Dalhousie University, Faculty of Dentistry

DECEMBER 1988

# Dental Research News

Research Development Office, (902) 424-1675

## This Was The Year That Was!

As 1988 draws to a close we can look back and say that our research activity and research efforts within the faculty during the past year were exceptional as measured by any standard. In March we had a record number of papers presented at the IADR meeting in Montreal. Our success in obtaining a large MRC Programme Grant was a further major achievement. Two major equipment and one operating grants have also been submitted to MRC with a further Operating grant submitted to NRHDP. A further activity during the year was the submission of a Centre of Excellence Proposal in Biomaterials. We also have a total of 18 abstracts submitted to the IADR meeting in Dublin for next June. In addition we have eight AADR papers together with several AADS papers which are to be read at the meetings in San Francisco next March. Never before in the 78 year history of the Dental Faculty have so many of our members been so much involved with genuine scholarly and research activities.

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## New Software for CISTI

The Canadian Institute for Scientific and Technical Information (CISTI), have just announced new software for the online nation-wide scientific and technical information system. The database covers a wide range of topics from the world's scientific literature. A complete list of topics is available from the Dental Research Development Office.

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GREETINGS OF THE SEASON AND BEST WISHES FOR A HAPPY NEW YEAR TO ALL OF OUR READERS.

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## An Excellent Effort.

Dahousie University had three major proposals submitted to the federal Centres of Excellence programme. These were the Ocean Production Enhancement Network, the Heart Health Science and Technology Network and our own "Biomaterrials" proposal submitted jointly by Dalhousie and Toronto. The budget of the Ocean Production Enhancement Network proposal was $27 million, our Biomaterials proposal had a budget of $18.8 million. The deadline was the 30th November for the proposals to be in Ottawa. We completed our work on the documentation for the Biomaterials proposal at 3:15 am on the 30th November the 4lbs of paper comprising 394 pages was delivered by hand to Ottawa from Halifax by Dr.Dennis Smith. It has been reported that a total of 158 applications were submitted, these had a total weight of 1,500 lbs. and comprised some 60,000 pages. Our overworked FAX machine and team of workers involved with the Biomaterials submission performed wonders in producing an excellent final document. The fifteen principal investigators collectively had a total of 1,600 publications in refereed journals and over $5 million in current research grants. We believe that we have a very strong application on paper. The proposed research programme contained the following seven project areas:

1. Adhesives and Wound Dressings,
2. Biomaterials for Drug Delivery Systems,
3. Reconstructive and Reparative Materials,
4. Structural Implants,
5. Vascular Grafts,
6. Biosensors and
7. Biocompatibility.

The participating Universities were British Columbia, Calgary, Dalhousie, St Francis Xavier, Laval, McMaster, Toronto, Waterloo with collaborators at Acadia, St Mary's, McGill, Montreal and Technical University of Nova Scotia.

The proposed budget for the Dalhoiusie University section of the programme has a four year total of $5,716,383. which represents over 30% of the total budget requested, this includes a total of $1.26 million in equipment for Dalhousie University.

Even if our Biomaterials programme is not successful in obtaining funding, we can at least claim to have forged some excellent long lasting collaborative relationships across the country which will enhance our research capability. We believe that the many long hours spent on this project will not have been for nothing. We had a tremendous contribution from staff and faculty members across the country in the preparation of this application. This was a team effort with many making contributions way beyond the call of duty.

## ABSTRACT NEWS ITEM

The following 18 abstracts have been submitted to the IADR meeting to be held next year in Dublin. The range of topics coverd clearly indicates the very broad base and strength of our research programme which has developed rapidly over the past few years.

C.A.Bain* et al. "Effect of Spriamycine and/or Scaling on Advanced Chronic Periodontitus".

G.Doyle*, K. Moore, C. Goodacre, and C. Munoz. :"Breaking Strength of Dicor™ Crowns Fabricated for Different Tooth Preparations".

J..D. Gerrow*, R.B. Price, and D.C.T. MaCintosh, :"Comparison of *In Vivo* and *In Vitro* Surface Detail Reproduction Test Methods".

J.D. Gerrow, M.R. Roda*, D.West, :"A Comparison of Advancing Angles of Die Stone on Set Impression Materials".

G.C. Hall*, D.W. Jones, R. Liston, and D. Barrett: "Modified Technique for Chemical Analysis of Dental Cements".

R. Harrison*, W.C. Foong, R.E. Howell, and C. Karst.:"Topical Anesthesia of Oral Mucosa by Liposome Encapsulated Xylocaine:.

B.B. Harsanyi*, W.C. Foong, S. Hughes and M. Mezei. :"Allergic Contact Mucsitis as a Model for Antiinflammatory Drug Action"

C. Hawkins*, J. Sterrett, J. Murphy, S. Friar. :"Septal Crest Image Presence Compared on Horizontal and Vertical Bitewings".

R.E. Howell, W.C. Foong*, S. Pyke, D.W. Jones, and M. Mezei: "New Cytotoxicity Test for Phthalate Esters and other Lipophilic Compounds "

D.W. Jones*, A.S. Rizkalla, E.J. Sutow, and P.Tangri: "Elastic Moduli and Poissons Ratio of Commercial Composite Systems".

D.W. Jones, W.C. Foong, K. Oscan*, R.E. Howell, and E.J.Sutow: "Comparison of Drug Incorporation on Physical Properties of Soft Polymers"

L.E.Peacocke*, W.A. Macinnis, K.L. Zakariasen, R.M. MacDonald "Metallurgical Interface Between New and Old Amalgam In Amalcore Restorations".

A.S. Rizkalla*, D.W. Jones, E.J. Sutow, and T. Shakerinia.: "Dynamic Elastic Moduli of Experimental Composite Systems".

J. Sterrett*, E.J. Sutow and H.J. Murphy. :"Dentin Collagen Fixation Prior to Demineralization".

**NOTE: FURTHER ABSTRACTS ARE CONTINUED ON PAGE 4.**

(IADR Abstracts Continued).

E.J. Sutow, W.C. Foong, R.E. Howell, D.W. Jones, K.A. Russell, and R.B. Price*: "In Vitro Corrosion Resistance of PFM Base Metal Alloys",

O. Sykora, A. Brown*, and E.J. Sutow, :"Posterior Palatal Seal Adaptation: Processing Techniques and Plate Shapes".

O. Sykora*, and E.J. Sutow, :"Fit of Acrylic Denture Base Using A New Dental Stone".

K.L. Zakariasen*, J. Barron, J. Cullinan, and D.Miller. "Temperature Elevations Occurring Across $CO_2$ Lased Dentine".

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"Research is an act of enlightenment for society. When fiscal climates are tight, selling enlightenment is tough".

Geraldine Kenney-Wallace
Chair, Science Council of Canada.

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## Accuracy and Precision

The significance of a measurement is determined by the degree of accuracy. Many are not clear about the difference between the terms accuracy and precision. Precision is defined as the degree of agreement of repeat measurements of the same quantity, on the other hand accuracy is defined as the agreement between the result of a measurement and the 'true value' of the quantity measured. We may talk about the accuracy of a dental impression material in terms of how close it can reproduce and replicate in negative form the shape and surface detail of the hard and soft tissues of the mouth. We could also talk about the 'precision' of the method by making twenty repeat impressions of the same shaped object and calculating the variation in size and surface detail produced. We can think in terms of a scientific instrument which we are using in our experiment to provide data as having a specific level of accuracy. In general this would be defined by comparing the indicated value to an accepted standard value ("True Value"). Interestingly we usually measure accuracy in terms of inaccuracy relative to some standard. Scientific equipment will usually provide an indication of accuracy which specifies the limit that errors will not exceed when the instrument is used under specified operating conditions. The accuracy may be specified as $\pm$ 1% of the output reading of the instrument.

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## "A COMMEN MATTER

Did you know that of the 90 elements found in nature only nine make up 99.25% of the earths crust. Many considered to be common are in fact quite scarce in terms of their percentage in the earths crust. Out of 104 elements only 18 have been discovered since 1900. In 1952 Dr.Harold Urey estimated the chemical elements in the cosmos. Hydrogen 3.5 $X10^8$ was thought to be the most abundant followed by helium 3.5 $X10^7$, other elements were oxygen 220,000, nitrogen 160,000, carbon 80,000, and neon 9,000 to 240,000. However, earlier in the 1930s Dr.Fritz Zwicky an astronomer from CalTech came up with the idea that some form of "dark matter" which can only be detected by its gravitational influence on visible matter exists in the universe and may even be present here on earth. Many scientists in laboratories around the world are busy trying to discover what may turn out to be the most common material in the universe. The administration at Dalhousie will be pleased to learn that our Biomaterials research is concentrating on visible materials.

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"The wise man's eyes are in his head; but the fool walketh in darkness".

Ecclesiastes 2:14

## $5.4 Million MRC Grant!

A five-member research team at the University of Toronto's Faculty of Dentistry has been awarded a six-year, 5.4 million dollar MRC grant to study the connective tissues that support teeth. The group, which combines know-how in cell biology, electro-physiology, endocrinology and molecular biology , is looking for methods to measure electrical activity at cell surfaces, monitor periodontal disease and gauge the recovery rate of periodontal tissue.

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## A LIGHT TOPIC

Did you know that scientists at Bell laboratories are working on the development of optical computers. These will perhaps one day work by using gallium arsenide and aluminum in 2,500 alternating layers which it is hoped will function to switch light beams on and off in much the same way as a semi-conductor switches electronic signals.

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## DENTAL MERCURY

Did you know that dental amalgam accounts for only about 1.5% of the total consumption of mercury in the US. The main uses are electrical apparatus 28%, mercury cells 20%, antifungal agents 18% and thermometers and 8% for electric control instruments and switches.