




Dental Research News


Research Development Office, (902) 424-1675

VOLUME III, NUMBER 2.

RESEARCH OPPORTUNITY ?

The US Food and Drug Administration has requested that six companies substantiate labeling claims regarding plaque and gingivitis or face the prospect of withdrawing the labeling claim. The following companies were listed Warner Lambert (Listerine), Colgate-Palmolive (Colgate Toothpaste), Vipont (Viadent Oral Rinse), Oral Research Labs (Plax dental rinse), Beecham Products (Aquafresh Toothpaste) and Rydelle-Lion (Checkup Toothpaste). This news provides an opportunity for dental clinical researchers to contact the companies and offer to conduct research to provide the data to support (or reject) the labeling claims. Claims by companies should be based on scientific evidence. Why not write and offer to develop a clinical trial for some of these products?   

NEW GUIDELINES ON FLUORIDE

New guidelines on the fluoride concentrations in toothpastes have been produced by the US FDA. Category I 850-1,150 ppm, Category II (powdered dentifrices) above 1,150 ppm. The guidelines also specify how much of the fluoride must be available to the tooth enamel. Some fluoride may interact and chemically bind with other ingredients in the dentifrices and thus not be available as an anti-caries agent. An *In Vitro* study of this problem would provide a nice research topic. Why not think about it? Why not take some steps to conduct a project... 

FREE MEMBERSHIP OF IADR & AADS ?

How would you like to have free membership of the IADR and AADS for 1990. If the answer is yes turn to page 6 for details.

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HOW SAFE IS SAFE

AIDS virus can pass through latex gloves which have holes which cannot be detected by recommended tests. According to Susan Arnold and James Whitman Jr. scientists at Advanced Biotechnologies Inc., viruses, including AIDS, can pass through holes less than 10µm in diameter which cannot be detected by the test recommended by the American Society for Testing and Materials. Latex gloves from four manufacturers when examined using scanning electron microscopy were found to have pits 3-15µm wide and up to 30µm deep on both interior and exterior surfaces. The FDA may revoke a rule exempting latex gloves from inspection for holes which would allow AIDS virus to penetrate, since recent tests have found that 35% of non-sterile latex gloves had holes that could easily be detected.

TT

SMALL IS BEAUTIFUL

We all know that little-old ladies request small white teeth on their full dentures. Our colleagues in prosthetics should realize that this may be due to natural selection. A twenty year study by Dr.Loring Brace at the University of Michigan, has shown that teeth have got consistently smaller in size

since the time of Neanderthal man. The rate at which the size of teeth was reduced has doubled in the past 10,000 years. The researchers have speculated that the use of fire for cooking food which made mastication easier some 100,000 years ago resulted in a reduction in the size of teeth by about 1% in every 2,000 years. Natural selection would presumably render it less likely for individuals to survive if they were born with small teeth prior to the introduction of cooking food.



Opportunity for Research?

The Apple Research Partnership Programme is designed to "Stimulate Research Activities in Universities. If you are using the Macintosh computer in your research the ARPP consultants on the fourth floor Room 4115 may be able to help you with your project. Why not drop in and discuss it with them. ARPP consultants are Mark Boyle, David Crowell, Jeff Holmes, Ray MacNeil, and Peter Russell. The office hours are Wednesday, 9:30-12:00 and Thursday, 9:00-3:00. If you wish to explore the use of the Apple Macintosh computer for your research why not give ARPP a call: ☎ 424-1946.



**ALL TIME RECORD NUMBER
OF PAPERS For Dalhousie!**

The following 19 papers will be presented at the AADS and AADR meetings to be held in San Francisco next March. This represents an all time record for Dalhousie for these two meetings. The numbers are all the more impressive if we add on the further 18 papers which have also been submitted to the IADR meeting to be held next June in Dublin. (The 18 IADR abstracts were listed in the December edition of Research News, pages 3 & 4).

AADS

T.B. Boran*, W.A. MacInnis, and H.J. Murphy. "Observed Outcomes of an Interpersonal Skills Development Programme".

R.M. MacDonald*, W.A. MacInnis, and H.J. Murphy. "Development of Self and Peer Assessment Skills Development Programme"

N.R. Prowse*, T.L. Mitchell, M.G.E. Forgay, and G.S. Jackson. "Educational Experience for Dental Hygiene Students With Intellectually Impaired Adults"

W.A. MacInnis*, T.B. Boran, and H.J. Murphy. "Clinician Role Models as Facilitators in Behavioral Skill Development"

H.J. Murphy*, D.V.Chaytor, and M.A. Boyd, "Group Embedded Figures Test: Psychometric Data for a Sample of Dental Students".

D.V.Chaytor*, H.J. Murphy, and K.M. Chaytor. "Impression/Die Matching Test: A three Dimensional Test of Negative Image Interpretation Ability".

B.S. Graham*, D.V.Chaytor and H.J. Murphy. "An Application of Stake's Evaluation Model in Dental Education".

N.R. Prowse*, M.G.E. Forgay, W.A. MacInnis, and H.J. Murphy. "A Comparison of Empathy Scores Among Dental Hygiene Educators, Graduates and Students".

R.L. Harrison*, and M.G.E. Forgay, "Self-Perceived Needs for Faculty Development at Canadian Dental Schools".

AADR

B.A. Burt*, A.I. Ismail, E.C. Morrison, R. Caffesse, and E. Beltran. "Patterns of tooth loss over 28 years".

B.S. Graham*, D.W. Jones, J.P. Thompson, and J.A. Johnson, "Clinical Thickness Changes of Two Resilient Denture Liners".

**A FURTHER 9 ABSTRACTS
ARE LISTED ON PAGE 5**

AADR Abstracts (cont.).

R.L. Harrison*, C. Karst,
R.E.Howell, and W.C.Foong.
"Effect of Helium-Neon Laser
Irradiation of 3T3 Mouse
Fibroblast".

A.I. Ismail*, E.C. Morrison, B.A.
Burt and R. Caffesse."Loss of
periodontal attachment in
adults :Tecumseh periodontal
disease study, 1959-87.

D.W. Jones*, A.S. Rizkalla, J.A.
Johnson, and E.J. Sutow, "Effect
of Composition on Some
Physical Properties of SiO₂-K₂O-
Na₂O Glasses".

W.A.MacInnis*, L. Peacocke,
K.L. Zakariasen, D. Miller, and J.
Cullinan. "Amalcore Strength
Recovery Following Refilling of
Access Preparations with
Amalgam".

A.S. Rizkalla*, D.W. Jones, G.C.
Hall, H.W. King, and E.J. Sutow,
"Chemical Composition
Variables of Feldspathic Glass
Synthesized by Sol-gel".

E.J. Sutow*, W.C. Foong, R.E.
Howell, D.W. Jones, K.A. Russell
and G.C. Hall "Cytotoxicity of
Electropolished and
Mechanically Polished Base
Metal Alloys".

S.M. Szpunar*, A.I. Ismail, S.A.
Eklund, "Diabetes and
periodontal disease: analyses of
NHANES I and HHANES".

K.L. Zakariasen*, J. Cullinan, and
D. Miller. "Sonic Tuning Effects
on Canal Preparation Time and
Procedural Errors".

The following paper has also
been accepted for presentation
at the 15th Annual Meeting of
the Society for Biomaterials.

A.S. Rizkalla, D.W. Jones*, E.J.
Sutow and H.W. King, "Effect of
Composition on the Fracture
Toughness of Synthesized
Glasses".

The excellent number and
quality of the research papers
being presented from our
faculty in 1989 clearly shows
that last years record number
of papers was not just a flash in
the pan, we do have a real
research base within the
faculty. A dry run presentation
of as many of the above papers
will take place as in previous
years. This will be held
towards the end of February.
Copies of abstracts will again be
put on display in the faculty
lounge to give all faculty
members an opportunity to see
the very wide range of
educational, clinical and
laboratory research activity
which is being undertaken
within our faculty.

**RESEARCH NEWS 21st ISSUE
CELEBRATION**

A competition will be held with the prize of free membership subscriptions to both the AADS and the CADR/IADR for 1990. The competition is open to all full and part-time members of faculty. All you have to do is to submit a description of your research interests with your philosophy about research and share with the Research News the details of how you became interested in the area of research which you have chosen to study. Submissions may be made at any time up to the 16th June 1989.

Submissions in 200 words or less should be handed in to the Research Development Office to Mrs Hames. Submissions will only be accepted if produced on a (Macintosh) disc in Microsoft Word. The publication of any submission will guarantee that it will be entered into the competition. Only those submissions which are published prior to the October issue of the Research News will be eligible for the competition. Since all submissions are bound to be well written and of excellent quality it has been decided to draw the winners names out of a hat. This will be done at the first of our Lunch time Research Development Seminars in September. The winners will also be announced

in the September 1989 issue of the Research News. The September publication should be our 21st issue and will celebrate two years since the first Research News was published in September 1987.

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CANADIAN

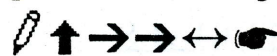
"the average Canadian believes that if something is technically sophisticated, it clearly came from somewhere else. If it is made in Canada, it is clearly suspect. But in fact, Canadian technology is generally superior"

John MacDonald, President,
MacDonald Dettwiler and
Associates Ltd.

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UNDERSTANDING

"Whenever a scientist does not understand the interactions of complex phenomena, he disposes of the problem by writing them all down and drawing arrows between them. This gives the illusion of both profundity and simplicity that allows him to live with his problem" Douglas Waugh.



It may be possible to take an unsolved problem from the scientific literature and get rid of the need for arrows?. Think about it!

MISUNDERSTANDING?

"It is better to understand a little than to misunderstand a lot". *Anatole France.*

A DRY TOPIC

Studies conducted by Dr's Fox and Weiffenbach at the US National Institutes for Dental Research (NIDR) are indicating that saliva production may not be as important to an individuals sense of taste as previously thought. The general understanding had been that a person required salivation in order to be able to have a sense of taste. research studies at NIDR have shown that individuals with salivary dysfunctions can identify taste. Some individuals with complete failure of the salivary systems were found to maintain a normal taste

sense. 

The following abstract was prepared for the submission of the application for a Centre of Excellence in Biomaterials. The abstract has to be in the form suitable for release to the general public.

BIOMATERIALS

"Biomaterials are artificial or natural materials that are placed into the body to serve as replacement or support for damaged or missing parts of skin, bones, teeth, blood vessels and entire organs. Collectively, biomaterials make up or are part of what are called 'medical

devices'. About two billion dollars are spent every year in Canada on medical devices but nearly 80% of this is imported. We aim to greatly improve the scientific and technological base for this area of health care to give us a greater self-sufficiency. Our research program will combine the expertise in our Universities and Industry to produce new and improved biomaterials. The research and development will be focussed on seven important areas that will be particularly important to medical care over the next twenty years. These areas are: a) new tissue adhesives and wound dressings based on marine life such as seaweed and mussels; b) moldable materials for bones and teeth on which new tissue can grow; c) biomaterials for drug release that can deliver just the right amount at the right time and to the right place in the body; d) porous plastic tubing replacement for veins; e) new artificial joints with shock-resistance built-in; f) understanding how to make new materials acceptable, safe and compatible with the body tissues. The results of our research and its industrial development will benefit all Canadians but especially the increasing number of older people as we move towards the year 2001".(see also page 11 The Future for Biomaterials)

***** BUGS *****

Computer programmes often contain errors, when they are originally written. These errors are commonly referred to as "Bugs" and the process of removing them and correcting the programme is termed "debugging". This debugging operation normally accounts for one-third to one-half of the expenditure in the development of new programmes. Quite often bugs have to be corrected long after the programme has been released for use.

Debugging is carried out in two stages; a) hand-checking test cases against the code and b) machine debugging in which a large number of test cases are run on the computer against the programme. To the experimental scientist, computing is usually a source of desperate impracticality-of bugs, breaks, hang-ups and crashes. If this is your problem you may wish to obtain a copy of the book "Practical computing for experimental scientists" by J.D. Beasley, Oxford University Press 1988. Pp233, (ISBN

19853754[SB]).

NATURE

"We cannot command nature except by obeying her"

Francis Bacon

M.R.C

In 1987 the MRC received 750 new grant applications, these were examined by 2,500 referees, about one-third of them scientists in the US and other countries outside Canada. Twenty-two advisory panels represent the different areas of biomedical research.

RESTORATIVE DEPARTMENT HOLDS RESEARCH MEETINGS

The Department of Restorative Dentistry are to hold quarterly departmental research meetings which are aimed at increasing the awareness of the level of scholarship being conducted within the department. The meetings aim to facilitate cooperation between and among faculty groups and individuals with similar interests. The discussions will aim to assist interested faculty to develop research protocols and research plans. The first session will be held on February 1st., all faculty members of the Department of Restorative Dentistry are encouraged to attend the initial session.

SCIENTIFIC DISCOVERY

Scientific discovery requires more than dedicated application of knowledge and experience it needs the inspired foresight to grasp the relationship between unexpected or serendipitous observation.

NATURE

"Nature always proceeds by jumps. She may spend twenty thousand years making up her mind to jump; but when she makes it up at last, the jump is big enough to take us into a new age".

G. Bernard Shaw.

(Back to Methuselah)



ONLINE

Your research begins with questions?. The use of scientific and information networks can give you comprehensive answers online. The Royal Society of Chemistry have an on line patent file search STN International which includes thousands of patents in pharmaceuticals, medicinal chemistry, bio-technology, and other drug-related fields. It also gives you immediate access to some of the world's best chemistry and chemical engineering databases, such as CAS ONLINE, Gmelin Formula Index, American Petroleum Institute Patent Database and Chemical Journals Online. The STN can give information on polymers, toxicity, surfactants, adhesives, electrochemistry, biochemistry and many more topics. It is possible to search for analysis, biological studies, occurrence, preparation, properties, reactions and uses reported in the world's chemical literature. It costs about \$35 to

open STN account then you pay for online time, telecommunications charges, search terms, and retrieved information.

SWEET TOOTH ERYTHRITOL

Erythritol has been known since 1874 but has not yet been successfully industrialized. Erythritol is a natural sweetener found in fruits and fermented foods such as wine and soybean sauce. It is about 25% less sweet than sugar but has hardly any calorific value; it is heat resistant, less hygroscopic than sugar and does not cause tooth decay. Japanese researchers have now found an industrial scale fermentation process using mutant species of microorganisms which can be used in batch or continuous mode to give yields of 43-52% erythritol from glucose. Erythritol is said to have better taste characteristics than the low calorie sweeteners such as Aspartame or Stevioside.

TRIVIA QUESTION

On the 15th December 1939 a new polymer was commercially produced for the first time. The polymer was unsuccessfully tried out as a denture base material. The commercial name of the polymer was derived from the initials of one great city and the first three letters of another. what was it?
(Answer on page 10)

AIDS IN SPACE

Researchers at Wellcome's research centre in the UK had an experiment on board the space shuttle Discovery which is part of the fight against AIDS. The experiment involved the anti-Aids drug Retrovir (Zidovudine), which inhibits the enzyme reverse transcriptase- a key factor in reproduction of retroviruses, the group to which the Aids-causing human immunodeficiency virus(HIV) belongs. The use of the shuttle will allow the growth of larger crystals in microgravity which will permit the determination of the three dimensional structure by using X-ray crystallography. This was just one of sixty different crystal growth experiments which were on the Discovery mission.

THE LIGHT OF LIFE

"Carbon dioxide is transformed into biomass at the annual rate of 2×10^{11} tonnes per year by green plants through the photosynthetic process."

Professor David Phillips.

The Chain of Events

Photosynthesis consists of a chain of electron transfer reactions which, in green plants and algae, result at the electron donor end in the oxidation of water to oxygen, and at the electron acceptor end in reduction processes such as the conversion of carbon dioxide to carbonate, or nitrogen to

ammonia, protons to hydrogen. Understanding how nature copes with the complex chemistry of electron transfer process has resulted in the award of the 1988 Nobel prize for chemistry for three German scientists. This represents a crucial breakthrough, with potential applications extending far beyond photosynthesis. Who knows it could well have implications for dental and medical research. We should keep a close watch on all scientific breakthroughs however, obscure and remote they may seem to our own subject area.

LIFE

However, "Do not take life too seriously you will never get out of it alive" Elbert Hubbard.

TRIVIA ANSWER

The polymer was "NY LON" named after New York and LONDON, first produced by DuPont in Seaford Delaware.

HOW SAFE IS SAFE ?

Italian researchers reported in the J. Amer. Med. Ass. that a study of 45 couples indicates that open-mouthed passionate kissing could possibly result in the spread of blood-borne diseases including AIDS. We do understand in dentistry that certain dental procedures in which blood is released pose a health risk in the absence of the use of surgical gloves.

The Future for Biomaterials:

Medical and dental care programmes in Canada are recognized throughout the world for their excellence. However, Canada has also one of the highest per capita expenditures in health care costs in the world. The market for materials used in medical devices is expected to triple by the year 2002. Areas predicted to receive greater emphasis are composites, ceramics, treated tissues, surface modification for biological fixation, bioactive and anti-thrombogenic coatings, targeted drug delivery systems, and wound healing materials. As health care costs continue to rise it is clear that an urgent

need exists for increased research and development on new biomaterials and biocompatibility evaluation. The government has a mandate for strategic directions identified in the National Science and Technology policy aimed at facilitating Canadian industrial development. The table below shows data for selected areas of biomaterials. The Department of AOS intends to further strengthen our research links with the national and international academic community and develop effective mechanisms for transferring to the private sector those research results which have economic potential.

*WORLD MARKET FOR SELECTED BIOMATERIALS

Application	1986 Number	Market (millions)	1996 Number	Market (Millions)
Total Hip	300,000	\$ 180	400,000	\$ 280
Total Knee	50,000	\$ 60	200,000	\$ 100
Ankles/elbow/shoulder	50,000	\$ 25	700,000	\$ 420
Finger	400,000	\$ 20	600,000	\$ 60
Fixation Pins Plates	1,000,000	\$ 50	1,200,000	\$ 72
Tooth Implants	300,000	\$ 150	1,500,000	\$ 375
Periodontal treatment	200,000	\$ 4	1,000,000	\$ 50
Ridge augmentation	100,000	\$ 2	2,000,000	\$ 80
Ridge maintenance	250,000	\$ 2.5	15,000,000	\$ 300
Mammary prostheses	400,000	\$ 40	500,000	\$ 60
Intraocular lenses	1,000,000	\$ 400	1,500,000	\$ 1,125
Middle Ear Prostheses	30,000	\$ 4.5	35,000	\$ 7
Cochlear Prostheses	500	\$ 5	10,000	\$ 100
Sutures	17,500,000	\$ 2	18,000,000	\$ 36
Facial augmentation	6,000	\$ 1.2	10,000	\$ 5
Myringotomy tubes	300,000	\$ 9	500,000	\$ 25
Pacemakers	190,000	\$ 285	200,000	\$ 400
Heart valves	40,000	\$ 80	60,000	\$ 150
Arterial prostheses	250,000	\$ 50	500,000	\$ 125
Ventricular assist	100	\$ 0.75	500	\$ 5
TOTALS (World)		\$ 3,509.87		\$ 9,437
Totals (US)		\$ 1,403.95		\$ 3,775
Totals (Canada est.)		\$ 140		\$ 377

*Adapted from: Hench.L.L, "Ceramic Implants for Humans"

Adv.Ceram.Mat. 306-324:1,1986.