

Dental Research News

Research Development Office, (902) 424-1675

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NHRDP Grant Success for Amid Ismail.

A large NHRDP Grant (\$141,872.00) has been awarded to Amid Ismail for a project entitled "Evaluation of the Restorative Treatment Services of the Quebec Children's Dental Insurance Program". This is excellent news for our faculty since it firmly places us on the map in terms of clinical and epidemiological research. This should encourage other faculty members to collaborate with Amid in this exciting area of research.

Four Faculty Members Chair AADR Sessions.

Four of our faculty members were selected to Chair sessions at the international meeting in San Francisco. They were Bruce Graham, who chaired the Prosthodontic Research session on complete dentures and overdentures, Derek Jones who

chaired the session on Properties of Ceramics, Elliott Sutow who chaired the session on fixed Prosthodontics, and Ken Zakariassen who chaired the session on Pulp Biology and Endodontics. The selection of our faculty as chairmen of these sessions reflects the high level of respect which the international community have for our research at Dalhousie.

MRC Major Equipment Grant Success

A grant (\$18,333.00) to purchase a high temperature furnace for the Biomaterials Programme has been awarded by MRC. The research team on the Programme Grant find this to be excellent news since the equipment was urgently required to undertake synthesis of glass for porcelain and glass ionomer biomaterials.

Summer Projects Approved

An ad hoc Committee of the Research Development Committee has selected the following 13 projects as being suitable for summer student research for 1989.

Brygider, R; & Graham, B.
Resilient Denture Liners Studies: Project A: Functional Impression Replicability.

Project B: The Effect of Two Surface Coating on Liner Flexibility, Plasticizer Leachability and Fungal Growth Support.

Doyle, G; Price, R. & Bannerman, R.

Crown Strength of Renaissance All Ceramic Restorations versus Dicor and Porcelain Fused to Metal Restorations.

Foong, W.C.; Jones, D.W., Howell, R.E. & Sutow, E.J.
The Relative *In Vitro* Cytotoxicity of a Range of Methacrylates.

Hawkins, C. & Sterrett, J.
A Retrospective Clinical Assessment of the Relationship of Maxillary Anterior Crown Margins and Periodontal Health.

Howell, R.,Cohen, M. & Precious, D. Improved Histological Methods for Plastic-Embedded Hard and Soft Tissues.

Ismail, A.I., MacInnis, W. Forgey, M., MacDonald, R. Clovis, J., & Graham, B

Oral Health Needs Assessment of Geriatric Residents in Mount Saint Vincent Mother House.

MacDonald, R., MacInnis, W. Peacocke, L., Martell, G. & Zakariasen, K.L.

SEM Comparison of Lased Enamel to Acid Etched Enamel for Similarities and Differences. To Determine Whether Resin Will Bond to Lased Enamel, and If It Does, To Compare the Bond Strength of Lased Enamel to Acid Etched Enamel.

MacInnis, W., Peacocke, L. MacDonald, R., & Sutow, E.
Strength Comparison Between Amalcore and Parapost Retained Amalgam Cores.

Pass, B. Enamel Biopsy Technique For Electron Spin Resonance Measurements Of Cumulative Radiation Dose.

Peacocke, L., Zakariasen, K., MacInnis, W., Boran,T., & MacDonald, R., The Effect of Surface Preparation on the Wettability of Vita Porcelain.

The Summer Research Projects are continued on page 3

Summer Research Projects-
(cont.)

Price, R., Sutow, E., &
Bannerman, R.
How Well Do Crowns Fit?

Wright, B. Epinephrine and
The Cardiac Patient.

Zakariasen, K, MacDonald,
R. & Boran, T.

(a) Temperature Changes
Associated with Dental Hard
Tissue Lasing;

(b) *In Vitro* Studies of Laser
Effects on Dental Caries Using
an Artificial Caries System.

(c) Continuing of Laser
Radiation vs Acid-Etching in
Bonding to Enamel.

A further six research projects
were also approved by the
committee but not funded for
summer students and a further
four projects were selected for
the MRC Farquharson Schola-
rships.

A Powerful Tool for CLINICAL RESEARCH

During the past two years a
large number of suggestions of
topics for clinical research have
been put forward in the Dental
Research News. It was
therefore rather disappointing
to find that only 4 out of the 24
research projects submitted for
this years summer research

were clinical and only one was
partly educational.

Most of our faculty do not have
formal training in research and
very few have any training in
laboratory research. It should
be much easier for our clinical
faculty members to use their
clinical skills to advantage in
research projects rather than to
try to learn a whole set of new
types of skills. Those faculty
who may feel that they have
little to offer in terms of
research capabilities should
realize that their clinical skills
are a very powerful research
tool.

CORRECTION

It is not often that the editor is
pleased to be able to publish a
correction to a previous issue.
However, this is the case with
our April issue of the Dental
Research News, which contain-
ed a major error. It was
stated that Dalhousie Dental
Faculty had 17 papers accepted
for the IADR meeting in Dublin.
Since the publication of the
April issue the RDO has heard
that a further paper has been
accepted for the meeting. Doug
Chaytor's name must now be
added to the list of individuals
presenting papers. This is
excellent news since it means
that we have equalled our
previous record number of
papers presented last year.

**Hawkins & Lovas to attend
Workshop.**

Chris Hawkins and John Lovas have been selected to attend the ACFD research Workshop "Getting Ahead in Applied Research in Biomaterials". The workshop will take place as part of the ACFD/CADR XV Biennial Conference on Canadian Dental Research and Education June 10th -16th 1989. in London, Ontario.

**MRC Farquharson
Scholarship Awards for
1989**

A total of four students were awarded MRC FARQUHARSON Summer Research Scholarships for 1989.

Fred Brown, 3rd year DDS student, will work with Dr's. Sykora and Sutow on the project: (a) Application of 3-Dimensional Computer Aided Design to Ranking Distortion of Complete Dentures. and (b) Testing of New Resin-Metal Primer".

Sheila Duke, 2nd year DDS student, will work with Dr's. Lovas and Ismail on the project: "Patterns of Diagnosis, Treatment and Outcome of Oral Pre-cancer in the Maritimes".

Cathy Johnson, 2nd year DDS student, will work with Dr's Rizkalla, Jones and Sutow on the project: "Determination of Glass Transition Temperature, Thermal Expansion and Softening Point for a Range of Methacrylate Soft Polymers".

Kathy Russell, 3rd year DDS student, will work with Dr's. Sutow, Foong, Rizkalla, Howell, and Jones on the project: "The Influence of Surface Finish on the Rate of Release of Hg from Dental Amalgam".

The purpose of the MRC Farquharson Summer Undergraduate Research Scholarships is to encourage our undergraduates as future clinicians to consider careers in medical or dental research. Priority is given in selecting students with a proven academic ability as well as a perceived aptitude for research. The future applied scientists who will make up the profession of dentistry must seek out new knowledge in order to better serve mankind and contribute further to the body of our general knowledge.

RDO The Second Anniversary

On April the 1st it was two years since the RDO was established.

On the second anniversary of the RDO we can look back with pleasure and some pride on the accomplishments in terms of scholarship during the past twelve months. This clearly shows that the second year of our "Academic Plan" has continued with an increased level of success. During this period we have seen the awarding of the MRC Programme Grant (\$712,591.00) to our multidisciplinary team and success in a Major Equipment Grant (\$18,333.00). We have seen a large NHRDP Grant (\$141,872.00) awarded to Amid Ismail for a project entitled "Evaluation of the Restorative Treatment Services of the Quebec Children's Dental Insurance Program". In addition Dalhousie was joint leading institution with Toronto making application to the federal government for a Centres of Excellence in Biomaterials with a projected budget of \$18.8 million. Our international student exchange research programme now in its fourth year will be having two visiting students from Holland conducting electives in biomaterials for a period of three months, during September,

October and November of this year. We have also seen a repeat performance in 1989 of the record number of papers (37) being presented at the AADS, AADR and IADR meetings. The students staff and faculty and administration together with our Division of Instructional Resources can feel justly proud of the excellent team effort which has made the past twelve months such a success in terms of our scholarly activities. The feedback received at the AADS and AADR meetings indicated that our research papers were of a very high standard and were well presented. The international reputation of Dalhousie in the field of dental research and scholarship now stands very high indeed. This was a fantastic second year for the RDO.

Knowledge Explosion!

It has been estimated that new knowledge is being created at the rate of about 60 million pages each year.

Information doubled in the first 1700 years AD, however, it is now doubling every two years, are you doing your share? . . .

What was said in some of the AADR Papers at San Fransisco

According to one presentation expenditures for dental services showed a decline of nearly 40% from 1979 to 1986; however, dental disease is highly prevalent and, if untreated, can lead to serious physiological and even emotional consequences. (Abst #9)

Researchers have found an alarmingly high prevalence of baby bottle tooth decay among Head Start participants in four southwestern states. (Abst #19)

Dentists who examine patients with temporomandibular disorders have found that a patient's psychological state may be a better predictor of long-term pain than an actual examination of the jaw. (Abst #104).

A new system for delivery of tetracycline into the gums of patients suffering from periodontal disease has been developed, and is virtually painless, as well as non-surgical. (Abst #123).

A new therapy, using a combination of antibiotics and dental hygiene measures, might be a more successful treatment for localized juvenile periodontitis (Abst #128).

Juvenile periodontitis occurs in a significant number of young people, particularly among the Black population. (Abst #311).

Researchers have found traces of DNA from several human papillomaviruses (common causes of warts) in cell samples from patients with oral and pharyngeal cancer, suggesting that these may play a role in the development of squamos cell carcinomas in this part of the body. (Abst #363).

The amount of fluoride in breast milk should be taken into consideration when pediatricians and/or dentists are deciding whether to prescribe dietary fluoride supplements for infants, to avoid the possibility of the infants developing fluorosis. (Abst 3845).

Pilocarpine, a drug used in prescription eyedrops, recently proved safe and effective as a medication for dry-mouth patients, in a large clinical trial at the National Institute of Dental Research. (Abst #1071).

Further AADR news items on page 7.

AADR news items (cont.)

A new survey indicates that most Americans are not intimidated by dentists who wear gloves, masks, and protective eyewear to prevent the possible transmission of infection during dental treatment. This contradicts the contention of some dentists that their patients would be "scared away" if they used these procedures. (Abst #935 and 936)

There is a need for greater emphasis on preventative dentistry for inmates in US Federal prisons, and need for greater numbers of dental personnel, since the population of Federal prisons is expected to double in the next 10 years. (Abst #1094)

Gingivitis had long plagued people with severe mental retardation, because they often cannot brush their teeth correctly. But findings from a recent study of such individuals show that the antimicrobial mouthrinse chlorhexidine, when used as a supplement to toothbrushing, can effectively overcome this problem. (Abst#1844)

An indication can be gauged of the current areas of

research interest by looking at the topics selected for symposia. The following symposia were held at the AADR meeting in San Francisco:

I - "Influence of Composition on Performance of Restorative Materials: A Fifty-year Perspective"

II - "Grantsmanship and Scientific Investigations"

III - "Dentistry's Response to AIDS: Implications for Professional Change"

IV - "Plaque Fluid: Biochemistry and properties of the Plaque/Enamel Interface"

V - "Molecular Biological Approaches to Oral Microbial Pathogenicity"

VI - "Update on Research in Root Surface Caries"

VII - "Odontoblast Differentiation--Expression and Controls"

VIII - "Safe and Effective Dental Implants--Criteria for Pre-market Approval"

IX - "The Use of Novel Disaccharides and Polyols as Sugar Substitutes in Caries Prevention"

NUCLEAR TEETH

The Institute of Biophysics in Moscow has asked Dr. Barry Pass to collaborate with them on radiation dosimetry investigations of the Chernobyl Nuclear Accident. Tooth enamel samples of two victims of acute radiation syndrome have been sent to Barry for evaluation.

Barry has an abstract on radiation dosimetry of military personnel who witnessed the A-Bomb tests during and after world war two, this has been accepted for presentation at the 34th annual meeting of the Health Physics Society in Albuquerque, New Mexico.

Communication

One of the problems all scientists face is communicating science to the public. The British Association, promoting Science and Technology in London UK put on a one day science and technology workshop in April 1989 with speakers from both national and local media. The workshop was aiming to explain how the media works, what determines whether a particular story is newsworthy and what you should do if you think you have a science topic which you think would make a good story.

On the face of it this might be a useful exercise in Canada, since many areas of science especially in the area of dentistry fail to get the message across to the public as to what dental science is about. However, as we found to our cost this is often due to distortion and an unbalanced presentation of the facts as was the case with the CBC programme dealing with the perceived mercury problem in dentistry.

One Science

"Science is a continuum, and any attempt to fragment it into its component parts does violence to the whole.

As physical measurements have steadily become more elegant, definitive, and profound, it has become obvious that all scientists are dealing with the same basic laws. Scientists are increasingly being required to learn one another's language in order to remain effective."

-Announcement, New England Institute, Ridgefield, Con. 1988.

The Art of The Possible

"...in the world of science anything that is possible in principle can be done if the intention to do it is sufficiently resolute and long sustained."

Peter Medawar

Important or Trivial

"Measurement demands some one-one relations between the numbers and magnitudes in question- a relation which may be direct or indirect, important or trivial, according to circumstances" Bertrand Russell in *The Principles of Mathematics*, 1937.

Certainties about Uncertainty

The larger the quantity we wish to measure the more certain we can be. If we wish to measure the duration of one year which can be measured to within about 1 microsecond (10^{-6} s), our 'relative uncertainty' of such a large interval of time would be of the order of 3 parts in the 10^{14} . We could measure an hour to within 20 nanoseconds and the 'relative uncertainty' in this case would be about 2 parts in the 10^{13} . However, if we wish to measure a very small interval of time such as 1 nanosecond and the uncertainty of the measurement is 0.1 ns, then the resulting relative uncertainty would be in 1 in 10 or 10 percent. The absolute uncertainty will set limits on the magnitudes that can be measured in a satisfactory way. Accuracy of measurement can be expressed as the range of possible values which include the "true" value. On the other

hand precision refers to the dispersion of values around the mean value.

Leonardo da Vinci wrote in his private and secret notebook five hundred years ago that measurement of time involves both extension (duration) and position. How long did it take? and How frequently does it occur within a period of time?.

O Time! Consumer of all things.

O Envious age!

You destroy all things and devour all things with the relentless teeth of years, little by little in a slow death.

Leonardo da Vinci.

And The Days Grow Longer?

Did you know that about 500 to 600 million years ago the day was only 21 hours long. Some analysts envisage that the length of the day will be 30 hours long in about 500 million years time. This change is said to be due to the deceleration of the Earth's rotational rate as a result of the friction of the tides on and within the Earth. Because of this we can now conduct more research in a single day than primitive man, think about it.

Self Correcting

The more dramatic a scientific discovery the more skepticism and disbelief will be developed. It is perhaps fortunate that science operates in this way. Test-tube fusion experiments have been reported recently which claim to have achieved nuclear fusion by electrolysis of heavy water using a platinum anode and palladium cathode. Scientists have treated the chemists' claim with caution. To date two groups of scientists have conducted the experiment and have obtained different results. No doubt thousands of experiments are being conducted around the world to see if the experiment can be repeated. There is a lesson in this for all of us who conduct scientific experiments, healthy skepticism is very good, and there is a very real need for verification of results produced by other researchers.

SYNTHESIS?

"First the test-tube, then the pail,
Then the semi-working scale,
Ever bigger, ever faster,
Faster, faster, then- disaster!"
Anon.

History of Polymers

"Ever since the late 19th century, when the click of the first celluloid billiard balls heralded a reprieve for hosts of elephants, to the present more modern sound of disposable plastic articles rumbling down the rubbish dumps of the world, the growth of polymer science and the polymer industry has been inexorable".
J.M.G. Cowie

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Going to bat for research at the AADR San Francisco.

Researchers at the University of California at San Francisco examined 1109 baseball players from seven professional teams. They reported finding oral lesions possibly precancerous in 46 percent of the 470 players who were chewers of either tobacco or snuff. The chance of developing such lesions in the mouth was said to be 25 times greater amongst the users of smokeless tobacco. A clinical study by Barbara Harsanyi and John Lovas has also found that there appears to be a strong linkage between nicotine chewing gum and lesions showing dysplasia. This was reported by Dr. Harsanyi at our faculty April lunch time Research Seminar.

Computer Crime

According to the US National Centre for Computer Crime Data in Los Angeles. Computer crimes now cost the US some \$555 million each year. Some 36% are financial thefts, 34% thefts of services, whilst the theft of information was about 12%.

===== Not so computer-friendly?

The distinctive visual-display icon symbols used by Apple - Computer for the Mac's in order to produce "user-friendly" displays has entered into a major court battle in California. In March Apple won the first round of the battle against two companies, Hewlett-Packard and Microsoft in a dispute over a licensing agreement signed by Apple and Microsoft in 1985. According to the court ruling the agreement only covered the earlier versions but not the latest Microsoft display software called Windows 2.03. The court must now decide who owns the copyright. Apple-Computer claims that Windows 2.03 and a programme called "New Wave" developed by Hewlett-Packard which uses the 2.03 display, have the look and feel of the typical screen displays used on the Macintosh. Microsoft is currently working with IBM to use the Windows technology

for IBM and IBM compatible computers. Apple Macintosh are aiming to keep the screen display development for their own use. The final outcome of the battle could have very significant implications for those of us who use either IBM, Hewlett-Packard or Macintosh computers. With so much at stake for all parties involved it is quite possible that the problem may get settled out-of-court. However, what we all require are improved statistical packages which are computer friendly, however, these may be further from development whilst the court battle continues.

===== A 16 Megabyte Floppy?

Conventional floppy discs store 2 megabytes by recording on both sides of the disc with a spacing of 135 tracks per inch. A Japanese company has now developed a new disc which has 542 tracks per inch the result is a 16 megabyte floppy disc, the company are also working on a further development which would result in a 24 megabyte floppy. However, the bad news is that the discs will not work on existing personal computers, you will have to buy a special disc drive at about \$500 and the discs will be about twice the price of ordinary floppy discs.