

Dalhousie University

Dental

Research News



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HAPPY BIRTHDAY RDO

It was just twelve months ago on the 1st April that the position of Assistant Dean for research was created and the proposal for a Research Development Office (RDO) set in place. The objectives of the RDO were to significantly increase the level of research activity within the faculty and in addition to encourage student participation in research activities within the faculty.

A look back over the past twelve months clearly shows that the first year of operation of our "Academic Plan" has been extremely successful. The faculty had a record number of papers being presented at the IADR meeting in March. In addition grant applications to external agencies have been vigorously persuade. The number of students involved in our research has also never been higher and we had two students from Scotland visiting to conduct electives in our research laboratories with a further four from Dundee and one from Birmingham due to participate this coming summer. Ten of our students presented papers at the IADR in Montreal. The celebration of the hard work of the past twelve months of scholarly activity was provided by the wonderfully successful IADR meeting.

The students, staff, faculty, administration and our Division of Instructional Resources can feel justly proud of the excellent team effort which went into putting together our presentations at both the IADR and the AADS meetings held in Montreal. The two dry runs held prior to the meetings clearly helped to pull together our large contribution to this years IADR and AADS programme.

Everybody could be expected to be impressed with the quantity of papers which we presented, a total of thirty seven papers at the two meetings carried the name of Dalhousie University. However, the feedback received at the IADR meeting indicated that our research papers were also of a very high standard and in addition were extremely well presented. Our students were particularly impressive once again demonstrating the very high quality which we have seen in previous years.

This years IADR was the largest ever held with some 4,600 delegates attending from all over the world. This was indeed a memorable event for Canada, the organization of the meeting was first class, many are claiming that this was the best IADR meeting ever held. It was also a memorable and important event for Dalhousie University, thanks are due to all who helped to make our contribution such a success. The international reputation of Dalhousie University in the field of dental research and scholarship stands so much higher because of our collective efforts. This was indeed a successful first twelve months for the RDO.

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DID YOU KNOW?

Some 340,000 new cases of cancer of the mouth and pharynx are reported each year according to the world Health organization.

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Greater even than the greatest discovery is to keep open the way to future discovery.

John Jacob Abel.

THE CONTROVERSY OF TOXICITY TESTING.

According to the Canadian Council on Animal Care (Resource 12(1) 1987), 191,173 animals 76% of them mice were used in testing in Canada in 1986. A total of 2,015,222 animals of 18 species were utilized in research, teaching and testing, this was said to be down slightly from the year before. Figures from Great Britain show that 3.1 million animal experiments were performed in 1986. It is not known how many animals were used in the UK only the number of experiments performed. In the USA no data is available to indicate the number of animal experiments or the number of animals used.

A conference on ethics and experimentation held in Ottawa in March 1986 reported that public opinion polls in the USA revealed that 77% of the public support the use of animals in research, 70% supported their use in basic research, and 80% supported their use in the testing of new drugs and products.

In the evaluation of our new biomaterials we do use some animal testing in the Faculty of Dentistry. However, we are also making extensive use of cell culture methods and are attempting to improve the methods used. Although more rapid and less costly, the short term in vitro tests are not universally accepted as providing conclusive evidence in testing chemicals. It is also generally accepted that no single or short term screening procedure is capable on its own of predicting all carcinogens. Experts have yet to agree as to which tests should be adopted since all tests may produce some false negatives and positives.

However, a very interesting observation has been made by Nelson (Envir. Health. Pers. 75:97, 1978) who makes the point that "as laboratory tests for toxicity expand and proliferate and become more routinized, one sees fewer and fewer studies on large animals such as dogs, cats, and primates; these have never been studied in large numbers but, nevertheless, have been sometimes

extremely useful in disclosing patterns of response that rodents do not show. Nelson makes the point that the specificity of the dog in responding to bladder cancer with aromatic amines (mimicking human responses) would have been missed had we been dependent on the current procedures using rodents only".

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FROM OLD TO NEW SCOTLAND

Last summer you may recall that we had two students from the University of Dundee in Scotland as part of our student exchange programme. Duncan Black and Joseph Gamba were able to conduct their elective research projects within a period of five weeks and produce some meaningful data. Both of these successful projects resulted in papers being presented as joint Dalhousie Dundee research at the IADR meeting in Montreal last March.

We are indeed pleased that a further four students from Dundee will be paying a visit this summer to Dalhousie in order to undertake their elective research in biomaterials. It is with considerable sadness that we hear that the University of Dundee Dental School may well be closing down as a result of a government decision.

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PhD Success for Dental Laser Research

Dr. Doug Dederich a former colleague of Dean Zakariasen is to be awarded a PhD for his work on the development and use of lasers for dental applications. Dr Dederich is an Assistant Professor at the Faculty of Dentistry, University of Alberta.

RESEARCH AWARD FOR BOB CLINTON

Bob Clinton 4th year DDS student is the recipient of the 1988 Warner-Lambert Award for his demonstrated aptitude in research. This recommendation by the Research Development Committee will allow Bob to attend the 24th Annual Dental Students Conference on Research. The meeting this year will take place at the The National Institute of Research in Bethesda on April 11-12th,1988.

The basic objective of the conference is to expose outstanding dental students to dental educators, scientists and administrators and make them aware of the wide scope of careers available in dental research.

The Council on Dental Research of the ADA sponsors the annual orientation programme on dental research for one dental student from each dental school in the United States, Canada and Puerto Rico. The training and recruitment of manpower is of paramount importance to the expansion and improvement of dental research. One very important source of future dental scientists is the dental student population of today. The involvement of students in our research within the faculty is one way of making a contribution to the future of dental science in Canada. Bob Clinton's research experience with Dr.David Precious may pave the way for a dental science career. Bob will be reporting to faculty and students on his experience at the conference on his return.

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RESEARCH AND SPACE

Derek Jones was approached about four years ago by the Canadian Space agency to participate in the development of projects to take advantage of microgravity in space for the synthesis of materials. However, with the Shuttle problems the programme was put on hold. On the 21st March Dr.Kumar of the space Division of NRC visited the Division of Dental Biomaterials to renew the request for the development of a space project.

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MRC FARQUHARSON RESEARCH SCHOLARSHIPS

The Faculty have again been fortunate in obtaining funding from MRC for support of summer research students. Four MRC Research Scholarships (Farquharson Scholarships) have been awarded again this year. The following students are this years recipients:

- Joanne Burke
- Susan Pyke
- Kathleen Russell
- Marc Verpoorte

The purpose of these MRC Scholarships is to enable undergraduates to gain research training during the summer months. The MRC stipulate that only students who rank in the top 20% of their class can participate. Priority is thus given in selecting those students with a proven academic ability as well as a perceived aptitude for research. The MRC further stipulate that the award holders must work full time in a research programme supervised by an established research investigator.

The MRC are assessing among other things the effectiveness of the programme in encouraging future clinicians to consider careers in medical or dental research. A true profession such as dentistry must seek out new knowledge in order to better serve mankind and contribute further to the body of general knowledge. We wish good luck to our four recipients and hope that they have an enjoyable summer research programme.

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AN APPLE FOR THE TEACHER

An Apple for the teacher and the researcher has been obtained by Dr.John Eisner. Congratulations are due to John Eisner who has received a grant from Apple Canada in the form of a Macintosh II computer. John will be using this in his research involving development of a hypertext/videodisc education programme.

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STRAIGHT FROM THE MOUTH

Karen Baker Assistant Professor Oral and Maxillofacial Surgery at the University of Iowa gave a paper at the Greater New York Dental meeting last December. She addressed the extravagant claims made by companies selling products in the \$2 billion oral health care market. While many of the new products have some effect in controlling plaque, their usefulness in preventing periodontal disease remains to be scientifically established.

Claims for "tartar control" by products such as Dentagard, Closeup, Viadent, Crest and Colgate Tartar Control have yet to be scientifically demonstrated (NHRDP would love to fund this).

The main problem with studies of products this type is that the patients are given special instructions with the new materials which may influence the result. Thus, well controlled double blind studies are required using control groups of age, sex and socio economic matching, in which all participants receive the same instructions.

The more effective tartar fighting toothpastes such as Prevent which contain zinc compounds may deplete calcium from teeth according to some studies (good idea for a project ?)

Studies have shown that the toothbrush remains the most effective plaque and caries control method. According to Karen Baker the brushes recommended by the dental profession have soft nylon bristles with rounded ends. However, only FIVE out of 58 brands evaluated by SEM had the desirable bristle structure these were Sensodyne, Reach, Butler, Jordan and Lactona.

Why not conduct a study of the types of brushes used in Nova Scotia ?. Ask them to send in their old brush to get a new one ?.

The boom market in plaque-fighting mouth washes is not supported by scientific studies of the claimed effectiveness. According to Karen Baker few of these studies were of sufficient length in order to establish meaningful

data. Studies should be conducted for at least eight weeks. Many studies use unrealistic test conditions, for example, in a study of Viadent the participants were asked to rinse five times a day, while the normal for most individuals would be once or twice a day.

Clearly there is considerable potential for faculty to get in and help clean up the data which at present supports some of the claims for products in the \$2 billion oral health care market. Our Dental Hygiene and Periodontal Faculty and Post Grad Students with the aid of our new epidemiologist Dr Amid Ismail could have a research bonanza with these topics. Tom Boran's artificial caries lab would also be another ideal collaborative opportunity for joint projects of this type. We could have three or four NHRDP grant applications dealing with these oral health problems.

FACULTY MEMBER RECEIVES INTERNATIONAL RECOGNITION.

The issue of "NEWSWEEK" dated February the 29th 1988 carried an account of some of the research findings of Dr. Michael Cohen. It carried a report of his work dealing with the genetic disorder of Joseph Merrick, the grotesquely deformed "Elephant Man". One of Michael Cohen's greatest findings involves the Proteus syndrome, a grossly disfiguring disease first described by Cohen and Hayden in 1979. Cohen and Tibbles have recently produced arguments which support the misidentification of the "Elephant Man" affliction of Joseph Merrick. The affliction was not neurofibromatosis, a fairly common genetic disorder but more probably the rarer Proteus syndrom.

CENTRE OF EXCELLENCE IN MATERIALS
RESEARCH

The Division of Dental Biomaterials Science are involved in discussions aiming to put forward an application with other groups for a centre of excellence for the federal governments \$1.3 billion programme. The announcement by the federal government of the programme to establish regional centres of excellence on university campuses provides us with a wonderful opportunity in Atlantic Canada to take advantage of the first class expertise which we have in our various regional institutions. It is generally understood that these centres will in effect be more like a network system than a true centre.

The biomaterials section of the proposed centre would be involved with the synthesis of inorganic glass ceramic biomaterials as well as organic polymers. A major area of interest would involve drug release from biomaterials. We also have strong expertise in corrosion science of biomaterials. Our current work in conjunction with The Division of Oral Pathology also encompasses biocompatibility testing of biomaterials.

A report from The National Advisory Board on Science and Technology states: "Though basic research activities are also performed in industrial and government laboratories, the relative superiority of the university setting for the pursuit of advancement in knowledge is a recognized fact. Indeed, in most advanced countries, a major proportion of basic research is performed in universities".

The proposal to set up "CENTRES OF EXCELLENCE" in our universities recognizes the importance of the academic and intellectual environment which can stimulate and innovate new research ideas.

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"O wad some power the giftie gie us,
To see oursels as ithers see us."

Burns

We rarely see ourselves as others see us. The image presented by Dalhousie University and by the Faculty of Dentistry to the outside world is very important to our future in the rapidly changing society in which we live.

The unfortunate error in the Dalhousie News of March 16th which carried the headline "Teaching or Research a decision needed", can clearly carry the wrong impression of our institution to the outside world. As emphasized by President Clark the teaching and research objectives of Dalhousie must complement each other.

The words of C.C. MacNiven say it all, "Research is, I would suggest, fundamental for teaching. One contribution which research ought to make towards good teaching is to keep up the intellectual standard of the material being presented to students by submitting it to the process of peer review".

The presentation of the results of our scholarship at an international meeting or publications in scientific journals inform the world of the intellectual standard of the Faculty of Dentistry and Dalhousie University. To make the statement that we are turning our Faculty of Dentistry into a research institute because we are placing a greater emphasis on research than in the past is most misleading. What we are doing is to improve the intellectual standard of the Faculty which will in turn lead to improved teaching by better informed faculty members. The image we project with the fruits of our scholarship and the standard of our teaching will influence the way in which others see us.

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PERIODONTAL DISEASE AND DRUG DELIVERY

- a new type of treatment.

A new system for local delivery of tetracycline to gingival tissue was launched by Alza Corporation in the USA. The treatment utilizes a fine polymer thread impregnated with tetracycline. The polymer thread is wrapped round the tooth and placed into the gingival pockets. The drug is slowly released as the polymer breaks down. It was estimated that this system could deliver tetracycline at a controlled rate for 7 to 14 days after which the thread is removed.

Alza Corporation claims that this type of "on site" slow drug release system could supply an average of 12 mg of tetracycline per tooth over 10 days, compared with the 1 to 2 g per day dosage with current standard treatment. Furthermore, the antibiotic level in the periodontal pockets is estimated to be 100 times higher.

Slow or controlled drug delivery systems in which localized drugs are supplied to specific sites in the oral cavity such as the periodontal pockets will be a significant step forward in the treatment of oral diseases. Our Division of Dental Biomaterials Science have been synthesizing polymer fibers for the past 18 months. Soft polymers for use in prosthodontics are also being synthesized, both of these systems are being evaluated for slow drug delivery applications. This will be one of the many research projects being conducted by our summer students.

ESR SPECTROMETER FOR PASS

Dr. Barry Pass recently acquired an electron spin resonance spectrometer for his research. Barry is working with Dr. John Aldrich (Department of Radiology) on the development of a technique using ESR to determine the accumulated radiation dose in tooth enamel. Dr. Pass will have a summer student working with him to develop an in vitro technique to determine the feasibility of an enamel biopsy method.

Mac Mouse Not Dead Mouse.

Dr. Richard Fosse a professor of veterinary science at the University of Bergen, Norway is in the process of developing an interactive computer programme which will replace animals used in some teaching of students in veterinary, medical, dental and pharmacology programmes. The programme aims to model responses which are usually produced in animals to demonstrate effects in practical pre-clinical laboratory courses, such as muscle twitching, α and β adrenergic responses and blood pressure. The work is making use of a programme called "Pharmatutor" which is made in Switzerland and runs on the Macintosh (512K memory).

Scientific Progress.

"The development of science is a stepwise process; nobody starts from scratch and nobody gets far ahead of the rest. At any point in history there is a range of possible discovery; the trailing edge is defined by everything known at the time, and the leading edge is a function of what is already known, together with variables representing available instrumentation, the capacity of brains, and so on." (Caws 1969.)

BROWN BAG RESEARCH THINK TANK

Several Brown Bag lunch time sessions on various research topics have been held during the past weeks. Why not drop in ^{on} these informal sessions and have some fun.

Do you have any "RESEARCH NEWS ITEMS" which you would like to share with your colleagues?. If so, please forward such items to the Research Development Office, or call 2545.