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## ICMR Welcomes Dr. Balram Bhargava

### AIIMS PROF AS DG, ICMR

AIIMS professor Balram Bhargava has joined as the Director General of Indian Council of Medical Research (ICMR) and Secretary of the Department of Health Research.

Prof. Bhargava is Professor of Cardiology at All India Institute of Medical Sciences (AIIMS), NewDelhi and also serves as the Executive Director for Stanford India Biodesign Centre, School of International Biodesign (SIB). Professor (Dr) Balram Bhargava is an outstanding cardiologist, one of the foremost leaders in biomedical innovation, public health, medical education and medical research.

Professor Bhargava has excellent leadership qualities; and has established the India-Sanford Biodesign programme, a unique interdisciplinary fellowship programme to foster innovation, design in low cost implants/devices.

This programme has led to the establishment of the School of International Biodesign (SIB) at AIIMS and development of 30 low cost medical devices leading to 10 startups. Four of the low cost devices are in the Indian market and one device has been approved by the USFDA. He developed the indigenous Platinum Iridium coil coronary stent and has been instrumental in clinically evaluating and establishing the use of two other laser cut medicated Indian stents. These low cost indigenous stents have benefitted several thousand patients. The philosophy of the programme has been “More for less for more” with a mandate to promote Global Affordable Need Driven Healthcare Innovation (GANDHI)

He has set up the c-GMP Centre for Excellence for Stem Cell Studies, at AIIMS, which has initiated treatment of patients with dilated cardiomyopathy; this has benefitted number of heart failure patients waiting on the cardiac transplant list.

He is currently developing the Chest Compression Device for Sudden Cardiac Death patients; funded by the Wellcome Trust, London and is providing leadership for creative disease prevention, early detection and transport system for sick cardiac patients. This programme mission DELHI (Delhi Emergency Life Heart-attack Initiative) is in the process of early diagnosis and treatment of heart attack patients by trained motorcycle first respondent paramedics.

He is an innovator par excellence with innovations touching everyday lives with very huge social impact for which he has started the Society for Less Investigative Medicine (SLIM). He has published several papers on the harmful cardiovascular effects of chewing tobacco and is evaluating the blood pressure of DTC bus drivers in Delhi. He has led two major trials in India funded by the NIH, Bethesda, USA, which has changed clinical practice. He has pioneered several techniques in interventional cardiology.

He has been awarded the SN Bose Centenary award by the Indian National Science Congress and National Academy of Sciences Platinum Jubilee Award, Tata Innovation Fellowship and Vasvik Award for Biomedical Technology Innovation , Ranbaxy Award and the OP Bhasin Award in the field of Health and Medical Sciences. He is the Founding , Editor in Chief of the British Medical Journal Innovations (BMJI) . He has been awarded the ‘ Padma Shri ’ high civilian award by the Honorable President of India and the UNESCO Equatorial Guinea International Prize for research in Life Sciences at Paris.

**The mandate of the programme is to train the next generation of medical technology innovators in India**



## Epigenetic regulation of APC in the molecular pathogenesis of gallbladder cancer

Gallbladder cancer (GBC) is a common neoplasm with high incidence in central India [1]. Due to lack of suitable diagnostic early biomarkers and its location inside the body, the success rate of chemotherapy and radiotherapy treatments has remained a major problem. Therefore, its early diagnosis is important in disease management. Adenomatous polyposis coli (*APC*) is a tumour suppressor gene, located on chromosome 5q21 [2,3]. Multiple forms of *APC* transcripts were found to be expressed in tissue specific manner, and its two transcripts have origin from exon 1A and 1B, respectively [4,5,6,7]. Differential methylation patterns of 1A and 1B are involved in cancers of gastric, skin, breast and lung [7,8,9]. Both somatic [10] and germline [11] mutations of *APC* play a key role in familial adenomatous polyposis (FAP) and colorectal cancer.

Inactivation of 1B has been observed in FAP due to deletion mutation in the promoter region [12].

Lower frequency of *APC* promoter methylation was earlier reported in Chilean GBC patients [13,14]. But, the actual role of both promoters is not yet elucidated in GBC. Based on our preliminary observations, we hypothesize that *APC* might be functionally inactive in GBC due to promoter methylation. Here, we report which promoter(s) of *APC*, 1A, 1B or both, is responsible for loss of expression of this gene in GBC and GSD (gallstone disease), that provides a significant clue on its role in the pathogenesis of GBC.

### Material & Methods

Gallbladder tissue samples were collected from Cancer Hospital and Research Institute (CHRI), Gwalior, India. Prior to collection of samples, a written informed consent was obtained from the patients. The study protocol was approved by the Institutional Ethics Committee of Jiwaji University,

Gwalior, India. Freshly resected tissues were transported from the Department of Pathology,

CHRI, to the Centre for Genomics, Jiwaji University in an ice pack (-10°C). All GBC and GSD samples,

finally diagnosed by fine needle aspiration cytology (FNAC) and histopathological examination, were included in the study. Epigenetic study was done in 50 GBC, 30 GSD and corresponding adjacent normal tissues (ANT). For expression analysis at RNA level, 20 GBC, 20 GSD tissues and 20 ANT were selected. For immunohistochemical analysis on tissue microarray (TMA), archival 138 gallbladder cases (88 GBC, 31 GSD and 19 adjacent normal tissues) were included in the study. Tissue samples were collected during January 2009 - December 2013, and stored at -70°C until use.

*Genomic DNA isolation and bisulphite modification:* Genomic DNA was isolated from the gallbladder tissues by manual phenol-chloroform-isoamyl alcohol method [15]. The quality and quantity of the DNA was checked by UV-VIS Spectrophotometer (Shimadzu Scientific Instruments, Japan). One µg of genomic DNA was used for bisulphite modification (Zymo Research, USA); 100 per cent methylated standard gold DNA (Zymo Research, USA) was used as positive control and the reaction was set with unmodified genomic DNA as negative control in methylation specific PCR (MS-PCR).

*Methylation - specific PCR (MS-PCR):* Methylation-specific PCR was carried as described by Herman *et al* [16], with slight modification. The master mix was composed of 1.5 mM MgCl<sub>2</sub>, 200 µM dNTPs, 10 pmol each of forward and reverse primers and 1U of Hotstart *Taq* polymerase (Qiagen, Germany). The primer sequences of *APC* 1A promoter were - AMF (Promoter 1A, methylated, forward): 5'-TGTTTTGCGGATTTTTTTC-3', AMR: 5'-GCAATAAAACACAAAACCCCG-3' and AUMF (1A, unmethylated, forward) : 5' -GTGTTTTATTGTGGAGTGTGGGTT-3', AUMR: 5'-CCAATCAACAACTCCCAACAA-3',

and APC 1B promoter are BMF ( Promoter 1B, methylated, forward) : 5'-TGTTTAGGTAGTAATGGTTTAC-3', BMR: 5'-TAAAACCTATTATACGCAAACG-3' and (Promoter 1B, unmethylated, forward): 5'-GGTTGTTTAGGTAGTAATGGTTTAT-3', BUR: 5'-AAACTAAAACCTATTATACACAAACA-3' [\[17\]](#).

The PCR products were separated on 10 per cent polyacrylamide gel, followed by silver staining. Gel images were acquired by gel documentation system (BioRad, USA).

*Total RNA and cDNA preparation:* Frozen tissues (25 mg), stored in RNA Later Solution (Qiagen, Germany), were taken for total RNA preparation using RNeasy Fibrous Tissue kit (Qiagen, Germany). QIAshredder spin column (Qiagen, Germany) was used for tissue homogenization. Quality control of RNA was done by Bio-analyzer 2100 (Agilent, USA). cDNA was prepared from 750 ng of total RNA by using QuantiTect Reverse Transcription Kit (Qiagen, Germany), following the manufacturer's instructions. Working aliquots of cDNAs were prepared in the ratio of 1:30 and kept frozen until further use.

*Semi-quantitative reverse transcriptase PCR (RT-PCR):* Two  $\mu$ l of cDNA sample (working) was used in 25  $\mu$ l reaction mix for RT-PCR. The reaction master mix contained 1 $\times$  Taq PCR buffer, 4 pmol of each primer, 2 mM MgCl<sub>2</sub>, 200  $\mu$ M dNTPs and 1U Taq Polymerase (Fermentas, USA).  $\beta$ -actin gene was used as internal control and reaction set without template as negative control. Primer sequences of APC exon 1A were - forward: 5'-GGAGACAGAATGGAGGTGC-3' and reverse: 5'-CAACTGATCATATGAAGCTGCAGCCAT-3', and for exon 1B forward: 5'-GCGAGCAGGAGCTGCGT-3', and reverse: 5'-CAACTGATCATATGAAGCTGCAGCCAT- 3' [\[17\]](#). The primer sequences of beta actin were forward: 5'-CCAGAGCAAGAGAGGTATCC-3', and reverse: 5'-CTGTGGTGGTGAAGCTGTAG-3' [\[17\]](#). Equal amount of PCR products (5  $\mu$ l) were separated on 10 per cent polyacrylamide gel, followed by silver staining [\[15\]](#). In densitometric analysis, after loading the gel to the Image Lab software (Gel Doc XR+,

BioRad, USA), lanes were manually marked and adjusted respective to their positions. Band detection sensitivity programme detected the correct bands on the gel against a 100 bp ladder (Fermentas, USA).

*Real-time PCR:* Two  $\mu$ l of diluted cDNA, each from GBC and GSD, was used for real-time PCR to estimate the normalized relative fold expression  $\Delta\Delta C_T$  of exon 1 (1A) and exon 2 (1B) in the GBC and GSD tissues with respect to their adjacent normal tissues. Average of C<sub>T</sub> values of APC exon 1 and exon 2 were 29.65 and 29.21 in GBC, 28.65 and 28.71 in GSD, respectively. The C<sub>T</sub> value of beta-actin was in 28.05 and 27.34 in GBC and GSD, respectively. Each reaction was set in duplicate. The primers used in the semi-quantitative PCR, were also used in real-time PCR (CFX96 BioRad, USA). Power SYBR green PCR mix (Applied Biosystem, USA) was used for real time PCR. CFX manager software (BioRad, USA) was used for quantitative analysis.

*Immunohistochemistry (IHC):* Tissue microarray (TMA) of 138 archival gallbladder tissues in duplicate cores was commercially developed. These samples from gallbladder cancer patients included grade I=13, grade II=32, grade III=35, poorly differentiated adenocarcinoma (PDA)=4, squamous cell carcinoma (SCC)=2, colloidal carcinoma (CoC)=1, mucinous carcinoma (MC)=1, GSD=31 and adjacent normal tissues (ANT)=19. One core each of kidney, ovary, cervix, liver, stomach, colon, salivary and breast were included as internal tissue controls. Vectastain Universal ABC kit (Vector laboratories, USA) was used for immunohistological staining. For tissue staining, the protocol given in the kit was followed, but with slight modification as standardised in our laboratory. The primary antibody against APC (Santa Cruz Biotechnology Inc., USA; Catalogue number sc-896) was used at a dilution of 1:500. Nuclei were counterstained with haematoxylin. Images were acquired and analysed in a fluorescence microscope (DM 4000, Leica, Germany). Scoring and analysis were done according to America Society of Clinical Oncology/College of American Pathologists Guidelines Recommendations [\[18\]](#).

**Statistical analysis:** For methylation analysis, Student's t test was performed to determine the differences in the methylation status of tumour and control samples using Graph pad Prism version 5 [19]. Linear regression analysis was performed to check the association of methylation with GBC and GSD. For RNA and protein analyses, Student's t test was performed to test the significance of difference in *APC* expression.

## Results

In a total of 80 patients (50 gallbladder cancer and 30 gallstone diseases), almost 80 per cent of the gallbladder cases possessed either gallstones or chronic inflammation (chronic cholecystitis). Most of the patients (>70%) included in this study were females (n=49) from the age group 40-50 yr, and had adenocarcinoma type of gallbladder. Mean age of GBC patients was  $47 \pm 8.5$  yr [Table 1].

Characteristics	DNA methylation analysis in GBC and GSD									
			GBC (N=50)		ANT (N=50)		GSD (N=30)		ANT (N=30)	
	GBC	GSD	AM (%)	AU (%)	AM (%)	AU (%)	AM (%)	AU (%)	AM (%)	AU (%)
Average age (yr)	47	47								
Sex										
Male	19	12	17 (34)	2 (4)	4 (8)	15 (30)	10 (33)	2 (7)	2 (7)	10 (33)
Female	31	18	29 (58)	2 (4)	6 (12)	25 (30)	14 (47)	4 (13)	3 (10)	15 (50)
Site of tissue										
Body	30	12	30 (60)	0	0	30 (60)	8 (27)	4 (13)	1 (13)	11 (37)
Fundus	9	9	6 (12)	3 (6)	0	9 (18)	7 (23)	2 (7)	0	9 (30)
Neck	11	9	10 (20)	1 (2)	1 (2)	10 (20)	9 (30)	0	0	9 (30)
Histopathology										
Grade I	3	0	3 (6)	0	0	3 (6)				
Grade II	14	0	13 (26)	1 (2)	4 (8)	10 (20)				
Grade III	29	0	28 (56)	1 (2)	7 (14)	22 (44)				
Acute calculus cholecystitis	0	14					12 (40)	3 (10)	2 (6.7)	12 (40)
Chronic calculus cholecystitis	0	16					12 (40)	3 (10)	2 (6.7)	14 (46.7)
Adenocarcinoma	2	0	2 (4)	0	0	4 (8)				
Squamous carcinoma	1	0	1 (2)	0	0	2 (4)				
Colloid carcinoma	1	0	1 (2)	0	0	2 (4)				

GBC, Gallbladder cancer; GSD, gallstone diseases; ANT, adjacent non tumour tissue; AM, methylated promoter 1A; AU, unmethylated promoter 1A

**Methylation status of promoter 1A and 1B in gallbladder cancer:** MSP analysis showed the presence of methylated alleles of *APC* exon 1 (1A) in 46 (96%;  $P=0.0155$ ) GBC cases ([Figure 1]a). Linear regression analysis revealed significant association of *APC* promoter 1A methylation with GBC ( $P=0.0159$ ) ([Figure 1]b). A few samples of adjacent normal

tissues of GBC (n=10) also displayed methylation. Both methylation and unmethylation were observed in 12 GBC and five adjacent normal tissues. 1B promoter region was unmethylated. The DNA samples from 30 cancerous tissues showed methylated allele of 1A (AM), but none of the cancerous samples examined, showed unmethylated 1A (AU) allele [Table 1]. Most tumour cells, which had origin at the body region of gallbladder and metastasized in hepatic cells, showed higher frequency of methylation. None of the samples showed presence of methylated alleles of 1B (BU).

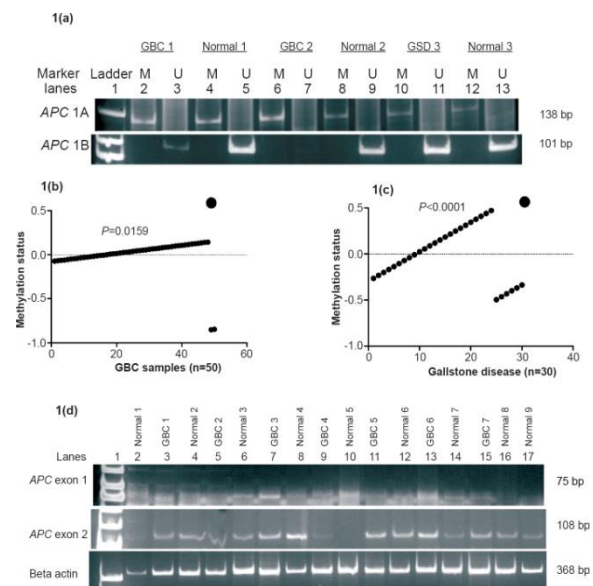


Figure 1(a). Polyacrylamide gel (silver stained) showing MS-PCR products of methylated (M) and unmethylated (U) 1A and 1B promoters of *APC* in gallbladder cancer (GBC), gallbladder disease (GSD) tissues and ANT (adjacent normal tissues). Lane 7 showed faint band for unknown reason. (b) Linear regression analysis of *APC* methylation and GBC. (c) Linear regression analysis of *APC* methylation and GSD. (d) Polyacrylamide gel (silver stained) showing semi-quantitative PCR products of exon 1, exon 2 of *APC* and beta actin gene in GBC, GSD and ANT (adjacent normal tissues) tissues of gallbladder. Lane 10 of *APC* exon 2 did not show amplification of unknown reason

*Methylation status of promoter 1A and 1B in gallstone diseases:* Of the 30 GSD samples, 24 (80%;  $P=0.015$ ) showed methylated allele of 1A promoter region ([Figure 1]a). Regression analysis showed a positive association of APC 1A promoter methylation in GSD ( $P<0.0001$ ) ([Figure 1]c). While only five adjacent normal tissues showed methylation, 25 adjacent normal tissues displayed no methylation. Out of 24 GSD, only two samples showed both methylated and unmethylated alleles of 1 A. Only six GSD samples possessed unmethylated allele of 1A (AU), while all 30 GSD and adjacent normal tissues showed absence of methylated alleles of 1B (BU).

*Expression status (transcription) of exon 1 (1A) and exon 2 (1B) in gallbladder cancer:* Semi-quantitative and quantitative RT-PCRs were carried out to estimate the levels of exon 1 and exon 2 transcripts. Comparative banding pattern and densitometric analyses (after semi-quantitative PCR) revealed downregulation of exon 1 and normal transcription of exon 2 in both GBC and GSD (see [Figure 1]d). On densitometric analysis, exon 1 was quantified to be about 17.6 U (or ng/ $\mu$ l) in grade I (25.5 U in adjacent normal tissues from grade I), 12.96 U in grade II (29.4 U in adjacent normal tissues from grade II), and 11.5 U in grade III (25 U in adjacent normal tissues from grade III) GBC tissues ([Figure 2a]). The downregulation of 1A exon in grade II GBC samples was found to be significant. Real-time PCR analysis also revealed < 3 unit fold expression of exon1 in GBC grade II ( $P=0.002$ ) and < 1 unit fold expression in grade III ( $P=0.0001$ ) tissues with respect to their adjacent normal tissues ([Figure 3]a, 3b).

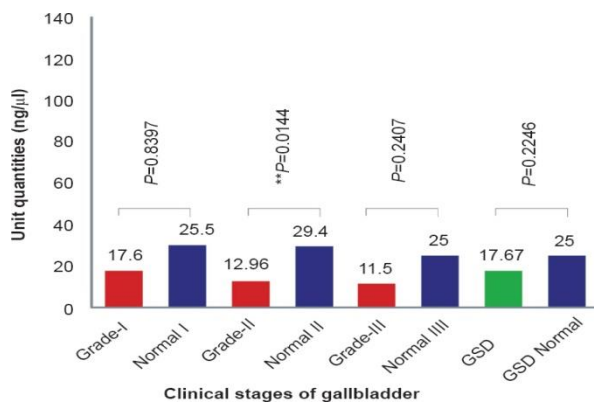


Figure 2a . Semi-quantitative PCR analysis showing the estimated concentrations or expression level (U or ng/ $\mu$ l) of APC exon1 in GBC, GSD and ANT (adjacent normal tissues)

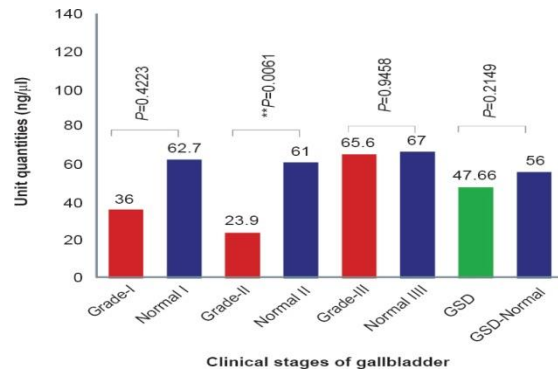


Figure 2b . Semi-quantitative PCR analysis showing the estimated concentration or expression level (U or ng/ $\mu$ l) of APC exon 2 in GBC, GSD and ANT (adjacent normal tissues)

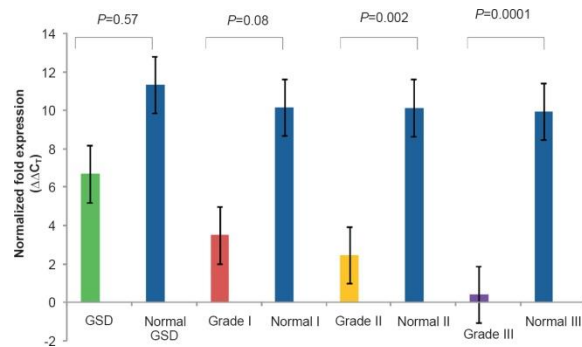


Figure 3a. Real-time PCR analysis showing normalized relative fold expression,  $\Delta\Delta C_T$  of APC exon 1 in GSD and different GBC grades as compared to their respective adjacent normal tissues

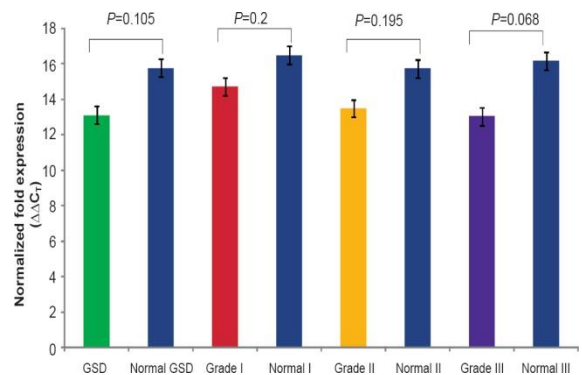


Figure-3b .Real-time PCR analysis showing normalized relative fold expression,  $\Delta\Delta CT$  of APC exon 2 in tissues of GSD and different GBC grades as compared to their respective adjacent normal tissues

The approximate quantities of exon 2 in different GBC tissue samples were 36.06 U in grade I (62.7 U in adjacent normal tissues from grade I), 23.9 U in grade II (61 U in adjacent normal tissues from grade II) and 65.56 U in grade III (67 U in adjacent normal tissues from grade III) ([Figure 2b]). However, the real time analysis of exon 2 was not significant.

*Expression status (transcription) of exon 1 (1A) and exon 1 (1B) in gallstone diseases:* Semi-quantitative PCR showed downregulation of 1A in GSD, as also observed in GBC. Exon 1 was amplified at an average value of 17.67 U and 25 U in GSD and adjacent normal tissues, respectively. Of the GSD samples, two showed visibly faint band. Exon 2 was transcribed normally in 19 GSD samples with an average value of 47.66 U, as compared to 56 U in adjacent normal tissues. Only one sample showed weak amplification. Real-time PCR analysis also revealed normalized 6.5 unit fold expression of exon 1 in comparison to their respective adjacent normal tissues with normalized 12 unit fold expression ([Figure 3a], [Figure 3b]). Real time analysis of exon 2 was not significant in GSD.

*Expression level of APC protein in gallbladder cancer and gallstone diseases:* In TMA analysis for APC expression, we observed complete silencing or negative scores of APC in grades II and III of GBC, as well as in various subtypes of GBC, including poorly differentiated adenocarcinoma, colloid carcinoma and mucinus carcinoma. Both adjacent normal tissues and GSD were indiscriminately scored. In all GBC cores, less than 6 per cent of tumour cells showed weak expression of APC ([Figure 4]), about 34.48 per cent of GBC cases scored negative ( $P=0.057$ ), about 24.14 per cent of GBC cases showed very low intensity of stain, *i.e.* 1+ score ( $P=0.005$ ), 25.85 per cent of early stage or GSD showed normal expression of APC, *i.e.* scores 2+ ( $P=0.091$ ), and the remaining 15.52 per cent

showed exceptionally intense stain of APC antibody ( $P=0.078$ ).

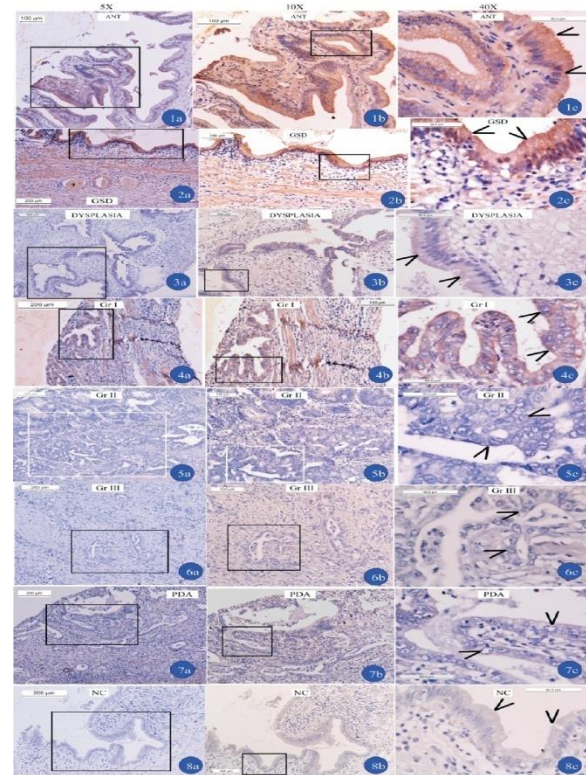


Figure 4. Immunohistochemistry of APC in ANT (adjacent normal tissues) gallbladder tissues (1), GSD (2), dysplasia (3) grades I (4), II (5), III GBC (6), and poorly differentiated adenocarcinoma (PDA). Negative control (NC) slide (8) is without primary antibody to check the non-specific stain in gallbladder tissue and positive controls were taken from eight different tissues. Arrow heads show the cells where cytoplasmic staining of antibody APC is observed (a=5X, b=10X and c=40X magnifications). Inset shown in (a) is magnified in (b), and inset shown in (b) is magnified in (c).

## Discussion

The present study showed epigenetic alteration of APC in the molecular pathogenesis of gallbladder cancer and gallstone diseases as reported in tumorigenesis of stomach [7], melanoma [8], prostate [20], breast [21] and colorectum [22]. Lower frequency of methylation in 27 and 30 per cent of GBC [13], [14] in Chilean population has encouraged us

to further investigate the expression of *APC* in our sample. We observed both methylated and unmethylated *APC* 1A alleles in 12 GBC, two GSD and five ANT which could be due to the presence of mono-alleles or heterogenous hypermethylation. High frequency of *APC*1A promoter methylation in GBC and GSD indicates importance of differential role of exon 1A (not exon 1B) in gallbladder carcinogenesis. About 80 per cent of GBC possesses stones irrespective of size and number [23] suggesting the mechanistic influence of stones to the epithelial cells to display hypermethylation. Single nucleotide polymorphisms (SNPs) and mutations are the common mechanisms to inactivate *APC* in familial adenomatous polyposis, colorectal, breast, pancreatic and Lung cancers [21,110,111,124,125,126,127,128]. Such a mechanism is also possible in GBC.

*Functional inactivation of APC in GBC and not in GSD:* High frequency of methylation of *APC* was further processed to evaluate the expression pattern in GBC and GSD. A differential expression pattern of *APC* exon 1 and 2 was observed in GBC. A slight downregulation of *APC* exon 1 in GSD indicates an early onset of epigenetic regulation in GSD. Exon 2 was not of significance. Promoter methylation of *APC* is responsible for loss of expression in stomach [7], breast and lung [9] and colon [25] cancers. Mutation in *APC* is one of the mechanisms responsible for tumorigenic transformation of normal cells of colon [24], pancreas [25], lung [26] and stomach [27,128]. Two cases of GBC and ANT showed similar pattern of expression of *APC* exon 1A suggesting normal transcription mechanism. Moreover, two GSD amplified very weak signal of exon 1A. This may likely be explained due to the presence of heterozygous methylated alleles which might mask the binding of transcription factors, thereby, blocking the transcription of exon 1A. A low level of insignificant expression of exon 2 in GBC and GSD may have protected the normal cells from transformation. This explain the role of exon 1 (promoter 1A), rather than exon 2 (promoter 1B), in the tumorigenesis of gallbladder.

Normal translation of *APC* requires both 1A and 1B to be active. Our IHC data showed loss of expression

of *APC* in advanced GBC grades II and III, not in GSD. This suggests an altered translation of *APC* despite normal status of exon 1B. Contradictory findings on *APC* 1B in cancers of gastric epithelium [7], breast [9], colon [23], etc. need to be studied further to unravel the differential role of the two exons in GBC. Negative scoring of grades II and III cases further confirms epigenetic silencing of *APC*. The similar expression level of *APC* in GSD and ANT suggests that *APC* does not have any role in the transformation of GSD to GBC, and downregulation of *APC* is just initiated during the early stage of GBC, i.e. Grade I. The present study was conducted in limited numbers of human GBC tissue samples (not in blood). But, the final validation needs large number of samples as well as *in vitro* analysis using GBC cell lines.

In conclusion, 1A promoter plays a cardinal role in the epigenetic silencing of *APC* in GBC. Epigenetic guided loss of expression of *APC* may be one of the key steps towards gallbladder carcinogenesis. Thus, detection of methylation pattern followed by expression analysis of *APC* may be useful in the disease management/prognosis or diagnosis of GBC.

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### A tough nut to crack

#### **Chewing areca nut (supari in Hindi) is a risk factor for general and central obesity**

Areca nut (supari in Hindi), the dried seed of the palm tree, Areca catechu, is the fourth most commonly used psychoactive substance in the world after caffeine, nicotine, and alcohol. An estimated 600 million people chew it, with southern Asia, especially India, Myanmar, Bangladesh and Pakistan, being high prevalence areas.

Areca nut consumption is not only culturally ingrained in India but has also acquired large commercial potential; it is used as a key ingredient in several kinds of smokeless tobacco (SLT) preparations. In addition, non-tobacco brand extensions are also aggressively marketed and advertised leading to higher areca nut use in India. The Global Adult Tobacco Survey India Report 2016-17, says 8% of the population ingests areca nut.

#### **Health risks**

Areca nut chewing produces a sense of euphoria, heightened alertness, sweating, salivation, a warm sensation in the body, and a feeling of having an increased capacity to work. Arecoline, the major alkaloid of betel nut, has been thought to be responsible for most of these claimed effects. Many labourers chew large amounts of areca nut while at work to enhance their productivity. It is suggested that chewing it leads to habituation, withdrawal, and addiction, although the underlying mechanisms remain under-researched and thus poorly understood.

Chewing areca nut is a risk factor for general and central obesity; it impairs blood sugar levels and delimits blood pressure control. Regular use stains the mucosa, gums, and teeth. It also acts as an abrasive and tends to wear off the tooth's surface, causing fracture of a tooth in chronic chewers, besides, recession of gums and abrasion of exposed root surfaces. Some studies have shown that it causes anti-ovulatory and abortion-causing effects and affects newborns by causing a lower birth weight and reduced birth length. Available evidence suggests that areca nut is the cause of oral

submucous fibrosis, a potentially cancerous condition in humans. Transformation of this disease to oral cancer has been estimated to be between 2% and 8%. It can also cause cancers of the liver, oesophagus, stomach, lung and cervix.

#### **Need for regulation**

In India, there are hardly any regulations on the use of areca nut. When used as an ingredient in smokeless tobacco, it was subject to regulations under the Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003. However, the government took a positive step by introducing the Food Safety and Standards (Licensing and Registration of Food Businesses) Regulation, 2011, which prohibits tobacco and nicotine use as an ingredient in any food item. Considering that areca nut is classified as food, its use in chewing-tobacco products is now banned.

With its adverse health effects, and given the huge number of users, there is an urgent need to step up regulation of areca nut products and their use. Their advertisement, promotion and sponsorship should also be regulated to prevent access by minors and those most vulnerable.

There is consensus among experts on the following: ban on 'pan masala' and 'supari' advertisements under Food Safety and Standards Authority of India regulations; standardisation of all tobacco packs with minimum quantity for sale (in weight or unit as may be applicable); and an end to the sale of loose tobacco products. In addition, there should be research into the prevalence of spitting in public places and its impact on SLT and areca nut use and initiation, and a ban on spitting in public to meet the objectives of the national Swachh Bharat Mission. This calls for a national areca nut control programme.

The Hindu / March 11, 2018

### **ICMR wins the 2017 Kochon Prize for TB research**

The 2017 Kochon Prize was awarded to the Indian Council of Medical Research (ICMR) today in New Delhi for building a tradition of excellence in TB research and development. The \$65,000 Prize is awarded annually by Stop TB Partnership to individuals and/or organizations that have made a significant contribution to combating TB. The ICMR emerged the winner from amongst 18 nominations.

“The 2017 Kochon Prize is specifically about contributions to TB research. Since ICMR and several of its research groups — NIRT, JALMA and India TB Research Consortium — are engaged in TB research, and some of them for a very long time, it made sense to nominate ICMR for this Prize this year. I nominated ICMR for the large body of research over many decades,” says Prof. Madhukar Pai, a TB expert from McGill University, Montreal, Canada who nominated ICMR for the award.

“I am delighted that this year’s Kochon Prize to ICMR recognises decades of ground-breaking TB research by India, which shaped the global DOTS strategy. The award is richly deserved, and timely, as India has raised its ambition and political commitment,” Prof. Pai says in an email to *The Hindu*.

“ICMR deserves the recognition. TB research itself needs recognition. We can’t end TB without research,” says Dr. Soumya Swaminathan, Deputy Director General at the World Health Organisation. She is a TB researcher and former Director of NIRT before becoming the Director-General of ICMR. “The Prize sends a strong message that investing in research is critically important to end TB epidemic. The recognition comes at a crucial time when the Indian government is increasing its commitment to end TB. The award will improve the profile of ICMR, bring more awareness and funding for research and attract more people to take up research on TB.” “Since its inception in 1956, Chennai’s National Institute of Research in Tuberculosis (NIRT) [which was formerly

known as the Tuberculosis Chemotherapy Centre and later as Tuberculosis Research Centre (TRC)] has undertaken several trials that had had impact internationally,” says Dr. Swaminathan.

TRC started with the landmark Madras Classic trial 1956 to compare the outcomes of domiciliary chemotherapy with treatment in sanatorium. The first of its kind trial showed that the cure rate was the same when treatment was offered at home and in sanatorium. The BCG vaccine trial by TRC, the largest ever to be conducted, followed-up 350,000 volunteers for 15 years. “The trial was conducted to the highest standards. Such a large trial has never been replicated anywhere else,” says Dr. Swaminathan.

TRC has also conducted more than 50 drug combination and duration trails for both pulmonary and extra-pulmonary TB, and undertaken pharmacokinetic studies for dosing. It has developed new diagnostics, and tested and validated diagnostics developed elsewhere.

The India TB Research Consortium is addressing the need for increased investment by India and other TB high-burden countries. In a few months, trails using the two new TB drug (Bedaquiline and delamanid) combinations for MDR-TB and XDR-TB will get under way. The trails will be combining two existing drugs and the two new drugs to reduce the duration of treatment from the current 24-30 months to 6-9 months.

Another trial to be carried out at multiple sites in India will test the effectiveness of adding the already approved diabetes drug metformin to standard anti-TB regimen for drug-sensitive TB. With the ethics committee approval already in, the trial is expected to start very soon.

*The Hindu / March 13, 2018*

## NEWS

**Smart gadget can detect TB in an hour**

The article states that researchers from ICMR, IIT Delhi and Jamia Hamdard University have developed 'iMC2 TB Test', which promises to bring down the detection time of mycobacterium tuberculosis from four days to an hour. The cost-effective gadget is the brainchild of Nasreen Ehtesham of ICMR, Seyed E Hasnain of IIT-D who is the VC of Jamia Hamdard and Ravikrishnan Elangovan of IIT-D. The diagnostic kit costing up to Rs 500 would be designed to minimize exposure among clinical workers and is currently being tested at Jamia Hamdard.

*The Times of India | March 5, 2018*

**Dengue, chikungunya may strike Delhi early this year**

The article states that a warmer-than-usual winter, earlier-than-usual summer, and very early trends of the disease have prompted experts to call for immediate measures to prevent the spread of dengue in the national capital. It quotes Dr. Neena Valecha, Director, ICMR-National Institute of Malaria Research stating that High temperature increases the transmission window of Aedes mosquitoes -- Aedes (Stegomyia) aegypti and the Aedes Alpoptictus -- that spread dengue and chikungunya. It also quotes Dr. P Jambulingam, Director, Vector Control Research Centre, Puducherry stating that once a huge chunk of the population gets chikungunya, it develops immunity against the virus and hence in the subsequent year the number of infections is less.

*Hindustan Times | March 6, 2018*

**Govt health centres ill-equipped to treat infertility, finds survey**

The article informs on the results of a survey by the Indian Council of Medical Research (ICMR) which has found that majority of government health centres in India lack basic infrastructure and equipment for treating infertility. It quotes Dr. Sanjay Chauhan, Director, Department of Operational Research, National

Institute for Research in Reproductive Health and author of the study stating that the availability of inadequate resources and skills for infertility management in the study areas reflects the absence of infertility as a mandate in the package of services under National Health Mission. He added immediate attention of government is required to incorporate infertility services in the national RMNCH + A program and strengthen infertility management services, particularly in the high prevalent districts

*Livemint | March 7, 2018*

**Confirmed: Deadlier dengue strains now circulating in Kolkata**

The article states the findings of a comparative serotype data analysis, done by ICMR, which has confirmed the apprehension that Kolkata was now confronted with new strains that could not be effectively countered by our immune system. It adds that Bengal is now more prone to the more dangerous dengue serotypes II and IV instead of serotypes I and III, which have hitherto been more predominant in the region, and this may be the cause for the sharp spike in the number of dengue deaths last year.

*The Times of India | March 7, 2018*

**Odisha cancer index brighter than other States**

The article using data released by National Centre for Disease Informatics and Research (NCDIR) informs that Odisha has performed better than other states as it recorded less incidence of cancer cases and mortality rate compared to developed states like Maharashtra, Tamil Nadu, Karnataka, Gujarat and Rajasthan. It states that the health officials have attributed the low mortality rate to the measures taken by the State Government for the treatment and screening of cancer patients.

*The New Indian Express | March 11, 2018*

### **High prevalence of conjunctivitis in NCR: Study**

The article discusses the findings of a multi-centric collaborative study funded by ICMR to assess the impact of environmental changes and ultraviolet ray exposure on ocular health for NCR (rural Gurgaon), rural Guwahati for the Northeast region and Hyderabad for coastal areas (Prakasam), by R.P. Centre, AIIMS. The study has found that there is a high prevalence of dry eye and vernal kerato conjunctivitis (VKC) in NCR areas.

*The Asian Age / March 11, 2018*

### **Increase funds to ICMR for robust research: Panel**

The article states that a parliamentary panel has sought increased fund allocation to the ICMR as it fears that a funds crunch will adversely affect the research activities and development of new drugs, vaccines and diagnostics in the country. The panel, in its 106th report on Demands for Grants 2018-19 for the department of health, extended its support to the department's demand for additional funds to the tune of Rs 350 crore. The committee emphasized that the ICMR, as the only custodian of health research activities, needed to be promoted and encouraged so that tangible outcomes are witnessed for various health care challenges.

*The Economic Times / March 11, 2018*

### **ICMR, health ministry to create own national lists of essential diagnostic tests, tools**

The article informs of ICMR along with several partners, including the WHO India and the McGill University, convening the first national consultation on an Essential Diagnostics List (EDL) to create their own national lists of essential diagnostic tests and tools. The article mentions that in a statement released by ICMR, the council has stated that previously the National Essential Medicines Lists in India has been helpful in capping prices of a variety of products, and has increased access to important medicines. The same model could be used for diagnostics as without

diagnostics, good medicines can be wasted, misused or simply not used

*Outlook India / March 12, 2018*

### **Medical body defines passive euthanasia to avoid misinterpretation**

The article states that Indian Council of Medical Research (ICMR) released a document explaining terms and rules relating to end-of-life care after the Supreme Court legalised 'passive euthanasia' and creation of living wills. It adds that it was important to define the terms as they are often misinterpreted by the people and even health care practitioners. The article quotes Dr. Roli Mathur, Head of Bioethics Unit, ICMR stating that the document draws the difference between terms withdrawal, withholding of treatment and passive euthanasia.

*Hindustan Times / March 13, 2018*

### **JK to have first population-based cancer registry**

The article states that amid growing prevalence of various types of cancer in Jammu & Kashmir (J&K), ICMR is going to establish the first population-based cancer registry system of J&K at Sher-e-Kashmir Institute of Medical Sciences (SKIMS) Soura. The registry will collect statistics of cancer prevalence across the state.

*Greater Kashmir / March 14, 2018*

### **Research Projects through ICMR 2015: Minister Apprises Parliament**

The article states the response to a question in Rajya Sabha, by Anupriya Patel, Minister of State, Ministry of Health and Family Welfare about the research projects undertaken by ICMR through 2015. According to the article, 903 research projects have been initiated through various labs of ICMR and medical colleges and universities, related to various diseases and ailments with funding of Rs 127.16 crores during 2014-17.

*Medical Dialogues / March 16, 2018*

### **Rajasthan: Miners' lungs under threat**

The article discusses the high prevalence of a health ailment caused while working in mines, when crystal-like silica enters the lungs and cause an incurable respiratory disease called silicosis. It cites a study by ICMR which states that 56 per cent of mine workers in Rajasthan are afflicted with silicosis. The article adds that according to experts, the control and management of silica dust is not difficult. Besides wet drilling, use of safety equipment and regular health check-ups can change the scenario for the better.

*The Asian Age | March 19, 2018*

### **ICMR issues consensus document for management of acute myeloid leukaemia**

The article states that ICMR has issued draft consensus document for management of acute myeloid leukaemia (AML) to assist the doctors in making major clinical decisions encountered in managing their patients. It adds that the initiative of the ICMR in this regard is significant as cases of AML are increasing in the country. ICMR has now asked the stakeholders to send their suggestions and comments to the Council by April 11, 2018.

*Pharmabiz | March 19, 2018*

### **Having fertility problems? 50% of patients coming for IVF have genital TB**

The article discusses that while the Tuberculosis bacteria primarily affects the lungs, it can spread and cause secondary infections to the kidneys, abdomen, brain, uterus and even the fallopian tubes, which can affect chance of pregnancy. It also quotes the latest study done by the ICMR, in which over 50% of female patients coming for In vitro fertilisation (IVF) procedure have been reported to have genital TB. In over 95% of the cases, the infection was found to affect the fallopian tube, in 50% the endometrium and in 30 % the ovaries.

*Hindustan Times | March 23, 2018*

### **1 in 4 patients resistant to any one of 13 TB drugs, says govt report**

The article discusses the insights from the national drug-resistance survey (NDRS), a survey of patients to know which TB drugs do not work on them and why. For the survey 5280 sputum samples of TB patients were put through drug-sensitivity tests on culture growth at Indian Council of Medical Research-National Institute for Research in Tuberculosis (ICMR-NIRT) in Chennai. It has found that one of four patients grappling with Tuberculosis have developed resistance to at least one of the thirteen drugs available to treat the scourge on this date.

*DNA | March 24, 2018*

### **Recalling man who put Chennai on TB research map**

The article discusses a programme held in ICMR-NIRT on the eve of International Day for Tuberculosis. Commemorating the founder of the institute, Dr. Wallace Fox, It quotes, Dr. Srikant Tripathy stating that it was due to Dr. Fox's efforts that TB patients were stopped being sent to sanatoriums and were recommended a stringent drug regimen and tracked patients at their homes.

*The Times of India | March 24, 2018*

### **Malaria Elimination Demonstration Project starts in Mandla district**

The article discusses the first of its kind public-private-partnership (PPP) between ICMR, Madhya Pradesh Government and Foundation of Disease Elimination and Control (FDEC) established by Sun Pharma for elimination of malaria in Mandla. It quotes Dr. Aparup Das, Director, ICMR-National Institute for Research in Tribal Health (NIRTH), Jabalpur, stating that the project stems from the vision of Prime Minister Narendra Modi to eliminate malaria from India by 2030.

*The Hitavada | March 24, 2018*

### **ICMR sends proposals for trials of two new TB vaccines to BMC**

The article states that ICMR has recently sent proposals for clinical trials of two new tuberculosis (TB) vaccines to various states as well as civic health officials. It quotes Dr. Raman Gangakhedkar stating that the trials for the vaccines could start within the next four to five months. The two vaccines, named VPM1002 and M Indicus Pranii (MIP), have been through safety trials earlier. While VPM1002 is the joint effort between the German Max Planck Institute and Serum Institute of India, MIP is a collaboration between the Indian department of biotechnology and Cadilla Pharmaceuticals.

*The Times of India | March 25, 2018*

### **Access to medical data for research will get tougher**

The article discusses the policy drafted by ICMR-National Centre for Disease Informatics and Research (ICMR-NCDIR) to streamline processing or accessing data and conditions under which it can be disclosed. It states that only projects that meet standards of scientific merit or public health importance determined by NCDIR Research Area Panels, Scientific Advisory Committee and Institutional Ethics Committee will be given access to data. The article quotes Dr. Prashant Mathur, Director, NCDIR stating that for requests from industry and academia for research, guidelines were needed to determine the conditions under which data can be disclosed. He added that data requests for any non-research activity or commercial requests will not be entertained.

*The New Indian Express | March 26, 2018*

### **Tobacco-related cancer a major health worry**

The article states the statistics from four Kerala hospitals that have been cited by the 'Consolidated Report of Hospital Based Cancer Registries 2012-2014' of the Indian Council of Medical Research (ICMR).

It adds that Tobacco-related cancers (TRCs) continue to be a major health concern in Kerala while in the country as a whole as many as 932,600 lives are lost due to the menace every year. The all-India figures released by the sixth Tobacco Atlas regarding the

deaths due to tobacco-caused diseases and the statistics compiled by Kerala's four hospital-based cancer registries emphasize the need for acting fast and tough to tackle the issue, according to health experts.

*Deccan Chronicle | March 26, 2018*

### **ICMR issues consensus document on pancreatic cancers to assist oncologists in making major clinical decisions**

The article states that Indian Council of Medical Research (ICMR) has issued a consensus document on pancreatic cancers to assist the oncologists in making major clinical decisions encountered while managing their pancreatic cancer patients. This consensus document may be used as framework for more focused and planned research programmes to carry forward the process. The aim of this document is to assist oncologists in making major clinical decisions encountered while managing their patients, while realizing the fact that some patients may require treatment strategies other than those suggested in these guidelines.

*Pharmabiz.com | March 27, 2018*

### **Why cancer strikes more women than men in India**

The article discusses a recent study published in The Lancet Oncology which states that more women are diagnosed with cancer than men in India. It quotes Dr. Ravi Mehrotra, Director, ICMR- National Institute of Cancer Prevention and Research (NICPR) and one of the authors of the study stating known risk factors for breast cancer - high-fat diet, obesity, late marriage, fewer children, inadequate breast feeding - may be leading to more cases in what is a rapidly urbanising country. Further the article quotes cervical cancer is still the second most common cancer among women in India, and accounts for a quarter of deaths among women suffering from cancer. Dr. Mehrotra also highlighted that no women should be dying of cervical cancer which is one of the most preventable cancer.

*BBC.com | March 28, 2018*



### **India's apex research institute floats a 'recipe-for-TB patients' contest**

The article discusses a one-of-its-kind national contest, seeking low-cost nutritional recipes from the public for people with tuberculosis (TB) being organized by Indian Council of Medical Research (ICMR). This initiative is a part of Union health ministry's initiative to help TB patients eat the right kind of food at low cost. It article states that National Institute of Research in Tuberculosis (NIRT), a Chennai-based research institute, under ICMR, is the nodal agency responsible for analyzing the applications. The article quotes Dr. Srikanth Tripathy, Director, NIRT stating that the main reason for mortality in TB patients is low serum protein and low hemoglobin levels and low body mass index, so the recipes should focus on compensating for these.

*Hindustan Times | March 28, 2018*

### **Visakhapatnam: Experts for multipronged study on kidney diseases stressed**

The article states that experts from Sri Lanka, London School of Tropical Medical and Hygiene, Nizam Institute of Medical Science, Hyderabad and National Institute of Epidemiology, ICMR, Chennai, have come together to pinpoint the reason behind Chronic Kidney Disease of unknown origin affecting a large number of people from Uddanam region of Srikakulam district.

*Deccan Chronicle | March 28, 2018*

### **Urban Indians have brittle bones, says study**

The article discusses the findings of a study published in the March 2018 edition of Indian Journal of Medical Research, ICMR which states that the risk of osteoporotic fracture in urban Indian population shows that the incidence was high among the city dwellers. It adds the findings of the study state that in people aged between 38 and 68 years, 9% suffer from osteoporosis while nearly 60% have osteopenia.

*The Hindu | March 30, 2018*

### **Lifestyle diseases screening initiative**

The article states that an initiative for population-based screening for lifestyle diseases and protocol-based, standardized management of hypertension and diabetes is being launched by the State government in Kerala in cooperation with the WHO, ICMR, and Resolve, a non-profit global initiative.

*The Hindu | April 4, 2018*

### **Govt releases new health warnings for tobacco packs**

The article discusses the new set of pictorial health warnings for mandatory display covering 85% on both sides of packets of cigarettes, bidis and chewing tobacco with effect from 1 September issued by Ministry of Health. It quotes Dr. Ravi Mehrotra, Director, ICMR-National Institute of Cancer Prevention and Research (ICMR-NICPR) stating that pictorial health warnings on tobacco products are cost-effective tool for educating on the health risks of tobacco use. He added that in a country like India, where people use several languages and dialects, the pictorial warning transcends the language and in many cases also the illiteracy barrier.

*Livemint | April 5, 2018*

### **Child rights panel wants adherence to norms on surrogacy**

The article states that Maharashtra Commission for Protection of Child Rights (MCPCR) has recommended strict implementation of the guidelines prescribed by the Indian Council of Medical Research (ICMR) for those who want to have a child through surrogacy until the bill on surrogacy laws was passed by Parliament. It has asked the [state government](#) to set up a task force to monitor the implementation of guidelines and to tighten the supervision of hospitals facilitating delivery of children through [surrogacy](#).

*Business Standard | April 5, 2018*

### **ICMR Junior Research Fellowship 2018 Notification Released; Exam In July**

The article informs of the national level exam to be conducted by ICMR on 22 July 2018 for selecting candidates to award 150 Junior Research Fellowships. Details of the exam can be found at the official websites of PGIMER Chandigarh ([pgimer.edu.in](http://pgimer.edu.in)) and ICMR New Delhi ([icmr.nic.in](http://icmr.nic.in)).

*NDTV / April 7, 2018*

### **Centre to monitor climate change effects on public health comes up in Pune**

The article discusses the setting up of a "Centre for Climate Change and Health" to address the immediate and long term impacts of climate change on people's health, especially the poor and vulnerable in society. The centre will work in collaboration with the National Environmental Engineering Institute, Nagpur, the Indian Institute of Tropical Meteorology, Pune, the Indian Institute of Public Health, Ahmedabad and the ICMR, New Delhi.

*Business Standard / April 10, 2018*

### **Karnataka tests ayurvedic drug to cure dengue**

The article states that ICMR-National Institute of Traditional Medicine, Belagavi along with Central Council for Research in Ayurvedic Sciences (CCRAS), an autonomous body under the ministry of AYUSH have formulated an ayurvedic drug to cure dengue. It adds that the Institutes have already conducted pilot studies which have proved the clinical safety and efficacy of the drug.

*The Times of India / April 18, 2018*

### **3 of 4 ART pregnancies see preterm babies: Study**

The article discusses a study by ICMR-National Institute for Research in Reproductive Health (ICMR-NIRRH) along with the Indian Society For Assisted Reproduction (ISAR) which has found that three out of four women who get pregnant using assisted reproductive techniques (ART)—earlier known as test tube baby methods—give birth prematurely. It quotes Dr Anushree Patil Scientist D, ICMR-NIRRH stating that preterm births are a global health problem but their incidence is higher in ART pregnancies. The study concluded that with the growing use of ART, there is an urgent need to develop a National ART Surveillance System in India like the one in Centre for Disease Control, Atlanta, to get complete data on the pregnancy course and outcomes of ART conceptions.

*The Times of India / April 22, 2018*

### **New threat in the air**

The article discusses that in order to understand changes in the distribution of malaria cases, a study by ICMR-National Institute for Research in Tribal Health (ICMR-NIRTH), Jabalpur, Madhya Pradesh, and their collaborators have mapped the burden from different malaria infections from across India. The study has confirmed a drastic shift in the patterns of malaria occurrence in India, from widely reported cases of *P. vivax* (a mild form of malaria) to an increasing number of cases of *P. falciparum* (a virulent form of the disease). It quotes Prof. Aparup Das, Director, ICMR-NIRTH stating that India is planning for malaria elimination by 2030, but a shift in malaria occurrence is really daunting for targeted malaria elimination as another species of malaria, *P. malariae* which was earlier confined to Odisha is now spreading to all over India and that there are no defined treatment guidelines or diagnosis in the field for this species.

*The Hindu / April 22, 2018*

### **Lassa fever is similar to Ebola and can spread human-to-human: Atanu Basu**

The article is an interview of Dr. Atanu Basu, Senior Deputy Director ICMR-National Institute of Virology (ICMR-NIV) discussing Lassa Fever, a highly contagious disease and its upsurge in West Africa. Dr. Basu stated that till date, there is no report of Lassa virus infection detected in humans or rodents in India. He adds that India has aggressive surveillance systems conducted through multiagency programs of the Government networks such as the Integrated Disease Surveillance Program (IDSP); ICMR, National Institute of Virology, Department of Health Research.

*Health Post / April 23, 2018*

### **Scientists find use of fly ash in mosquito control**

The article states that ICMR-Vector Control Research Centre (ICMR-VCRC) has successfully used fly ash, a harmful by-product of coal-based power generation, as a carrier for *Bacillus Thuringiensis Israelensis* (Bti), a bio-pesticide used for killing larvae of many insects. It quotes Dr. Arulsamy Mary Manonmani, Scientist, ICMR-VCRC stating that as different types of formulations have varied levels of residual activity in addition to feasibility for use in specific types of habitats, their application if planned appropriately and continuously in any area will help in bringing about a drastic reduction in the mosquito population.

*The Hindu Business Line / April 26, 2018*

### **Autism spectrum disorder among kids is 2.25 per 1000, says GMCH survey**

The article discusses an ICMR funded survey which has revealed that the prevalence of autism spectrum disorder (ASD) among children is 2.25 per 1000 children in Chandigarh. ASD is a serious neuro-developmental disorder, which affects a child's ability to communicate and interact with others. The survey was conducted by Government Medical College and Hospital (GMCH) and began in 2015 after ICMR

approved the GMCH project the same year to find the prevalence of autism among children in the city.

*The Indian Express / April 26, 2018*

### **'Medical colleges should set up tobacco clinics'**

The article mentions the launch of book titled "Global Smokeless Tobacco Control Policies and their Implementation" by ICMR-National Institute of Cancer Prevention and Research (ICMR-NICPR). The article quotes Dr Balram Bhargav, Director General, ICMR stating that ICMR would set up three tobacco testing laboratories in Guwahati, Mumbai and Noida. The article also quotes Dr. Ravi Mehrotra, Director, ICMR-NICPR stating that these labs are going to be state-of-the-art set-ups for testing tobacco products. He added that currently there is no facility capable of doing a regulatory test in India

*The Times of India / April 26, 2018*

### **ICMR Study: Survey on elderly across four cities to gauge influenza prevalence**

The article discusses a survey undertaken by ICMR, its Institutes ICMR-National Institute of Virology; ICMR-National Institute of Epidemiology; ICMR-National Institute of Cholera and Enteric Diseases and All India Institute of Medical Sciences to gauge influenza prevalence in elderly population. The survey being conducted for the first time, will cover nearly 10,000 elderly people across four cities — Pune, Delhi, Chennai and Kolkata. The article quotes Dr. Atanu Basu, Deputy Director, ICMR-NIV and one of the study's principal investigators, stating the study is focused more on community prevalence aspects for influenza and respiratory virus infections.

*The Indian Express / April 27, 2018*

## Various Technical Committees/Group's Meetings

<b>The following meetings of various technical committees/ Groups of the Council were held in March-April 2018</b>		
1.	Meeting to review Antimicrobial Stewardship (AMSP) Projects	1/3/2018
2.	The meeting of "PRC Tuberculosis, Leprosy and ther Chest Diseases"	5/3/2018
3.	The meeting of "PRC Tuberculosis, Leprosy, and other Chest Diseases"	5/3/2018
4.	Selection committee for the post of "Scientist 'B' Medical	5/3/2018
5.	Project Review Committee (PRC) to review the Annual /Final reports under Research Methodology projects	6/3/2018
6.	Socio-Behavioural & Health Systems Research (SBHSR) Division	6/3/2018
7.	Convene joint meeting of the steering group on rare disease registry	7/3/2018
8.	Subject Project Review Committee (PRC) meeting on "Neurological Science"	8/3/2018
9.	The Expert Group meeting on financial assistance to MD/MS/DM/MCH, thesis	8/3/2018
10.	"Task Force Project for validation of innovative claim of Herbal Healers"	9/3/2018
11.	Meeting of the task for "CVD" Delhi emergency life heart-attack initiative : Mission Delhi"	9/3/2018
12.	Walk in interview for the post of Data Entry Operator	12/3/2018
13.	Joint meeting of the Expert Group and the Task Force Project on Haemoglobinopathy	13/3/2018
14.	"A Meeting of the FAO approved ICMR-ICAR project of AMR meeting"	15/3/2018
15.	Experts cum Project Review Group (PRG) meeting of Div. Reproductive Biology, Maternal and Child Health RBMCH	15/3/2018
16.	19 <sup>th</sup> meeting of National Apex Committee for Stem Cell Research and Therapy (NAC-SCRT)	16/3/2018
17.	"Expert committee meeting" Centre for Advance Research on Pre-Eclampsia	18/3/2018
18.	Meeting of the ICMR technical committee for the procurement of the scientific equipments at its institute's / center's	19/3/2018
19.	Scientific Advisory Committee meeting on ICMRcentre for capacity building in the north east in evidence based child health	19/3/2018

20.	WHO-ICMR meeting regarding improving medical certification of Cause of Death (CoD)	20/3/2018
21.	Meeting regarding egarding NFHS-4 dried Blood spot (DBS) sample	20/3/2018
22.	The selection committee meeting for the Post Doctoral Fellowship (PDF):Division of HRD	20/3/2018
23.	ICMR experts committee for discussion with the firm's for various related logistic issues	21/3/2018
24.	Expert group meeting for advance research on Neonatal	3/21/2018
25.	The selection review committee meeting for the Post Doctoral Fellowship (PDF):Division of HRD	3/21/2018
26.	Project Review Committee meeting:RBMCH	22/3/2018
27.	Project Review Committee meeting on childhood injuries	23/3/2018
28.	"Barriers to case seeking for childhood pneumonia "Task force study"	23/3/2018
29.	"A meeting to review the progress of EQAS system of AMR	23/3/2018
30.	Meeting of expert group on Task Force project on "Comparative Analysis of Genetic, Clinical and Epidemiology Factors of Breast Cancer in Indian population"	26/3/2018
31.	"Meeting of the problem of CKD in Supebeda district of Chhattisgarh estate"	26/3/2018
32.	Meeting of Expert Group on Task Force project on "Indian Childhood Collaborative Leukaemia Group –A collaborative multicentre national study for newly diagnosed patients with acute lymphoblastic leukaemia"	26/3/2018
33.	Meeting of Expert Group on "Cancer prevention"	27/3/2018
34.	"Biomedical communication and the menace of predatory journals : lesson for scientists"	27/3/2018
35.	The meeting to discuss the issue of procurement of Bedaquiline and dreamland to the clinical trials etc.	27/3/2018
36.	A walk-in-Interview for the post of project "Co-Ordinator (Medical) Consultant"	4-4-2018
37.	Meeting of external expert committee to review the report and raw data of the ICMR project entitled "Hospital Based Study of/Congenital Malformation in Neonates of Gas Exposed and Non-Exposed Mothers and their first Generation Progenies in Bhopal (PI Dr. Ruma Galgalekar, Scientist –B NIREH)	4-4-2018
38.	The meeting on "Vaccines of subcommittee to discuss the proposal POD vaccine trial"	6-4-2018

39.	Selection committee meeting for the scientific posts under various Task Force Projects	9-4-2018
40.	A task force meeting to discuss project entitled "Crohn's Disease in India: A Multicenter Study From A Country Where Intestinal Tuberculosis as Well as Johne's Disease is Endemic"	10-4-2018
41.	The Expert Group Meeting for POD Vaccine Trial	11-4-2018
42.	Drafting meeting to finalize standards for stem cell banking	11-4-2018
43.	ICMR-NIMS workshop on equity considerations and cost-effectiveness analysis	12-4-2018
44.	Fellowship expert group meeting on Nanomedicine	13-4-2018
45.	A meeting of Investigators of COHRPICA project	16-4-2018
46.	Expert group meeting to discuss to white paper on alternative to animals	17-4-2018
47.	Selection committee meeting for the post of "Research Assistant at ICMR Hqrs, New Delhi"	18-4-2018
48.	"Advisory committee meeting to discuss/review ongoing activities of ICMR-NIRTH field station in key long"	23-4-2018
49.	VIP reference hearing impairment in Gridieh (Bokaro District) Jharkhand	24-4-2018

## SEMINARS/SYMPOSIA/CONFERENCES/WORKSHOPS ETC

### SUPPORTED BY ICMR

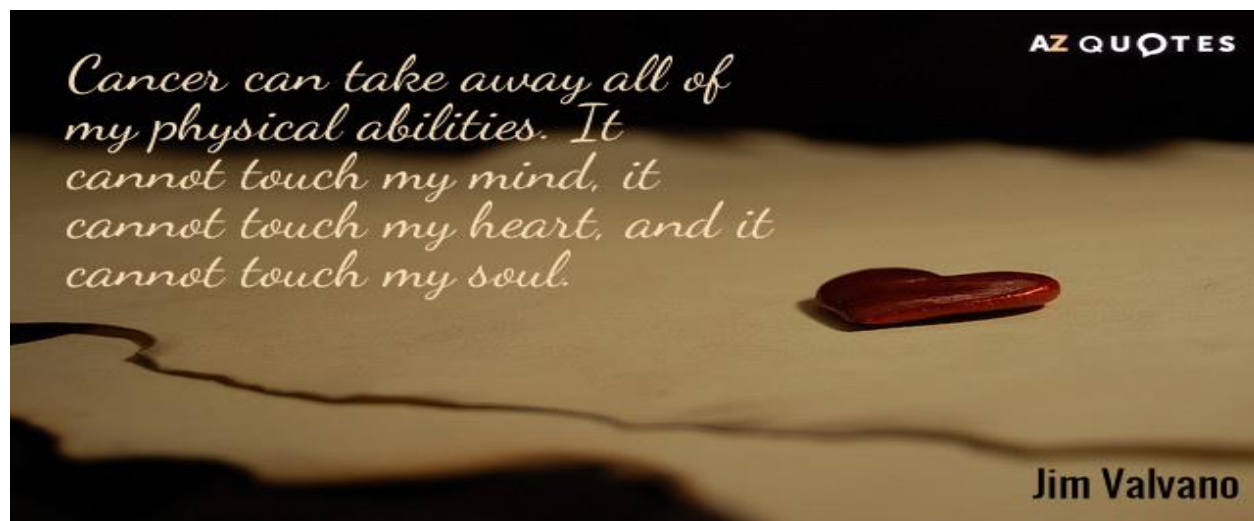
S. No.	TITLE	DATE/ DURATION/ PLACE	ORGANISERS
1.	Indo-US Workshop On Research capacity Building	1-16 March, 2018 at Chennai	Sri Ramachandra Medical College & Research Institute
2.	12 <sup>TH</sup> National Conference of Society of Indian Human And Animal Mycologists	2-4 March, 2018 at Bangalore	St. John's Medical College
3.	International Collaboration For Research Methods Development In Oncology (CREDO) Workshop	4-9 March, 2018 at Lonavala (MS).	Critical Care & Pain, Tata Memorial Hospital,

4.	Indo-US Conference Transcription, Chromatin Structure, DNA Repair And Genomic Instability	6-10 March, 2018 at Bangalore.	Indian Institute of Science,
5.	National Conference on Technological Empowerment of Women Scientists- Commemorating The International Women's Day	8-9 March, 2018 at New Delhi	Young Woman Scientist,  The National Academy of Sciences
6.	Workshop On Health Analytics And Disease Modeling (HADM 2018)	8-9 March, 2018 at New Delhi	ICMR-NIMS
7.	4 <sup>TH</sup> Public Health Symposium on Nutrition on Strengthening National Action To Combat Malnutrition	9 <sup>th</sup> March, 2017 at Chandigarh.	PGIMER
8.	Seminar on Research Acumens In Machine Learning Algorithms For Bioinformatics Applications	9-10 March, 2018 at Chennai.	Rajalakshmi Institute of Technology
9.	45 <sup>th</sup> National IAPSM & 19 <sup>TH</sup> Maharashtra State Joint Conference of IAPSM & IPHA-2018	9-11 March, 2018 at Pune.	Smt. Kahibai Navale Medical College & General Hospital
10.	Seminar on A Primer on Patient Safety	15-16 March, 2018 at Shillong (Meghalaya)	Military Hospital
11.	International Conference on Health Communication: Bridging Gaps And Raising Awareness	16-17 March, 2018 at Manipal (KAR)	School of Communication
12.	Pediatric Emergency Conference 2018 (PEMCON)	17-18 March, 2018 at AIIMS, Raipur (CG).	AIIMS,
13.	Conference on Bio-Medical Waste Management, Issues, Challenges, Awareness & Opportunities	22 <sup>nd</sup> March, 2018 at New Delhi.	ASSOCHAM,
14.	National Conference on Role of Yoga In Stress Management ROYISM-2018	22-23 March, 2018 at Kolhapur (MS).	D.Y. Patil Medical College
15.	Conference on Bio Ethics In Research	23 <sup>rd</sup> March, 2018 at Chennai	Apollo College of Nursing
16.	National Conference-Surgipath 2018	23-24 March, 2018 at Navi Mumbai	MGM Medical College
17.	National Seminar on Current Regulations For Medical Devices & In Vitro Diagnostic	23-24 March, 2018 at OOTY (TN).	JSS College of Pharmacy
18.	Workshop on Integration of Technologies For Affordable Healthcare	23-24 March, 2018 at Bangalore.	Dayananda Sagar College Of Engineering
19.	Workshop on Recent Trends of IOT In Medical Devices	24 <sup>th</sup> March, 2018 at Coimbatore	Dhaanish Ahmed Institute Of

			Technology
20.	Workshop on Molecular Diagnosis of Tuberculosis-MDR TB Gene Detection	24-26 March, 2018 at Kattankulathur (Kancheepuram) TN.	SRM Medical College  Hospital & Research Centre
21.	International Symposium on Crystallography And Advanced Materials-2018 (ISCAM-2018)	26-27 March, 2018 at Chennai	CAS In Crystallography & Biophysics, University of Madras,
22.	International Symposium on Ciliate Biology 2018(ISCB- 2018) with International Research Co-Ordination Network for Biodiversity of Ciliates(IRCN-BC): ISCB 2018	4-6 April, 2018 at New Delhi	Maitreyi College, University of Delhi
23.	Symposium on Inclusive Manufacturing Forum (IMF-2018)& Workshop on Affordable Healthcare Policy for Inclusive Manufacturing	5-7 April, 2018 at Bengaluru	National Institute of Advanced Studies
24.	10 <sup>th</sup> Annual Conference of The Indian Society of Neuro-Oncology-Isnocon 2018, Pre-Conference Workshops on WFNS 3d Neuro-Anatomy & Live Surgery, Molecular Neuro-Oncology and Stereotactic Radio Surgery & Radiotherapy Contouring	5-8 April, 2018 at New Delhi	AIIMS
25.	Conference on Trauma-Recent Trends	6 <sup>TH</sup> April, 2018 at Bhilai (CG).	Shankaracharya Swami Swaroopanand College of Nursing
26.	12 <sup>th</sup> Annual Conference of Indian Society of Toxicology: Toxocon-12 Cumistols Workshop	6-7 April, 2018 at Gangtok (Sikkim)	Sikkim Manipal Institute of Medical Sciences
27.	Conference on Role of Young Scientists In Developing New India	7-9 April, 2018 at Hamirpur (HP).	Career Point University
28.	UP-UK APPICON 2018	13-15 April, 2018 at Bareilly (UP).	SRMS Institute of Medical Sciences
29.	Phytocon-2018, International Conference on Commercialization of Medicinal Plant Products: Lab Techniques To Trade	14 <sup>TH</sup> April, 2018 at Phagwara (PB.).	Lovely Professional University
30.	CME PSYCHIATRY BHDC 2018	14-15 April, 2018 at Delhi Cantt.	BASE Hospital
31.	Seminar on Viscitudes of Normal Aging Elderly Care- A Neuropsychological Perspective	20-21 April, 2018 at Tirupati (AP).	Govt. College of Nursing, Sri Padmavati Mahila Visvavidyalayam



32.	Symposium on Clinical and Biological Research in Orthodontics	22-24 April, 2018 at AIIMS, NEW DELHI	AIIMS
33.	Pharma Conclave 2018, Strengthening Indian Pharmaceutical Industry Through R&D and Innovation	26 <sup>TH</sup> April, 2018 at New Delhi.	ASSOCHAM



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