yagi M, Miyazaki H. Gakkochō-Dori, Niigata, Japan.

- 72 ..... EDITOR'S NOTE

#### **HEALTH/TOXIC EFFECTS ON ANIMALS**

- 72 ..... EFFECT OF FLUORIDE INTOXICATION ON ENDOMETRIAL APOPTOSIS AND LIPID PEROXIDATION IN RATS: ROLE OF VITAMINS E AND C  
Güney M, Oral B, Take G, Giray SG, Mungan, T. Isparta, Turkey.

#### **HEALTH/BIOLOGICAL EFFECTS ON ANIMALS**

- 72–73 ..... SODIUM FLUOROACETATE POISONING (REVIEW)  
Proudfoot AT, Bradberry SM, Vale JA. Birmingham, UK.

- 73 ..... SODIUM FLUORIDE INGESTION INDUCED OXIDATIVE STRESS IN BUCCAL MUCOSA OF RATS  
Gutierrez-Salinas J, Morales-Gonzalez JA. Mexico City, Mexico.

#### **HEALTH/BIOLOGICAL EFFECTS IN HUMANS**

- 74 ..... STRUCTURAL FORMS OF FLUORIDES IN BONE TISSUE OF ANIMALS UNDER CHRONIC FLUORIDE INTOXICATION  
Gabuda SP, Gaidash AA, Kozlova SG, Allan NL. Novosibirsk, Russia.

- 74 ..... EXPERIMENTAL STUDIES OF THE PATHOGENESIS OF CHRONIC FLUORIDE INTOXICATION  
Mikhailova NN, Anokhina AS, Ulanova EV, Fomenko DV, Kizichenko NV. Novokuznetsk, Russia.

#### **CORRECTION**

- 74 ..... Effect of fluoride on growth and feed intake of juvenile giant freshwater prawn *Machrobrachium rosenbergii* (De-man) by S Adhikari, Ajaz Ahmad Naqvi, and N Sarangi in *Fluoride* 2006;39(4):313-7.

#### **LETTER TO THE EDITOR**

- 75–76 ..... “TARDIVE PHOTOPSIA” AND THE TIEL-CULEMBORG STUDY  
Hans Moolenburgh. Haarlem, The Netherlands.

#### **SUBMITTING MANUSCRIPTS TO *FLUORIDE***

- 77–88 ..... GUIDELINES FOR AUTHORS—REVISED JANUARY–MARCH 2007

## THE INTERNATIONAL SOCIETY FOR FLUORIDE RESEARCH

The International Society for Fluoride Research was founded in 1966, at a meeting in Detroit of the American Society for Fluoride Research, to promote the sharing of scientific information on all aspects of inorganic and organic fluorides. This is done by the publication of a quarterly journal *Fluoride* and the hosting of international conferences. The first ISFR conference was held in Frankfurt, Germany in 1967. Conferences have also been held in Spain, Austria, the Netherlands, England, the United States of America, Switzerland, India, Japan, Hungary, China, Poland, and New Zealand. The next conference, the XXVIIth, will be hosted by Professor Guifan Sun, with the assistance of Dr Dianjun Sun, in Beijing, People's Republic of China, October 9–12, 2007 (See announcements, *Fluoride* 2006;39(4):247-51 and in this issue, p. 1-2). The XXVIIIth conference will be hosted by Dr JD Sharma in Jaipur, India, in 2009. Subscription to *Fluoride*, membership in the ISFR (for fluoride researchers), and attendance at the conferences are welcomed.

The Society does not hold an official position on issues such as water fluoridation but encourages, through its conferences and the publication of papers, commentaries, and letters to the editor, a critical examination of the scientific basis of the views which are held by individuals and organizations.

### MEMBERS OF THE ISFR ADVISORY BOARD 2006

**President:**

Professor Jörg Spitz. Society for Medical Information and Prevention, Wiesbaden, Germany.

**Vice President:**

Professor Guifan Sun. China Medical University, Shenyang, People's Republic of China.

**Co-Secretaries:**

Professor Dariusz Chlubek. Pomeranian Medical University, Szczecin, Poland.  
Assoc. Prof. Masashi Tsunoda, Kitasato University School of Medicine, Sagami-hara, Japan.

**Editor of *Fluoride*:**

Professor Emeritus Albert W Burgstahler. University of Kansas, Lawrence, KS, USA.

**Members at Large:**

**Asia**

Professor Emeritus Humio Tsunoda. Iwate Medical University, Morioka, Japan.

**Europe**

Professor Miklós Bély. Hungarian Academy of Science, Budapest, Hungary.  
Professor Jürgen Franke. Rehaklinik an der Salza, Bad Langensalza, Germany.  
Professor Emeritus Zygmunt Machoy. Pomeranian Medical Academy, Szczecin, Poland.

**North America**

Dr Richard G Foulkes. Abbotsford, BC, Canada.  
Professor Emeritus Gene W Miller. Utah State University, Logan, UT, USA.

**Treasurer and Managing Editor of *Fluoride*:**

Dr Bruce Spittle. Dunedin, New Zealand.

### MEMBERS OF THE ISFR EDITORIAL BOARD 2006

**Editor of *Fluoride*:**

Professor Emeritus Albert W Burgstahler. University of Kansas, Lawrence, KS, USA

**Associate Editors:**

Dr Richard G Foulkes. Abbotsford, BC, Canada.  
Professor Emeritus Lennart P Krook. Cornell University, Ithaca, NY, USA.  
Professor Hardy Limeback. University of Toronto, Toronto, ON, Canada.  
Professor Emeritus Gene W Miller. Utah State University, Logan, UT, USA.  
Professor Emeritus Ming-Ho Yu. Western Washington University, Bellingham, WA, USA.

**Editorial Board Members:**

Dr Miklos Bély. Hungarian Academy of Science, Budapest, Hungary.  
Professor Masahiko Chikuma. Osaka University of Pharmaceutical Sciences, Osaka, Japan.  
Professor Edward Czerwinski. Jagiellonian University, Kraków, Poland.

Dr Mark Diesendorf. Sustainability Centre, Box 521, Epping, NSW 1710, Australia.  
Professor J Franke. Rehaklinik an der Salza, Bad Langensalza, Germany.  
Assistant Professor Toshitaka Horiuchi. Nihon University School of Dentistry at Matsudo, Japan.  
Associate Professor Kazuyoshi Itai. Iwate Medical University, Morioka, Iwate, Japan.  
Prof Emeritus G Neil Jenkins. Newcastle-upon-Tyne, England, UK.  
Professor K Kono. Osaka Medical College, Osaka, Japan.  
Professor Jerzy Krechniak. Medical University, GdaNsk, Poland.  
Professor Emeritus C James Lovelace. Humbolt State University, Arcata, CA, USA.  
Dr Boguslaw Machaliński. Pomeranian Academy of Medicine, Szczecin, Poland.  
Professor Emeritus Zygmunt Machoy. Pomeranian Medical Academy, Szczecin, Poland.  
Professor F Murray. Murdoch University, Murdoch, WA, Australia.  
Professor Masayuki Okazaki. Hiroshima University, Hiroshima, Japan.  
Dr James C Pushnik. California State University, Chico, CA, USA.  
Dr BP Rajan. Ragas Dental Clinic, Mylapore, Chennai, India.  
Professor Masashi Shimahara. Osaka Medical College, Takatsuki City, Osaka, Japan.  
Professor Jörg Spitz. Society for Medical Information and Prevention, Wiesbaden, Germany.  
Professor Anna Strunecká. Charles University, Prague, Czech Republic.  
Dr Dianjun Sun, Harbin Medical University, Harbin, P.R. China.  
Professor Guifan Sun. China Medical University, Shenyang, China.  
Professor Emeritus AK Susheela. Fluorosis Res & Rural Develop Foundation, New Delhi, India.  
Professor Emeritus SPS Teotia. Institute of Higher Medical Sciences, Whitefield, India.  
Professor Emeritus Humio Tsunoda. Iwate Medical University, Morioka, Japan.  
Assoc. Professor Masashi Tsunoda. Kitasato University School of Medicine, Sagamihara, Japan.  
Professor Emeritus Zan-Dao Wei. Guiyang Medical College, Guizhou, China.  
Professor Emeritus Y Yoshida. Osaka Medical College, Osaka, Japan.  
Professor Emeritus NBK Yoshitake. Shiga University of Medical Science, Otsu, Japan.

**Editorial Assistant:**

Bill Wilson. North Shore City, New Zealand.

**Managing Editor:**

Dr Bruce Spittle. Dunedin, New Zealand.

**FLUORIDE QUARTERLY JOURNAL OF THE INTERNATIONAL SOCIETY FOR FLUORIDE RESEARCH**

ISSN 0015-4725, is published four times a year (January–March, April–June, July–September, and October–December), and contains scientific reports on agricultural, analytical, biochemical, biological, chemical, clinical, dental, ecological, environmental, industrial, medical, metabolic, pharmacological, synergistic, toxicological, and veterinary aspects of inorganic and organic fluorides. Publication is usually made towards the end of each quarterly period rather than at the start of the period. The journal does not contain advertising.

**COPYRIGHT.** *Fluoride* is owned and published by the INTERNATIONAL SOCIETY FOR FLUORIDE RESEARCH © 2007. All rights reserved.

**ONLINE ACCESS** Fluoride is available with free full text access at: [www.fluorideresearch.org](http://www.fluorideresearch.org), [www.fluorideresearch.com](http://www.fluorideresearch.com), and [www.fluorideresearch.net](http://www.fluorideresearch.net). Further details are given below in the section on past issues. Articles in Fluoride can be searched for using the 35-year Cumulative Author and Subject Indexes on the website and the Chemical Abstracts search engine *SciFinder Scholar* (from Chemical Abstracts Service) and *Web of Science* (from Thomson Corporation for Science Citation Index), but not, at present, through *Index Medicus/PubMed*. Some articles may also be found with the Google search engine and with Google Scholar and Google Advanced Scholar at: <http://scholar.google.com>.

**SUBSCRIPTION & MEMBERSHIP.** Subscription to *Fluoride* is available to all. Membership in the ISFR is invited from fluoride researchers and others interested in fluoride research. The membership fee is the same as the subscription fee and includes receiving *Fluoride*. Family and student membership are described below. Application for subscription or membership may be made by letter including name, postal address, and E-mail address, and should be sent, with the appropriate fee when applicable (no fee is payable for student membership), to the Treasurer Dr Bruce Spittle (E-mail: [spittle@es.co.nz](mailto:spittle@es.co.nz)); 727 Brighton Road, Dunedin 9035, New Zealand. Please indicate if you would like the membership or subscription to start with the calendar year or with a particular issue of the journal.

**SUBSCRIPTION AND MEMBERSHIP FEE for 2007**, payable annually in advance, is: US\$51, Canadian\$63, £28, Japan¥5500, €42, Australian\$66, New Zealand\$72, with a discount of 10% for copies posted to a New Zealand address, which incurs a lower postal cost. No subscription agency discount is available in order to keep the fees as low as possible for all members and subscribers. Subscribers and members may pay in whatever currency is most convenient for them. The rates for 2006 and 2007 have been kept at the same level as was set on 23 June 2005. No journals will be mailed until payment is received for the current subscription or membership period. Apply to Dr Spittle, E-mail: [spittle@es.co.nz](mailto:spittle@es.co.nz).

**FAMILY MEMBERSHIP:** Members of the same family may apply for family membership. The fee for the whole family is the same as that for a member. One copy of the journal will be posted to the family.

**STUDENT MEMBERSHIP:** Students may apply for membership. No membership fee is payable. Access to the journal will be via the website and no hardcopy of the journal will be posted. Membership allows participating in the activities of the Society and voting at business meetings.

**COPIES OF ARTICLES AND PREVIOUS ISSUES OF FLUORIDE:** Hard copies of all of the previous

issues of *Fluoride*, including the 35-year cumulative indexes in *Fluoride* 2002;35(4-Parts 1 and 2), are usually kept in stock and may be ordered directly through the Managing Editor for US\$10 or equivalent per single copy of an issue or part of *Fluoride* including postage. Individual articles can also be downloaded, free in full text, from the ISFR websites at: [www.fluorideresearch.org](http://www.fluorideresearch.org), [www.fluorideresearch.com](http://www.fluorideresearch.com), and [www.fluorideresearch.net](http://www.fluorideresearch.net), by clicking on the blue highlighted page numbers on the relevant Table of Contents for *Fluoride* 1969;2(1), 1969;2(3), 1969;2(4), and 1999;32(1) to the current issue. All the other issues from *Fluoride* 1968;1(1) have also been posted at the websites but are in the form of "disassembled issues." For these the issues were taken apart and adjacent pages were scanned so they consist of large files with the pages not in numerical order, but in the order used for printing, e.g. p. 1 next to p. 72, p. 2 next to p. 71, p. 3 next to p. 70. Because the files are large they are slow to download but if downloaded and printed out (doublesided) the original issue can be reassembled. Alternatively a hardcopy of the issue is available from the Managing Editor as above. Copies of articles are also available, at rates set by the supplier, from: University Microfilms International, Box 91, Ann Arbor, MI 48106, USA; Institute for Scientific Information, 3501 Market St., Philadelphia, PA 19104, USA; BIOSIS, c/- Advanced Information Consultants, Box 87127, Canton, MI 48187, USA; The UnCover Company, 3801 E. Florida, Suite 200, Denver, CO 80210, USA.

**POSTAL METHODS USED:** *Fluoride* is posted by Economy International Airmail to all countries (11-25 days for delivery) except Australia (International Air, 3-6 days) and New Zealand (Post, 2-3 days). In practice, deliveries to India, often appear to take longer than the times advertised by New Zealand Post.

**ENQUIRIES ABOUT NON-DELIVERY:** To help minimize the time spent on administration, which is being given on a voluntary basis, enquiries about non-delivery should not be made until two months have passed since the end of the publication period to allow time for publication or delivery delays. The issues are normally published during the period covered by the issue, usually near the end of the period, and making enquiries about non-delivery before the times shown below is not helpful.

Issue No.	Period covered by issue	Month to wait for before enquiring about nondelivery
1	January-March	June
2	April-June	September
3	July-September	December
4	October-December	March

**PAYMENT OPTIONS** for the subscription to *Fluoride*, membership of the ISFR which includes receiving *Fluoride*, and the purchase of back issues are: bank transfer, cheque, cash, or PayPal. Bank transfers can be made to The Bank of New Zealand, New Lynn Branch, 3029 Great North Road, New Lynn, Auckland, New Zealand; Swift BKNZNZ22; Website: [www.bnz.co.nz](http://www.bnz.co.nz); Fax 64 09 827 6806; Account name: International Society for Fluoride Research; Account number 02 0184 0333239 000. Cheques should be made out to the same or to ISFR. Personal cheques, bank cheques or drafts, and cash may be posted to Dr Bruce Spittle, 727 Brighton Road, Ocean View, Dunedin 9035, New Zealand. Personal or bank cheques, and cash, in US\$, Canadian\$, £, €, Australian\$, and NZ\$ are fine. Cash as Japanese Yen is also fine. Please do not send Canadian or British Postal Notes, cheques drawn on Japanese banks, or cheques in US\$ drawn on British banks in the United Kingdom as they cannot be negotiated in New Zealand. PayPal allows payment by Visa or Mastercard directly to an E-mail address in a secure way. It is necessary to first register with PayPal at <http://paypal.com>. The recipient E-mail address for the payment is [spittle@es.co.nz](mailto:spittle@es.co.nz). Just giving the credit card number to the ISFR is insufficient.

**INSTRUCTIONS TO AUTHORS:** Manuscripts, including reports of original research, papers presented at ISFR conferences, research reviews, discussion papers, and letters to the Editor, are accepted for publication after appropriate evaluation and recommendation by qualified reviewers. The initial version of the manuscript, double-spaced throughout with wide margins, should be submitted, as a Word attachment by E-mail, to Prof Emeritus AW Burgstahler, Editor, *Fluoride*, 1620 Massachusetts Street, Lawrence, KS 66044-4254, USA (E-mail: [awburg@ku.edu](mailto:awburg@ku.edu)). Do not send manuscripts to the Managing Editor. If submission is by post, please send two copies, without a computer disc. Detailed instructions for preparing papers are at [www.fluorideresearch.org](http://www.fluorideresearch.org) and in this issue, p. 75-84.

The Editorial Officers of *Fluoride* strongly support the maintenance of the highest standards of animal care and the control of discomforts to animals in research. Authors must indicate whether their institutional and national guidelines for the care and use of laboratory animals were followed. When reporting experiments on human subjects, authors should indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA* 2000 Dec 20;284(23):3043-5).

**COMPLIMENTARY COPIES:** Donors wishing to fund gift copies, which will be suitably inscribed, are invited to contact Dr Spittle.

**CO-SECRETARIES:** Enquiries about ISFR membership, ISFR conferences and meetings, and other matters under their jurisdiction may be made to the co-secretaries:

Professor Dariusz Chlubek, Department of Biochemistry and Chemistry, Pomeranian Medical University, al. Powstancow Wilkp. 72, 70-111 Szczecin, Poland. E-mail: [dclubek@pam.szczecin.pl](mailto:dclubek@pam.szczecin.pl)

Associate Professor Masashi Tsunoda, Department of Preventive Medicine and Public Health, Kitasato University School of Medicine, Kitasato 1-15-1, Sagami-hara, Kanagawa, 228-8555, Japan. E-mail: [mtsunoda@med.kitasato-u.ac.jp](mailto:mtsunoda@med.kitasato-u.ac.jp)