Dalhousie University, Faculty of Dentistry

Dental Research News

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Stimulus & Challenge

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Research Opportunities

Next month the Research Development Committee will begin to evaluate applications for the MRC Farquharson Summer Undergraduate Research Scholarships. The Medical Research Council stipulate that only those students in the top 20% of the class are eligible for the award. The purpose of the MRC Farquharson Summer Undergraduate Research Scholarships is to provide a sound research educational experience for the students and 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. MRC Summer Research Scholarships awarded in the past to our undergraduate dental students have enabled them to obtain a rich experience from the involvement in our research programmes. Very many of these students have gone on to graduate programmes in which the research experience gained at Dalhousie University has been of significant value to them. Many of these students have also made significant contributions to the development of our faculty research programmes.

Chair in Biomaterials

The Division of Dental Biomaterials Science, Department of Applied Oral Sciences, is pleased to announce that a University/-Industry Chair in Biomaterials has been set up. Dr Amin Rizkalla has been appointed to this chair. Amin obtained a BSc in Materials Engineering from the American University in Cairo, Egypt, an MEng in Metallurgical Engineering from McGill. He obtained a PhD at TUNS. The industrial support for the Chair is provided by the 3M Company of Canada. This industrial support recognizes the international status of the research conducted by the Dalhousie University Biomaterials group. The record research accomplishments of the Division of Biomaterials Science during the past 16 years have achieved international acclaim. Excluding the funding of the 3M Chair the successful biomaterials group have received a total of $1.4 million in research funding during the past four years. During the past 5 years a total of 118 papers and abstracts have been published or submitted for publication. The Division has supervised 3 MSc and two PhD students in their biomaterials research. The Division have been funded by MRC since 1976, with Major Equipment Grants, Operating Grants, a Programme Grant and an MRC/-University/Industry Grant. The establishment of the first University/Industry Chair in our Dental Faculty supported by a top international company provides significant prestige and credibility for our Biomaterials research programme at Dalhousie University. The achievement of obtaining support for the Chair is even more significant in light of the tough economic times. The establishment of a University/-Industrial Chair in Biomaterials fits in perfectly with the thrust of strategic academic plans of the University, in which health science research is designated as an area of special emphasis. The establishment of the Chair in Biomaterials also marks a consolidation in the focused theme of our research programme. The biomaterials research programme is however, broad based and not simply confined to dental materials. This Chair further builds on the significant strength of one of Dalhousie University's strongest research areas.

Dr. Amin Rizkalla Appointed to Chair in Biomaterials

Abstract Analysis

A total of 135 authors were named on the 35 research abstracts submitted by our faculty to the IADR for the March meeting in Chicago. The average number of authors per abstract was 3.86. As might be expected a number of authors names naturally appeared on more than one abstract. The actual number of different names on the 35 abstracts was amazingly 69. Another statistic which was surprising was that six different font types were used on the abstracts. These were:

Normal size

New Century Schlbk/12;

Bookman/12;

Geneva/12;

Palatino/10;

Helvetica/12 and

N Helvetica narrow/12

These will appear as follows when reduced 50% in the abstract programme.

New Century Schlbk/12;
Bookman/12;
Geneva/12;
Palatino/10;
Helvetica/12 and
N Helvetica narrow/12

Several of these fonts may not be in conformity with the requirements laid down by the IADR in the instructions to authors. However, it must be admitted that the instructions are very vague, it is difficult to measure with any degree of accuracy the acceptable typeface size which are given as examples. However, what can be evaluated is the number of lines reproduced in the two examples given. In the so-called ideal typeface size a total of 20 lines fit into the box. In the second example of the smallest acceptable typeface size a total of 23 lines fit into the box. It might be inferred that one could get a larger number of words into the box using the so-called 'Smallest Acceptable Typeface Size.' However, simple observation tells us that both examples fill the box with identical words in each case. The so-called ideal size has 5 lines to the inch for a total of 20 lines, while the smallest acceptable typeface has 6 lines to the inch, for a total of 23 lines. The so-called ideal size is in fact only 9-10 letters to the inch. The height of the upper case letters in the so-called smaller type are very slightly less than 3 mm, while the upper case letters in the ideal example are about 3mm. A further observation will show that the amount of space left for the ideal typeface on the last line of the box is 115mm. However, in the case of the so-called smaller type it is only 40mm. The simple answer is that the ideal example has greater height which only allows five lines to the inch, however, it's narrower font on average allows more words to the line. What is interesting is that the example which is said to be the smallest acceptable occupies more space in the abstract box and is much less easy to read. The commonest typeface used by our faculty members (21 out of 35) was New Century Schoolbook/12. The second most popular was Bookman (8 out of 35). A simple test shows that New Century Schoolbook/12 can give an extra one and a half lines for an abstract compared to Bookman. Both styles give 5 lines to the inch but Bookman is on average slightly wider, and the height of the upper case letters are slightly smaller. It would seem that the New Century Schoolbook #12 font may be the best choice for abstracts. If you are in any doubt as to which font to use try reducing the size of your abstract on the photocopier by 50% to see if it looks readable. The instructions for the MRC grant applications are however, much more explicit than for the IADR abstracts, they give the limit on typeface size as well as the number of lines and letters permitted per 2cm. It is quite possible that the IADR may eventually specify how many lines and letters per 2cm. Since our abstracts have to be reduced in size by 50%, it is important that the correct font type and size be used if the abstract is to be readable. As it is, we often try to read these during the sessions at the meeting in a room in which the lights have been dimmed. I would suspect that in future years IADR may get a little tougher on enforcing their rules on font type. The answer is that next year we must all be careful to observe the recommended limitations for the size of font which is acceptable. Have a look at last years programme of abstracts and you will be surprised at how many of them are almost unreadable, at least for those of us over 45 years of age even with our eye glasses. One important point to remember is if you want to impress the reviewer who reads and evaluates your abstract, make sure that you use a font which is pleasing to the eye, even if it does mean reducing your abstract by one or two words. Just for the record the instructions for the MRC grant application forms clearly state that print should be of letter quality, dot matrix is not acceptable. Single spacing with type no smaller than 12 pitch. The lower case characters must be at least 2mm high. A maximum of 6 lines per 2.5 cm and 9 letters per 2cm, is allowed. Bookman satisfies these rules but New Century Schoolbook is too narrow, it can give more than 9 letters per cm. So it is Bookman for MRC grants and New Century Schoolbook for abstracts. However, for our Biomaterials abstracts we still prefer the appearance of Bookman, unless we have a problem fitting them into the abstract box.

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Come Fly with Me

Would you like to conduct research into a stimulating and tasty topic? If so, the biochemical characterization of the events occurring at receptor sites in the oral cavity may be of interest. Did you know that the chemical aspects of taste receptor functions can be studied by simply recording the patterns of electric potentials in receptor cells while the cells are being stimulated with pure chemicals of known composition. Analysis is made following electrolyte and carbohydrate stimulation of the receptor site. Intracellular recordings from taste cells of rat and hamster show that even primary receptor cells are sensitive to three or four of the so-called basic taste modalities. The general consensus is that a number of different receptor sites exist on the receptor membrane of any one receptor cell. Research conducted some 35 years ago was the first to successfully apply NaCl (a known pure chemical) to a single taste receptor cell in the mouth of a blow-fly. Following stimulation the reaction occurs extremely rapidly, typical nerve impulses are recorded within 1 millisecond after stimulating electrolytes have been applied. In the case of blow-flies, 0.004M NaCl, which produces 1 impulse per second, represents the threshold for behaviour response. The advantage of using flies for this type of research is, 1) they do not eat as much as larger animals, 2) they occupy less space, 3) they cost less to purchase than hamsters or rats and the animal rights groups and the general public rank flies lower than most other animals used for research studies. However, even flies have a right to live a stress free life. Animal research protocols do apply even for blow-flies. It is important that we look carefully at the various options and possibilities for collaboration with colleagues in other disciplines such as biochemistry or physiology. If you have a taste for research this may be the way to go. Taste sensation can be effected by the presence of dental restorative materials or prosthesis. This is especially true in the case of full coverage of the palate with dentures. It may even be less expensive to do research on humans and not bother with the blow-flies. When you think about it there are probably very few disciplines across the Dalhousie campus which could not interact with the very wide range of potential applied dental/biomedical research projects available to us. In dentistry we are indeed fortunate that we have such a wide range of intriguing and interesting research problems just waiting to be addressed.

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Taste Receptors Beware

If you want to fool those taste receptors you can use the following synthetic substitutes for your favorite flavours.

Banana:- Cyclohexylacetate, butyrate, propionate; ethyl valerate.
Cheese:- Hexanoic acid; Isovaleric acid.
Chocolate:- Tetrahydrofurfuryl propionate.
Vanilla:- Propenyl guaiethol; Vanillydene acetone.
Grapefruit:- Styralyl acetate.
Orange:- Linalyl anthranilate.
Wine:- Ethyl acetate; heptylate.
Cognac:-Allyl pelargonate; Cyclohexyl caproate.
Rum:- Ethyl formate; isobutyl formate.
Cola:- 2-Ethyl-3-furylacrolein.

Even a blow-fly could be fooled by some of these. However, if they offer you 2-Ethyl-3-furylacrolein the best advice is to say no, stick to the real thing. Fenaroli's 'Handbook of Flavor Ingredients' describes nearly 200 natural and nearly 750 synthetic flavorings.

Common Linkage- Chicago

What have the following in common? Fluorescence of human tooth enamel, incipient caries, laser irradiation, DAI scores, creep and plasticizer efficiency, serum and tissue levels of Beta-Carotene, glass transition temperature, assimilation of anionic amino acids by periodontal pathogens, cytotoxicity of an endodontic obturator, flexible die materials, the rate of transconjugation of *P. gingivalis*, Branemark abutments, methacrylate soft polymer bead size, liposomal encapsulation, marginal adaptation of composite inlays, surface area and size of composite filler particles, effectiveness of sealants in reducing the need for restorations, chemical analysis of glass, pretreatment pain, water fluoridation and DMFS scores, tarnish of alloys using the CIELAB colorimeter system, canal flaring using sonic or Endo-Lift, permeability of hamster pouch mucosa, bleaching of teeth, cracks in the Palmqvist regime, ribosomal RNA gene restriction analysis, fibrous encapsulation, extracellular proteinase, epithelial remnants, release of metallic ions, *Fusobacterium* species, diagnosis of pit and fissure caries, root canal leakage, scan matrices and fluorescence, and bioelectrical impedance. What do all these have in common? Well, the simple answer is that they are the subject matter of the extensive research presentations which our faculty will be making at the international (IADR) meeting in Chicago in March.

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"RESEARCH NEWS ITEMS"

Do you have any research news which you would like to share with your colleagues? If so, please forward such items to the Research Development Office. It would help if submissions were produced on a (Macintosh) disc in Microsoft Word, or simply call 1675.