



# S&T Newsletter



A Quarterly of the  
Centre for Science and Technology of the Non-Aligned  
and Other Developing Countries (NAM S&T Centre)

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## From the DG's Desk

Heartiest greetings to all our readers!!



As reported earlier, the Honourable Robert G. Mugabe, President and Head of State and Government of Zimbabwe had offered to host a NAM S&T Centre of Excellence on Minerals Processing and Beneficiation (CEMPB) in Zimbabwe.

To initiate the process of establishing this entity, a Task Team was constituted and the first meeting of its Consultative Committee was held in Harare on 16-17 April 2015 when in depth discussion took place on the vision, mission, objectives, governance and sources of funding for CEMPB.

The Centre successfully organised an international Training Workshop on 'Herbal Medicine: Drug Discovery from Herbs - Approaches, Innovations and Applications' during 29<sup>th</sup> March - 4<sup>th</sup> April 2015 at Mysore (Karnataka) and Ooty (Tamilnadu), India. More than 100 experts and researchers from 24 countries participated in this event that concluded with the unanimous adoption of a Mysore-Ooty Resolution - 2015 on 'Herbal and Medicine Knowledge for Health and Wellness'.

The Centre entered into an Agreement of Collaboration with UNESCO UNISA Africa Chair in Nanosciences & Nanotechnology (U2ACN2) at the University of South Africa, Pretoria for instituting five Research Associateships for scientists from developing countries to undertake training and upgrade their research skills on Nanosciences and Nanotechnology for 2-4 months duration at U2ACN2. International airfare of Associates is borne by the NAM S&T Centre and free furnished accommodation and US\$300 monthly allowance is provided by U2ACN2. Last date for receiving applications is 31<sup>st</sup> July 2015.

We greatly appreciate the decision by the Department of Science & Technology (DST), Government of India, sponsors of our Research Training Fellowships for Developing Country Scientists (RTF-DCS) scheme, in increasing the Fellowship number from 20 to 50 per year. We are also grateful for the cooperation of the ministries, departments and scientific agencies of developing countries for widely disseminating this year's announcement on this scheme that has resulted in our receiving ~600 online applications for 50 slots. We hope to complete the selection process in next three months.

Happy Reading!

**(Arun P. Kulshreshtha)**

## International Training Workshop on Herbal Medicine: Drug Discovery from Herbs- Approaches, Innovations and Applications

**Mysore / Ooty, India**  
**29<sup>th</sup> March – 4<sup>th</sup> April 2015**

Use of plants for healing purpose predates human history and forms the origin of much modern medicines. Herbal medicine is the mainstay of about three-fourth of the world population, significantly in the developing countries, for primary health care. There is a great demand for herbal medicines because of their wide biological activities, higher safety of margin than the synthetic drugs and lesser costs. However, these traditional herbal products are heterogeneous in nature and impose multiplicity of challenges vis-à-vis quality control, quality assurance and the regulatory process. Most herbal products being marketed today have not undergone the drug approval process to demonstrate their safety and efficacy. Therefore there is an urgent need for a debate on the current status of research and practices of Herbal Medicines and ongoing advancements on drug discovery from natural products that would lead to an understanding of the need of innovation and novel approaches to pharmacological screening of the natural products.

With the above in view, the Centre for Science & Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre) and JSS University, Mysore organised an international Training Workshop on 'Herbal Medicine: Drug Discovery from Herbs - Approaches, Innovations and Applications' during 29<sup>th</sup> March - 4<sup>th</sup> April 2015 at Mysore (Karnataka) and Ooty (Tamilnadu), India.

2. The Training Workshop was inaugurated on 30<sup>th</sup> March 2015 with a welcome by Dr. B. Manjunatha, Registrar, JSS University followed by lighting the lamp by the dignitaries. The Opening Remarks were delivered by Prof. Dr. Arun P. Kulshreshtha, Director General, NAM S&T Centre, who presented the genesis of the event and also briefly described the activities of his inter-governmental organisation. This was followed by the Address by Prof. B. Suresh, Vice Chancellor,



Inauguration of Herbal Medicine Training Workshop, Mysore, India, 30<sup>th</sup> March 2015

(Contd. from Page 1 - Training Workshop on Herbal Medicine, India)

JSS University, Mysore. Dr. V. Prakash, Distinguished Scientist of the Council of Scientific & Industrial Research (CSIR) of India and Director, Research, Development & Innovation of JSS Mahavidyapeetha (JSSMVP), Mysore delivered the Keynote Address titled 'The Treasure of Traditional Herbal Knowledge For Tomorrow's Healthy India: *Integrated* Approach to boost the Economy in Herbal Sector'. The Session concluded with the Vote of Thanks by Dr. P.A. Kushalappa, Director Academics, JSS University, Mysore and a group photo.

2.1 During the Inaugural Session a CD titled 'Workshop Chronicle' was released by Prof. Dr. K. Chinnaswamy, Professor Emeritus, JSS College of Pharmacy and a 'Medicinal Plants Research Compendium', which has a Foreword by Prof. A.P.J. Abdul Kalam, former President of India, was released by Prof. Arun Kulshreshtha, DG, NAM S&T Centre.

3. Before starting the Training Workshop, the foreign researchers visited the Anatomy Lab of the Medical College of JSS University where a technique has been developed for the first time in Asia for plastinating the human organs for their preservation.

4. Among the experts, professionals, researchers and administrators of 24 countries participating in the event were 31 from Afghanistan, Botswana, Cambodia, Cameroon, Egypt, Indonesia, Iran, Iraq, Malaysia, Mongolia, Myanmar, Nepal, Nigeria, Oman, Pakistan, Qatar, Rwanda, South Africa, Slovenia, Tanzania, Turkey, Uganda, Vietnam and Zimbabwe, which were sponsored by the NAM S&T Centre, and 83 from the host country India, including special guests, speakers and co-chairs. 39 poster presentations were made by the participants.

The overseas participants were from Afghanistan [Mr. Abdul Ghani Karimi, Assistant Professor, Department of Pharmacognosy, Faculty of Pharmacy, Kabul University, Kabul]; Botswana [Prof. Dr. Daniel M Motlhanka, Professor, Medicinal and Edible Food Plants Research Laboratories, Department of Basic Sciences, Botswana College of Agriculture, Gaborone]; Cambodia [Ms. Bota Chengli, Technical Officer, National Center for Traditional Medicine,

Ministry of Health, Phnom Penh]; Cameroon [Mr. Deeh Defo Patrick Brice, Ph.D. Scholar, Animal Physiology and Pharmacology, Faculty of Science, University of Dschang]; Egypt [Prof. Dr. Mona H. Hetta, Dean, Faculty of Pharmacy, Beni-Suef University; Prof. Dr. Mohamed Abd-elkareem Fatah-Allah, Head, Department of Plant Genetic Resources, Agriculture Research and Development Institute (ARADI), and Research Centres District, New Burg el-Arab, Alexandria; and Dr. Nora ElSayed Ameen Megahed, Head, Dietary Supplement Registration Department, Central Administration of Pharmaceutical Affairs (CAPA), Ministry of Health]; Indonesia [Dr. Rizna Triana Dewi, Staff Researcher, Research Center for Chemistry, Indonesian Institute of Sciences, Komplek PUSPIPTEK Serpong, Tangerang Selatan, Banten]; Iran [Dr. S. Heydar Mahmoudi Najafi, Assistant Professor, Institute of Chemical Technology, Iranian Research Organization for Science and Technology (IROST), Tehran]; Iraq [Ms. Eman Hussain Abbas, Director, Division of Sensors for Early Cancer Disease, Ministry of Science & Technology, Baghdad]; Malaysia [Dr. Nurul Izza Binti Nordin, Researcher, Sirim Berhad, Shah Alam, Selangor]; Mongolia [Ms. Khongorzul Odgerel, Plant Biotechnologist and Researcher, Plant Biotechnology Lab, Biology Institute, Mongolian Academy of Science, Ulaanbaatar]; Myanmar [Dr. Htet Htet Win, Senior Lecturer & Researcher, Biotechnology Research Department, Ministry of Science & Technology, Kyaukse, Mandalay Division]; Nepal [Ms. Reeta Mandal, Ph.D. Scholar, Tribhuvan University, Kathmandu]; Nigeria [Mr. Attah Francis Alfred Unuagbe, Ph.D. Scholar, Department of Pharmacognosy, Faculty of Pharmacy, University of Ibadan; Dr. Gabriel Gbolagade Awolehin, Deputy Director and Head, Policy Analysis and Development, Raw Materials Research and Development Council (RMRDC), Abuja; and Mr. Awotunde Oluwasegun Samson, Currently at Habib Medical School, IUIU Kampala Campus, Uganda as Lecturer]; Oman [Dr. Sharifa Amur Al Jabri, Section Head (Q.A.), Department of Central Quality Control Laboratory, Directorate General of Pharmaceutical Affairs and Drug Control, Ministry of Health, Muscat; and Mrs. Maryam Zahran Al-Kindy, Clinical Pharmacist, SQU Hospital]; Pakistan [Dr. Ahmad Bilal, Deputy Director,



Group Photo of Foreign Participants and Resource Persons of Herbal Medicine Training Workshop, Mysore, India



(Contd. from Page 2 - Training Workshop on Herbal Medicine, India)

Ministry of Science & Technology, Islamabad]; Qatar [Dr. Ameena A. Fakhroo, Senior Scientist, Qatar Biomedical Research, Doha]; Rwanda [Prof. Dr. Jean Pierre Nkurunziza, Lecturer and Researcher, Department of Chemistry, College of Science and Technology, University of Rwanda, Butare]; Slovenia [Prof. Samo Kreft, Head, Department of Pharmaceutical Biology, Faculty of Pharmacy, University of Ljubljana]; South Africa [Dr. Shameim Ahmed Adam, Dispensing Medical Practitioner, Cape Town; Prof. Dr. Maryna van de Venter, Associate Professor, Nelson Mandela Metropolitan University, Port Elizabeth; and Mr. Alireza Kiyaei, Doctoral Candidate, Department of Molecular and Cell Biology, University of Cape Town]; Tanzania [Mr. Denis T. Mwangomo, Drug Registration Officer, Tanzania Food and Drug Authority, Dar-es-salaam]; Turkey [Dr. Tijen Talas Ogras, Senior Scientist & Assoc. Professor, Tubitak Marmara Research Center (MAM), Genetic Engineering and Biotechnology Institute, Gebze Kocaeli]; Uganda [Ms. Margaret Dhabangi, Molecular Biologist, Department of Microbiology & Biotechnology, Uganda Industrial Research Institute, Kampala]; Vietnam [Dr. Nguyen Van Hung, Associate Professor and Dean, School of Pharmacy, and Head, Department of Medical Ethics and Family Medicine, Haiphong University of Medicine and Pharmacy, Haiphong City]; and Zimbabwe [Mr. Louis Gadaga, Lecturer & Drug Information Pharmacist, Drug & Toxicology Information Service, School of Pharmacy, College of Health Sciences, University of Zimbabwe, Harare]. The NAM S&T Centre was represented during the Workshop by Prof. Dr. Arun P. Kulshreshtha, Director General and Ms. Vaneet Kaur and Ms. Keerti Mishra, Research Associates.

5. The overall programme of the Workshop was conducted in three Technical Sessions, two in Mysore and one

in Ooty. The Sub-sessions of the first Technical Session on the themes titled 'Herbal Drug Research, Development, and Pharmacological Screening of Natural Products' and 'Herbal Drug Research, Development, and Pharmacological Screening of Natural Products For Anti-Microbial Activities' were co-chaired respectively by Dr. M. Mahadevappa, Director (Rural Development), JSSMVP, Mysuru, Karnataka, India and Dr. Tijen Talas Ogras of Turkey; Prof. P. A. Mahesh of the Department of Pulmonary Medicine, JSS Medical College, JSS University, Mysore, India and Dr. Ameena A. Fakhroo of Qatar; and Dr. V.P. Durairaja, Vice-President Corporate, Sovenir Organo-Chemicals Pvt. Ltd., Bangalore and Prof. Samo Kreft of Slovenia. The Sub-sessions of the second Technical Session on the theme titled 'Drug Discovery Approaches For The Identification of Newer Anti-Diabetic Agents' were co-chaired by Dr. Prasanth Viswanath, Associate Professor of Biochemistry, JSS Medical College, JSS University, Mysuru, Karnataka, India and Prof. Dr. Maryna van de Venter of South Africa; Dr. P.V. Salimath, Director (Research), JSS Medical College, JSS University, Mysuru, Karnataka, India and Prof. Dr. Mona H. Hetta of Egypt; and Dr. G. Parthasarathi, Dean, Faculty of Pharmacy, JSS University, Mysuru, Karnataka, India and Dr. Nguyen Van Hung of Vietnam. The third Technical Session, which was held in Ooty, was co-chaired by Dr. S. Heydar Mahmoudi Najafi of Iran and Ms. Eman Hussain Abbas of Iraq.

6. During the technical sessions, expert talks were delivered by eminent Indian experts and professionals on 'Developing Monographs For Quality of Herbs/Herbal Products: Indian Leadership' by Dr. D.B. Anantha Narayana, Chairman, Herbs and Herbal Products Committee; Member of Indian Pharmacopoeia Commission Scientific Committee and Former Director, Hindustan Lever Research Centre, Bangalore; 'Drug



(Contd. from Page 3 - Training Workshop on Herbal Medicine, India)

Discovery from Herbs: A Phytochemical Perspective' by Dr. Atul N. Jadhav, Principal Scientist, Phytochemistry, R&D, Himalayan Drug Company, Bengaluru; 'Developing Mechanistic Insights into Action of Natural Ingredients as Applied to Skin Care Products: Application of Molecular Biology and Cell Biology Methods' by Dr. Sandeep Varma, Senior Scientist, Department of Cell Biology, R&D Centre, Himalayan Drug Company, Bengaluru; 'Herbal Industry Status' by Mr. Ramesh Suriyanarayanan, Associate Professor, Pharmaceutics, JSS College of Pharmacy, Mysuru, Karnataka, and Formerly, Director R&D, Himalayan Drug Company; 'Herbal Medicinal Products - Changing Trends in Healthcare System: Current Opportunities and Future Challenges' by Dr. U.V. Babu, Head, Phytochemistry, Research and Development, Himalayan Drug Company, Makali, Bangalore; and 'The Role of Natural Products in Drug Discovery' by Dr. M.J. Nanjan, Director, TIFAC Centre of Relevance and Excellence in Herbal Drugs / PG Studies and Research, JSS College of Pharmacy, Ooty.

The scientific papers presented by the foreign participants were on 'Fostering Traditional Herbal Medicine as a Solution to Emerging Drug Resistance in Primary Health Care: A Case of An Efficacious Herbal Concoction against *Streptococcus Pneumonia*' by Ms. M. Dhabangi of Uganda; 'Mechanism of Action of Active Constituents from *Zingiber Officinale* Roscoe var. *rubrum* (Halia Bara) on Psoriasis's by Dr. N.I. Nordin of Malaysia; 'Antibacterial and Antifungal Potential of Plant Seeds' by Dr. T.T. Ogras of Turkey; 'Involvement of D<sub>1</sub>-D<sub>2</sub> Receptors in *Guibourtia tessmannii* induced Fictive Ejaculation in Spinal Male Rats' by Mr. P.B.D. Defo of Cameroon; 'Detection of the Anti-Microbial Activity of Some Myanmar Medicinal Plants' by Dr. H.H. Win of Myanmar; 'A 28-Day Sub-Acute Neurobehavioral Toxicity Study of a Hydro-Ethanollic Extract of *Boophone disticha* in Sprague Dawley Rats' by Mr. L.L. Gadaga of Zimbabwe; 'Assessment of Enzyme Activities and Hematological Parameters in Male Wister Rats administered with Aqueous Extract of *Massularia Acuminata* Root' by Mr. O.S. Awotunde of Nigeria; 'Sedative Effect of Essential Oil from *Heracleum afghanicum* Kitamura Seeds by Mr. A.G. Karimi of Afghanistan; 'Antihyperglycemic Agents from Natural Sources: *in vitro* and *in vivo* Studies' by Prof. Mona Hetta of Egypt; 'Anti-Diabetes Compounds from *Aspergillus terreus*' by Dr. Rizna Dewi of Indonesia; 'The Biochemical Study of Some Standardized Herbal Extract on Diabetic Atherosclerosis Patient' by Ms. Eman Abbas of Iraq; 'Prophylactic Potentials of Some Underutilized Plant species in Diabetes' by Dr. G.G. Awolehin of Nigeria. 'Effect of Different Preparations of Black Seed (*Nigella sativa*) on Glucose & Lipid Metabolism in Type 2 Diabetic Patients' by Dr. A. Bilal of Pakistan; 'An Integrated Multi-Target *in vitro* Screening Platform to prioritise Medicinal Plant Extracts with Antidiabetic Activity' by Prof. Maryna van de Venter of South Africa; 'Chemical Screening and *in vitro* Antibacterial Activity of Plants used by Rwandan Traditional Healers to treat HIV/Aids Opportunistic Diseases' by Prof. J.P. Nkurunziza of Rwanda; 'Accumulation and Production of Total Indole Alkaloids, Vinblastine and Vincristine from Egyptian *Catharanthus Roseus* (L.) G. Don. Calli Cultures by using Levels of Cytokinins (Kin)' by Prof. M.A. Fatah-allah of Egypt; 'Herbal Medicine in Egypt between Ancient and Modern Civilization' by Dr. Nora Megahed of Egypt; 'Herbal and Phytomedicines in Iran: Research, Technology and Industry' by Dr. S.H.M. Najafi of Iran; 'Traditional Medicine in Cambodia' by Ms. Bota Chengli of Cambodia; 'Regulation of Herbal Medicine in Tanzania' by Mr. D.T. Mwangomo of Tanzania; 'Complementary Medicines (Category D Medicines): Quality,

Safety and Efficacy' by Dr. S.A. Adam of South Africa; 'Effects of *Moringa oleifera* Lam. (Moringaceae) Aqueous Seed Extracts on Fertility and Pregnancy Outcome of Female Wistar Rats' by Mr. Alfred F. Attah of Nigeria; 'Identification of Herbal Drugs' by Prof. S. Kreft of Slovenia; 'Traditional Herbs and Allergy in Vietnam' by Dr. N.V. Hung of Vietnam; 'Medicinal and Edible Wild Food Plants as Emerging New Crops for Poverty Alleviation in Africa' by Dr. M. Daniel of Botswana and 'The Medicinal Prospects of Southern African resurrection Plants' by Mr. A. Kiyaei of South Africa. The NAM S&T Centre representative Ms. Vaneet Kaur, Research Associate, NAM S&T Centre presented a paper on 'Curcumin: A Chemopreventive and Chemotherapeutic Agent'.

7. A high point of the Mysore Training Workshop programme was a meeting of the foreign and a few selected Indian participants with the Chancellor of the JSS University, Mysore, His Holiness Jagadguru Sri Shivarathri Deshikendra Mahaswamiji, the 24th pontiff of Sri Suttur Math at Sachidananda Ashram, Mysore followed by a High Tea hosted by His Holiness.

8. The technical sessions in Ooty were followed by visits to various Departments of the JSS College of Pharmacy in Ooty, respectively, of the Pharmaceutical Chemistry, Pharmaceutical Analysis, Pharmacognosy, Pharmacology, Pharmaceutical Biotechnology and Pharmaceutics.

9. In Ooty, Field Visits to (a) Medicinal Plants Development Area – Doddabetta, (b) Homeopathic Medicinal Plants Research Garden and (c) a Tribal Museum were arranged for the participants.

The participants were also given a practical demo on Organic Farming of Medicinal Plants at the Horticultural Research Station, Rose Garden.

This was followed by an Exhibition and Workshop on 'Medicinal and Nutritional Value of Culinary Herbs and Fruits of Nilgiri's Tribal People' in the JSS College Conference Hall, and interaction with Tribal Practitioner's of Nilgiris, who also gave a cultural programme. An NGO – Earth Trust – and Nilgiri's Adivasi Welfare Association were responsible to organise these events. Prof. B. Duraiswamy of the Department of Pharmacognosy, JSS College of Pharmacy welcomed the delegates of the workshop, which was inaugurated by the Chief Guest, Mr. Srinivas R. Reddy, IFS, Field Director (MTR) & Project Director, Hill Area Development Programme, Udhagamandalam.

10. The Concluding Session was chaired by Dr. P.A. Kushalappa, Director Academics; Dr. P. Nilani, Deputy Controller of Examinations; and Dr. H.V. Raghunandan, Deputy Director Academic of JSS University, Mysore; Dr. S.P. Dhanabal, Principal, JSS College of Pharmacy, Ooty; and Prof. Dr. Arun P. Kulshreshtha, DG, NAM S&T Centre, who all made their remarks.

Prof. Kulshreshtha delivered a presentation on 'The Role of the NAM S&T Centre for South – South Cooperation in Science & Technology'.

Subsequently, there was considerable discussion and debate to generate a set of recommendations titled 'Mysore-Ooty Resolution – 2015 on Herbal and Medicine Knowledge for Health and Wellness', which was subsequently unanimously adopted by the participants.

The Certificates of Participation were handed over to the participants by Prof. Kulshreshtha and Dr. Dhanabal.

The concluding remarks were given by Dr. P.A. Kushalappa and Dr. S.P. Dhanabal gave the Vote of Thanks.

## MYSORE - OOTY RESOLUTION- 2015

### on Herbal and Medicine Knowledge for Health and Wellness

**WHILE EXPRESSING GRATITUDE** to the Centre for Science & Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre) for organising the International Training Workshop on 'Herbal Medicine: Drug Discovery from Herbs - Approaches, Innovations and Applications' at Mysore/Ooty, India during 30<sup>th</sup> March - 3<sup>rd</sup> April 2015;

**EXPRESSING APPRECIATION** to the JSS University, Mysore and JSS College of Pharmacy, Ooty for co-organising and hosting the International Training Workshop on Herbal Medicine;

**RECOGNISING that** large sections of the population in the developing countries depend on the traditional medicines and the use of traditional medicines is not limited to these developing countries alone, as the public interest in natural therapies has increased greatly in recent years all over the world with expanding use of ethno botanicals;

**FURTHER RECOGNISING that** extensive research is required to meet the present day challenges by identifying the plants to develop advanced techniques for future discovery of potent pharmaceutical agents and to document these techniques and already existing and widely used herbal remedies in English and other languages;

**HAVING CONSIDERED that** there is a need for establishing standards for preparing the herbal formulations, characterisation of the herbal drugs, appropriate storage and archiving methods, safety and toxicity profiles, safe use of herbal drugs, determining the mechanistic basis of action and conducting and implementing the clinical trials and establishing research laboratories to help modern drug testing processes in NAM and other developing countries;

**HAVING DELIBERATED on** the need to establish the appropriate standards and methods mentioned above to promote research and development activities as well as to archive the representative herbal materials and conduct clinical trials, and extensively debating various aspects of herbal medicines in promoting better health and wellness, improving the quality of life by global networking including the power of herbals, innovations, formulations, characterisation, compositions and safety and toxicity.

**WE, THE PARTICIPANTS OF THE WORKSHOP**, representing the institutions and agencies from Afghanistan, Botswana, Cambodia, Cameroon, Egypt, India, Indonesia, Iran, Iraq, Malaysia, Mongolia, Myanmar, Nigeria, Oman, Pakistan, Qatar, Rwanda, South Africa, Slovenia, Tanzania, Turkey, Uganda, Vietnam and Zimbabwe;

#### UNANIMOUSLY RESOLVE AND RECOMMEND:

- A Global team effort by interfacing with the knowledge of each country, each region, the continents and subcontinents to usher in a new world with less disease and a healthier society.
- Achievable, doable and affordable interfacing through academia, R&D and industry interactions with the right policies and dynamic framing regulations and the individual government policies in harmony with global policies involving the NGOs, Self Help Groups and the consumers for the safety of this herbal approach.
- In conjunction with using the most modern scientific tools to understand the mechanism of action of the drugs and development of newer drugs, molecules and cluster of molecules from herbs and a wide variety of plants covering the large biodiversity of species to ensure a sustainable livelihood not only for the low socio-economic countries, but also for the benefit of all countries in respect of advancing knowledge.
- An integrated approach that will take the system through a long and sustainable mechanism right from the sourced integration of herbals to the trading of cost effective herbal products for tomorrow's market (*Farm to Folk*).
- Knowledge transfer of traditional and modern medicine, pharmaceuticals, nutraceuticals and phytochemistry with support of advanced science and technology for validating traditional use of herbal medicine.
- Developing best practices and procedures in cultivation, harvesting and processing of medicinal herbs with due consideration for conserving the environment and further protecting threatened and endangered species.
- Contribution of the scientists, technologists, pharmacists and herbal pharmacists, practitioners, social groups, medical doctors, farmers, policy makers and other stakeholders together with information technologists with modern scientific knowledge to a great level of achievable goals in herbals through scientific adaptation of commitment for the claims and principles of herbal products to reach out to the society through joint projects between NAM and other developing countries.

The participants urged the Member Countries of the NAM S&T Centre and other developing countries to individually and collectively support the above recommendations.

It was proposed by JSS University to host a joint NAM S&T Center – JSS University Herbal Medicine Fellowship scheme for the training of the developing country scientists, researchers, professionals and practitioners for a period of two weeks with International fare being paid by the selected fellows themselves and local hospitality accorded by JSS University, Mysuru, India with its constituent colleges free of any cost including accommodation and food etc., subject to approvals from concerned agencies. The proposal was highly welcomed and applauded by the participants of the training workshop.

**THUS, RESOLVED IN OOTY (TAMIL NADU), INDIA ON THIS DAY, THE 3<sup>RD</sup> OF APRIL 2015.**

## *Visits of the Director General, NAM S&T Centre*

### Visit to the Ministry of Science & Technology, Ethiopia, 15<sup>th</sup> April 2015

Prof. Dr. Arun P. Kulshreshtha, DG, NAM S&T Centre accompanied with Mrs. Reshmi Hariharan, Research Associate in the Centre called on Mr. Negash Tolla Bedasso, Director, International Relation and Cooperation Directorate, Ministry of Science and Technology of Ethiopia during his visit to Addis Ababa on 15<sup>th</sup> April 2015. The DG made a presentation before senior officials of the Ministry about the activities of the NAM S&T Centre aimed at technological advancement of developing countries and shared his views on how Ethiopia could benefit by more proactively participating in the programmes of the Centre.



Mr. Negash Tolla Bedasso, Director, International Relation and Cooperation Directorate, Ministry of Science and Technology, Ethiopia

### Consultative Meeting for NAM S&T Centre of Excellence in Minerals Processing and Beneficiation, Harare, Zimbabwe, 16-17 April 2015

Prof. Dr. Arun P. Kulshreshtha, DG, NAM S&T Centre attended the meeting of the Consultative Committee of the Task Team for the establishment of the NAM S&T Centre of Excellence in Minerals Processing and Beneficiation (CEMPB) in Harare, Zimbabwe during 16-17 April 2015. The meeting was attended by several stakeholders, including a representative from South Africa.



Consultative Meeting for NAM S&T Centre of Excellence in Minerals Processing and Beneficiation, Harare, Zimbabwe

Establishment of CEMPB was announced by H.E. Dr. Robert G. Mugabe, the Honourable President and Head of State and Government of the Republic of Zimbabwe during the inauguration of the 3<sup>rd</sup> International Workshop on 'Mineral Processing and Beneficiation' on 11<sup>th</sup> September 2014 that was organised by the NAM S&T Centre at Harare jointly with Ministry of Higher & Tertiary Education, Science and Technology Development and the Ministry of Mines and Mining Development of Zimbabwe and the proposal was included in the Harare Resolution adopted on the 14<sup>th</sup> September 2014. It was subsequently endorsed at a high level during the First NAM Science & Technology Ministerial Conference held in Tehran, Iran from 23-24 February 2015. The outcome of the successful meeting was a deliberated document that includes the vision, mission, ultimate goal, objectives, governance and structure of CEMPB and possible sources of funding for the Centre. Mrs. Reshmi Hariharan, Research Associate at NAM S&T Centre accompanied DG on his visit.

## SCIENCE AND TECHNOLOGY NEWS IN THE DEVELOPING WORLD

### Benin: Weaver Ants lift Cashew Nut yields in Test Trials

Cashew is a highly valued commodity in Benin, where the nuts have overtaken cotton to become the top export. It is also important elsewhere in Africa. But pests can destroy up to 80 per cent of the crop. According to the researchers in Benin, the patrols of ants on cashew nut trees can roughly double the yield of the crop. The African weaver ants (*Oecophylla longinoda*) are an effective natural way to reduce considerable losses of cashew nuts from insect pests, such as fruit flies, and improve cashew quality, on farms in many African countries. The researchers compared three methods of ant-based pest control on trees with existing ant populations. On the first set, the ants were left as they were. On the second, they were fed sugar solution. A third set were sprayed with an organic pesticide that kills fruit flies. Finally, as a control, some trees had sticky bands placed around their main stem so no ants could reach them. It was found that all treatments involving ants increased the cashew nut yield. Compared with the ant-free control plants, the yield increased by 78 per cent on plants with the ants alone, by 122 per cent on plants with ants fed with sugar and by 151 per cent on plants with ants that were sprayed with pesticide. Interestingly, the researchers saw that a higher proportion of nuts on the ant-treated plants were damaged by thrips. These insect pests have a great effect on the quality of nuts, scarring the leaves, flowers and fruits, leading to deformity and nut abortion. But the study says the net increase in nut yield outweighed this damage. Thus the presence of weaver ants patrolling the trees provides protection against pests, which can have a direct impact by capturing insects as prey, through excretions that act as a repellent or simply by their physical presence.

Source: *SciDev.Net* update, 11<sup>th</sup> May 2015

### Brazil: Combating Dengue by using Colorant extracted from Turmeric

A compound extracted from the roots of turmeric (*Curcuma longa* L.), a plant that belongs to the ginger family (Zingiberaceae) and is also known as Indian saffron, has been successfully tested by researchers in the city of São Carlos, São Paulo State, as a weapon against larvae of the mosquito species that transmits dengue virus. The research is being conducted at the Optics and Photonics Research Center (CEPOF), one of the Research, Innovation and Dissemination Centers (RIDCS) funded by FAPESP. Curcumin, one of the substances that give turmeric its orange color, has natural photodynamic properties. In the presence of light, it stimulates the production of reactive oxygen species, which are highly toxic. The larvae of *Aedes aegypti* are transparent and are therefore particularly sensitive to photodynamic effects. The pigment accumulates in the insect's gut after being swallowed with the water in which the larvae breed. When activated by light, it stimulates the production of singlet oxygen molecules, which cause fatal damage to digestive tract tissue. A similar principle has been used in experimental applications of photodynamic therapy designed to target tumor cells and infectious agents. The researchers are comparing the effects of photodynamic therapy using sunlight, ordinary white light, and blue LED light. In the most successful trial, 100% of the larvae that were present in the sample died after eight hours of exposure to sunlight. Mortality rates began to increase after the first two hours. The colorant was used at a concentration of 15 micrograms per millilitre of water. An important result is that mortality was high even on overcast days, which means that the breeding ground does not have to be in direct sunlight for the method to work. CEPOF group is also conducting three separate clinical trials to evaluate the effectiveness of the curcumin-based colorant to combat nail fungus, for oral decontamination, and in the treatment of venous ulcers. In vitro experiments performed at the University of São Paulo's São Carlos Institute of Physics (IFSC-USP) have already shown that the compound is effective at killing microorganisms. The process used to extract curcumin pigment from turmeric powder was developed in partnership with researchers at UFSCar, who belong to the CEPOF group and PDT Pharma. However, the extraction and purification of the natural product would be too costly for use on a large scale. To address this problem, UFSCar's Photosensitizing Heterocyclic Compound Synthesis Group developed a method of producing synthetic curcumin with the same

chemical structure as the natural pigment, which can be produced on a large scale and it is also more sustainable. The absence of other curcuminoids does not significantly diminish the molecule's activity in our ongoing studies. On the contrary, the use of synthetic curcumin enhances the experiments' dynamism, breadth, versatility and reproducibility.

Source: *Agência FAPESP*, 6<sup>th</sup> May 2015

### Burkina Faso: National Base Map Infrastructure of Burkina Faso updated

IGN France International was awarded a massive GIS project by the European Union in 2001 for assisting the tiny nation of Burkina Faso to update and enhance its national base map infrastructure. IGN is presently a subsidiary of the French based National Institute of Geographic and Forest Information, providing services in both the acquisition of geographic information (such as the processing and the modelling of data) and the implementation of new GIS technology. The last time the government of Burkina Faso updated its national base map was way back in the 1950's. During this timeframe up until now, major changes have occurred in the landscape of Burkina Faso. For instance, many new water based dams and roadways have been created and there has been massive urban expansion, as well as growth in the agricultural land. The completion of the IGN project was announced during a ceremony at the National Mapping Institute of Burkina (also known as 'IGB'), and this major breakthrough has created 34 GIS topographic maps. The base map infrastructure had four main components to it – (a) The acquisition of hundreds of satellite images, as well the procurement of the sophisticated GIS technology in order to capture these images; (b) The recruitment of local talent in Burkina Faso to carry out the tasks and project milestones associated with this project; (c) The actual production phase which consisted of the collection of the information and data to upgrade the national map; and (d) With the work now completed, government officials are now highlighting the many benefits that this upgraded national map now brings to the population of Burkina Faso. As a result of this massive undertaking, GIS professionals can now can utilise, as well as reference, the data which will let them collect, share, aggregate data and information coming from various sources.

Source: *Geotol*, 11<sup>th</sup> May 2015

### Burkina Faso: Herbal Tea to treat Malaria heads for Clinical Trial

A herbal tea that could combat malaria is due to start its first clinical trial in July. The brew, called Saye, will be trialled against the conventional malaria drug artemisinin with funding from the Ministry of Health in Burkina Faso. The Saye tea has been used in the country for more than 30 years. It is a mixture of three plants, including the root of the local N'Dribalaplant (*Cochlospermum planchonii*), and was first licensed as a herbal medicine in Burkina Faso ten years ago. But the compounds it contains that might act against malaria have yet to be identified. An article published in *The Journal of Alternative and Complementary Medicine* on 15<sup>th</sup> April 2015 explores the anecdotal and laboratory results for Saye ahead of the clinical trial in humans. It is not good enough just to reduce parasites in the blood. One really needs to clear malaria completely.

Source: *SciDev.Net*, 24<sup>th</sup> April 2015

### China: Heat Tolerance Genes from African Rice Variety

A team of scientists from the Chinese Academy of Sciences successfully isolated and cloned heat tolerance genes from African rice strains, which could be used to develop rice varieties that can resist the effects of global warming. The temperatures over 35 degrees Celsius decrease the productivity of rice plants. Heat stress destroys rice proteins, causing the plants to wither. Under heat stress, the heat tolerance gene from African rice variety is activated, and gets rid of the toxic proteins that may cause death to the rice plant. The researchers have tested Asian rice varieties with the transplanted gene in field conditions. The results showed that the gene's dominant traits enabled the transformed plants to withstand heat stress. Furthermore, the cloned gene may also be used to develop heat tolerant varieties of wheat and cruciferous vegetables such as Chinese cabbage.

Source: *Crop Biotech Update*, 27<sup>th</sup> May 2015

(Contd. from Page 7 - S&T News)

### **Cuba: Historic Pact with USA on Science**

U.S. and Cuban scientists recently engaged in 'science diplomacy', when they signed an agreement that furthers scientific and medical cooperation. The deal was inked after a delegation from the American Association for the Advancement of Science (AAAS) visited Havana for a three-day tour hosted by the Cuban Academy of Sciences and other institutions. Although Cuba is a logical partner for the United States to collaborate with on medical research and development, the longstanding U.S. embargo severely limits trade, travel and exchanges with the island nation. This trip was an opportunity to reinvigorate the long-standing friendship between U.S. and Cuban scientists and to form a specific plan of action that covers four areas in the life sciences: emerging infectious diseases, brain disorders, cancer and antimicrobial drug resistance. Cuba has committed a large amount of its resources to its scientific, medical and public health systems, including a hardy biotechnology industry that exports a number of vaccines, antibody based drugs, and other medical technologies. The life expectancy in Cuba is as high as in the United States. A large aging population gives rise to many common interests in fighting cancer and diseases of older people. Both countries are also at risk for mosquito-carried viruses such as dengue and chikungunya. To date, there is no vaccine for either disease. Neither Cuba nor the U.S. has ever had a known case of chikungunya. But it is spreading across Caribbean Islands and both countries are concerned. In December it was spreading in Saint Martin by mosquitoes infected with the disease. That is just the kind of issue where international cooperation among scientists can save lives and turn back the disease.

*Source: AAAS News, 30<sup>th</sup> April 2015*

### **India: Graphene Nanoribbons for Sensors, Supercapacitors**

Researchers of the TIFR Centre for Interdisciplinary Sciences, Hyderabad have used three-dimensional graphene nanoribbons to produce an electrode that could potentially be used in efficient sensors and supercapacitors. They synthesised two-dimensional graphene nanoribbons by chemically cutting multiwalled carbon nanotubes with a strong oxidising agent such as potassium permanganate in an acidic medium and deposited these on a glassy carbon electrode, converting them into three-dimensional graphene nanoribbons using a chemical called glutaraldehyde. The scientists performed electrochemical measurements to probe the efficacies of the three-dimensional nanoribbon-modified electrodes to sense biochemicals and store charge and compared the results with those for an electrode modified with two-dimensional graphene nanoribbons. It was found that the electrode with three-dimensional nanoribbons exhibited a high peak current and fast charge transfer due to large surface area of the nanoribbons. When dipped in solutions containing ascorbic acid and the neurotransmitter dopamine, the three-dimensional nanoribbon-coated electrode showed a large increase in peak current. The researchers attribute this current response to the high surface area and fast electron transfer through the network of three-dimensional graphene nanoribbons. The electrode coated with three-dimensional nanoribbons could also store charge, indicating its potential for use in supercapacitors. The three-dimensional graphene nanoribbons have been found to aid the oxygen reduction reaction, which is important for triggering electrochemical energy conversion processes in fuel cells and metal-air batteries.

*Source: Nature India update, 29<sup>th</sup> April 2015*

### **Malaysia: Launch of National Composite Centre**

Malaysia launched its National Composite Center (NCC) at the Malaysian Industry-Government Group for High Technology (MIGHT) pavilion during Langkawi International Maritime and Aerospace Exhibition (LIMA) 2015. The Centre, a collaboration between MIGHT, MARA and Persatuan Industri Komposit (PIK) under the Science to Action (S2A) national agenda, highlights the importance of the crosscutting technology for Malaysia, and will combine academics and business capabilities to speed the progress from laboratory to design to factory and into high-quality composite products. The Centre targets to spearhead the development of composite technology, become the reference for all composites activities in all industry sectors, provide direction and focus for fundamental research and collaborative links with Malaysia universities for composite, and help to develop training needed to build skills base necessary for applying advanced and specialist composite technologies. With the long term goal of

building the composites cluster for Malaysia, the Centre will focus on 8 key areas i.e. material, design, manufacturing, maintenance overhaul and repair (MRO), training (human capital development), business, standard, and research & development. MARA, which is anchoring composite as one of its strategic platform through TVET programme, has been instrumental in the setting of the Centre at Kolej Kemahiran Tinggi MARA, Masjid Tanah, Melaka. Melaka houses some of key local players in composite industry, which is expected to help accelerate the development of local SMEs in composite industry. The NCC is expected to play a major role in establishing strategic high technology industries for Malaysia, and has been identified in the Malaysian Aerospace Industry Blueprint 2030 as one of the key platform to enhance aerospace industry competitiveness and develop new capabilities through composite Research & Technology (R&T) focusing on new production technologies, thermoplastics & green composites.

*Source: MIGHT (Malaysian Industry-Government Group for High Technology) Newsletter, The Voice, April 2015*

### **The Philippines: Faster Salmonella Detection in Meat through Biotech**

The University of the Philippines (UP) Diliman, with support from the Department of Agriculture-Biotechnology Program (DA-Biotech), is conducting a study to improve methods of detecting Salmonella in raw meat and meat products by looking at the genetic blueprints of the organism and analysing the mechanism for its transmission and proliferation. It also aims to find the prevalence of Salmonella species in slaughtered swine and other livestock and poultry - both in raw meat and meat products - in wet markets in Metro Manila. The Salmonella species will also be classified according to what antigens they have. A developed protocol and Polymerase Chain Reaction (PCR) can allow rapid detection of organism and its sources. The organism can be further characterised, outbreaks can be controlled, and mechanisms of transmission can be identified. Faster and better detection of Salmonella would mean better control strategies and policies, and can ultimately help ensure safer meat and meat products in the agricultural and livestock industry in the Philippines.

*Source: Crop Biotech Update, 24<sup>th</sup> June 2015*

### **Vietnam: Promoting Vietnamese Agro-produce through PPPs**

Vietnam's farming sector has been transformed over the last five years through the public-private partnership model between the Ministry of Agriculture and Rural Development and various multinationals. This strategy has proved incredibly useful in promoting "made-in-Vietnam" agricultural products in many demanding markets across Europe. The "New Vision in Farming" initiative was launched by the World Economic Forum (WEF) in 2010 in Vietnam and has since involved the participation of 11 different countries and 20 major global corporations. These public-private partnership (PPP) projects have been quite successful in Vietnam, with working groups involved in fisheries, coffee, tea, fruits and vegetables, general commodities, and agro-business financing. PPP projects in these sectors have involved international corporations such as Metro Cash&Carry Vietnam, Unilever, Nestle, Syngenta, Cargill, Bunge and PepsiCo. Aside from promoting a better mix of private and public enterprises, the PPP model helped the adoption of new processes, greater certification, consumption, increased productivity and added value to a wide range of Vietnam's products. Five years into the "New Vision in Farming" initiative, some 10,000 farmers in Vietnam have adopted sustainable standards, giving Vietnamese agro-products access to international markets through the distribution channels of the international corporations. More importantly, this has laid the groundwork for new production models to emerge, forming value chains that use sustainable standards to spearhead businesses.

*Source: ICPE Public Sector Enterprises World News Newsletter, June 2015*



## *Past Scientific Associates of NAM S&T Centre*

### **Ms. Garima Sahney**



Ms. Garima Sahney joined the Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre) in July 2005 in the capacity of Research Associate soon after completing her post graduation in Biotechnology from Banasthali Vidyapith, Rajasthan.

Garima was associated with the Centre for a short duration of 6 months during which tenure she made significant contributions towards implementing various scientific programmes undertaken by the Centre and organizing workshops in multiple developing countries. While at the Centre, Garima got an opportunity to participate, on behalf of the Centre, in a roundtable conference on Intellectual Property Rights (IPR) which was organised by FICCI. The Conference made her aware of a new promising field of IPR, besides the conventional R&D or teaching practice, that was open for people with technical or science background. Being determined to explore the universe of IPR, Garima then contributed in compiling publication of a book titled 'Intellectual Property Rights in the NAM and Other Developing Countries' authored by R. Saha with a Foreword from the former Secretary to the Government of India, Prof. V.S. Ramamurthy.

Subsequently in December 2005, Garima was offered one year fellowship by Biotech Consortium of India Limited (BCIL) to work in any firm of her choice and without any second thoughts she chose an IPR boutique firm of Delhi, Lakshmikumaran & Sridharan. In March 2007, Garima joined Pangea 3, a Mumbai based Legal Process Outsourcing (LPO) firm s Solutions Pvt. Ltd. as a Manager leading a team of more than 25 people. At Echo Solutions, she worked extensively on pharma patent matters involving Hatchwaxman litigation. In 2011, Garima joined a Noida based law firm called Saikrishna & Associates, where she contributed in setting up the patent practice. Today, she heads the patents team at Saikrishna and believes that 'NAM Centre' played a very important role in shaping up her career.

Her message to the readers is - "if you fail to plan, you plan to fail"

### **Mr. Rohan Dev Talwar**



Mr. Rohan Dev Talwar was associated with the NAM S&T centre from 13th June to 27th September, 2013 in the capacity of a Project Assistant. During his short tenure at the Centre, he was instrumental in bringing out the Centre's publication on Intellectual Property Rights and also authored a scientific paper titled 'Intellectual Property Rights in India with a Perspective in Design, Engineering & Manufacturing'. His prime responsibility was that of implementing the Research Training Fellowship for Developing Country Scientists (RTF-DCS) scheme initiated by the Centre.

Subsequent to his association with the Centre, Mr. Rohan went on to work as a researcher with KPMG, a job area that requires him to work across industry sectors and service domains; he continues to work with the same firm. His current role pertains to advising clients from the telecom, technology, media, management consulting and the utilities space through industry analyses, opportunity assessments, competitive intelligence, Financial and strategic assessments, and peer bench marking by applying analysis methodologies such as Hedonic Analysis, Big Data, SWOTs, PESTEL's etc. He is responsible for providing insights and analysis through secondary research, taking into consideration market environment, customer sentiment, policy environment, economic and political trends, economic KPIs and drivers, and competition and investment opportunities. Given his dedication and exemplary performance, he was presented with the coveted KPMG Kudos award last year for outstanding performance which included going above and beyond the usual call of duty.

During the initial months subsequent to his departure from the Centre, he also founded a life coach organisation, which assists school and college students and corporate professionals in performance enhancement, time management, confidence building, improving efficacy at work, balancing work life and other issues pertaining to life struggles. In a short span of time, his clientele has come to include reputed schools in Delhi/NCR such as GD Goenka, Amity International and Tagore International, along with colleges such as Miranda House, Delhi University.

Realising his responsibilities towards the society, he went on to head the Marketing and Operations Department of a project based NGO, Together for a Cause, from May 2013 to December 2013.

Currently, he is looking for opportunities to scale his professional capabilities and considering study options related to managerial sciences.

## Research Training Fellowship for Developing Country Scientists (RTF-DCS) 2014-15 Research Project Completion Reports

### Mongolia– Project Completion Report of Ms. Khongorzul Odgerel



**Ms. Khongorzul Odgerel**, Assistant Researcher, Plant Biotechnology Laboratory, Institute of Biology, Mongolian Academy of Sciences, Mongolia was deputed by the NAM S&T Centre to the Department of Biochemistry, Biotechnology and Bioinformatics, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, India as a Fellow under the Research Training Fellowship for Developing Country Scientists (RTF-DCS) scheme 2014-15 for a period from 14<sup>th</sup> January 2015 to 22<sup>nd</sup> April 2015 to carry out research work on a project titled “Biochemical and Molecular Biological Research on Endangered Plant *Acorus calamus* L. (Sweet Flag) which is distributed in Mongolia and India” under the supervision of Dr. Kalaiselvi Senthil, Assistant Professor.

The major objectives of this research were to establish *in vitro* culture of *A. calamus* and to analyse the phytochemical and morphological characters of *A. calamus* collected from Mongolia and to compare them with those collected from different regions of India. The higher growth rate of Indian plants is due to the warmer climate in the India; however morphologically, not many differences were observed. Sweet flag is an important medicinal plant and its number is decreasing day by day. To conserve and produce good quality of sweet flag, tissue culture is the preferred alternate method to regenerate plant population. We successfully established a protocol to propagate plantlets *in vitro* from mature seeds. The influence of different growth regulators on *in-vitro* regeneration was also analyzed. The seeds were germinated on ? MS media and best germination rate was 11.17% after sterilized with 70% of ethanol and 0.1% HgCl<sub>2</sub> for 1 min. Regeneration of shoot from rhizome bud explant was observed at different hormone concentrations. The highest percentage of shoot proliferation was recorded at dual phase medium ¼ MS supplemented with 2.0 mg/l BAP, 0.5 mg/l NAA. The major phytochemicals analyzed include saponin, phytosterols, flavonoids and alkaloids. Significant variations were observed among all the phytochemicals studied. Overall observation from the analysis, is that, the phytochemical content of Indian isolates were higher in saponin and phytosterols, and the flavonoid content was similar among all isolates. Alkaloids were below detectable levels in all isolates. The saponin content of the Kerala, Thoothukudi, Madurai accessions was significantly higher (0.37±0.4mg/g) and its composition differed from the Mongolian *in vitro* cultured and wild type accessions. The content of phytosterols ranged widely from 0 to 0.12mg/g. Some of the Mongolian isolates were completely devoid of any phytosterols. The methanolic extract of *A. calamus* from different localities (India, Mongolia, China) showed good radical scavenging ability in DPPH radical scavenging assays and this might be attributed to the antioxidant property. Comparatively, among the 10 different extracts, Mongolian wild type *A. calamus* extract showed better radical scavenging ability in DPPH radical scavenging assays when compared to that of Indian *A. calamus* extract. This study provided an opportunity to establish a successful protocol for *in vitro* culture of *A. calamus*, and to test and differentiate the various phytochemicals present in different isolates across climatic zones. Further studies can be continued to establish the differences by karyotyping and metabolite profiling.

## DISTINGUISHED VISITORS TO THE CENTRE



Dr. Parmod Kumar, Professor and Head, Institute for Social and Economic Change (ISEC), Bangalore, India (2<sup>nd</sup> from L)



(L-R) Prof. M. Maaza, Africa Chair in Nano, UNESCO-UNISA; Prof. Bhekhe Mamba, Director, Nanotechnology and Water Sustainability, and Chair, Water Research, UNISA; Prof. Mamokgethi Phakeng, Vice Principal, Research Innovation, University of South Africa in Pretoria (UNISA); and Prof. Vijaya Srinivasu Vallabhapurapu, Research Chair for Superconductivity Technology, UNISA



Prof. Predhiman Kaw, Ex-Director, Institute of Plasma Research, Gandhinagar, India (3<sup>rd</sup> from L)



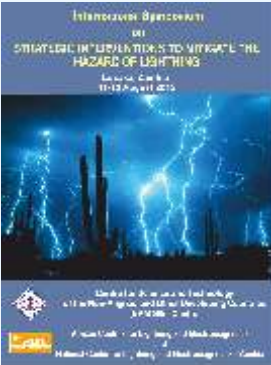
Dr. Balaprasad Ankamwar, Associate Professor, Department of Chemistry, University of Pune, Pune, India



Dr. V. Rajendran, Professor and Director, R&D and Centre for Nano S&T, K.S. Rangasamy College of Technology, Tiruchengode, Tamil Nadu, India

## Centre Announces

### International Symposium on STRATEGIC INTERVENTIONS TO MITIGATE THE HAZARDS OF LIGHTNING 11-13 August 2015, Lusaka, Zambia



Although lightning is a natural phenomenon with global presence, it remains an underrated weather hazard. Lightning can cause injuries and deaths for people and animals plus costly infrastructural damage and downtime of crucial equipment. The impact of lightning in most African regions is far worse than the rest of the world for many reasons. Parts of Central Africa have the highest lightning density (lightning strikes/km<sup>2</sup>/year) in the world. Most of the population is at high risk because safe shelters are not available, they are often employed in outdoors work, rapid high-quality medical care may not be available, and there is a general lack of knowledge about lightning and how to avoid injury. In a country like Zambia, isolated efforts have been made to protect electronic/ electrical equipment, but little is being done to protect human beings and livestock. To consider various aspects of lightning at regional level in Africa, the African Centres for Lightning and Electromagnetics (ACLE) has been set up in Kampala, Uganda, with associated groups in several African countries, including Zambia.

The Centre for Science and Technology of the Non-aligned and Other Developing Countries (NAM S&T Centre) and the African Centres for Lightning and Electromagnetics announce the organisation of an International Symposium titled 'Strategic Interventions to Mitigate the Hazard of Lightning' in Lusaka, Zambia during 11-13 August 2015, which will be hosted by the National Center for Lightning and Electromagnetics of Zambia. The Centre is currently being hosted by the Zambia Air Services Training Institute (ZASTI). The main objective of the Symposium is to bring the stakeholders at national and regional levels together, with participation of learned experts, to share experience and work together in a scientific manner for chalking out strategic interventions to mitigate the lightning hazard.

The International Symposium will provide a platform for the participants to learn about lightning hazards related topics and insights into strategic interventions (what has been done) and on lightning protection and safety in general.

The expected outcomes are a database on current state of the challenge of lightning in different countries, a database on the current status of lightning protection in various countries/ industries and a roadmap on the way forward for the purpose of developing appropriate systems / interventions to decrease deaths, injuries and property damage from lightning.

For further details, please see the website of the NAM S&T Centre: [www.namstct.org](http://www.namstct.org).

### Visitors To The Centre

9 <sup>th</sup> April 2015	<b>Dr. Parmod Kumar</b> , Professor and Head, Institute for Social and Economic Change (ISEC), Bangalore, India.
23 <sup>rd</sup> April 2015	<b>Prof. Mamokgethi Phakeng</b> , Vice Principal, Research Innovation, University of South Africa in Pretoria (UNISA); <b>Prof. M. Maaza</b> , Africa Chair in Nano, UNESCO-UNISA; <b>Prof. Bhekhe Mamba</b> , Director, Nanotechnology and Water Sustainability, and Chair, water Research, UNISA; and <b>Prof. Vijaya Srinivasu Vallabhapurapu</b> , Research Chair for Superconductivity Technology, UNISA.
5 <sup>th</sup> June 2015	<b>Prof. Predhiman Kaw</b> , Ex-Director, Institute of Plasma Research, Gandhinagar, India.
8 <sup>th</sup> June 2015	<b>Dr. Balaprasad Ankamwar</b> , Associate Professor, Department of Chemistry, University of Pune, Pune, India.
15 <sup>th</sup> June 2015	<b>Dr. V. Rajendran</b> , Professor and Director, R&D and Centre for Nano Science and Technology, K.S. Rangasamy College of Technology, Tiruchengode, Tamil Nadu, India.

### Participation of Centre's Scientists in Scientific Event

30 <sup>th</sup> March-3 <sup>rd</sup> April 2015	<b>Ms. Vaneet Kaur and Ms. Keerti Mishra</b> , Research Associates attended an International Training Workshop on 'Herbal Medicine: Drug Discovery from Herbs-Approaches, Innovations and Applications', jointly organized by the NAM S&T Centre and JSS University, Mysore. Ms. Vaneet Kaur also presented a scientific paper on "Curcumin: A Chemopreventive and Chemotherapeutic Agent" in this Workshop.
9 <sup>th</sup> April 2015	<b>Dr. Kavita Mehra</b> , Publication Advisor and <b>Ms. Radhika Tandon</b> , Research Associate attended a conference organized by the Indian Council for Research on International Economic Relations (ICRIER) on 'Harnessing Indian Agriculture to Global Value Chains: Prospects and Challenges' at Indian Habitat Centre, New Delhi
15 <sup>th</sup> April 2015	<b>Dr. Kavita Mehra</b> , Publication Advisor and <b>Ms. Vaneet Kaur and Ms. Radhika Tandon</b> , Research Associates attended the second event of EU STI Platform in India on 'How Can European Institutions and Industry Engage with India's New Research Universities?' organized by the CNRS Office in India, French Embassy, New Delhi.
16 <sup>th</sup> -17 <sup>th</sup> April 2015	<b>Mrs. Reshmi Hariharan</b> , Research Associate attended the Consultative Meeting for NAM S&T Centre of Excellence in Minerals Processing and Beneficiation at Harare, Zimbabwe.

## NAM S&T Centre – U2ACN2 (South Africa) Research Associateship in Nanosciences & Nanotechnology: Call for Applications for 2015

### NAM S&T Centre – U2ACN2 Research Associateship in Nanosciences & Nanotechnology (2015)

In line with its resolute efforts to promote South-South and North-South cooperation in science and technology, the NAM S&T Centre has instituted a number of Fellowship schemes that are aimed at supporting deserving young scientists in the developing countries to establish closer linkages with the Centres of Excellence located in various countries, thereby facilitating the affiliation of these researchers with the academic and scientific institutions such as the Leibniz Centre for Tropical Marine Ecology (ZMT) in Bremen, Germany; International Centre for Chemical and Biological Sciences (ICCBS), H.E.J. Research Institute of Chemistry in Karachi, Pakistan; Central Food Technological Research Institute (CFTRI) in Mysore, India; MINTEK, South Africa through the Department of Science and Technology (DST), Government of South Africa; and Indian scientific and academic Centres of Excellence through the Department of Science and Technology (DST), Government of India.

The NAM S&T Centre [[www.namstct.org](http://www.namstct.org)] is now pleased to announce yet another scheme, titled '**NAM S&T Centre – U2ACN2 Research Associateship in Nanosciences & Nanotechnology**', jointly with the UNESCO UNISA Africa Chair in Nanosciences & Nanotechnology (U2ACN2), University of South Africa, Pretoria, South Africa [[www.unisa.ac.za](http://www.unisa.ac.za)]. The objective of the Research Associateship is to provide opportunities to the scientists and researchers from the developing countries to affiliate themselves with senior researchers in U2ACN2, University of South Africa to undertake training and upgrading their research skills in the various fields related to Nanosciences and Nanotechnology.

Five Research Associateships each year are available for duration of 2 to 3 months and are awarded to only one scientist each from any given developing country in each year on a strictly competitive basis based on the applicant's academic and professional background, proposed Plan of Work and the mutual research interests of the applicant and U2ACN2. The offer may be renewed for a researcher for a second term depending on the availability of funds and subject to receiving satisfactory reports.

Under this scheme, U2ACN2, University of South Africa in Pretoria will provide free local hospitality (food and accommodation), and an amount of US\$300 per month for incidental local expenses, as well as the necessary research facilities to the selected Research Associates.

The NAM S&T Centre will pay the return international airfare from the home country to Pretoria, South Africa only to the selected Research Associates from those member countries of the NAM S&T Centre or members of the NAM S&T – Industry Network, which have no outstanding dues towards the annual membership subscription to the Centre. [List of member countries and members of the NAM S&T – Industry Network is available in the Centre's website [www.namstct.org](http://www.namstct.org)]. Researchers from the countries which are not the member of the NAM S&T Centre, or which have outstanding dues against their membership, will be required to bear their own international fare. Preference in selection will however be given to the applicants from the member countries of the NAM S&T Centre.

Copies of the guidelines for the Research Associateship and the application form are attached (also available at the Centre's Website: [www.namstct.org](http://www.namstct.org)). Applications recommended by the parent institution of the applicant and endorsed by the Focal Point of the NAM S&T Centre in the country may be submitted to the Centre by email ([namstcentre@gmail.com](mailto:namstcentre@gmail.com)) in the relevant format. The contact details of the Focal Points of the NAM S&T Centre in its member countries may be seen in its website: [www.namstct.org](http://www.namstct.org).

Applications are invited in the prescribed format for the Joint NAM S&T Centre – U2ACN2 Research Associateship in Nanosciences & Nanotechnology for the year 2015.

**The last date for submitting application for the Fellowship is Friday, 31<sup>st</sup> July 2015.**