Dalhousie University, Faculty of Dentistry

Dental Research News

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A First for the Faculty of Dentistry.

For the first time in the history of the Faculty of Dentistry at Dalhousie University an MRC Development Grant worth **$743,156** has been awarded. Rumor has it that Chairman of Oral Biology, Mike Cohen already has the champagne on ice. The Development Grant is designed to assist in recruiting or establishing new faculty members who have the potential for major accomplishments in research. MRC state that Development Grants are intended to provide an impetus for research in specific schools of medicine, dentistry and pharmacy. Funding is only provided to support individuals who can be counted upon to develop a vigorous research programme and make a major contribution to the generation of a productive research environment. In times of constraint, such as we are experiencing within the university sector, Development Grants are extremely competitive. The success of the Faculty of Dentistry at Dalhousie University in being awarded a Development Grant at this time is a momentous achievement. The grant has been awarded to support the research of Dr. Haroun Shah who will be joining us next July as a faculty member in the Department of Oral Biology, with a cross appointment in Microbiology. It is indeed an exciting time for Dr. Shah to be joining us at Dalhousie. The success of our Biomaterials Programme Grant in the stimulation of interdisciplinary research will be given a significant boost by the success of Dr. Shah's Development Grant. Dr. Shah has also agreed to be involved with some microbiological aspects of the Biomaterials programme.

Further Explosion of Research

The April Edition of DRN featured an item dealing with the explosion of research in the Dental Faculty. This was further underlined by the recent good news from Ottawa. A major breakthrough has taken place in the development of research in the Faculty of Dentistry with the awarding of an MRC Development Grant to support the work of Dr. Haroun Shah. The MRC site visit for his Development Grant application took place last December. The good news, received from Ottawa, is that the grant application, worth **$743,156.**, has been successful. Dr. Shah will be taking up his position as a Faculty member jointly appointed between Dentistry and Medicine in July 1991. Haroun is one of the top dental microbiologists in the world. It is indeed fortunate for Dalhousie that we have been able to attract Haroun to our faculty. Our international reputation in certain areas of research will now be supplemented with an impressive international reputation in microbiology.

The appointment of Haroun Shah and the successful MRC Development Grant funding marks a major breakthrough in the development of biological research in the Faculty of Dentistry. Haroun will round out an impressive group of academics in our Department of Oral Biology. An indication of the area of research which is currently being pursued by Dr. Haroun Shah's research group can be gained from the January edition of the Research News which featured details of some of his current research. The MRC funding is exciting news since it will allow Dr. Shah to bring with him two post doctoral fellows who are excellent scientists, Dr. S. E. Gharbia and Dr. P. A. Lawson. The Faculty of Dentistry at Dalhousie University can at last claim to be an academic institution with a well balanced research base of international quality. The achievement of obtaining the MRC funding in 1991 is indeed a remarkable event. The funding for operating grants this year is the lowest that it has ever been in the history of the MRC. As reported in last month's Research News, the success rate was less than 18%, compared with at least 30% in other years. To obtain funding against this opposition clearly illustrates the quality and reputation of Dr. Shah at the international level. The dream of Dean Zakariasen of developing a critical mass of scientists within the Faculty of Dentistry has finally become a reality.

Dr. Haroun Shah

Haroun is a very charming, quiet spoken, modest man. Haroun is also a fun loving individual with a passion for the game of cricket. Fortunately for Haroun the game still flourishes on the Halifax Commons each summer. Haroun is an extremely productive researcher with a total of 88 publications to his name; some 50 of these have been produced in the past five years. Dr. Shah has gained particular renown through his work on the taxonomy of anaerobic bacteria of the mouth. Haroun received his PhD in microbiology from the University of London, England in 1981. He was then appointed as a lecturer at the London Hospital Medical College from 1981 to 1984. During the period 1983-84 he conducted research at the MRC Periodontal Research Unit at the MRC Laboratories in London, UK. From 1985 to 1987 he was an Associate Professor in the Faculty of Medicine, University of Kuwait. Since 1987 he has been a Senior Lecturer at the London Hospital Medical College, University of London. Dr. Shah currently has a high level of research support in the UK holding five joint research grants with colleagues in London.

Dr. Shah's future research programme at Dalhousie will have three main areas of interest.

1) Study of the diversity and phylogeny of subgingival plaque bacteria. Development of diagnostic markers and probes.
2) The nutritional properties of periodontal pathogens in relation to the ecology of subgingival sites.
3) Isolation, characterization and assessment of putative virulence determinants of periodontal pathogens.

Dr. Shah believes that despite the evidence that anaerobic bacteria are important etiological agents in periodontal diseases, the factors that can lead to the development of periodontal diseases with loss of the attachment and bone resorption are still poorly understood. Dalhousie University and the rest of the world can look forward to some very important developments in our understanding of these common dental diseases emerging from the laboratory of Haroun Shah during the next few years. Dr. Shah's group have shown excellent productivity over the past five years. They have demonstrated an ability to characterize bacterial cell surfaces and to understand the metabolism of organisms. They have also shown the ability to apply new methodology in the field of molecular biology.

Dr. Saheer Gharbia

Dr. Gharbia will be part of the team of investigators working with Dr. Shah. Saheer who conducted her PhD studies with Dr. Shah is very eager to continue her successful collaborative research with him at Dalhousie. Dr. Gharbia has been working in the field of Oral Microbiology for less than 6 years. Even so, at the age of 27 years, Saheer already has an international reputation in the fields of biochemistry, physiology and metabolism of bacterial systems. Saheer is in constant demand as a speaker at international conferences throughout the world. Saheer is incredibly gifted and has been hailed as the most promising young scientist in the area of Oral Biology. Saheer completed her PhD in 1990 at the University of London, UK., in under 3 years with an outstanding performance. Saheer was able to bind 10 papers with her PhD Thesis and submitted another 10 soon after completion of her PhD. Her PhD examiners wrote after her defense that her thesis and her Oral Examination were exceptional. Her expertise in the areas of molecular biology, biochemistry, immunological and cell biology of bacteria which cause human periodontal (gum) disease and soft tissue infections throughout the body is unparalleled. Dr. Gharbia has published 25 papers in the past three years. Dalhousie is indeed fortunate that both Dr. Gharbia and Dr. Shah have chosen this location in which to continue their excellent, high quality, internationally acclaimed research.

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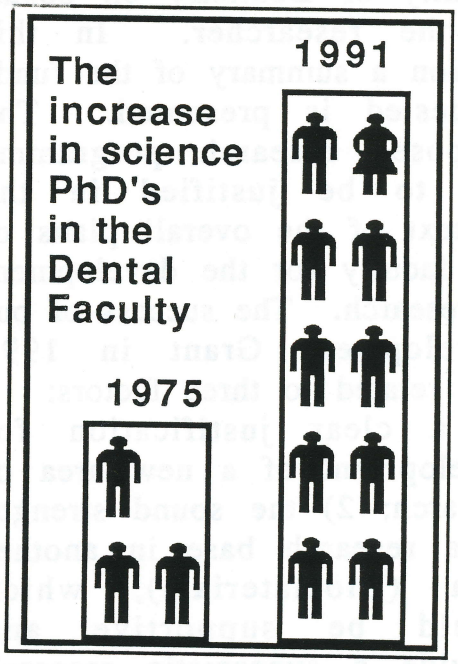
A 233 % Increase in the Science Base

The arrival of Dr. Haroun Shah and Dr. S. E. Gharbia will boost the number of science PhD's amongst the full time faculty and staff in Dentistry. Only 15 years ago the total of PhD's was 3, with the new arrivals it will give us a total of 10.



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Formula for success.

Perseverance is a strong will. Obstinacy is a strong won't.

Jubilant RDO

The RDO believes that the successful application for an MRC Development Grant was due to having all of the right ingredients for success.

An MRC Development Grant application comprises two components.

i) MRC Grant application (form #11) completed by the investigator outlining the research proposal.

ii) MRC Development Grant application (form #12) completed by the Dental Research Development Office on behalf of the Dean. The application is made by the Faculty of Dentistry on behalf of the researcher. In this section a summary of the funds requested is presented. The proposed research programme has to be justified in the context of the overall plans of the faculty for the development of research. The success of our Development Grant in 1991 was related to three factors:

1) a clear justification for development of a new area of research; 2) the sound strength of a research base in another area (Biomaterials), which would be supportive and provide a synergistic research atmosphere; 3) having a high quality researcher with a proven track record as the recipient.

The application on behalf of Dr. Shah was considerably complicated by his being located 3,000 miles away in the UK. This made it much more difficult for the Dental Research Development Office to coordinate the application and ensure that it arrived on time and in good shape in Ottawa for review by MRC.

Many colleagues at international meetings have suggested that Dalhousie Dental Faculty is now amongst the research leaders in the world. The success of the Development Grant provides substantive proof that research has arrived and is here to stay as an integral part of the excellent quality dental programme at Dalhousie. The research and scholarship aspects of our endeavour can now clearly be said to supplement the excellence of our clinical and educational expertise. The development of research in our faculty can be looked on as providing a wonderful opportunity for all faculty members.

Stop Press:

Amid Ismail Grant Success

We are pleased to report that Dr. Ismail has recieved a renewal of his NHRDP grant worth **$120,080.** Full details of this will be reported in next month's Dental Research News. Our total external research funds for this month are **$878,236.**

Biomaterials Graduation.

Congratulations are due to former graduate student in Biomaterials, Jim Johnson, who defended his PhD thesis last October. His PhD degree will be officially conferred at the Technical University of Nova Scotia convocation in May 1991, for his research conducted in collaboration with the Division of Biomaterials at Dalhousie University. Jim's PhD involved a study of acrylic bone cement poly(methyl methacrylate) which has seen widespread use in the fixation of synthetic joint components to bone. Despite the immediate and secure fixation usually achieved at surgery, mechanical breakdown of this polymer may occur leading to the eventual gross failure of the implant. Such failures have been widely implicated, particularly in the femoral replacement of the hip joint. Jim Johnson's study examined the stresses in the acrylic cement mantle along with the mechanical properties of a range of methacrylate formulations, some of which have been recently advocated to reduce the levels of stress. An axisymmetric finite element model with non-axisymmetric loading of the femoral hip replacement structure was conducted to compare the stress distribution in the cement mantle for variable elastic properties of the cement. A reduction in the cement's modulus of elasticity produced an increase in the length of the load introduction region, effectively reducing peak stresses. Bulk polymerization techniques were used to synthesize a range of copolymers. A detailed study was made of the effect of substituting poly(ethyl methacrylate) or poly(butyl methacrylate) into the methacrylate polymer chain. The results indicated a progressive reduction in the modulus of elasticity, fracture toughness and resistance to fatigue crack growth and creep when tested in water at 37°C. Jim Johnson now holds a three-way joint faculty position amongst the Department of Mechanical Engineering at the Technical University of Nova Scotia, the Department of Surgery (Orthopedics) and the Department of Applied Oral Sciences (Biomaterials) at Dalhousie University.

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NSERC Scholarship for Biomaterials

Congratulations are also due to Kevin Farrell a Graduate student who is taking an MSc through the Department of Physics with his Research project in Biomaterials. Kevin has been awarded a $15,000 NSERC scholarship for 1991/92.

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Ten out of Ten for Biomaterials

The following six papers were published during March, April and May 1991.

1) 'Gel Strength and Rate of Gelation of Soft Polymers,' D. W. Jones, E. J. Sutow, and B. S. Graham , Dental Materials, April 1991.

2) 'Plasticizer Penetration Across Mucosal Tissue: An Experimental and Theoretical Study,' D. A. Pink, W. C. Foong, D. W. Jones, K. A. Gates, M. Mezei and K. Farrell , J Applied Biomaterials, 2: 41-48, 1991.

3) 'An In Vivo and In Vitro Study of the Loss of Plasticizer from Soft Polymer-Gel Materials,' B. S. Graham, D. W. Jones and E. J. Sutow. J. Dent Res. May 1991.

4) 'Chemical and Molecular Weight Analysis of Prosthodontic Soft Polymers,' D. W. Jones, G. C. Hall, E. J. Sutow, M. F. Langman, and K. N. Robertson, J. Dent Res. May 1991.

5) 'Clinical Applications of Resilient Denture Lining Material Research. Part II: Gelation and Flow Properties of Tissue Conditioners.' B. S. Graham, D. W. Jones and E. J. Sutow. J. Prosthet Dent 1991; 65: 413-508.

6) 'In Vivo Fungal Presence and Growth on Two Resilient Denture Liners.' B. S. Graham, D. W. Jones, J. Burke and J. P. Thompson. J. Prosthet Dent 1991; 65: 528-532.

The following paper was published in January 1991.

7) 'The Influence of Spray and Freeze Drying Preparation Methods on the Chemical Composition of Six Feldspathic Glass Formulations,' A.S. Rizkalla, D.W. Jones, G.C. Hall, H.W. King, and E.J. Sutow, Br.Ceram.Trans. J., 90, 1-8, 1991.

Following three papers have been accepted for publication.

8) 'Composition of Feldspathic Glass Synthesized by Sol-Gel,' A.S. Rizkalla, D.W. Jones, G.C. Hall and E.J. Sutow: (Accepted for publication Brit.Ceram.Soc.Trans.& J. January, 1991).

9) 'Hamster Cheek Pouch test for of Dental Soft Polymers.' B.B.Harsanyi, W. C. Foong, R. E. Howell, P. Hidi, and D. W. Jones: (Accepted for publication J. Dent Res. February 1991).

10) 'Effects of Composition on Selected Physical, Properties of SiO_2-K_2O-Na_2O Glasses,' D. W. Jones, A. S. Rizkalla, J. A. Johnson and E. J. Sutow, (Accepted for publication, J. Mater Sci. April 1991).