HEPATOLOGY

Faculty

Professor and Head	Y.K. Chawla	MD, DM, FAMS, FACG
Professors	R.K. Dhiman	MD, DM, FAMS, FACG
	Virendra Singh	MD, DM, FASGE
Associate Professor	Ajay Duseja	MD, DM, MNAMS, FACG

ACADEMIC ACTIVITIES

Dr Y Chawla delivered 'Dr. Devi Chand Memorial Oration' on "Management of Hepatocellular Carcinoma", held at IGMC, Shimla on May 19, 2012. He was invited as a guest speaker at the European Association for the Study of the Liver (EASL) Conference entitled "Vascular diseases of the liver" and delivered a lecture on "Portal venous obstruction: an update" at Estonia from June 22-23, 2012. He chaired a session on "Use of direct antiviral agents (DAA) in Clinical Practice: Case presentations" at the Asia Pacific Hepatitis Summit organized by INASL at Goa from 4-5 August, 2012. He was a guest speaker at the 2nd Annual Conference of Clinical Infectious Disease Society and spoke on "Update in therapeutic advances in Hepatitis B and C" held at Chennai from August 25-26, 2012. He was invited as a Guest Faculty at the 1st Indo-Spanish Symposium on Liver Diseases "Recent advances in Portal Hypertension" and spoke on "Budd-Chiari syndrome-diagnosis and treatment options" on September 30, 2012 at New Delhi. He was invited as a Faculty at the single theme conference on "HBV" organised by Asian Pacific Association for the Study of the Liver (APASL) at Dhaka, Bangladesh from October 6-7, 2012. He was a faculty and patron for the 11th PGI-AIIMS "Current Perspective in Liver Disease" (CPLD)-2012 and Single Theme Conference on "Hepatocellular Carcinoma" organized by the Department of Hepatology, PGIMER, Chandigarh from October 13-14, 2012. He attended the Annual Conference of ISG at Jaipur and delivered a lecture on "Treatment options in Alcoholic Liver Disease" and also attended the Golden Jubilee Celebration at National Institute of Nutrition, Hyderabad from November 28-30, 2012. He was invited as a speaker on "SIRS and septic complications in cirrhosis" and "Non-cirrhotic portal hypertension" at the Asian Pacific Digestive Week -2012 held at Bangkok, Thailand from December 5-8, 2012. He was a Guest Speaker at the 16th Punjab Science Congress held at Faridkot from February 7-16, 2013. He was a panelistin the session"Training in GI Endoscopy: Unmet needs in India" at the Endocon 2013 held at Gurgaon from February 28, 2013 to March 1, 2013. He was the Chief Guest at the 2nd Convocation of Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly. He was the Organising Chairperson and chaired a session on "Epidemiology of NAFLD" at the National Academy of Medical Sciences- PGI symposium on "Nonalcoholic fatty Liver Disease in Children and Adolescents" held at PGIMER on March 10, 2013. He was invited as a guest faculty in the 21st Annual Liver Meeting - 2013 of INASL from March 22-24, 2013 held at Hyderabad and delivered a lecture on "Cryptogenic cirrhosis: Does etiology matter?" and was

also a panelist in the "South Asian Association for the Study of the Liver Symposium on Hepatology Education".

Dr R.K. Dhiman is Editor-in-Chief of *Journal of Clinical and Experimental Hepatology,* a International peer reviewed Journal. He gave an oral presentation entitled "Efficacy and safety of a probiotic preparation in the secondary prophylaxis of hepatic encephalopathy in cirrhotic patients: Interim results of a double blind, randomized, placebo controlled study" at the 63rd Annual Meeting of American Association for the Study of Liver Diseases (AASLD) held in Boston, Massachusetts from November 9-13, 2012. Dr Dhiman received prestigious $2,500 Harold O. Conn Memorial Award on November 10, 2012 at the 'AASLD Annual Awards Reception' which recognizes Scientific Research and Career Development Award Recipients and Distinguished Honorees.

Dr Dhiman has been elected as President-Elect for the years 2012-2014 and President for the years 2014-2016 of the prestigious International Society for Hepatic Encephalopathy and Nitrogen Metabolism (ISHEN). He spoke on "Gut flora in hepatic encephaloapthy: New results" and chaired a session on "The brain in liver failure" at the 15th ISHEN symposium held in Grenaa, Denmark from May 29 to June 2, 2012. Dr Jayanta Samanta, a MD student, also presented his thesis work entitled “Correlation between degree and quality of sleep disturbance and the level of neuropsychiatric impairment in patients of cirrhosis” at same ISHEN symposiumand received the Travel Fellowship from ISHEN. Mr Kiran K Thumburu, a PhD student, presented his thesis work entitled “Role of aquaporin-4 in the development of brain edema in acute liver failure”at same ISHEN symposium and received the Travel Fellowship from ISHEN.

Dr Dhiman is Governor of American College of Gastroenterology (ACG) for India and participated in Governors meeting at the Annual Meeting of ACG held in Las vegas, USA from October 19 to 24, 2012. He also presented his work "Increased expression of aquaporin-4 in perivascular astrocytes end-feet contribute to the development of brain edema in acute liver failure". He was invited as a speaker on "Pathogenesis of hepatitis B flare and reactivation" at the Asian Pacific Association for the Study of the Liver (APASL) 3rd Single Topic Conference (STC) on Hepatitis B Virus in association with Association for the Study of the Liver, Dhaka, Bangladesh in Dhaka on October 6-7, 2012.

He was a faculty and Organising Chairperson for the 11th PGI-AIIMS "Current Perspective in Liver Disease" (CPLD)-2012 and Single Theme Conference on "Hepatocellular Carcinoma" organized by the Department of Hepatology, PGIMER, Chandigarh from October 13-14, 2012 during Golden Jubilee celebrations of the Institute for the year 2012-2013. Dr Dhiman received (Indian Society of Gastroenterology) ISG- (Asian Pacific Digestive Week) APDW Award for the year 2012. He presented "Extrapyramidal Signs in Patients with Cirrhosis Who Have Minimal Hepatic Encephalopathy" at the APDW 2012, held in Bangkok from December 5-8, 2012.Dr Dhiman was selected for Travel Fellowship for presenting his work

entitled " Loss of expression of glial glutamate transporters and glial fibrillary acidic protein in brain of patients with liver cirrhosis and hepatic encephalopathy" at the Seoul International Digestive Disease Symposium (SIDDS) 2012 and the Annual Meeting of Korean Society of Gastroenterology held in Seoul, South Korea from November 22-23, 2012. Dr Kiran K Thumburu, a PhD student, presented the paper and received best paper award.Dr Dhiman was invited as a faculty to give a talk on "Gut micobiota and hepatic encephalopathy" at the Annual Conference of ISG held in Jaipur from November 29, 2012 to December 2, 2012. He was a panelist in a session on "Clinics in liver disease" and chaired a Symposium "Hepatitis B and C: Treatment Goals in Hepatitis B and Future treatment options in Hepatitis C". Dr K Thumburu, a PhD student, received best paper award for his work entitled "Loss of expression of glial glutamate transporters and glial fibrillary acidic protein in brain of patients with liver cirrhosis and hepatic encephalopathy" in the Plenary Session of this conference. Dr Dhiman was an invited speaker and spoke on " Modulating Gut Microbiome: Do probiotics work in MHE " and " Use of antituberculosis drugs in chronic liver disease" at the Annual conference of Indian National Association for the Study of Liver (INASL) held in Hyderabad from March 22-24, 2013. He also presented INASL guidelines on "Portal Cavernoma Cholangiopathy" in the same meeting. Dr Dhiman presented his research work entitled "Efficacy and safety of a probiotic preparation in the secondary prophylaxis of hepatic encephalopathy in cirrhotic patients: Interim results of a double blind, randomized, placebo controlled study" in "Hot Topics in AASLD 2012" which was held in Kolkata on December 14-15, 2012. Dr Dhiman was invited as a faculty to give a talk on "Anti-tubercular therapy induced hepatotoxicity and its management in practice" at the PEDGASTROCON-2012, 22nd Annual Conference of Pediatric Gastroenterology held in Lucknow from November 2-4, 2012. He was an invited speaker and spoke on "Overview of Acute Liver Failure: Definition, etiologies and outcomes" in the Monothematic Symposium of Acute Liver Failure, held at BGS Global Hospitals, Bangalore between January 19-20, 2013. He actively participated in the "Workshop for Intensivists and Transplant Co-Ordinators" held in Delhi from February 28 to March 1, 2012 and delivered a talk on "Liver and Pancreas Transplant". He moderated a session on " HCV: Treatment in special populations" at the Asia Pacific Hepatitis Summit organized by INASL at Goa from August 4-5, 2012. He delivered a talk on "Past, present and future of endoscopic ultrasound (EUS) in portal hypertension" at the 4th international conference on EUS held in Meerut from September 1-2, 2012. Dr Dhiman moderated the Round Table Discussion on "Hepatitis C & Liver Transplantation" at Medanta Institute of Liver transplantation, and Regenerative Medicine, Gurgaon, Delhi from February 16-17, 2013. He chaired a session on 'Pathogenesis of NAFLD' at the National Academy of Medical Sciences- PGI symposium on Nonalcoholic fatty Liver Disease in Children and Adolescents at PGIMER on March 10, 2013. He was invited as a faculty to give a talk on "Advances in Hepatic encephalopathy in patients with cirrhosis" in the Mid-Term INASL Meeting, "Medical Emergencies in Hepato-Biliary Diseases" held in Delhi on September 15-16, 2012. He was a speaker and delivered a talk on"Portal Biliopathy, an Enigma" at the Endocon 2013 held at Gurgaon from February 28, 2013 to March 1, 2013. He spoke on "Liver and

Pancreas Transplant" at the Workshop for Promotion of Deceased Donation held from February 28, 2013 to March 2, 2013 in New Delhi. He spoke on "Future of Hepatology" at Himalayan Institute of Medical Sciences, Dehradun.

Dr. Virendra Singhattended the European Association for the Study of the Liver annual meeting held atBarcelona, Spain, from April 18-22, 2012. He attended the 11th PGI-AIIMS "Current Perspective in Liver Disease" (CPLD)-2012 and Single Theme Conference on "Hepatocellular Carcinoma" organized by the Department of Hepatology, PGIMER, Chandigarh on October 13-14, 2012. He chaired a session on "Day to day management issues in Hepatology" at annual conference of ISG held at Jaipur on November 30, 2012. He attended the 13th Annual Conference of SGEI (Endocon 2013) held at Delhi from March 1-3, 2013. He chaired a session on "Diagnosis of NAFLD" at the National Academy of Medical Sciences- PGI symposium on Nonalcoholic fatty Liver Disease in Children and Adolescents at PGIMER on March 10, 2013. He delivered a guest lecture on "Management of Hyponatremia" at the annual conference of INASL held at Hyderabad on March 23, 2013.

Dr Ajay Duseja was a guest speaker on 'Pathogenesis of Fibrosis in HBV cirrhosis and Liver Cancer' at the single theme conference on HBV organised by Asian Pacific Association for the Study of the Liver (APASL) at Dhaka, Bangladesh on October 6-7, 2012. He was a guest speaker on 'NAFLD – Global and Indian Perspective – Do they differ' and 'NAFLD – Third world phenotype is not a distinct entity' at the Annual conference of the Indian National Association for the study of Liver (INASL) organised at Hyderabad from March 22-24, 2013. He was also a guest speaker on "Fatty Liver Disease" at a CME organised by the Banka Foundation, Mumbai on March 17, 2013. He was the Organising Secretary and speaker on the 'Pathogenesis of NAFLD – Indian Scenario' at the National Academy of Medical Sciences- PGI symposium on Nonalcoholic fatty Liver Disease in Children and Adolescents at PGIMER on March 10, 2013. He was a guest speaker on "HCV and insulin resistance/metabolic syndrome" and "Treatment of CHC in patients with CKD" at the 'INASL-National task force meeting on HCV' organised by the INASL on February 28, 2013 at New Delhi. He was also a guest speaker on 'Post Transplant recurrence of NAFLD and metabolic syndrome' at the 'First Transplant Hepatology Course' organised by the Medanta Medicity, Gurgaon on February 16-17, 2013. He was an invited speaker on 'Staging of HCC' at the 'INASL-National task force meeting on HCC' at Puri on February 9-10, 2013 and on 'Position paper on NAFLD and metabolic syndrome' at the 'INASL-National Task Force meeting on NAFLD' at Bhubaneswar on February 10, 2013. He chaired a session on 'Endoscopic grading' in the PGI-AIIMS-SGPGI Endoscopy course on January 26-27, 2013 at PGI, Chandigarh. He was guest speaker on 'NAFLD – Indian scenario' and 'Asymptomatic rise in transaminases' at 'Hepatology CME- Current Trends' organised by Midas Medical Foundation & Research Institute at Nagpur on January 19-20, 2013. He spoke on the 'NAFLD – Indian scenario' and 'Role of Fibroscan in Liver Diseases' at a CME organised by the Doctors' Forum, Patiala on December 26, 2012. He was a moderator at the 'Hot topics at AASLD' and an invited speaker on 'NAFLD in India – Possible mechanisms' at the '4th Kolkata

Liver Meeting - Indo – European Summit on NAFLD/ NASH' organised by the Science First Communications and West Bengal Liver Foundation at Kolkata on December 14-16, 2012. He spoke on the 'Timing of Liver Transplantation' at a CME organised by IMA Chandigarh in November, 2012. He was a guest speaker on four topics at the Annual conference of the Indian Society of Gastroenterology and Midterm conference of the Indian National Association for the study of Liver (INASL) on November 29 to December 2, 2012 at Jaipur. He was also a guest speaker on 'Pathogenesis of NAFLD in India' at the NASH Conclave organized by Indian National Association for the study of Liver (INASL) at New Delhi on November 3-4, 2012. He was the Organising Secretary of the 'Current Perspectives in Liver Diseases – CPLD- 2012' and the single theme conference on 'Hepatocellular carcinoma' organised jointly by the department of Hepatology, PGIMER, Chandigarh and Department of Gastroenterology, AIIMS, New Delhi on October 13-14, 2012. He was also the Organising Secretary and chaired a session at the 'CME on Nutrition in Liver Diseases' organised jointly by the department of Dietetics and department of Hepatology on September 9, 2012. He spoke on the 'Management of occupational exposure to HBV and HCV' at a CME organised by the Prime Academic Society, at Chandigarh on September 29, 2012 and a guest speaker at a CME on 'Viral hepatitis' organised by the Indian Dental Association, Chandigarh chapter on July 29, 2012. He spoke on the 'Timing and Indications of Liver Transplantation' at a CME on 'Liver Transplantation' organised by the Gastroenterology and Liver Forum, Chandigarh on July 21, 2012.

SERVICE

An outpatient liver clinic is conducted every Monday and Friday. A total No. of 19470 old and 4044 new patients were seen in liver clinic during 2012-2013.

During the year, the investigations performed included:

Name of Test/Procedure	**2012-13**	**2011-12**	**2010-11**
UGI Endoscopies	2667	2057	1797
Lower GI Endoscopies	74	57	120
ERCPs	339	332	367
Ultrasound	2332	2221	2087
Endoscopic Ultrasound (EUS)	25	20	-
Fibroscan	3181	363	-
Liver function tests	653	500	3000
Anti HCV	3399	2800	3322
HBsAg	3967	3000	3143
HBeAg/Anti HBe	3512	220	1599
Anti HEV (IgM)	768	670	436
Anti HBc (IgM)	256	220	97

Anti HBc (total)	366	165	20
Anti HBs	200	150	126
Anti HAV (IgM)	805	412	180

These services were rendered to outpatients, patients attending special clinics, emergency and indoor patients.

TRAINING

Residents of Internal Medicine rotated through the department for training imparted through regular sessions of clinical case discussions, topic discussions, hepato-radiology rounds, seminars, liver biopsy rounds and journal clubs. They were also trained to perform bedside procedures like liver biopsy, abdominal paracentesis, etc. Seven students passed out with DM (Hepatology) in the year 2012-13. Five Ph.D students are undergoing training in the Department. Two short term trainees Ms Nadia Al-Bader from Canada trained from June 18, 2012 to July 16, 2012 (One month) and Dr. Ashish Kumar, from GMC, Patiala from September 1, 2012 to November 30, 2012 (3 months).

RESEARCH COMPLETED

PHARMACEUTICAL FUNDED (CD PHARMA, NEW DELHI)

1. **EFFICACY AND SAFETY OF A PROBIOTIC PREPARATION IN THE SECONDARY PROPHYLAXIS OF HEPATIC ENCEPHALOPATHY IN CIRRHOTIC PATIENTS: INTERIM RESULTS OF A DOUBLE BLIND, RANDOMIZED, PLACEBO CONTROLLED**

   Probiotics may not be efficacious in altering clinically relevant outcomes in cirrhotic patients with HE. Demonstration of unequivocal efficacy is therefore needed before probiotics can be endorsed as effective therapy for hepatic encephalopathy (HE). This study was conducted to assess the efficacy of a probiotic preparation for the prevention of HE recurrence, the reduction in hospitalizations and in improving the severity of liver disease in cirrhotic patients. This study demonstrated a trend in the reduction in the risk of an HE episode for probiotic, as compared with placebo, over a 6-month period. Hospitalizations for overall complications of liver and for those involving HE were significantly less in the probiotic group as compared with the placebo group. Child-Turcotte-Pugh (CTP) score improved significantly in probiotic, as compared with placebo. Serum interleukin-6 (IL-6) levels reduced significantly in probiotic group after 6 months, as compared with placebo. There was no significant change in blood ammonia levels in either group. The incidence of adverse events reported during the study was similar in the two groups and there was no serious adverse event. Over a 6-month period, treatment with probiotic significantly reduced the risk

of hospitalization involving HE. Probiotic treatment also significantly reduced CTP and MELD score and IL-1β, IL-6, IL-10 and TNF-α levels.

ICMR

2. **LOSS OF EXPRESSION OF GLIAL GLUTAMATE TRANSPORTERS AND GLIAL FIBRILLARY ACIDIC PROTEIN IN BRAIN OF PATIENTS WITH LIVER CIRRHOSIS AND HEPATIC ENCEPHALOPATHY**

In-vitro and in-vivo studies reveal significant losses in expression of genes coding for both the astrocytic Glial Fibrillary Acid Protein (GFAP), a major component of the glial filament and the Excitatory Amino Acid Transporter 1 (*EAAT1*) and EAAT-2 whose role is to remove excess of glutamate from the synaptic cleft and aquaporin-4 (AQP-4), a water channel protein. Brain tissues were obtained at autopsy from 12-patients with liver cirrhosis with HE and from 7-patients with no evidence of liver disease(controls) matched for age, gender and post-mortem delay intervals. Expression of GFAP, EAAT-1, EAAT-2 and AQP-4mRNAs was investigated by real-time PCR and appropriate molecular probes and protein expression were assessed using both immunoblotting (western) techniques as well as immunohistochemistry using commercially-available polyclonal antibodies. Levels of GFAP mRNA and protein expression decreased in the frontal cortex of cirrhosis patients compared to control patients ($P<0.036$ and $P<0.011$ respectively). Loss of EAAT-2 protein (both on western blot and immunohistochemistry) in liver cirrhosis patients was found to be post-translational in nature ($P=0.002$). Expression of EAAT-1 at both mRNA and protein levels remained within normal limits. Expression of AQP-4 mRNA was up-regulated but its total protein expression (western blot) remained within normal limits. However immunhistochemical analysis demonstrated that the losses of GFAP was localized to the glial end feet process surrounding the microvessels. These findings, for the first time, conclusively demonstrated that the loss of GFAP and EAAT-2 expression play a key role in the pathogenesis of HE and underline the important role of the astrocyte in the pathogenesis of HE.

DEPARTMENTAL

3. **CORRELATION OF ADIPOSE TISSUE WITH LIVER HISTOLOGY IN PATIENTS WITH NONALCOHOLIC FATTY LIVER DISEASE (NAFLD).**

A single slice CT scan at the level of L4-L5 vertebrae was done to assess the abdominal visceral and subcutaneous adipose tissue (VAT and SAT) volumes in 21 patients [13 males, median age: 35 years, median BMI: 25.97 kg/m(2)] with histological diagnosis of NAFLD. Even though overweight/obese patients had severe liver disease, there was no difference in

the volume of VAT adjusted for BMI between 6 (28.5%) lean and 15 (71.5%) overweight/obese patients. Patients with NASH and borderline NASH were older, obese with higher VAT and SAT volumes than no-NASH group. Both SATV and TAT volume correlated significantly with severity of liver disease as determined by NAS score whereas presence of metabolic syndrome or insulin resistance had no correlation with histological severity.

4. **CORRELATION OF TRANSIENT ELASTOGRAPHY WITH LIVER HISTOLOGY IN PATIENTS WITH NAFLD AND CHRONIC VIRAL HEPATITIS.**

Of 1512 patients who underwent Fibroscan (Transient Elastography - TE), 36 patients with valid liver stiffness measurement (LSM) acquisitions and satisfactory liver biopsy specimens were prospectively included in the final analysis comprising of 15 patients in NAFLD group and 21 in the chronic viral hepatitis (CVH) group. Liver fibrosis was graded by an independent pathologist using the METAVIR (F0–F4) classification. In all 36 patients with chronic liver disease (CLD), TE had an AUROC of 0.828 and 0.819 respectively for the detection of mild and advanced fibrosis respectively at optimal cutoffs of 5.8 kPa and 7.8 kPa respectively. TE maintained high accuracy for detection of mild and advanced fibrosis in patients with CVH (AUROC of 0.713 and 0.711 at cut off value of 6.4 and 7.8 kPa respectively) and NAFLD group (AUROC of 0.893 and 0.962 at the optimal cut off values of 5.9 and 8.2 kPa respectively). There was a significant positive correlation between LSM and fibrosis stage in total patients with CLD (r=0.600, P=0.000), in patients with CVH (r=0.455, P=0.05)) and NAFLD (r=0.837, P=0.000).

5. **MATURATION DEFECTIVE MYELOID DENDRITIC CELLS IN NONALCOHOLIC FATTY LIVER DISEASE PATIENTS RELEASE INFLAMMATORY CYTOKINES IN RESPONSE TO ENDOTOXIN.**

Effect of lipopolysaccharide (LPS) stimulation on maturation and activation of monocyte derived dendritic cells (mo-DCs) was evaluated in ten patients with NAFLD using flow cytometry, endocytosis assay, cytokine assay and mixed leukocyte reaction. Although the frequency of mo-DCs in NAFLD patients was similar to that of healthy controls, there was no upregulation in levels of HLA-DR, CD83, CD80 and CD86 on their surface in response to LPS stimulation ex vivo. Although the mo-DC from patients had higher endocytosing and lower allostimulatory capacities as compared to healthy controls indicating maturation defects yet they secreted significantly high amount of TNF-α and IL-6 suggesting higher activation state.

6. **TREATMENT OF CHRONIC HEPATITIS C IN END STAGE RENAL DISEASE**

Data of 65 patients of CHC with ESRD receiving hemodialysis (duration 1-60 months, males: 53, mean age: 39.2 +/- 14.4 years) was analysed retrospectively. Sixteen patients

(25%) (genotype 1: 11, genotype 3: 4, genotype 2: 1) agreed for treatment (13 pegylated IFN and 3 conventional IFN without ribavirin). RVR was achieved in 7 patients (44%) and out of 11 patients (69%) who achieved EVR, ETR was achieved in 7 (44%) patients. Seven patients (44%) dropped out during treatment (2 because of side effects). SVR could be demonstrated in one of 7 patients who achieved ETR (6 patients were lost to follow up after ETR).

7. **INDOCYANINE GREEN CLEARANCE TEST (USING SPECTROPHOTOMETRY) AND ITS CORRELATION WITH MODEL FOR END STAGE LIVER DISEASE (MELD) SCORE IN INDIAN PATIENTS WITH CIRRHOSIS OF LIVER.**

Forty patients with cirrhosis of liver were included and divided into two groups according to their CTP scores. Group A had 20 patients with CTP class A and group B had 20 patients with CTP class B. After ICG injection, ICG retention at 15 minutes (ICGR 15) and ICG clearance rate were calculated. In group A, the mean ICGR15 was 32.86% +/- 6.4% while in group B it was 51.08% +/-12.8% ($p < 0.001$). ICG clearance rates were 4.3% +/- 2.8% and 3.5% +/- 3.8% per minute in group A and B respectively. MELD score had a strong positive correlation with ICGR15 but a negative correlation with ICG clearance rate. On ROC curve analysis, AUC for MELD was 0.805 vs. 0.88 for ICGR15 in assessing prognosis of patients with cirrhosis. The sensitivity and specificity of MELD score was 60% and 80% respectively while that of ICGR15 was 85% and 90% respectively.

RESEARCH IN PROGRESS

ICMR

1. Alterations in gene expressions coding for key Astrocytic and neuronal proteins in patients who have died from acute liver failure or chronic liver failure associated with hepatic encephalopathy.
2. To study the protective effect of Nrf2 gene against oxidative stress and inflammation in frontal cortex and cerebellum regions of brain and blood in acute hyperammonemic rats.
3. Comparison of ablative therapies in hepatocellular carcinoma.
4. Expression and polymorphism of toll like receptors (TLR) and small intestinal bacterial overgrowth in patients with nonalcoholic fatty liver disease (NAFLD)

PHARMACEUTICAL FUNDED

(CD PHARMA, NEW DELHI)

5. Supplementation with a probiotic preparation, VSL#3as a support pharmaceutical therapy in cirrhotic patients for the treatment of minimal hepatic encephalopathy (MHE); A double-blind, randomized, placebo controlled study.
6. Secondary prophylaxis of hepatic encephalopathy: A double blind, randomized, placebo controlled study with supplementation with a probiotic preparation.
7. Small Intestine bacterial overgrowth and role of probiotic, VSL#3 in patients with Nonalcoholic Fatty Liver Disease.

DEPARTMENTAL

8. To study the proof of concept IN the improvement of cognition and quality of life in cirrhotic patients with minimal hepatic encephalopathy by means of a pharmacological intervention with sildenafil (a phosphodiesterase-5 inhibitor)
9. Cognitive functioning, mental health, and health-related quality of life in survivors of acute liver failure
10. G-CSF in alcoholic hepatitis
11. Adrenal insufficiency in cirrhosis
12. Contrast-free air cholangiography-assisted unilateral stenting in malignant hilar biliary obstruction.
13. Relationship between obstructive sleep apnea and Nonalcoholic Fatty Liver Disease
14. A randomised controlled trial of Vitamin D in patients with Nonalcoholic Fatty Liver Disease
15. Impaired renal functions in patients with Nonalcoholic Fatty Liver Disease

INDEXED PUBLICATIONS

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NON-INDEXED PUBLICATIONS

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2. Agrawal S, Duseja A. Non-alcoholic Fatty Liver Disease: East versus West. J Clin Exp Hepatol 2012;2:122-34.
3. Beenish R, Kiran M, Saxena R, Chawla YK, Sharma RR, Kaur Jyotdeep. Microsomal Epoxide Hydrolase Polymorphisms and Haplotypes as Determinants of Hepatitis B Virus and Hepatitis C Virus-related Liver Disease in Indian Population. J Clin Exp Hepatol 2012;2:104-111.
4. Dhiman RK, Saraswat VA, Rajekar H, Reddy C. A Guide to the Management of Tuberculosis in Patients with Chronic Liver Disease. J Clin Exp Hepatol 2012;2:260-70
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12. Taneja S, Dhiman RK, Khatri A, Goyal S et al. Inhibitory Control Test for the Detection of Minimal Hepatic Encephalopathy in Patients with Cirrhosis of Liver. J Clin Exp Hepatol 2012;306-314
13. Vasishta R, Kakkar N, Duseja AK, Dhiman RK. Fatal Hepatitis C in a Renal Transplant Recipient on Immunosuppression. J Clin Exp Hepatol 2012:191-192

VISITING PROFESSORS

1. Prof. Kevin D. Mullen, MD, Director of Hepatology, Metro Health Medical Center Case Western Reserve University, Cleveland, Ohio, USA
2. Dr. Gagan K Sood, Associate Professor, Department of Surgery, Baylor College of Medicine, Houston, Texas, USA
3. Prof. Gyongyi Szabo, MD, PhD, Professor, Associate Dean for Clinical and Translational Sciences, Director, MD/PhD Program, Vice Chair for Research, Department of Medicine, LRB-208, University of Massachusetts Medical School, 364 Plantation Street, Worcester, MA 01605

PART – I
(Awards Honours)

Dr Dhiman received prestigious Harold O. Conn Memorial Award on November 10, 2012 from American Association for the Study of Liver (AASLD) at the 'AASLD Annual Awards Reception' which recognizes Scientific Research and Career Development Award Recipients and Distinguished Honorees. Dr Dhiman has been elected as President-elect for the years 2012-2014 and President for the years 2014-2016 of the prestigious International Society for Hepatic Encephalopathy and Nitrogen Metabolism (ISHEN). Dr Jayanta Samanta, a MD student and Dr Kiran K Thumburu received International Travel awards from ISHEN. Dr RK Dhiman continues to be the Editor-in-Chief of *Journal of Clinical and Experimental Hepatology*. Dr Jayanta Samanta, Sandeep Goyal and Dr Kiran K Thumburu received best paper prizes at Annual conference of the Indian national association for the Study of the liver (INASL) and Indian Society of Gastroenterology (ISG).

PART II
(DEPARTMENTAL HIGHLIGHTS)

The Department organized public forum on "Organ Donation" on April 7, 2012. Dr YK Chawla, Dr RK Dhiman and Dr Ajay Duseja were invited faculty at the single theme conference on HBV organised by the Asian Pacific Association for the Study of the Liver (APASL) at Dhaka, Bangladesh. As a part of the Golden Jubilee celebrations of the Institute, the department organised CME on 'Nutrition in Liver Diseases', PGI-AIIMS joint conference 'Current Perspectives in Liver diseases – CPLD-2012' and the NAMS- PGI symposium on 'NAFLD in children and adolescents'.

PART – III
(RESEARCH HIGHLIGHTS)

Over a 6-month period, treatment with probiotic significantly reduced the risk of hospitalization involving HE and significantly improved CTP and MELD score and IL-1β, IL-6, IL-10 and TNF-α levels. A study on human brains in patients with acute liver failure provides the first direct evidence for selective alterations in expression of genes coding for aquaporin-4 and underline the important role in the pathogenesis of cerebral edema. Both night time sleep disturbance and excessive daytime sleepiness have significant relation with the neuropsychiatric impairment in patients of cirrhosis and are significantly associated with the observed impairment in health-related quality of life. Both subcutaneous and total adipose tissue volume are related to the disease severity as determined by NAFLD activity score in Indian patients with NAFLD. Transient elastography is an excellent predictor of fibrosis and has significant positive

correlation with liver histology for detection of both mild and advanced fibrosis in patients with NAFLD and chronic viral hepatitis. Dendritic cells in patients with NAFLD exhibit immature yet functionally activated phenotype in response to lipopolysaccharide stimulation. Dropouts before, during and after treatment are a major problem in patients with CHC and ESRD. ICG retention at 15 minutes has a higher sensitivity and specificity than MELD score in assessing the prognosis of patients with cirrhosis of liver.