Notes and News

Seven-Day Online Workshop on Science Communication : A Brief Report

The seven-day workshop on science communication and media practice, organized jointly by the Indian Science News Association (ISNA) and VigyanPrasar, DST, Government of India has been successfully held online on web platform from 24th November to 1st December, 2020. It was the part of the 33rd training program on Science Communication and Media Practice organised by ISNA during 2019-2021. More than 150 candidates applied for this online workshop, and finally 27 were selected on the basis of their interests on science writing. Among them, 18 participants attended the online webinar regularly.

24th November, 2020 : The whole webinar was divided into eight sessions. In the inaugural session, Prof. Biswapati Mukherjee, the Chairman of the 33rd training program and Former Professor, S. N. Pradhan Centre for Neuro Sciences, Calcutta University addressed all by stating why science communication is necessary in everyday life. His informative speech was followed by addresses from two honorary secretaries of ISNA, Prof. Sudhendu Mandal, former Professor of Botany, Viswa-Bharati University and Prof. Manas Chakrabarty, former Professor of Chemistry, Bose Institute. Dr. Nakul Parashar, Director of Vigyan Prasar, DST, GoI delivered the inaugural address. The coordinator of the workshop, Dr. Arnab Kumar Banerjee, Head, Department of Journalism and Mass Communication, Vijaygarh Jyotish Ray College and the joint convenor, Dr. T.V. Venkateswaran from Vigyan Prasar, DST stated the objectives and utility of the workshop. All the participants gave their brief introduction in due course. Prof. Sunil Kumar Talapatra, the Vice President of ISNA in his short speech wished the event a grand success. Dr Amit Krishna De, the Joint Convener and Advisor, Indian Science Congress Association, DST, GoI proposed vote of thanks.

25th November, 2020 : On the second day, there were 2 sessions, namely 'Science Communication through Print and Photography, and 'Science Communication through Electronic Media', respectively. The speaker of the day's first session, Shri Prasun Chowdhury from 'The Telegraph' spoke about the role of print media and infographical illustration in efficient science communication. He highlighted a relatively new aspect named, 'info-demic' with respect to fighting the COVID 19 pandemic. He pointed out that print media still remain as a powerful tool of science communication. The speaker of the day's 2nd session, Dr. T. V. Venkateswaran of Vigyan Prasar, DST, discussed about the key aspects of Audio-Visual science communication and emphasized on accuracy of information. The two sessions were chaired by Mr. Hasan Javed Khan, Editor, Science Reporter and Prof. Devaprasanna Sinha, respectively. The anchor for this programme was Dr. Debosree Ghosh, former student of ISNA and Assistant Professor, Dept. of Physiology, Government General Degree College, Kharagpur.

26th November, 2020 : On the third day of the online workshop, there were also two consecutive sessions on "Science communication through film and video" and "Science communication through writing and speech", respectively. The first session of the day was chaired by Dr. Nimish Kapoor, Vigyan Prasar, DST, GoI. The speaker, Sri Nandan Kudhyadi, the famous Science Film Maker, shared his knowledge and experience of making a science film that can be very helpful in promoting science among common people. He pointed out that films dealing with science should be interesting so that the common people can relate it with their thoughts and beliefs. The second session of the day was chaired by Sri Prasanta Kumar Bose, Former Chief Media Advisor, US Consulate. The speaker, Dr. Manas Pratim Das, Prasar Bharati taught how writing and speaking can be an important tool for science communication. Dr. Das pointed out the way one can bridge the gap between science and common people effectively. The anchor for this programme was Dr. Neepa Banerjee, former student of ISNA.

27th November, 2020 : On the fourth day of the online Workshop, there were two sessions emphasizing on "Science communication through traditional Media" and "Science communication through digital and social media", respectively. Dr. Subhabrata Roychowdhury, Former Vice Chancellor of Techno University, the Chairperson of the day's first session introduced the speaker Dr. Sima Mukhapadhay, former Editor, Jiban Katha. In her talk, Dr. Mukhapadhay enlightened us how traditional media like puppetry show, *kobigaan*, *bonbibirpala*, etc. can create science awareness in the society. She also showed how

puppets can be made easily with recycled materials and attract the audience giving promising results. The Chairperson of the next session, Dr. Buroshiva Dasgupta, Head, Department of Mass Communication, Sister Nivedita University introduced the next speaker, Mrs Bakul Srimany, Faculty, Department of Journalism and Mass Communication, Vijaygarh Jyotish Ray College. Mrs. Srimany described how science communication can be made through the internet and social media. She also pointed out how Twitter and Facebook can become a very important weapon against fake news. The anchor for this programme was Dr. Junaid Jibran Jawed, former student of ISNA and Assistant Professor, School of Biotechnology, Presidency University.

28th and 29th November, 2020 **:** The following two days of the workshop were hands-on training on blogging, e-tabloid making, audio presentation and puppetry show. Mrs. Srimany trained the students how they can make a blog on the internet. Prof. Deblina Basu nicely described how the participants can create their own e-tabloid using the google platform. Dr. Manas Pratim Das made his expertise views on making attractive audio clips that can appeal audience. Dr. Sima Mukhapadhay made a hands-on training on making puppets and attractive scripts for effective science communication.

Every day after completion of each session, the students were given some assignments, which they submitted to the rapporteurs and they forwarded those to Mentors for evaluation. The rapporteurs were all past students of ISNA. For Bengali write-ups, the rapporteurs were Shri Chandan Patra, Sk. Tuhin Sajjad, Sk. Jinnat Ali, Sk. Mizanur Rahaman, Shri Sukalyan Gainand for English write-ups, the rapporteurs were Ms. Barnini Bhattacharyya, Ms. Sohini Basu, Dr. Sourav Ghosh, Shri Samraj Sinha, Ms. Zarafshan Neyaz. The Mentors were Dr. Sumitra Chaudhuri, Vice-President, Bangiyo Bigyan Parisad, Prof. Sabyasachi Chattopadhyay, Department of History, Kalyani University, Dr Minakshi De, Department of Microbiology, Surendranath College, Smt. Arpita Chakraborty, Science Communicator, Dr. Shankarashis Mukherjee, Department of Nutrition, West Bengal State University, Dr. Kali Prasanna Dhara, former Professor, Department of Chemistry, Calcutta University, Dr Ashis Das, Chief of News Bureau, High News TV Channel and Prof Devaprasanna Sinha. The good communication between the mentors and the rapporteurs was really eye-catching.

1st December, 2020 : The last day of the online workshop was the valedictory session, which started with an address by the chairman, Prof Biswapati Mukherjee. Dr Arnab Kumar Banerjee, the Conven orbriefly summarized the workshop. Every participant made a feedback video, which was presented in the session. The Chairman, Dr Manoj Kumar Patairiya, the Advisor and Head of SERB, DST, GoI shared a few words about the importance of science communication and urged both the scientists as well as the people from mass media to help in communicating science to common people. The speaker of the valedictory session, Prof (Dr.) Dhrubajyoti Chattopadhyay, the Hon'ble Vice-Chancellor of Sister Nivedita University, Kolkata, highlighted the importance of digital communication and its influence in communicating science. The enriched speech was followed by the presentation of the blogs, e-tabloids, audio recordings and a puppetry script made by the participants. The presidential address was delivered by Prof Sunil Kumar Talapatra, the Vice president of ISNA. Dr T V Venkateswaran, the Joint Convenor of the training program, urged the participants to carry forward their work and keep communicating science. Dr Amit Krishna De, the Joint Convener, concluded the webinar.

The 7-day online workshop was very fruitful and enriched the participants. They felt delighted for being a part of these informative and knowledge gaining sessions. ❐

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How much Gandhi Matters Today: A Thematic Meeting at Gandhi Teerth

An interesting meeting on Gandhi was held in Gandhi Teerth, a sprawling campus dedicated to Mahatma Gandhi and his philosophy, located in the picturesque Jain Hill in the outskirts of Jalgaon in Maharashtra on 23-24 August 2019. The sprawling estate is a telling example of how an individual endeavour can realise the dreams of the Mahatma at this remote place now known as Gandhi Teerth. The Gandhi Research Foundation (GRF) is a part of it. GRF is dedicated to research and training in the philosophy and vision of the Mahatma as can be seen from how the establishment is made self-sustained in terms of food, water and such needs as energy. Waste and water are recycled, modern fertilisers and pesticides are kept at bay, and all effort is made to live in harmony with nature. The GRF has a state-of-the art library, an archive, a digitization and document preservation department, a khadi

unit, and a museum, housed in a magnificent building, pristine in simplicity and exceptionally elegant in design.

The museum must be the best of its kind on Gandhi in the country; and the towering statue of Bapu in the forefront of the structure, with a boy and a girl hugging him, pleasantly different from the popular image of the Mahatma in short *dhoti* (loincloth) and a *lathi* (club) in hand, emits the wholesome spirit of renascent India, brimming with love for all on this planet.

The meeting was a joint venture of the GRF and the Indian Institute of Advanced Study (IIAS), Shimla, to contemplate on "How Gandhi Matters" in our troubled times. Ramachandra Guha, noted historian and intellectual, delivered the keynote address, historian Sudhir Chandra of the JNU presented the valedictory speech, and political scientist MP Singh, IIAS National Fellow and the co-convener of the meet, enlivened the discussion with scholarly comments.

None of the participants disagreed that Gandhi mattered more today than ever in the past; but how to follow him is the crucial question. They reasoned out, but most seemed to be baffled by the rat-race and aggressive competition for the growth-fired development drive—something Gandhi did not approve of. Ramachandra Guha is a keen chronicler of India before and after Gandhi, with an eye on environment and many things Gandhi was concerned with. The participants belonged to different disciplines, but Gandhi had brought them to this remote hillock in search of an alternative way of development. But did he elude them between despair and hope?

Gita Dharampal, Dean (Research), GRF and once the head of History, Heidelberg University, Germany, and Vidya Krishnamurthi, GRF Research Coordinator, remained on toes to make the event a success.

Despite the fact that the centre is not very old, it is attracting visitors from all over the world. I met students from Europe, others from different parts of the country at the centre. They have come to know about the life and thoughts of Gandhi; many are doing regular courses in Gandhian philosophy. Every day, people in hundreds visit Gandhi Teerth, with curiosity and reverence for Gandhiji. I met one Vishnu Das from Tripura, a PG Diploma student at the centre, who is determined to take the Mahatma to the disturbed life of the Northeast and is already very much on the Gandhian path. I wish people will support him. There must be many more like him. Everyone here is different from their generation elsewhere. They are soft spoken, gentle and helpful; and they are punctual, sincere and mindful. The Dean of Academics, John Chelladurai, was exacting, and working with clockwork precision. It was all inspiring. ❐

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Nutrition Security and Fisheries: Observance of World Fisheries Day 2020

The World Fisheries Day 2020 was observed on-line by Association of Fisheries Graduates, Cochin, Kerala on 21/11/2020 and a Panel Discussion was organized on the theme for this year 'Nutrition Security and Fisheries'. In introductory note, Dr N. K. Sasidharan Pillai, Former Joint Director, Dept of Fisheries, Govt of Kerala highlighted ways by which COVID-19 drastically affected fisheries sector in India where more than 60 million people are employed. Fish consumption annually is 6-7kg/person in India but is nearly 30kg in Kerala. Importance of culture fisheries (aquaculture) is more felt now globally and shifted from capture fisheries, and wild captured fish gives more nutritional value than cultured ones. Dr Pillai also spoke about UN Sustainable Development Goals (SDGs) emphasizing on a world without hunger and poverty. In 2020, India ranks 94 among 107 countries in Global Hunger Index which isn't good. He outlined that fish is an important component in maintaining people's nutritional security and India needs a roadmap for a nutritional-cum-food secured nation.

Dr D. Cheruvat, Addl. Director of Fisheries, Govt of Kerala spoke on 'Policies for sustainable development of fisheries in Kerala' released in 2019. He emphasized on marine resource conservation and sustainable use, protection of rights of traditional fishers, ensuring minimum price to the catch, need of adequate infrastructure (housing, drinking water, etc) of fishermen; discussed about issues like declining marine fish catch, high population density in coastal belt, high cost of production and low per capita marine catch, reducing income of sea-going fishermen. He elaborated on 'Targets' and strategies taken by the Department, *viz.*, scientific intervention for increasing fish production and productivity (imbibing research outcome to be useful for them), development of marine fisheries, inland fisheries, aquaculture, marketing and fishing harbours, fishermen welfare and human resource management.

Prof. A. Biju Kumar from Dept of Aquatic Biology and Fisheries, University of Kerala spoke on 'SDGs, nutritional security and small-scale fisheries (SSF)'. He opened up his talk with anchovies, group of small marine fishes that are most dominating pelagic fish, nutritionally rich and contribute to nutritional security. About 3000 million people worldwide rely on wild-caught and farmed marine fish as primary source of protein. Head, viscera and backbone of small inland and marine fishes are rich in micronutrients; key nutrients in seafood include long chain n-3 fatty acids, Vit-D, iron, calcium, zinc. Bones of tuna used for fish powder is comparable with maize flour in terms of nutrition. Out of 12% of world's population dependant on fisheries, 85-90% involved in SSF. Prof. Kumar vividly put forth about important contribution of SSF in global food security, improving marginalized community and their livelihood; 90% of small-scale landings destined for local human consumption, *i.e.*, 'hidden harvest'; SSF generates less byecatch discards compared to large-scale fisheries; SSF and fishers often remains unrecognized, excluded from decision-making process and needs appreciation; need of critical evaluation about their contributions on fish catch data, economic development and ecosystem management.

Dr S. Mohamed, Principal Scientist, ICAR-CMFRI, Kochi spoke on 'Towards sustainability of Indian marine fisheries'.He stressed on seafood as world's most globally traded commodity; discussed on profile of Indian marine fisheries; biologically-sustainable and biologically-unsustainable fishing; dimensions of sustainability; major marine fishery resources; marine fish landings in India during 1950-2019; fishing vessels and gears used in capture fisheries; diversity in life pattern, biological and morphological characteristics and catch of marine fishes; need of fisheries management, protection of resource in territorial waters upto 12 Nautical miles and in EEZ and sustainable exploitation; regulatory measures in vogue (vessel registration, closed fishing season and protected areas, fishing gear specification, regulation on fishing effort and minimum legal size of different fish species to be caught to prevent growth overfishing); specification of fishing grounds and cage mariculture zones; Fisheries governance in India; genesis of Ecolabels towards sustainable fisheries; Indian marine fisheries Code.

Prof. I. S. Bright Singh from National Centre for Aquatic Animal Health, CUSAT, Kochi spoke on 'Sustainable intensification of aquaculture for nutritional security'. The terms sustainability, carrying capacity and intensification were explained in detail. He further discussed about warranting human intervention from preventing aquaculture environment to be collapsed; differentiated between earthen pond fish culture systems having sediment beneath water and polythene lining between sediment and overlying water, carrying capacity of former and latter can be enhanced by bioremediation and high investment respectively; principles of RAS, Aquaponics tech and Biofloc tech as artificial high density fish culture systems. Speaking on 'purchasing capacity *vs* nutrition capacity', Dr Singh's talk highlighted that intensification becomes sustainable if there is flow of finfish produced to mass people, emphasized on nutritional capacity of masses irrespective of financial capacity. Best quality fish has to be produced at affordable price.

Dr G. Kumaran, Asst. Director, MPEDA Regional Division, Mangalore spoke on 'Aquaculture diversification for nutrition security'. Rajiv Gandhi Centre for Aquaculture, a wing of MPEDA, introduced some commercial aquaculture species in India, both hatchery and grow-out farming operations and explored possibility of their seed production and demonstration. He discussed about ongoing RGCA projects, *viz.*, seabass ('Bhetki' in Bengali) broodstock maintained in RAS, early larval rearing phase, control of cannibalism, its growth in grow-out cage farms and open ponds; potential of culture of export-oriented edible mud crab *Scylla serrata* in pens and individually in box using hatchery-produced crablets; farming of marine finfishes cobia, silver pompano and grouper in open sea cages; domestication of selective-bred adult tiger shrimp, screening and monitoring to produce infection-free shrimp seeds; broodstock facility of vannamei shrimp; all-male freshwater prawn development; innovative aquaculture approach for improved Tilapia. RGCA aims to produce and supply seabass and SPF shrimp seeds throughout the year as per timely requirement of fish and shrimp farmers. Finally, this programme elicited active discussion between participants on Google Meet and eminent panelists. ❐

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Newer Studies in COVID-19 and Herbs in Western Ghats in Protection from Viral Infection

The National Webinar 'COVID-19 Impact on Life Sciences' was organized by Departments of Botany and Zoology, Late Rajkamalji Bharti Arts, Commerce and

Smt. Sushilabai R. Bharti Science College, Arni, Dist. Yavatmal, Maharashtra on 28/11/2020. As 1st invited speaker, Dr M. Baig, Researcher at Dept of Integrative Biology, University of Guelph, Canada spoke on 'SARS-CoV-2: challenges and promises'. He stated that information on bioscience behind COVID-19 outbreak and response can be accessed in Bulletin published by Royal Society of Biology on 23/11/2020. Scientists are tracking small differences in SARS-CoV-2 genome to explain why the disease has different effects. Tiny variants in genes may dictate its severity, are responsible for varying degree of infection and can be exploited in vaccine preparation. Dr Baig briefed about some research news of November 2020, *viz.*, strange ways by which Coronavirus can affect human brain (leaving a delirium and emerging evidence suggest COVID-19 can leave a long shadow); study linking air pollution to 15% of COVID deaths and death linked to COVID-19 and air pollution represents 'potentially avoidable, excess mortality'; young children unlikely to spread the virus but older kids more at risk (researchers explained schools probably aren't COVID-19 hotspots); severe infection rare in newborns; blood samples from recovered patients suggest a powerful, long-lasting immune response to Coronavirus. Dr Baig discussed in short about his studies on phylogenomics and phylodynamics analysis of 286 retrieved SARS-CoV-2 whole genomes from India.

Prof. S. R. Yadav, INSA Senior Scientist, Dept of Botany, Shivaji University, Kolhapur spoke on 'Angiosperm diversity of India in Western Ghats and antiviral herbs in protection from COVID-19'. Total 18259 angiosperm species recorded in India, 4303 endemic species found in India and 2116 species endemic to Western Ghats. Prof. Yadav said that great correlation exists between herbs and human health and India's traditional knowledge 'tr' is rich. Our plants synthesize phytochemicals that we use to control diseases. He spoke about Mahasudarshankada -list of 54 plant species prepared by Sandu and Jhandu and list of 55 plants prepared by Vaidhnath that are used, of which 50% plants in each exhibit anti-viral properties. Viruses are unable to attack those who take it regularly. Our Ayurveda, Siddha help us to keep healthy even in times of COVID-19. He showed list of 41 Indian plants antiviral in nature, specifying their local names, medicinal uses of plant parts for different diseases; discussed about antiviral phytochemicals produced from plants; their activity against specific virus pathogenic to humans (can be used against fever in COVID-19); plants used by local doctors in Kolhapur for treating virus-infected patients; mechanisms of action of existing anti-viral plant drugs; importance of *Andrographis paniculata* and compound and rographolide shows impressive antiviral properties.

Plants like Daruhaldi, Kalmegh, Chirayata, Sariva have great practical value, we can help our society with our knowledge and it must not be underestimated. Dr Yadav informed about herb *Enicostema axillare* equally effective like *A. paniculata*in viral infection and skin diseases; *Swertia densiflora*, *S. chirayata* (bitterest compound found in it), *Tinospora cordifolia* useful for many diseases, found in Maharashtra villages, acts against HIV and Herpes virus; *Ancistrocladus heyneanus* used to treat AIDS patients; *Coscinium fenestratum* used by tribals as antimicrobial drug; intake of withanone from *Withania somnifera* or Ashwagandha powder helps to block or weaken entry of SARS-CoV-2; *Bacopa monnieri* leaf extract having anti-viral properties, also that of *Pueraria tuberose* and leaf decoction of *Centella asiatica* (Brahmi); *Wrightia tinctoria* as best antidotes against H1N1 virus inhibition; *Zingiber zerumbet* against common cold and cough; different flowering varieties of Curcumas or Haldi found in Western Ghats in beginning of June; Jasmine species used against Hepatitis-B infection. Utilization of both research findings and 'tr' is important to prevent entry of SARS-CoV-2 in our body. Dr Yadav vividly put forth that biodiversity is real capital asset of human beings and is of great significance for real progress and happiness. Plants are only 'scientists' who can synthesize food for us. All medicines, since origin of human beings and our health, breathe and stomach - all come from and maintained by plants. Botany students should learn and gather treasure of 'tr' from tribal and local village people.

Dr A. K. Jha, Head, Dept of Zoology, Hislop College, Nagpur spoke on 'Immune system and its response to Coronavirus'; it was highly educative for PG students and researchers. He outlined that our immune system has evolved to protect us from pathogens. Dr Jha pictorially explained different components of leucocytes; functions of interferons and different lymphocytes; how cytokines signal between lymphocytes, phagocytes and other cells of body; discussed in detail about immune system of human body; different types of Coronaviruses; depiction of sites of replication of human Coronaviruses; emergence and spread of SARS-CoV-2, its biochemical interactions and pathogenesis; innate immunity and adaptive immune response against viruses in COVID-19 patients; effector mechanism by which adaptive responses combat virus replication; virus strategies to evade host's immune response in COVID-19 patients and finally suggested food, vaccination, drugs and supplementary for immune system

for COVID-19.

As 4th and final speaker, Dr D. V. N. S. Suresh from Dept of Zoology, Dr Ambedkar College, Nagpur spoke on 'COVID-19: understanding and combating in different perspective' and showed a Video clip on how Coronavirus spreads from infected person, infects new ones, replicates inside body cell, gets out with multiple copies of it and how our immune system acts against it. He discussed about origin story and studies of Shi Zengli on bat Coronavirus in 2010, ways of combating SARS-CoV-2, network graphs and how PCR-based and antigen-based tests work. ❐

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Psychoneuroimmunology: Mind Impacts on Health

The Dept of Genetics of Indian Academy Degree College - Autonomous, Bengaluru organized National Webinar on 'Psychoneuroimmunology (PNI): Mind Impacts on Health' on 30/11/2020 and Dr M. Jayalakshmi, Professor of Immunology, School of Biological Sciences, Madurai Kamaraj University, Tamil Nadu spoke on this subject. Dr Jayalakshmi begun her talk saying that PNI is a complex and emerging field which deals with understanding of existing connection between body and mind, *i.e.*, between psychological process, nervous and immune systems of human body. It is full-fledged interdisciplinary area concerning study between behaviour, brain and immune system. She explained that stress causes illness and has impact on immune system. We can help our body by doing meditation/Pranayam that is important for our lungs, walking and exercise for heart, good food for intestines, good thoughts for our soul and good deeds for the world. Coordination between immune, endocrine and nervous systems in our body is very essential and immune system is the sixth sense after vision, touch, smell, hear and taste. Our immune and nervous systems communicate ('speak') through a particular language *via* various biological factors (specialized cells, hormones, neurotransmitters) and respond to physical stressors.

The 'lotus and cactus' model of Dr R. M. Pitchappan was nicely explained by Dr Jayalakshmi in connection with the immunological dictum 'Not all the infected develop the disease'. She continued saying that an established surveillance system is within us and battle between good and evil (pathogens that can compromise our health) is going on in our body. She spoke about primary and secondary lymphoid organs in human body; physiological happenings in a stressful situation and how stress affects our body; release of stress hormones and their impact on immune processes; the 'fight or flight' response; induced stress experiments in lower vertebrates (acute exposure to electric shock, social defeat, immersion in cold water, loud noise, intraperitoneal injection of saline water, etc) and all of these have effect on immunity. We must learn to manage stress, which is both psychological and physical and it leads to increased risk of disease. Chronic stress leads to insomnia, anxiety, muscle pain, high blood pressure, depression and weakened immune system. She discussed about some adaptive measures to bring out this stress; the immune-stress vicious cycle; activation of hypothalamic-pituitary-adrenal connection as physiological response to stress; modulation of immune response by stressors; correlation between stressors, immune and nervous systems and that PNI has deep implications in future of medical research, treatment of diseases and attitude towards handling stress.

Dr Jayalakshmi stated that brain talk regularly and powerfully to the immune cells and vice versa. Brief stressors suppress cellular immunity while preserving humoral immunity but chronic stressors suppress both types. We can study about possible association of stress with major disease episodes (cardio-vascular disease or others) of ourselves or persons whom we know. Immune functioning goes up at onset of stress and goes low down with progress (duration) of chronic stress; it has relation with reactivation of latent viral infection like Epstein-Barr virus. Evidences show that stress increases rate of progression of HIV/AIDS. She has experienced that prognostic marker of HIV infection, *i.e.*, CD4 count, to be high in female HIV individuals. Dr Jayalakshmi highlighted on her studies about differential expression of immune response genes in lonely *vs* sociable persons. Inflammatory response genes and anti-viral response genes found to be upregulated and downregulated respectively in lonely individuals, and it is other way round in social individuals. She spoke about happiness as best medicine and maintaining balance between eudaimonic (intrinsic/process-based) and hedonic (extrinsic/outcome-based) ways of happiness in life. Reduction of stress is important to lead happy life and maintain a healthy immune system. She suggested ways of boosting our immune system naturally (healthy food sources, keep learning, 'Count your blessings', work that will relieve us from all mental ailments, etc) and means of activating it by doing grounding exercise

for anxious moments and other means. It was a very informative session where PNI, the new perspective of research, was explained elegantly. ❐

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International Webinar on Functional Fermented Foods

People are increasingly dependent on diet to keep them healthy in present COVID-19 pandemic. Functional foods (FF) play crucial role on daily basis in their lives and further among it, fermented FF (traditional, ethnic and scientific) have been prominent. To discuss about current status and prospects of fermented FF, International Webinar on 'Functional fermented foods: current status and future prospects' was organized by Dairy Microbiology Dept, SMC College of Dairy Science, Anand Agricultural University, Gujarat in association with Gujarat State Biotechnology Mission and Swedish South Asian Network on Fermented Foods (SASNET-FF) on 15/12/2020.

As 1st speaker, Prof. N. P. Shah, Dept of Food Science, University of Hong Kong spoke on 'Nutraceuticals and FF: some perspectives'. He discussed about dietary supplements, FF, medicinal foods and pharmaceuticals as categories of nutraceuticals; Indian nutraceutical market divided into FF & beverages (68%) and dietary supplements (32%) and major nutraceutical industry; addition of probiotics, prebiotics, phytochemicals, bioactive peptides, n-3 PUFA modifies food to become functional and examples of possible functionality of modified foods; composition of biologically-active compounds of whey (α-lactoglobulin, á-lactalbumin, protease peptone, serum albumin, lactoferrin, IgM, IgG and IgA) in milk; whey protein (WP) powders and fractions (with glycomacropeptide, isolated WP, lactoferrin) and WP hydrolysates; WP with superior nutritional properties compared to egg, casein, meat and soya; isolation of lactoferrin from milk having antimicrobial activity; importance of WP in muscle physiology after exercise, weight management, diabetes, wound repair; that isolated WP supplement in food cause decrease in fat mass. He opined that caseino-macropeptide, the 64 amino acid long glycophosphopeptide cleaved from Kappa-casein that is used in cheese making, will be suitable for people suffering from phenylketonuria if added to food.

Dr (Ms) S. Senan, Associate Principal Scientist (PS), Nutrition Division, PepsiCo., USA spoke on 'Recent advances in research of functional cultures and ingredients'. She stated that term 'fermented' grew 46% in US restaurants' menu in last four years and is trending; discussed about psychobiotics, *i.e.*, probiotics with curative potential for central nervous system, its effects on microbiota-gut-brain axis in early-life stress and neuro-psychiatric disorders and potential role to counteract pervasive effects of stress and anxiety; multi-strain potential probiotic formulation with anti-depressant effect; preserving harvested vegetables and foods naturally through fermentation and pickling; fermenting hot chillies, peppers and others for bringing unfamiliar flavour and functionality, multiple products coming up. Many essential oils and extracts used to extend shelf-life of foods, and synergy/combination of such oils/natural anti-fungal agents (cinnamon flavour, green tea extract, East Indian lemongrass, oregano) will help to run lower through flavour threshold as well getting minimum inhibitory concentration, Dr Senan explained. Discussing on 'biopreservation for dairy products', she focused on surfaces of semi-hard cheese and sour cream treated with beneficial microorganisms and incorporated with their fermentates respectively as natural preservatives; spoke about fermentation of plant-based milk alternatives for improved flavour and nutritional value, reducing off-flavours by mixed bacterial culture fermentations.

Dr A. N. Bhadalkar, Joint Director, Gujarat State Biotechnology Mission, Govt of Gujarat spoke on 'Govt initiatives and support systems for funding innovation in FF and bioactives'. As 4th speaker, Dr P. Singh, Key Account Manager, DSM Food Specialties Ltd spoke on 'Consumer perspectives and future prospects of fermented FF'. He discussed about continuing growth of market of plain yogurt, sour milk and drinking yogurt in Asia-Pacific; global trends in yogurt; six main dairy trends identified, *viz.*, food chain efficiency, protect the planet, clean label and transparency, snackification, premiumization, health and well-being. In the 6th concept, Dr Singh mentioned about sugar as bad carbohydrate which consumers are cutting down, search for protein food, digestive wellness; probiotics *Lactobacillus acidophilus*, *L. casei* and *Bifidobacterium* sp showing steady growth in company-produced dairy products in different parts of world; popularity and growth of lactose-free yogurt; sugar-reduced yogurts produced; that yogurt brands in Norway innovated immune-boosting recipes for children. Many consumers now consider yogurt as on-the-go healthy office snack. Dr Singh also gave overview on retail market of cheese in India, China and Australia in 2020 and growth opportunities for fermented milk products, reducing food waste and extending its shelf-life naturally.

In the panel discussion session, Dr J. P. Tamang, Dean, School of Life Sciences, Sikkim University discussed about status of academic programme involved in fermented foods and probiotics in microbiology in Indian colleges and means of promoting fermented foods for people in higher status; Dr (Mrs) S. Grover, Former PS, Diary Microbiology Division, NDRI, Karnal discussed about need for taking up diversified research on Indian traditional fermented foods and milk products and recommendation of its consumption to society for building immunity; Dr (Mrs) N. Hajela, Head of Science and Regulatory Affairs, Yakult Danone India Pvt Ltd discussed about increasing consumer awareness about preventive healthcare in COVID-19 times, changes to be done in regulatory mechanism and other standard systems so that right fermented food products goes to right consumer in right way; Dr A. Jana, President, Alumni Association, SMC College of Dairy Science discussed about strategies to be applied to build confidence in consumer about the FF, *wrt* probiotic foods in general and consumer perception; Dr P. Salunke, R&D and Technical Services Coordinator, Saputo Dairy, USA discussed about status and perspectives of probiotic and prebiotic cheese markets in USA. Dr (Mrs) V. Sreeja, Head, Dairy Microbiology Dept, SMC College of Dairy Science coordinated this Webinar and Dr J. B. Prajapati, Coordinator, SASNET-FF moderated the panel discussion session. ❐

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