

Orations

AJIT SINGH SAINI ORATION

Biography

Dr Ajit Singh Saini was born in the small village of Gande Pindi in Punjab on March 10, 1934. After a brilliant undergraduate career, he did his MBBS from Government Medical College and Hospital, Amritsar, Punjab, India. During those days when people would think of joining any clinical branch of medicine, he voluntarily chose to pursue MSc Biochemistry followed by a Doctorate from Nagpur University, Maharashtra, India, where he topped with distinction. He served in various capacities as a teacher in various medical institutes before joining as Professor and Head of Biochemistry in the Government Medical College & Hospital, Rohtak, Haryana, India, way back in 1972 in which year he also completed his PhD. His original work on chromatography found reference in many textbooks.

Later, he rose to become Director of the same institute besides being the founder Director of the Maharaja Agrasen Institute of Medical Research and Education, Agroha, Haryana, India. He also remained President of the AMBI in 1994 to 1995.

He was an excellent teacher still fondly remembered by his students and a research worker par excellence with over 140 publications and two textbooks in biochemistry to his credit. He has guided many MD and PhD students of biochemistry and various other faculties in medicine for more than two decades.

He left for his heavenly abode on December 22, 2003. This oration has been started in the everlasting memory of Dr AS Saini as a tribute to his contribution in medical biochemistry and his other qualities of head and heart, which endeared him to one and all.

Role, Value, and Future of Basic Science Education in Medical Sciences

Bipin Batra

Executive Director, National Board of Examinations Medical Enclave, Ansari Nagar, New Delhi, India

The allocation of time and resources for teaching the basic sciences is competing with corresponding attention on teaching/learning in clinical medicine. The resources have been increasingly deployed toward instruction in clinical medicine with perceptible decline in the time and focus on basic sciences. The positioning of basic sciences especially the biochemical basis of disease and the value of nutrition in wellness, health, disease, and larger perspective of public health/health policy cannot be compromised. The role and value of biochemistry in modern day practice of clinical medicine, nutrition, and public health is indispensable. A strong foundation of biological sciences before entry to medical college, appropriate teaching and assessment of basic sciences in the foundation year (first professional) of the MBBS course, and an integral focus on biochemical basis of disease, recovery, and wellness are a key to a medical graduate's fitness to practice medicine. An emphasis on learning basic sciences plays a fundamental role in developing analytical skills, including logical reasoning, critical appraisal, problem solving, and decision making. There is increasing evidence in literature to provide evidence that knowledge of biochemistry plays an important role in clinical decision making. In fact, there are models of curriculum wherein, an additional exposure to biochemistry has been implemented in clinical years to augment knowledge recall to know how and translation of knowledge gained to analytical ability. The present day medical education curriculum implementation and Continuous Professional Development (CPD) strategies must focus on integrated approach to medical education covering basic sciences and clinical medicine in the entire continuum of education from medical graduate to postgraduate medical education and continuing medical education/CPD for practicing professionals.

S GOPALAKRISHNAN ORATION

Biography

Dr S Gopalakrishnan, a doyen in the field of clinical biochemistry, was born on August 1, 1931, in Mayiladuthurai, Thanjavur district, Tamil Nadu, India. He graduated from Thanjavur Medical College, Thanjavur, in the year 1953. He joined the Tamil Nadu Medical Service in the year 1957. He obtained his MRCP in the year 1967 and later was conferred FRCP in the year 1975. He worked as Professor in most of the government medical colleges like Thanjavur Medical College, Stanley Medical College, Kilpauk Medical College, Tirunelveli Medical College, Madurai Medical College, and Madras Medical College. He was the first Director of the Institute of Biochemistry in the year 1983. He became the Dean of Stanley Medical College in the year 1987. Later, he retired as Dean of Madras Medical College in August 1989. Postretirement, he worked as Professor and Head of Annamalai Medical College, Chidambaram, Tamil Nadu, India. He was the founder member of the Association of Clinical Biochemists of India (ACBI) and he conducted the ACBI conference in 1977. He was the founder member of the Annual Conference of the Association of Medical Biochemists of India (AMBICON). He has attended many national and international conferences and has published more than 75 papers at the national and international level. He passed away on December 30, 1992.

An Anti-inflammatory Nematode Carbohydrate moiety is a putative drug for endotoxemia

Dr B Ravindran

Director, Institute of Life Sciences, Bhubaneswar, India

Metazoan pathogens persist in infected hosts for several years. One of the cardinal features of such parasitism is their ability to silence the host immune response and inflammation. The other end of this spectrum is enhanced host response observed in sepsis--- a syndrome associated with injury, tissue damage superimposed with infectious pathogens, characterized by hyperinflammation. During the course of our studies to understand regulation of host inflammation in metazoan infections, an immunomodulatory molecule in nematodes that blocks host innate immune responses in mammalian hosts was recognized. The active component was found to be a linear carbohydrate molecule with ability to bind to TLR4 and activate macrophages by alternate pathway (anti-inflammatory pathway) leading a blockade of endotoxemia both *in vitro* and *in vivo* in mice and *in vitro* in human monocytes. The carbohydrate moiety-induced cytokines like interleukin-10 that signaled anti-inflammatory host response and blocked endotoxemia. Demonstration of very low prevalence of filarial infections in sepsis patients validated these observations. The possibility of using the small molecule carbohydrate for reprogramming inflammatory monocytes/macrophages in sepsis, ulcerative colitis, and drug induced liver toxicity and nephritis is currently being investigated.

B SADASIVUDU ORATION

Biography

Dr B Sadasivudu was a meritorious student with top honors in medical school, both at undergraduation from Andhra Medical College, Visakhapatnam, Andhra Pradesh, India and postgraduation from the All India Institute of Medical Sciences. After retirement from a long tenure in the Government of Andhra Pradesh Medical Services, he has been associated with various institutes in India and abroad in teaching and research faculties.

He has trained in neurochemistry at the Columbia University Medical Center, New York and Oakland University, and is a member of various national and international bodies. He is also the recipient of the prestigious B.C. Roy award for best medical teacher.

He is well known for his research abilities and has nearly a 100 papers in reputed journals, such as *Nature*, *WHO Immunology New Letters*, *Journal of Neurochemical Research*, *Journal of Brain Research*, *Archives Internationales de Physiologie et de Biochimie*, *IRCS Journal of Medical Science*, to name a few.

He is a constant guide in various issues of clinical chemistry and research and for anyone with an ear for biochemistry even today.

Subrata Sinha

Director, National Brain Research Centre (NBRC), Mansera, Gurgaon, Haryana

The purpose of classifying tumors is to find clues to their behavior prognosis and management. This is typically done by staging and histological grading. However, molecular markers are increasingly impinging into this domain. This has resulted in molecular "re-classification" of the disease in some cases. In brain tumors, this has added to the existing histological classification. In our lab, we have tried to use gene expression to get clues on tumor behavior, especially the interaction of hypoxia and downstream signaling. It is well established that hypoxia is a natural corollary of the disordered autonomous growth of cancer cells, and the resulting neoangiogenesis is an essential adaptive mechanism by cancer cells for their survival. Similarly, inflammation has been identified to be one of the tumour promoting "enabling characteristics" of cancer cells. Hypoxia and inflammation interact with the process of carcinogenesis through a variety of signaling pathways, cytokines, and transcription factors, leading to adverse effects on phenotype and patient survival. This also necessitates new pharmacological approaches to deal with hypoxic tumors. The above aspects will be discussed in the context of human glial tumors, an overview of molecular markers that can be added to histological classification will be discussed in the context of hypoxia and related gene expression markers for possible theranostic applications.

(MRS) SHEELA DEVI MALLIKARJUNA KODLIWADHMATH ORATION

Biography

Dr (Mrs) Sheela Devi Mallikarjuna Kodliwadhmath oration was instituted in the year 1999 by Dr MV Kodliwadhmath, founder member and past president of AMBI, in the name of his wife, Dr Sheela Devi. She is a well-known gynecologist. She did her MBBS from Dr Vaishampayan Memorial Government Medical College, Solapur, Maharashtra, India, in the year 1975 with gold medal in obstetrics and gynecology. She completed her MD in the year 1982 from Karnataka University, Dharwad, Karnataka, India. Presently, she is working as Professor and Head, Department of Obstetrics and Gynecology, Navodaya Medical College, Raichur, Karnataka, India. She got fellowship award of ICOG in the year 2004. She has published more than 15 papers in national and international journals of obstetrics and gynecology and has participated and presented many research papers in national and international conferences.

The Importance of Ethics in Health Care System

Reena Nayyar

Secretary, Medical Council of India, New Delhi, India

Developments in science and technology in the 20th century have led to advances in medicine and health care that have benefited millions of lives. The changing context in which health care is provided has created new challenges for health workers and health researchers. Medical professionals increasingly find themselves confronted with moral questions and ethical dilemmas.

Medical ethics demands that a professional physician should not only care for the sick but also he or she should do it honestly--upholding the highest standard of personal and professional integrity: competently---by acquiring necessary medical competence by study and training: apply his knowledge and training to do so correctly and behave in such a way that the patient (the sick person) the family members of the sick, the society, and law approves the behavior of the physician. Medical ethics thus lays standards for the behavior of a physician and ethically judges him against these standards.

Given the importance of ethics in medical profession, the Medical Council of India has laid down the regulations relating to the professional conduct, etiquette, and ethics in 2002, the knowledge of which is must for every doctor. Medical ethics must be understood as an applied professional concept that is separate from the concept of avoiding doing harm to patients. Part of his understanding is acknowledging is that health and medical professionals are confident that medical ethics, as an essential branch of general ethics, offers a valuable framework in which to define the norms for medical care. Thus, medical ethics is concerned with promoting health and medicine and clarifying norms for improving relationships between patients and physicians.

CHINTALA SITA DEVI ORATION

Biography

Dr Chintala Sita Devi served in the Andhra Pradesh Medical Services for over 30 years and retired as Principal and Head of the Department of Biochemistry, Andhra Medical College, Visakhapatnam, Andhra Pradesh, India. She is a fellow of NAMS, ACBI, AMBI and founder fellow of the International Medical Sciences Academy. She worked at the University of Minnesota on TCM fellowship for 1 year (1961–1962). She received the World Health Organization fellowship for 1 year (1971–1972) when she worked in Sarafimer Hospital of Karolinska Institute, Stockholm. She has published 52 papers in national and international journals. Her work on scorpion venom, dracunculiasis, and lipids was quoted in foreign textbooks. She received B.C. Roy Award under eminent Medical Teacher's category. She received meritorious teacher's award of Andhra Pradesh in 1983. She was honored as eminent women scientist 2004 by Academy of Sciences Technology and Communications. She was awarded Emeritus professorship by NAMS, New Delhi, in the year 2005. She served as a member of the National Technical Committee of NABL, member of Andhra Pradesh Medical Council (1997–2001). She also served as president for CBI (1980) and AMBI (1993–1994). After retirement, she worked as consultant in laboratory services of various hospitals like CDR, CARE Hospital, Banjara Hills, and ELBIT Medical Diagnostics, Hyderabad.

Aging War between Chemistry and Biochemistry

Chandra Prakash

Former Professor of Medicine, PGIMS, Rohtak, Government Medical College, Patiala, PGIMER, Chandigarh, India

With recent demographic revolution, geriatrics has assumed greater significance because of increasing population of elderly both in developing and developed countries. It is estimated that its numbers will cross even the pediatric population by 2050. Aging comprise the processes that result in diminution of the capacity of various organs as a person ages, resulting in age-related diseases and diminution of both health and life spans. Hence, increase in life expectancy is only possible if the underlying mechanisms of leading to aging transformation are combated or eradicated. Hence, study of these mechanisms has become a hot subject for research in 21st century. Aging has proved to multifactorial in origin and act at multiple sites. Hence, it is classified as physiological loss of functions of various organs termed as organ aging leading ultimately to organ failure; cellular aging comprising of changing at cellular level like DNA, RNA, and mitochondria, telomere; molecular aging especially affecting the gene and epigenes and their mutation and expression; biochemical aging mechanisms comprising of production of toxic chemical during cellular metabolism and their detoxification by various biochemical reactions. On reading in between the lines and further analyzing, it is revealed that changes are due to imbalance between chemicals produced during metabolism in a living cells and biochemical processes to neutralize or detoxify them. The restoration and sustenance of this balance has been compared to constant war between chemical produced (chemistry) and biochemical armamentarium (biochemistry). If aging mechanisms are to be combated, biochemical processes are to be strengthened by healthy lifestyles or by addition of pharmacologic *armamentarium*.

AKHORI S SINHA ORATION

Biography

Dr Akhori Surya Shekhar Sinha was born in Patna on September 4, 1908. He did his MBBS from Patna Medical College in 1936 and MD Physiology in the year 1943. He joined Sriram Chandra Bhanj Medical College & Hospital, Cuttack, Odisha, India, and worked there from July 1944 to June 1946. He became founder teacher of Physiology at Darbhanga Medical College, Bihar, India and established the Department of Physiology. He then went to London and did his PhD in Physiology in the year 1949 and served as teacher in the Sherrington School of Physiology, St. Thomas Hospital, London. After his return, he joined as Professor and Head of the Department of Physiology at Patna Medical College, Bihar, India in the year 1949, a post he continued until 1971.

He has to his credit 18 research publications in national and international journals.

Dr Sinha was elected as Fellow to the Royal Society of Medicine (London), Physiological Society of UK, and was a member of the Sectional Committee of the Indian Science Congress and founder member of the Physiologists and Pharmacologist Association of India.

***In vitro* Proliferation and Characterization of Umbilical Cord Blood Stem Cells**

PC Mohapatra

Director of Medical, Education and Training, Bhubaneswar, Odisha, India

Umbilical cord blood (UCB) is an extremely attractive source of stem cells for the treatment of various benign and malignant hematological and nonhematological disorders. The low frequency of both hematopoietic stem cells (HSCs) and mesenchymal stem cells (MSCs), present in UCB unit is not enough for effective engraftment after transplantation. Taking into consideration the lack of uniform approach for expansion and storage of these cells for future use, in this work focus is laid on identifying their optimal culture and storage conditions. We obtained poor results of expansion when these cells were harvested without the use of any extrinsic regulators. Several attempts have been made with the use of various cocktail of hematopoietic and mesenchymal specific growth promoting cytokines to induce robust *in vitro* expansion of HSCs and MSCs. The multiple differentiation commitments triggered by the cytokine cocktail when the cells expose to the whole cytokine combination, there may be any possible counteracting effects of the cytokines or inhibitory factors produced by cells as suggested by many studies. In order to simplify the cytokines or inhibitory factors produced by cells as suggested by many studies. In order to simplify the cytokine cocktail with their self renewal and undifferentiated state maintenance behavior, we choose two early acting cytokines like stem cell factor and Fms like tyrosine kinase 3-Ligand (Flt3L) for HSCs and basic fibroblast growth factor (FGF-3) for MSCs proliferation respectively. Our thesis demonstrates amelioration in the proliferation and number of functional colony formation as observed both in HSCs and MSCs of UCB unit with 80–90% confluence after the inclusion of both above cytokines to the culture medium. Above all, FGF supplemented medium enhanced the trilineage differentiation characteristics of MSCs.

Furthermore, we characterized the HSCs contents of cord blood (CB) with respect to neonatal parameters like birth weight, gestational age, gender, and mode of delivery. Primitive HSCs like CD34+ and CD90+ cells were enumerated by flow cytometry method. Their associations with aforementioned neonatal factors on these primitive cell counts. Subsequently, birth weight was studied as a categorical variable to assess the increments in the mean stem cell counts. Our data results pointed out that birth weight and gestational age were strongly correlated with primitive hematopoietic content with high R2 value during univariate analysis of this cross-sectional study. Similar association was noticed in cesarean delivery but particularly for CD34+ cell contents only. Gender of neonate did not have any influence on HSCs counts. In multivariable analysis, unlike gestational age, a strong positive relationship with both of the primitive cell counts was observed in case of birth weight. Significant impact of caesarean delivery and gestational age was noticed on the expression of CD34 and CD90 proteins respectively. Altogether it suggests that neonatal parameters like birth weight, gestational age, and mode of delivery should be considered as selection measures for the collection of CB units of better quality. An essential prerequisite to the commercial and clinical application of stem cells are suitable cryopreservation protocols, nontoxic cryoprotectant additives (CPA) for their efficient storage. Our results recommended that refrigerated storage of freshly collected samples for 24 hours was found to be optimal in comparison to that of storage under room temperature for short term storage of CB stem cells before cryopreservation. To date dimethyl sulfoxide (DMSO) is a common CPA of choice for adult stem cells, virtually used by all clinical banks. It is potentially toxic at the molar concentrations (10%) as it is often used to preserve cells. The clinical use of frozen-thawed cells treated with DMSO can cause many adverse effects and toxic reactions as reported by many studies. Therefore, it is essential to develop cryopreservation protocols either with lower concentrations of DMSO or with nontoxic.