

**MOLECULAR AND AYURVEDIC BIOLOGY OF INFLAMMATION 2014**

The symposium and workshop on “Molecular and Ayurvedic Biology of Inflammation” organized by Molecular Biology Unit of the Institute of Medical Sciences (IMS) in association with the Department of Bioinformatics, Mahila Maha Vidyalaya (MMV), Banaras Hindu University (BHU), was held from February 7 to 9, 2014 in Varanasi, India. The event was attended by about 65 scientists, who were from various streams of life-sciences ranging from Molecular Biology to Ayurveda.

**THE SYMPOSIUM**

Prof. Rajavashishth Tripathi, Molecular Biology Unit, IMS, in his talk, expressed that a better understanding of the inflammatory cells, molecules and mechanisms should result in novel strategies to control the detrimental effects of chronic inflammation, and should aid in the development of potential molecular targets to favorably modify inflammatory diseases. Dr. Sudhir Verma, of Department of Zoology, Sri Venkateshwara College, University of Delhi South campus, focused on the link between “epigenetics and inflammation.” He highlighted the usefulness of the technique of inducing poly-microbial sepsis in a murine surgical model of “cecal ligation and puncture” to investigate the global and gene-specific histone modification status. Dr. Zahid Asaraf, Defense Institute of Physiology and Allied Sciences, New Delhi delivered a talk on “chemotactic mechanisms underlying inflammation.” He also emphasized the role of platelets apart from granulocytes, macrophages, and lymphocytes in the inflammatory process. Dr. Prafulla K. Tailor, National Institute of Immunology, New Delhi mentioned the role of interferon regulatory factors (Irf) in dendritic cell development and functions. He emphasized the fact that Irf 8 plays a central role in CD8 $\alpha$ + subtype of dendritic cell development.<sup>[1]</sup>

Dr. P. P. Manna, Department of Zoology, Faculty of Science, BHU, while describing the current advances in the understandings related to the mechanisms of dendritic

cell-mediated anti-tumor immunity against lymphoma, explained the role of tumor necrosis factor super-family ligands in the effector functions of dendritic cell.<sup>[2]</sup>

Prof. Bhushan Patwardhan, Interdisciplinary School of Health Sciences, University of Pune, proposed that the knowledge and wisdom of Ayurveda may offer new avenues for biomedical research. He cited several examples to substantiate his claim from relevant areas such as natural product drug discovery, Ayurvedic Biology, AyuSoft and Ayu Genomics. He also shared his research experiences in this domain.<sup>[3]</sup> Dr. P. S. Byadgi, Department of Vikrati Vigyana, IMS, BHU, mentioned the pathophysiological events of diseases as explained in Ayurveda which is technically called Shat-kriyakala, specifically marked with *Tridosha* imbalance. Prof. V. K. Joshi, Department of Dravyaguna, IMS, BHU, shed light on various medicinal plants from Ayurvedic classics that are useful in shotha (inflammation) such as *Shunthi* (*Zingiber officinalis*) *Punarnava* (*Boerhaavia diffusa*), *Musta* (*Cyperus rotundus*) etc.<sup>[4]</sup> Prof. G. P. Dubey, Department of Kriya Sharir, IMS, BHU discussed on the “Ayurvedic management of inflammation and metabolic syndrome.” He explained that effective doses of formulation containing the hydro-alcoholic extract of *Salacia oblonga* and *Berberis aristata* exerts anti-inflammatory, anti-obesity, anti-atherosclerotic and cardio-protective effects. Prof. Yamini B. Tripathi of the Department of Medicinal Chemistry, IMS, BHU, while talking on “obesity and inflammation: Modern versus ancient medicine,” voiced that in the experimental setup it has been shown that several plants that suppress *Vata* have antioxidant and anti-inflammatory potential.<sup>[5]</sup> Dr. Bhaswati Bhattacharya, BHU, described the vital role the entities such as *Ojas* and *Tejas* play in the process of inflammation. This session concluded with the lecture of Prof. Manoranjan Sahu, Department of Shalya Tantra, IMS, BHU, who spoke on “Ayurvedic management of inflammation with special reference to wound healing.” He explained the beneficial effect of *Panchwalkala* in wound management based on his clinical experiences.

Prof. Anand Chaudhary, Department of Rasa Shastra, IMS, BHU and Prof. K. K. Narang, Emeritus Professor, Department of Applied Chemistry, IIT-BHU, chaired the sessions.

**THE WORKSHOPS**

The first workshop on ‘Computational Methods to Molecular and Ayurvedic Biology’ started with an introductory note by Dr. Kishor Patwardhan, Department of Kriya Sharir, IMS, BHU. He articulated the concept

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of *Dosha-Prakriti* as per the explanations derived from Ayurvedic text books. Subsequently, the *Prakriti* of the participants was determined by administering a self-assessment questionnaire.<sup>[6]</sup> The participants were introduced to the basics of the Computational Biology and Bioinformatics by Dr. Rajeev Mishra, MMV, BHU. The advanced information about biological database and sequence retrieval, sequence analysis and phylogenetic tree construction was given by Mr. V. K. Singh, Information Officer, School of Biotechnology, BHU, which was accompanied by the demonstration of these techniques.

Second workshop was focused on 'Molecular Methods to Measure Inflammation in Humans'. The session began with the collection of blood samples of the participants to measure the selected inflammatory biomarkers including C-reactive protein, macrophage-colony stimulating factor (M-CSF) and granulocyte M-CSF by ELISA technique to examine a possible biological association between *Dosha-Prakriti* and these biomarkers. The samples were collected after the consent from the participating volunteers. The details of molecular modeling and docking were demonstrated by Mr. V. K. Singh. The participants were provided with the software of certain bioinformatics tools and were trained on hands on basis in accessing the biological information resources on the web to study various aspects of molecular modeling and docking. The participants were also trained in advanced computational methods of phylogenetic tree construction. Later on, a thought-provoking discussion was organized to re-assess the theory of *Dosha-Prakriti* and to comprehend the challenges of determining one's *Dosha-Prakriti* as described in Ayurveda in which Dr. Kishor Patwardhan, Dr. Manoj Kumar and Dr. Vijay Srivastava participated as resource persons and led the discussions. The event was concluded with the proposal of the vote of thanks and concluding remarks by the organizing secretary, Prof. Rajavashisth Tripathi.

This symposium was a small beginning but an affirmative step toward building stronger bridges between the fields

of Molecular Biology and Ayurveda. It also shed a new light on the mechanisms promoting and preventing inflammatory diseases. The various topics covered during the sessions were aimed at understanding the inflammatory mechanisms underlying various diseases, and at having a better definition of pathways underlying inflammatory conditions, using both Ayurveda and biomedical tools. The workshops on the other hand, focused on the basic skills in bioinformatics to identify various strategies for tackling the detrimental effects of inflammation. They also motivated the participants to look into Ayurveda biology, the understanding of which might be of significant help in this process. Overall, the event proved successful in providing a platform for open-minded discussions among the experts in various fields.

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