ISSN 0409-7467

VOL 52 NO 18 30 SEPTEMBER 2002

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Shri Azim H. Premji, *Chairman,* M/s WIPRO Ltd, visits INSDOC

Shri Azim H. Premji with Shri V. K. Gupta and a representative of M/s WIPRO Ltd, at INSDOC

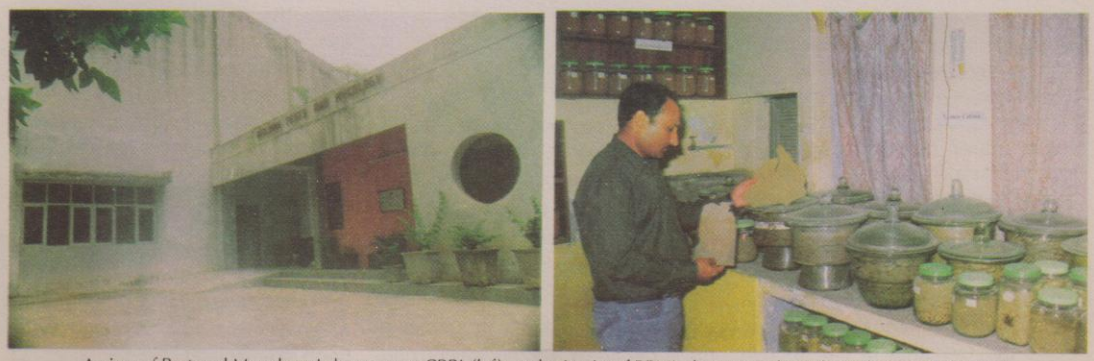
been made on the effects of ectopic expression of ras p21 in the protozoan parasite, *Leishmania*. The overrexpression of ras enables *Leishmania* cells to have a prolonged longevity or delay in cell death; probably due to an acquired ability to deal with low nutrients or the ability to undergo increased number of cell divisions or to deal with a accumulated signals that normally lead to cell death. This situation is strikingly similar to the effects of ras on higher eukaryotic cells and suggests new avenues to the study of signal transduction pathways in protozoan parasites.

Effect of bioactive peptides on *Leishmania donovani* — In the study towards identification of bioactive peptides effective against visceral leishmaniasis, atleast five out of the ten antibacterial peptides tested have shown a significant lytic effect on *Leishmania* promastigotes, with LD_{50}s in μM range. While the mechanism of action of these peptides on the *Leishmania* cell is not clear, they appear to cause rapid lysis of the parasite. A TEM based analysis of the damage induced by these peptides in the leishmanial cell suggests that rather than inducing membrane damage in the cells, these peptides promote events leading to the loss/dissolution of cytoplasmic and nuclear material. The results suggest that the addition of these peptides leads to some kind of signaling event, which leads to the destruction of cellular content. There have been no reports of programmed cell death in *Leishmania* and scientists are intrigued by the possibility that these peptides may be setting into motion, pathways of apoptosis or autophagy in the parasite.

Development of a Luciferase assay system for viability of *Leishmania* — In addition to the above work with bioactive peptides, experiments are in progress at CCMB to develop a machine read assay for viability of parasites, using Luciferase as a reporter. Towards this goal, scientists have generated a stable, transgenic *Leishmania* clone, expressing the firefly Luciferase gene, under the control of *Leishmania*-specific transcriptional elements. The Luciferase assay has been standardized for cell number, stage of growth linearity, etc. The CCMB scientists have also examined whether the Luciferase activity will reflect the number of viable parasites under any given condition or treatment. The results suggest that the Luciferase assay, using the CCMB transgenic clone, can be used for a rapid identification of anti-Leishmanial molecules, which have at least a 50% or greater killing rate. It is planned to develop the assay in a 96-well format, allowing for screening of a large number of samples. ❑

Building Pest and Mycology Laboratory at CBRI

IT is difficult to imagine a building without wood. Around one-third of the wood cut is used in buildings, and of this, around one-third is destroyed by biodegradation. Destruction by termites is a major factor. The pesticides/termiticides are quite toxic and hence a cause of environment/health concern. The search, therefore, goes on for lesser toxic but effective pesticides and also other means such as physical barriers and



A view of Pest and Mycology Laboratory at CBRI *(left)*; and scientist of BPML showing polyurethane foam and a board (wood substitute) attacked by termites after termite-resistance test

herbal alternatives. Physical barriers are safe, non-toxic, long lasting, inspection-free and eco-friendly alternatives, but these work out to be ~ 25% costlier than the chemical treatments. The common types of these barriers are: fine sand, stainless steel wire mesh, termite shields, waterproof membrane barriers, alunite collars, cavi-guard and termite-tie system. These are in use in Australia and meet the performance standards prescribed in that country.

A view of wood-preservative test of materials in BPML *(left)*, and wood-borers and borer attacked wood

The Central Building Research Institute (CBRI), Roorkee, has been pursuing a major research programme on termite control for the last 14 years. The activities of the laboratory were diversified in 1997 to include other pests, e.g. wood borer and cockroach, in addition, to termite, and the laboratory, with expanded facilities, was named as 'Building Pests and Mycology Laboratory (BPML). BPML is fully equipped to undertake studies on termite-resistance of materials and preservation of wood. The laboratory has also started R&D work on physical barriers. The studies show that stone particles (preferably granite) may be used in foundations of the buildings to check the penetration of termites.

Work is being also carried out in the field of cockroach and wood borer control, and herbal formulations in place of the toxic chemicals. ❑

Dr Jui Chakraborty gets MRSI Young Scientist Award

DR Jui Chakraborty, Quick Hire Fellow at the National Metallurgical Laboratory (NML), Jamshedpur, has won the Young Scientist Award of Materials Research Society of India, Kolkata Chapter, for the year 2001-02.

Dr Chakraborty has been given this coveted award for her work in biomimetic synthesis of inorganic materials. The conventional physical and chemical routes of nanomaterials synthesis in materials science are not always feasible owing to several limitations like expenses, high energy consumption of particle agglomeration and poor yield. So, one has to find out an alternative route for the advanced materials synthesis. Since the evolution of life, mother nature has produced numerous advanced materials like bone, shells, teeth or biosensors in migratory birds and animals. All of these materials have highly controlled morphological features in terms of particle size, shape and distribution. And this is the secret of the exotic properties of these materials. The underlying principle is the *in-situ* mineralization of the inorganic crystals in the biopolymer matrices of the natural organisms. Motivated with this simple synthesis route in nature at the cost of minimum energy expenses, Dr Chakraborty made an attempt to replicate the method in synthetic system. This method is termed as biomimetic synthesis. Oriented magnetite nanoparticles alike to the natural magnetic sensor in magnetotactic bacteria as a magnetic sensor material, agglomeration free, uniformly distributed magnetite particles in the size range of 5-10 nm for enhancement of MRI contrast in medicine and acicular maghemite particles in the size range of 200-300nm for magnetic memory storage have been synthesized. ❑

Printed and Published by V.K. Gupta on behalf of National Institute of Science Communication (CSIR), Dr K.S. Krishnan Marg, New Delhi -110 012 and printed at Photocomposing-cum-Printing Unit, National Institute of Science Communication, Dr K.S. Krishnan Marg, New Delhi -110 012
Editor: Dr B.C. Kashyap; Associate Editor: Meenakshi; Editorial Assistant: Neelima Handoo; Design: Pradip Banerjee; Production: Kaushal Kishore
Phone: 5786301 Fax: 5787062 E-mail: bck@niscom.res.in Website:http://www.niscom.res.in
For subscription: The Sales & Distribution Officer, NISCOM; E-mail: sales@niscom.res.in Annual Subscription: Rs. 100.00; Single Copy: Rs. 5.00
Subscription Complaint No 5785359
RN 4512/57