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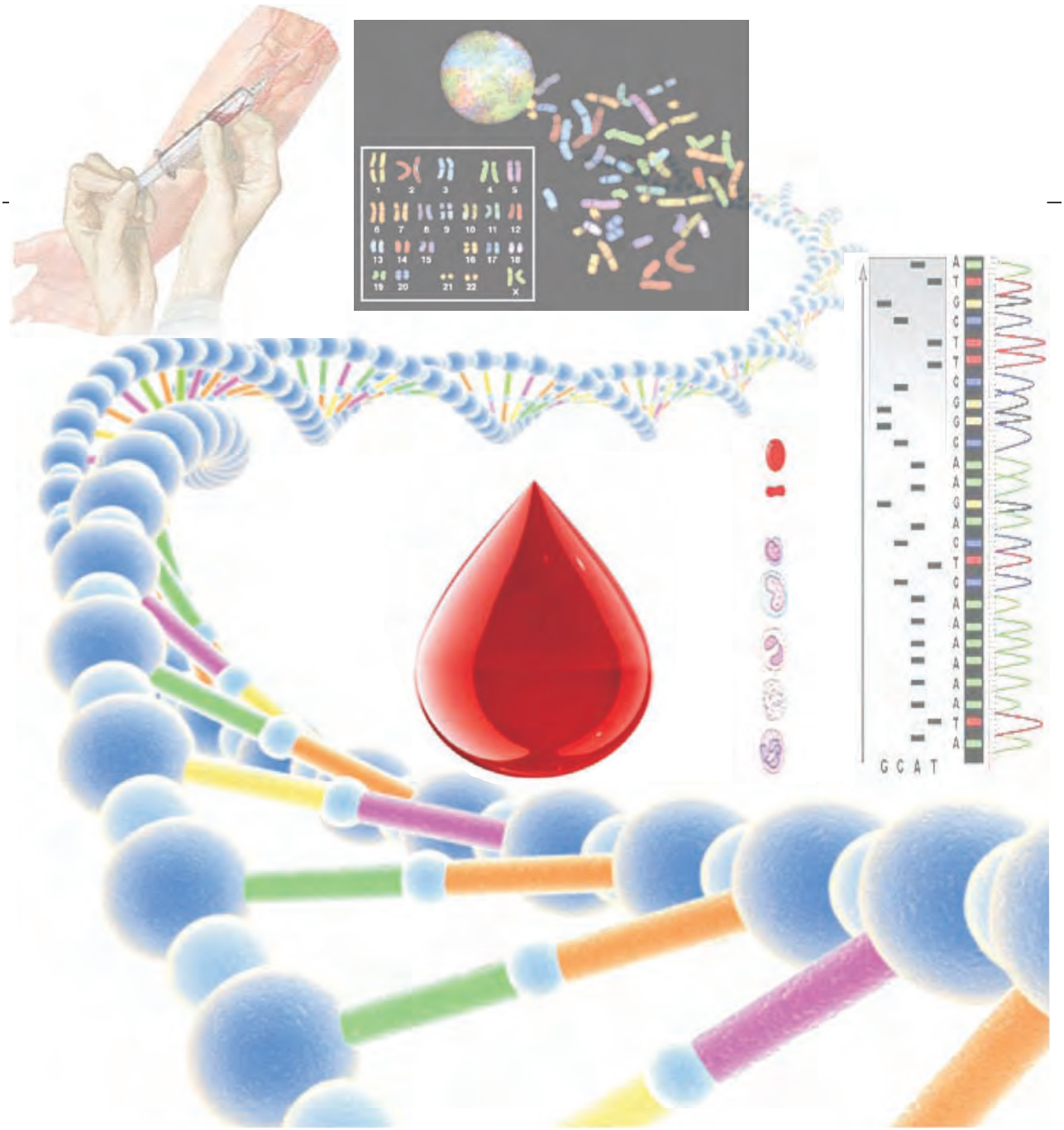

Indian Council of Medical Research Centenary Celebration (1911 - 2011) Issue

Cultural programme during the Foundation Day celebration of the Institute

Dr. I.C. Verma receiving 23rd Dr H.M. Bhatia memorial oration from Dr R Sarin, Director, ACTREC

Annual picnic of the Institute

Land acquired at Nahur for future expansion of the Institute

HISTORY OF NATIONAL INSTITUTE OF IMMUNOHAEMATOLOGY (ICMR)

Kanjaksha Ghosh

National Institute of Immunohaematology (NIIH) had a meek beginning 54 years back as "Blood Group Reference Centre (BGRC). The mandate of the centre was to study various facets of blood groups, its clinical consequences and finally its day to day application. The history and functioning of Blood Group Reference Centre (BGRC) has been narrated in several previous accounts; hence I will not repeat them again. In 1982, BGRC became Institute of Immunohaematology (IIH) with extended mandate and continued research in several areas like 1. Red Cell Enzymopathies, 2.Haemoglobinopathies, 3. HLA antigens, 4. Autoimmune disorders, 5. Leucocyte biology etc.

In this brief account, I will revisit the progress of this Institute in the last 10 years. The Institute was renamed as "National Institute of Immunohaematology (NIIH)" in 2008. Several new departments like Department of Transfusion Transmitted disorders, Department of Thrombosis & Haemostasis and Department of Cytogenetics were developed during the latter part of 1980's and 1990's. These departments nicely integrated with already established departments. In 2006, a new Department named "Pediatric Immunology and Leukocyte Biology" was added to work on Primary Immunodeficiency Disorders. Considering the expanding role of immunology in understanding the pathobiology of many disorders and its extensive applicability in diagnostic and therapeutic medicine, it was necessitated to rename the Department of 'Autoimmune Disorders' as "Department of Clinical and Experimental Immunology" in 2010. The overall progress of the institute since its inception has been shown in Fig 1. Here, I will discuss mainly the progress made by this Institute over last 10 years under following heads;

I) Development of New Departments

ii) Research activities

iii) Application of research findings for clinical use (Translational Research)

iv) Services to the patients

v) Human resource development

I) Development of New Departments

Several new Departments like Thrombosis and Haemostasis, Cytogenetics, Pediatric Immunology, Leucocyte Biology, Clinical and Experimental Immunology have already been developed while several Departments like Bioinformatics, Nutritional anaemia and Pharmacogenomics are going to be developed in near future.

ii) Research Activities

Significant contribution of research activities during the last decade was to understand the molecular mechanisms and pathology of Colton, Bombay Oh and Rh blood group systems, development of SSCP based technique has helped in demonstrating the ABO gene heterogeneity in the population, development of monoclonal antibodies to detect B, N & H blood group antigens and evaluation of Fy negative red cells in some populations.

In the area of haemoglobinopathies, red cell membrane disorders and red cell enzymopathies, several haemoglobin variants were found like Hb M – Ratnagiri, Hb D- Agri along with other haemoglobin variants. Many new mutations of red cell enzymes were catalogued and new techniques for evaluation of red cell membrane defects were also established. Major contribution of the Department of Hematogenetics was in the area of prenatal diagnosis and geographical micromapping of $^{+}$ and - thalassemia mutation. Tissue typing unit contributed a substantial amount of research work in HLA and disease association, various molecular alleles of common HLA antigens and hitherto undescribed but very strong association of HLA-B27 with haemophilic synovitis. Considerable work emanated from department of Cytogenetics in the area of Franconia's anaemia and Myelodysplastic Syndrome making the Institute proud.

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Department of Transfusion Transmitted Diseases described initial reports of HIV infection from this country, and prevalence of various transfusion related viruses in haemophilia patients. Initial study of this centre as a multicentric study established the reference range of CD4/CD8 cells in Indian population and also described the natural history of HIV epidemic i.e. starting with high risk group and spilling over into monogamous pregnant females in general population via its extensive sentinel surveillance data. The unit also tested seronegative blood products by NAT testing and demonstrated that in Mumbai at least 1/1000-1500 seronegative blood bags are NAT positive.

Major research contribution of the Department of Haemostasis was to establish the prenatal diagnostic technique for various coagulation disorders. The department did extensive work in various facets of venous thrombosis, recurrent fetal loss and how thrombotic genes modulate severity of congenital coagulation disorders. The studies conducted on hemophilia patients with inhibitor were also considered pioneering studies in the country. Several new techniques were also developed by the department over last 10 years. In addition, quite a few studies on various mutations in different coagulation disorders were published in leading international journals. Department of Clinical and Experimental Immunology contributed significantly in our understanding of ITP and ANCA related vasculitis.

iii) Application of research findings for patient care

The outcome of the research conducted by NIIH over the last 10 years has helped common people in several areas.

a) Techniques developed for prenatal diagnosis are regularly applied in clinical fields and several thousand families have been benefited so for.

b) Rh D variant studies have produced a simple algorithm which can be used by the Blood banks to identify variants in RhD antigen.

c) Common variants of G6PD deficiency are now easily diagnosed and will help to micromap Molecular pathology of this deficiency in the country.

d) Operations in severe haemophilia patients have been performed successfully with minimal factor concentrates.

e) Pharmacovigilance of factor VIII inhibitor development is now easily possible.

f) New Department of Paediatric Immunology is providing diagnosis for many congenital Immunodeficiency cases including prenatal diagnosis.

g) Quick diagnosis of severe Glanzmann's thrombasthenia is now possible as a spot test.

iv) Services to the patients

Several thousands of patients across India come here for many haematological tests which are either not available elsewhere in the Government setup or not financially affordable to these patients. Over last 10 years, thousands of families with congenital coagulation disorders and haemoglobinopathies have taken the advantages of prenatal diagnosis from this Institute. Many rare investigations are carried out in this institute which has helped countless patients from Municipal and Government hospitals of Mumbai.

v) Human Resource Development

NIIH has taken special care to develop human resources inside the Institute and also for the country. Almost all our scientists have received international exposure and our Research Assistants are also highly qualified availing a Ph D degree and Post Doctoral fellowships abroad. Our institute provides M.Sc and PhD degrees and also laboratory training to MD and DM candidates. These types of trainings help the country in developing expert manpower. Short term training in Transfusion Medicine, WHO fellowship, International Haemophilia Federation Centre (IHTC) fellowships and other training programmes contribute to our national manpower generation. For the last two years NIIH is also accepting nominated trainees from the National Academy of Science. Two tailor made projects i.e. Jai Vigyan Mission project for thalassemia and Control of sickle cell anemia in primitive tribes have provided NIIH a truly national breadth across various states for training man power in molecular technology and hemoglobinopathies research.

How the Institute will develop in future.

Presently the Institute is going through space and human resource crunch, as no new posts have been created corresponding to the increased activities of the institute.

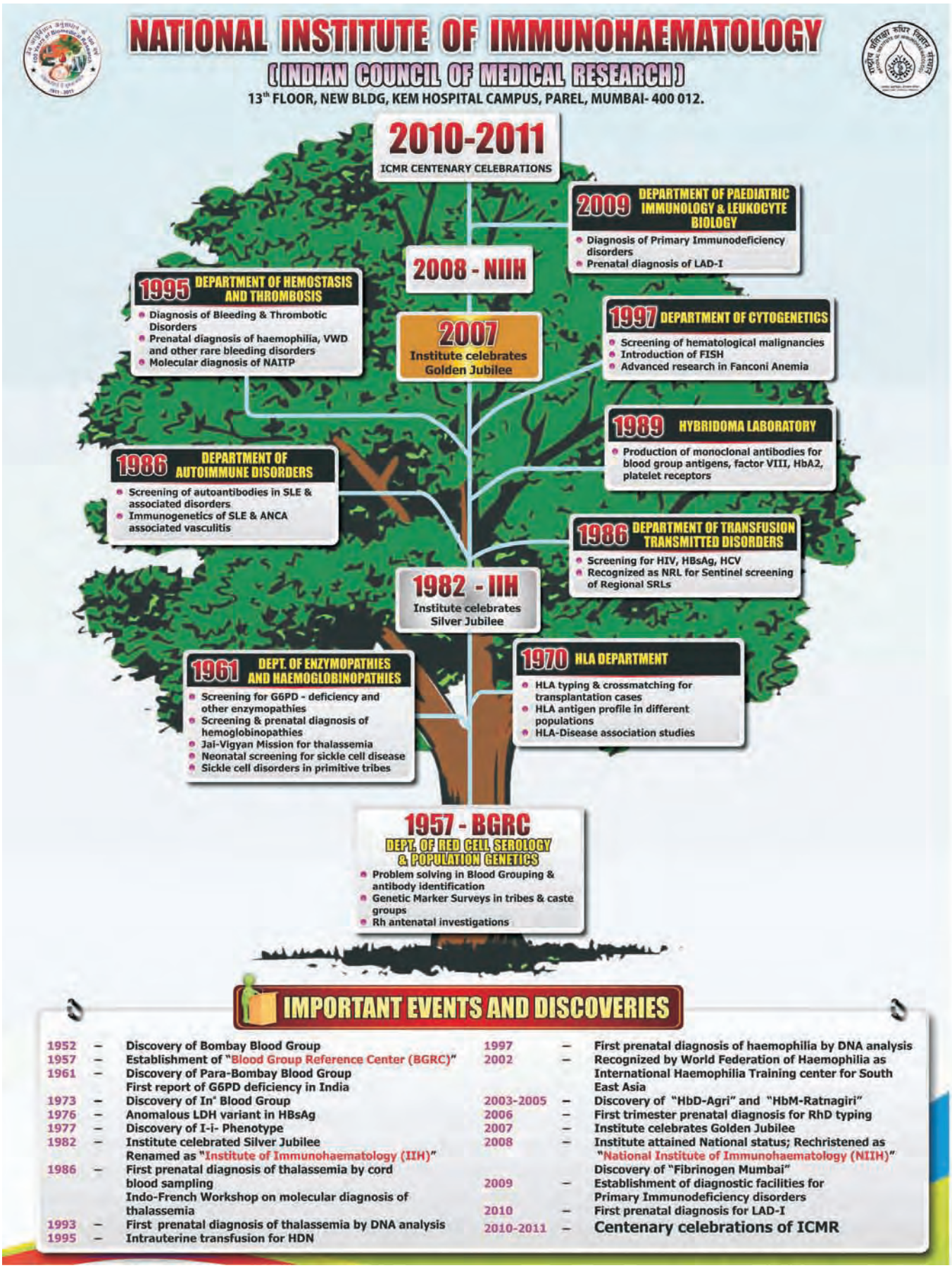


Figure 1: Overall progress of the Institute since its inception

NIIH now envisages expansion of its own base in Mumbai and plans to develop satellite centre for I) Haemoglobinopathies, ii) Haematovirology, iii) Transfusion Medicine, iv) Nutritional Haematology in different parts of the country. Pharmacogenomics and Bioinformatics are two more specialties which will be developed at the Mumbai Centre. NIIH will also try to forge greater interaction with other ICMR and non ICMR research institute, medical colleges and veterinary institute which are virtually the resource bank in the country. Stem Cell Biology, Regenerative medicine, Gene therapy, Targeted Therapy, Angiogenesis and vascular biology, Retro differentiation and Trans differentiation of cells, Membrane Biology, Nanotechnology, Combinational Nanotechnology Chemistry, Immuno informatics, Cellular Engineering are all newer emerging areas. Haematology & Transfusion Medicine are flowering science hence these two specialties will always crave for incorporating the emerging areas in taking the scientific frontiers further in the area of Hematology and Transfusion Medicine. I am sure that scientists of NIIH under proper guidance will reach hitherto untouched heights of scientific excellence.

RED CELL SEROLOGY

Background

With the establishment of Blood Group Reference Centre in the year 1957, the first Department to be started was the Department of Red Cell Serology.

The main activities of this Department were

1. Development, production and standardization of blood grouping reagents.
2. Development of methodologies for blood grouping and crossmatching.
3. Problem solving in grouping, crossmatching, identification of irregular antibodies and rare bloods.
4. Conduct research in transfusion medicine.
5. Train blood bank personnel.
6. Antenatal serology for maternal isoimmunization.

Facilities offered

The service activities of this Department extended to blood banks, hospitals, patients etc. include solving problems in a) ABO and Rh blood grouping whenever there are discrepancies in blood grouping results and confirming the ABO & Rh blood group status b) perform Rh antibody titres in RhD negative antenatal mothers to detect Rh antibodies c) Rh genotyping by serology for husbands of RhD immunized mothers d) ABO antibody titre in mothers having ABO incompatible infants suspected to have ABO-HDN e) Detection and Identification of alloantibodies in patients with history of transfusions / pregnancies, in patients with problems in finding compatible units of blood for transfusion and in patients who have had transfusion reaction f) investigations for autoimmune hemolytic anemias.

Training programme

Annual training programme in Transfusion Medicine is conducted for Blood Bank Medical Officers for a period of six weeks and for blood bank technicians for a period of four weeks at the Institute. The course covers topics on blood group serology and blood bank methodologies and other relevant topics related to blood banking. Candidates from all over India can apply for this course. This annual training programme is being conducted regularly for the past four decades. Training programmes are being conducted to establish Basic Red Cell Serology Techniques as a part of pretransfusion investigation procedures in the blood banks of North East Region of India.

Major thrust areas of Research and Achievements.

The discovery of Bombay phenotype, a rare blood group in the year 1952 and the discovery of In^a blood group in the year 1973 had given international recognition to the department and the centre. In addition, other rare blood groups reported by the department are D--/D--, I-i- phenotype, Mg antigen of the MNS blood group system,

In a+b-, Co(a-b-) and Rh Null. Facility for Intrauterine Transfusions was established at Wadia Maternity Hospital to treat cases of severe Rh alloimmunized women.

After the discovery of the Bombay blood group and In^{a} blood group, extensive systematic population studies were conducted to know the incidence of these blood groups and their inheritance pattern. Studies on weaker variants of A and B antigens, along with observations like weakening of ABH antigens in pregnancy and leukemia, glycosyl transferace studies in pregnancy, I and i antigen studies on Bombay phenotype, seed agglutinins and blood group specificities, E.Coli and acquired B antigens, factors responsible for hyperbilirubinemia in neonates, response in anti-A, anti-B titres after tetanus toxoid injections in pregnant women and normal adults, studies on Rh-HDN and ABO-HDN have been important contributions of this department. Different techniques like IRMA, Penicillanase ELISA and Alkaline phosphatase ELISA for measurement of anti-D concentration and Antibody Dependent Cell mediated Cytotoxicity assay were standardized and used in correlating it with severity of Rh HDN. ELISA technique using Penicillanase enzyme was developed for detection of weaker variants of A and B antigens.The following studies were conducted on RhD variants

1. Epitope analysis of D antigen in different caste and communities in Indian population
2. Incidence of partial D in Indian population
3. Classification of partial D and weak D into different categories using serological and molecular techniques
4. Efficiency of commercial monoclonal anti-D reagents to detect partial D variants in our population
5. RhD PCR for prenatal diagnosis in RhD immunized women
6. Diagnostic strategy for detection and identification of D variants in discrepant cases in Indian population.

Flowcytometric methods were standardized for

1. Quantitation of D antigenic sites in normal, partial D, weak D and rare Rh variants
2. Rh genotyping
3. Anti-D quantitation
4. Feto maternal leak estimation
5. Estimation of Red cell bound immunoglobulins

Molecular characterization studies of Bombay phenotypes and ABO blood group antigens have been carried out. Studies were performed in the donor population to identify a) rare blood groups b) donors lacking a combination of common blood group antigens so that a rare donor registry can be created. Enzyme Linked Antiglobulin Test was standardized for estimation of red cell bound immunoglobulins.

HAEMATOGENETICS

Back ground

The department was one of the first to be established in the late 1950s as department of red cell enzymes at the Haffkine Institute unit of BGRC. The first case of G6PD deficiency in India was reported in 1961. This led to screening of different population groups for G6PD deficiency and abnormal hemoglobins in 1960s and 1970s. Screening of other red cell enzyme deficiencies was also established as a cause of hemolysis. RBC membrane alterations in different hemolytic anemias were studied and storage lesions in blood preserved in different anticoagulants related to changes in red cell enzymes and red cell membrane proteins and lipids were studied. Later, free radical induced oxidative damage to the red cell in different hematological disorders was studied. In the mid-1980s the technique of globin biosynthesis was established to measure and globin synthesis in the thalassemia syndromes. This was then used for second trimester prenatal diagnosis of hemoglobinopathies. In 1988, the department was renamed as Department of Haematogenetics.

Facilities offered

- Screening for hemoglobinopathies.

- Characterization of mutation in and thalassemias.
- First and second trimester prenatal diagnosis of hemoglobinopathies.
- Screening for unstable hemoglobin and HbM variant.
- Screening and molecular characterization of G6PD and PK deficiency.
- Screening for the glycolytic enzymopathies (e.g PFK, HK, PGK, GPI, NADH-MR).
- Screening for RBC membrane defects.

Training courses offered

We also periodically conduct training programmes in screening and molecular diagnosis of hemoglobinopathies.

Major thrust areas of research and achievements

We established the 1st center in India for prenatal diagnosis of hemoglobinopathies in 1985 using fetal blood analysis. This department also established the 1st molecular biology lab in the Institute in the year 1990. We have also had some experience in non invasive prenatal diagnosis of hemoglobinopathies by isolating fetal NRBCs from maternal blood as well as circulating cell free DNA from maternal plasma. The major thrust areas of research of the department have been to identify novel globin gene mutations and polymorphisms, genotyping, understanding the genetic factors modulating the severity of sickle cell disease in India and understanding genotype-phenotype correlations in thalassemia patients. The other interesting field of research includes the response to hydroxyurea therapy in sickle cell anemia and thalassemia patients in induction of fetal hemoglobin production and its effect on clinical expression of the disease. The first programmes for newborn screening for sickle cell disorders among tribal and non-tribal populations and follow up of the babies to understand the natural history of sickle cell disease in India are also being undertaken. Several cases of rare enzymopathies have been identified and their molecular basis determined. Prenatal diagnosis was also offered for some of these deficiencies. Simple methods for screening red cell membrane disorders using the E5'M dye test and flow cytometric osmotic fragility have been established as more sensitive and specific approaches. Several cases of methemoglobinemia due to Cyb5R deficiency were identified and many mutations identified in this gene. Besides this, our interest is also to look for the genetic risk factors causing hyperbilirubinemia among the neonates, adults and individuals with hemoglobinopathies by studying the SNPs in the candidate genes involved the bilirubin metabolism pathways.

HLA AND IMMUNOGENETICS

Background

In late 1960, Prof. P. K. Sen, a cardiothoracic surgeon of KEM Hospital did the first human heart transplantation in the country and second such transplant in the world. Subsequently along with Prof.Bhalero, Prof.Samshi, Prof.Vidya Acharya a team of organ transplantors arose in KEM Hospital and their frustrating work on dog kidney transplantation and searching its season lead to the development of the department of "Leucocyte Biology" in National Institute of Immunohaematology (known that time as Blood Group Reference Centre or BGRC). This department eventually gave birth to several interdependent departments, one of which we call today as "HLA & Immuno genetics" department.

Facilities Offered

HLA typing both by serology and molecular typing for transplantation purpose, to study HLA polymorphism in different population and for patients investigation for particular disease/drug related side effects.

HLA typing both by serology and molecular typing for transplantation purpose, to study HLA polymorphism in different population and for patients investigation for particular disease/drug related side effects.

Crossmatching for anti HLA antibodies for organ transplantation.

Training Course

The department offers training programme tailor made to develop manpower in the area of HLA & Immunogenetics

Major thrust areas of research

(I) Correlation of sequence based HLA typing with other molecular techniques of typing.

(ii) HLA and population resistance to certain infections.

(iii) Pattern of antigen presentation by HLA antigens.

Achievements

1. This department has trained several trainees across the country that is providing HLA typing services in various hospitals.
2. Over 60 research articles have been published in various areas of HLA studies including description of several antigens which has not been described from this country.
3. A strong association of HLA-B27 with haemophilic chronic synovitis, has been reported.
4. Several association studies of HLA antigens with leprosy, sero negative spondarthritis, SLE recurrent fetal loss, Rh isoimmunization, HIV infection, reaction to some of the anti HIV drug and its association with HLA antigens have also been reported

CLINICAL AND EXPERIMENTAL IMMUNOLOGY

Background

Department of Autoimmune Disorders was established in 1980 after the recommendation of the Scientific advisory committee of the Institute. Initially the interest was to develop cost effective and easy methodology to understand the pathophysiology of various autoimmune disorders. During this period, simple methodologies like passive haemagglutination technique, Immunofluorescence test using tissue sections, complement fixation assays were developed for the diagnosis of autoimmune diseases which has helped in giving referral services to government and municipal hospitals in Mumbai and neighboring cities for serological autoantibody testing and inflammatory marker detection along with clinical manifestations. This was beneficial to clinicians for early diagnosis and prognosis of the disease. This also helped in understanding immuno biology of autoimmune diseases where some of the immunological mechanisms were well understood such as idiotype-anti-idiotype network in ITP, SLE and ANCA associated vasculits (AAV), immune complex clearance mechanisms in SLE, background noise of ANCA in infectious diseases, role of anti-endothelial cell antibodies in SLE, mycobacterium tuberculosis as a trigger to autoimmunity etc.

The autoimmune diseases still pose a challenge to clinicians and research scientists ever since the nineteenth century. To widen the horizon, this department was renamed in 2010 as Department of Clinical & Experimental Immunology which is currently conducting various research activities on basic understanding of some systemic autoimmune diseases and nationally relevant infective disorders with a view to develop specific early diagnostic and management protocols.

Facilities offered

This department now gives referral services to all municipal and government hospitals in and around Mumbai for detection of various autoantibodies that helps in diagnosing autoimmune disorders at an early stage. This includes detection of various autoantibodies such as anti-nuclear antibodies (ANA), anti-double stranded DNA (anti-dsDNA) antibodies, anti-neutrophil cytoplasmic antibodies (ANCA), anti-C1q antibodies, anti-mannose binding lectin (MBL) antibodies, anti-cardiolipin (ACA) antibodies, anti-b2GP antibodies and anti-endothelial cell antibodies (AECA). This department also gives testing facilities for immune markers such as circulating immune complexes (CIC), rheumatoid factor (RF), C3, C4, MBL and C reactive protein (CRP). Patients clinically diagnosed and serologically confirmed to have different autoimmune disorders such as systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), progressive systemic sclerosis (PSS), scleroderma, ANCA

associated vasculitis (AAV) are regularly monitored every 3-4 months for their clinical severity and disease activity based on these parameters. Autoantibodies are tested in them at regular interval. The department has an access to immunofluorescence microscope, ELISA reader, ELISPOT testing system and Nephelometer.

Major thrust areas of Research and Achievements

The current goal of the research is to understand immunogenetic and environmental causes of various autoimmune diseases and their etiopathogenesis, in the hope for finding better treatment modalities and eventually a cure for patients suffering from autoimmune diseases. The research being carried out currently is mainly based on the humoral immunological aspects for development of possible biomarkers and detection of new target autoantigens for screening, early diagnosis and management with overall aim to reduce autoimmune and infectious disease burden. The recent research interest of the department includes Fcγ receptor polymorphisms, complement and mannose binding lectin gene polymorphisms, cytokine polymorphisms in SLE and autoantibodies as abzymes in SLE and Scleroderma patients. Major breakthroughs and achievements involve the study of ANCA in systemic vasculitides and development some of the latest non-invasive methodology such as indirect immunofluorescene technique using confocal laser scanning microscope for early detection of AAV cases.

This autoimmune diagnostic technology currently available at our center can be gainfully utilized to include more regional centers for early diagnosis of a significant number of autoimmune patients in Maharashtra and the neighboring states. The clinical and laboratory data generated over last two decades from our center will enable us to document the clinical course of autoimmune disease patients in Western Indian population which can be further compared in different ethnic populations across India. This will also serve a basic resource for possible clinical trials to define autoimmune disorder treatment modalities for patients in the near future.

TRANSFUSION TRANSMITTED DISEASES

Background

The TTD department was established in 1978-79, for testing of HBs antigen in different disease condition. In 1983, research as well as service activities are being carried out in collaboration with the major hospitals and research institutes of Mumbai.

After identification of other viral transmissions like HIV, HCV and HBV through blood and blood products, we have started a systemic screening programm 1989 for HIV as well as HCV and HBV as per the NACO guidelines by serology based Rapid and ELISA assays. Putative seropositive sera were then confirmed by Western blot assay. In 1991, Sentinel Surveillance centre with WHO global program on AIDS was started by including the following groups.

1. Sexual transmission: patients receiving treatment for STDs, prostitutes, and barmaids.
2. Sexual and perinatal transmission: Antenatal pregnant mothers.
3. Variable risk behavior: Blood donors, health care workers, hospital staff, and military personnel.
4. Blood and Blood Products: IVD users, recipients of blood / blood products.

In 2000, the department has been recognized as one of the twelve National Reference Laboratory (NRL) under National AIDS Control Organization (NACO).

Major thrust areas and achievement

1. Viral load assays using plasma samples of HIV positive individuals on herbal and Receptol trial by Real time PCR.
2. NAT testing for HIV, HCV and HBV antigen in blood donor samples.

One of the significant landmarks in the history of the department is the identification of an anomalous serum lactate dehydrogenase (LDH) band between LDH4 and LDH5 in Hepatitis B (Australia) antigen positive serum of a patient with hepatitis which could be due to the

interaction of hepatitis B virus and LDH enzyme in infected hepatic cell. Further studies on seropositivity of the HBs antigen in the Indian populations have been explored and documented.

NABLAccreditation

The department is also heading towards NABL (National Accreditation Board for Calibration and Testing Laboratories) accreditation for HIV testing.

HEMOSTASIS AND THROMBOSIS

Background

The Department started off in the year 1993 with establishment of basic coagulation techniques which included the screening coagulation tests, factor assays and inhibitor screening in haemophilia patients and gradually expanded into various other areas like platelet aggregation, Bethesda assays for inhibitors, thrombophilia profile, platelet antigen genotyping , thromboelastography, platelet receptor studies, endogenous thrombin potential and so on. Today the Department caters to the patients referred not only from Mumbai but other parts of the country as well, afflicted with different types of bleeding and thrombotic disorders.

The genetic diagnosis services for haemophilia were not available in the country till the mid ninties. After an initial exposure to these techniques to one of the Scientists in Angelo Bianchi Bonomi Thrombosis and Haemostasis Center at Milano , Italy the Department began offering carrier diagnosis and antenatal diagnosis to haemophilia families in the year 1995, for the first time in the country. Till to date more than 1500 families have been offered prenatal diagnosis in haemophilia and approximately the same number have been offered carrier diagnosis services. These services have also been expanded to other bleeding disorders like von Willebrand disease, rare coagulation factor deficiencies like factor VII, X and factor XIII.

In the research area, molecular basis of all the bleeding disorders have been worked out and a huge array of mutations, several being novel with interesting functional implications (Fibrinogen Mumbai, prothrombin Mumbai etc) have been reported. Some of the original contributions of the Department include, effect of the antifibrinolytic agent EACA in reducing inhibitor activity in haemophilia patients with inhibitors, role of coinherited thrombophilia in modulating clinical severity in haemophilia patients, HLA B27 and its association with chronic synovitis in severe haemophilia, association of factor V Leiden with Budd chiari syndrome and thromboelastographic classification of severe hemophilia patients.

Facilities offered

- Screening coagulation (PT, APTT, TT), Factor XIII and fibrinogen
- Factor assays
- Inhibitor screening, Bethesda assays
- Platelet aggregation studies using different agonists
- Platelet receptor studies
- Platelet antigen genotyping
- Thromboelastography
- Thrombophilia profile (protein C, protein S, antithrombin, factor V Leiden mutation)
- Carrier diagnosis , first and second trimester prenatal detection of haemophilia, VWD and rare factor deficiencies

Training Programmes/others

- The Department is a recognized Center for training in Comprehensive Haemophilia Care Program for South East Asia and so far 8 Doctors from India and other Asian countries have been trained in different aspects of haemophilia care.
- The laboratory techniques and the genetic techniques are updated by taking part in different quality control programmes like EQAS, NEQAS, ISTH micropartcle standardization programme and others
- Training Medical and paramedical personnel in the laboratory diagnosis of coagulation disorders

Major thrust areas

- Catalytic antibodies in haemophilia
- Microparticles and their role in thrombosis and recurrent fetal loss
- Warfarin pharmacogenomics
- Folate pathway gene polymorphisms and their association with severity of malaria
- Education, training in laboratory and genetic diagnosis of haemophilia
- Development of cost effective techniques for diagnosis of different bleeding disorders, inhibitors with high sensitivity and specificity

Achievements

- Report of novel functional variants of coagulation factors like Fibrinogen Mumbai, Prothrombin Mumbai.
- Strong association of HLA B27 with chronic synovitis in severe haemophilia A patients
- Human platelet antigen profile in Indian population and its association with neonatal alloimmune thrombocytopenia
- Thromboelastographic classification of severe haemophilia patients
- Modulation of clinical severity in severe haemophilia patients by coinherited thrombophilia
- Acquired and heritable thrombophilia as a major cause of recurrent fetal loss
- Education of laboratory workers in basic coagulation techniques
- Molecular basis of hemophilia A and VWD and other rare coagulation disorders and platelet function defects
- Genetic and nongenetic risk factors for inhibitor development in haemophilia patients
- Report of prevalence of catalytic antibodies in congenital haemophilia A patients, a novel mechanism of factor VIII neutralization
- JAK2 mutation in different thrombotic groups
- Effect of the antifibrinolytic agent EACA in reducing inhibitor activity in haemophilia patients with inhibitors
- Strong association of factor V Leiden mutation with Budd chiari syndrome
- Heterogeneous genetic defects in genes involved in platelet cytoskeleton as a cause of macrothrombocytopenia in West Bengal
- Role of cytochrome and VKORC1 gene polymorphisms in warfarin dosing
- Development of ELISA for detection of Glanzmanns thrombasthenia and its heterozygote carriers

CYTOGENETICS

Background

The cytogenetics department was established in the year 1997 with an objective to study the chromosomal aberrations in hematological malignancies. The department expanded the area of research and also catch up the advanced technology like, fluorescence in situ hybridization (FISH), comparative genomic hybridization (CGH), spectral karyotyping and molecular biology. The department is actively engaged in research, service and training.

Facilities Offered

Karyotyping and FISH investigations are available for the patients DS,AML,CML,ALL and CLL.

RT-PCR study in CML patients.

The Karyotyping investigations also available for patients with Down syndrome, dysmorphic features, congenital anomalies, sex abnormal etc.

Chromosome breakage investigations (MMC, DEB induced) for aplastic anemia, fanconi anemia, Ataxia-

Telangiectasia,Nijmegen breakage syndrome.

Training

Short term training in the area of Human cytogenetics is given to the students, technologists, mid level scientists, and University faculty members as and when required.

Major thrust areas

The main area of research interest is to look for genomic instability and molecular mechanisms in chromosomal instability syndromes. Study of chromosomal abnormalities in hematological malignancies using advanced cytogenetic tools as well as the identification of chromosomal break points and its molecular pathogenesis in MDS are also the research area of interest. Presently, the study of fanconi anemia pathway and DNA repair mechanism is a high priority area of research to understand the genomic instability and leukemeogenesis in humans.

Achievements

Identification of 56% chromosomal abnormalities including novel chromosomal aberrations in myelodysplastic syndromes (MDS). The occupational exposure, especially pesticides was found to be one of the etiological factors in MDS.

DNA copy number changes were detected on chromosomes 1 and 7 in MDS patients by comparative genomic hybridization (CGH).

The mutational analysis of tyrosine kinase domain (TKD) was established in chronic myeloid leukemia with drug resistance.

The two micro RNAs (MIRN 219-2 and MIRN 199b) of 9q34 region in CML patients proposed to be associated with Imatinib drug resistance.

We are the first to established fanconi anemia work up including chromosomal breakage , western blotting for FANCD2 and complementation analysis of A,C,G genes.

The novel mutations in FA-A group patients were also identified by MLPA.

PAEDIATRIC IMMUNOLOGY AND LEUKOCYTE BIOLOGY

Background

Dept. of Paediatric Immunology and Leukocyte Biology is one of the youngest departments in NIIH. In 2006, Bai Jerbai Wadia Children's Hospital approached to us with a proposal to establish the facilities for diagnosis of Primary Immunodeficiency Disorders (PID). In 2006, we diagnosed the first case of severe combined immunodeficiency (SCID). Gradually facilities for comprehensive evaluation of different components of immune system to diagnose different PIDs including SCID, antibody deficiencies like X-linked agammaglobulinemia (XLA), phagocytic defects like chronic granulomatous disease (CGD) and leukocyte adhesion deficiency-I (LAD-I), disorders of Immune Dysregulation like hemophagocytic lymphohistiocytosis (HLH), etc were established. In 2008 the facilities for prenatal diagnosis by flowcytometry in selected PID was established and subsequently the first prenatal diagnosis for LAD-I was done.

Facilities offered

- Investingations for diagnosis of PID.
- second trimester prenatal diagnosis for families affected with SCID, CGD, LAD-I and XLA
- Diagnosis of Paroxysmal Nocturnal Hemoglobinuria and immunopheno typing of acut and chronic leukemias by flowcytometry.

Investigations	Disease
T cells: **Lymphocyte subsets:** 1. T, Tc, Th, B , NK 2. DNT cells 3. Memory, naïve and activated T cell **Specific cell surface antigen expressions:** 1. CD132: 2. CD127 3. CD154 **Functional assays:** pSATA5 expression after stimulation pSTAT3 expression after stimulation T cell proliferation assays by CFSE Certain cytokine estimations: IL-10, IL 12 and INF RBC ADA levels	**Combined immunodeficiencies** All PID X-SCID IL-7Ra deficiency X-HIGM X-SCID and JAK 3 SCID HIES Combined immunodeficiencies ADASCID
B cells: 1. B cell numbers: CD19, CD79a, CD20 2. Intracellular Btk expression 3. Immunoglobulin estimation by nephelometry: Ig G, A, E,M 4. Specific antibody responses	**Antibody deficiencies** XLA
Phagocytic Functions: 1. CD18, CD11 expression: 2. DHR 3. NBT	**Phagocytic defects** LADI CGD CGD
NK cell function: 1. NK cell enumeration 2. NKcell cytotoxicity 3. Granule release assay 4. Perforin expression	Genetic HLH MUNC and Syntaxin defects Perforin deficiency
Miscellaneous: Intracellular expression of WASP	 WAS

Training courses offered

We conduct training programmes for 'Advanced clinical applications of flowcytometry'.

Major thrust areas of research and achievements

In India we are the first center to offer comprehensive diagnostic work-up for patients with PID. This is also the only center offering prenatal diagnosis of certain PID by flowcytometry analysis. We have also established molecular diagnostic facilities for some common PIDs like LAD-I, HIGM and some SCIDs. Our thrust areas of research include phenotypic and molecular characterization of Primary Immunodeficiency Disorders. We have identified and characterized many rare PIDs. We have diagnosed a case of autoimmune lymphoproliferative disorder (ALPS) with homozygous FASL deficiency, which is the first case in world literature. We have also performed molecular characterization of LAD-I, HIGM, SCID and found many novel mutations in these patients.

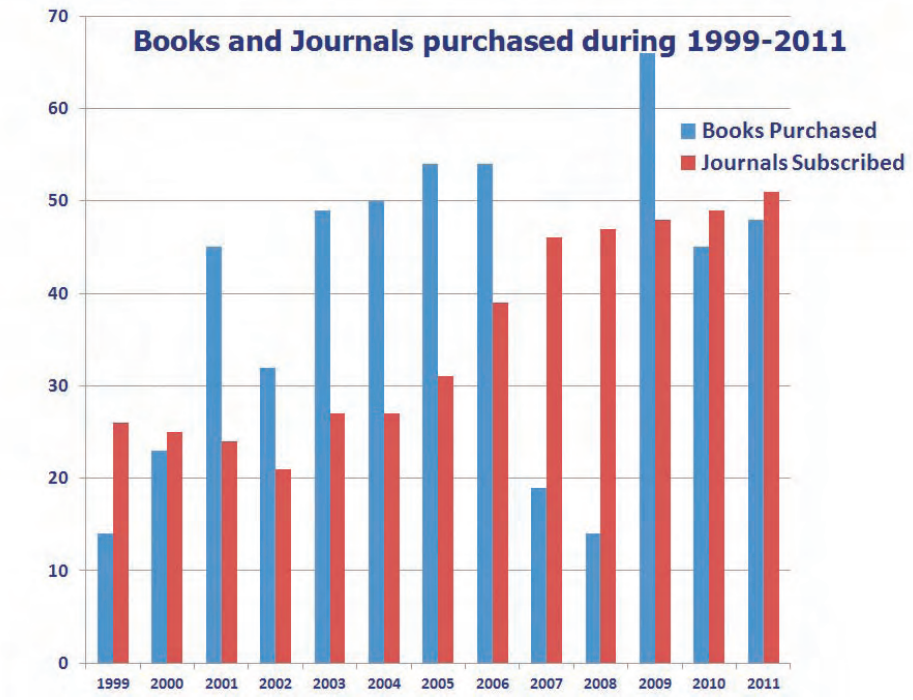
We have developed two new assays for comprehensive evaluation of NK cell function (NK cell cytotoxicity and NK cell Granule release Assay) using whole blood for the first time. These assayas are not only easy to perform but also require very less volume of sample and save significant amount of processing time and reagents. These assay have been used for evaluation of patients with Hemophagocytic Lymphohistiocytosis (HLH). This is the only institute in India which is offering facilities for diagnosis of Familial HLH.

We are the first center in India to start FLAER based PNH diagnosis. We are also working on biology of leukemic stem cells in patients of acute myeloid leukemia (AML) especially immunophenotypic characteristics, cell signaling and molecular abnormalities.

LIBRARY & INFORMATION SCIENCE

Background

The NIIH library plays a vital role in the collection, development and dissemination of scientific and technical information to meet the present and future needs of the Institute. The Library was established in the year 1988 and thereafter expanded its collection of print media and now has a collection of 1300 books and 1600 bound volumes especially on specific topics of Medicine like Hematology and Immunohaematology. It has been classified under Category II according to 1st modernization plan of ICMR libraries in 1999. Presently it is classified under Category III under 2nd Modernization Plan of ICMR Institutes Libraries in 2010.It has other print media like reports, technical reports, reprints, theses etc.



NIIH library services have been upgraded by incorporating modern information technology (IT) like Computer, communication (e-mail,internet) fax, scanners, database access (online/offline), CD-ROM's, DVD and Pen drive facilities, multi-media, audio-visual, multi-digital color Xerox facilities, e-resources (consortia, Journals/books). NIIH library has been automated by using Graphical Library Automated System (GLAS) software with additional Web OPAC features. Library functions like cataloguing, serials, acquisition and circulation are being carried out. Implementing this software, library functions become more productive and will allow efficient sharing of our library resources with other ICMR networking libraries.

NIIH library has an access to J-Gate Custom Content for Consortia (JCCC@ICMR), J-Gate through Informatics India and NML-ERMED consortia which is a customized intranet solution to maximize the usage of journals of ICMR Institutes and National Medical Library of India. It also has an access to ICMR e-journals consortia and the Cochrane Library.

Library Collections from 1988-2011

Books	1300
Journals Subscribed	Intl-39 Nat-20
E-Journals Subscribed	Intl -28, Nat- 3
Bound Volumes	1600
Thesis (M.Sc & Ph.D)	136
Reprints	3087
Annual Reports	140
NIIH Publications	12 (Books/Tech Manuals)
CD-ROM/DVD	652
Video Cassette's	17
Audio Cassette's	22

Library Services

a. Library catalogue and its link to NIIH Website. (www.niih.org.in)

b. Library Newsletters published from 2002 to till date.

c. Inter-library loan facilities to Readers.

d. Reprographic services to scientists, scholars, students and staff.

e. Current awareness services to reader.

f. Selective dissemination of Information to readers.

g. Collection of Newspaper clipping for important news.

h. Comb and spiral binding facilities for readers.

i. Reprint request facilities to researchers.

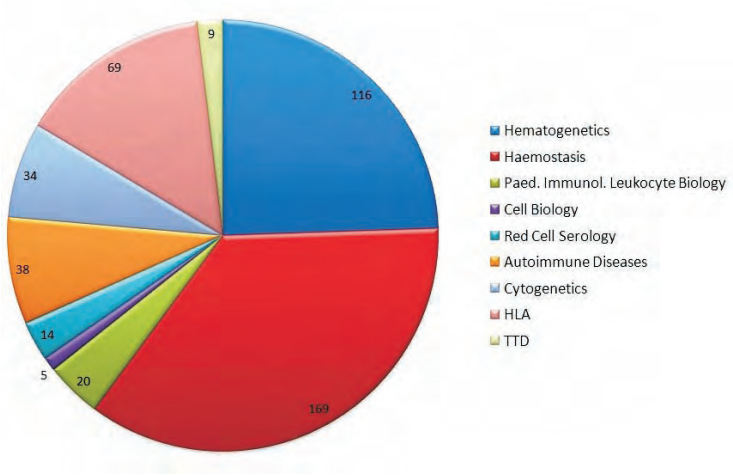
j. GLAS (OPAC) online library resources searching catalogue facility to readers.

k. Online searching facilities with high speed internet connections to readers.

l. Wi-Fi connection facility for library and seminar hall for internet & email.

m. Audio-Visual facilities like LCD projector, slide projector, overhead projector with laptops, cord-less conference system with high watt speakers, TV and 42" LCD-TV for projection, video cassette player, CD-DVD record player, audio players, automatic motorized screen for display, and other multi-media instruments.

List of published National and International articles of all the Departments of National Institute of Immunohaematology ICMR, Mumbai from 2000-2011 (Ref. Data taken from Annual Reports)



Laboratory Animal Facility

The Laboratory Animal Facility of NIIH is registered with the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) New Delhi, for breeding and conducting experiments on small laboratory animals. Since 2004, we maintain small animals like Bulb/C mice and Rabbits for the production of murine monoclonal antibody against whole human platelets, and anti ABO blood groups antigen. Breeding mice and experimental animals are kept in polypropylene cages on separate racks. The Institutional Animal Ethics Committee (IAEC) which was approved by CPCSEA meets once in a year to discuss research projects which involved animal experiments.

NIIH HAPPENINGS

Scientific Meetings

Dr. K. Ghosh, Director:

1. Attended the Hemophilia Federation of India Orthopedics meet at Goa from 21st-22nd January 2011.
2. Attended the Scientist and Technicians meet at NIV, Pune on 3rd February 2011.
3. Attended the Institutional Animal Ethics Committee meeting of Bombay Veterinary College, Mumbai on 5th February 2011.
4. Attended the meeting of the Moving Academy at Belgaum on 26th February 2011.
5. Invited as a member of the Scientific Advisory Committee of Span Diagnostics at Surat from 12th - 13th March 2011.
6. Attended a meeting on Disscussions on Sickle Cell Anaemia and Thalassemia at Nirman Bhavan, New Delhi on 20th April 2011.
7. Attended the Director's meeting at ICMR New Delhi on 8th - 9th May 2011.
8. Attended the meeting of the Tribal Health Research Forum at Dibrugarh from 8th-9th August 2011.
9. Invited as an Expert Member for 7th IBSC Meeting of Primal Health Sciences and was also a member of the team for Inspection at Goregaon, Mumbai on 8th September 2011.
10. Attended the Tribal Health Research Form meeting at ICMR, New Delhi on 4th December 2011.
11. Attended the Scientific Advisory Group meeting held at ICMR, New Delhi on 26th December2011.

Dr Roshan B Colah, Scientist F:

1. Attended the SAC meeting of Surat Raktadan Kendra on 12th March 2011.
2. Attended the Blood Transfusion Sub-Committee meeting of Indian Red Cross Society as a member on 16th May 2011.
3. Attended the meeting of the ICMR Tribal Health Forum at Dibrugarh from 9th - 10th August 2011.
4. Organized the quarterly meeting of the ICMR Tribal Health Research Forum at NIIH Mumbai on 6th December 2011.

Dr Manisha Madkaikar, Scientist E:

1. Invited as an expert for the meeting on 'Development of ICMR/ DBT guidelines for Stem Cell Research and Therapy' held at Lonawala on 25th -27th Nov 2011.

Dr Malay Mukherjee, Scientist D:

1. Attended Combined Project Review Committee meeting on Anatomy, Hematology, Anthropology and Human Genetics held at ICMR Headquarters, New Delhi on 3rd March 2011.
2. Attended “Tribal Health Forum Meeting” held at NIIH, Mumbai on 6th December 2011.

Conferences / Seminar / Workshops

Dr.K.Ghosh, Director:

1. Attended the International Conference on Thalassemia, at NRS Medical College, Kolkata on 4th - 5th March 2011.
2. Invited to attend the 100 years Landstainers Discovery and delivered a guest lecture on "Epidemiology in Hemoglobinopathies" at St.John's Medical College, Bangalore on 17th June 2011.
3. Invited to deliver a talk on "Consultation for identification of Public Health Research in India" at the ICMR Centenary Celebration, at NIE Chennai on 13th August 2011.

Dr. Roshan Colah, Scientist F:

1. Invited to talk on "Alpha globin chain variants: Identification and clinical significance" at the CME in Hematology at Bombay Hospital, Mumbai on 28th Jan, 2011.
2. Conducted a Translational Research Workshop on "Molecular analysis and Prenatal diagnosis of hemoglobinopathies" at Govt. Medical College, Nagpur for 6 Medical Colleges from Maharashtra on 3rd - 4th Feb 2011.
3. Invited to give talks on " Research on Thalassemia in India- Initiatives by ICMR" and " Prenatal diagnosis of Thalassemia in India" at the International Meeting on Hb E-β thalassaemia- A focus on South East Asia held at Kolkata from 5th - 6th March 2011.
4. Conducted Translational Research Workshops on "Molecular and Prenatal Diagnosis of Hemoglobinopathies" at NIV, Pune for Medical Colleges from 11th - 13th May 2011.
5. Organized a workshop on "Molecular and Prenatal Diagnosis of Hemoglobinopathies" for ICMR Institutes under the Tribal Health Research Forum at NIIH Mumbai from 11th - 14th October 2011.
6. Participated and gave an invited talk on "Antenatal diagnosis and pre-implementation genetic diagnosis of thalassemias" at the 52nd Annual conference of ISHTM at Chandigarh from 10th - 13th November 2011.
7. Invited to talk on "Genomics of fetal hemoglobin and its clinical implications in β- thalassemia " at the 3rd Asian Workshop on "Genomics and Community Genetics" at Dehradoon on 20th November 2011.
8. Conducted a Translational Research Workshop on "Screening and Molecular diagnosis of Hemoglobinopathies" at CMC Ludhiana for Medical Colleges of Punjab from 12th - 14th December 2011.

Dr. K. Vasantha, Scientist E:

1. Invited to deliver lectures and practical demonstration into the workshops on "Importance of Red Cell Antibodies and the Techniques for screening and Identification" held at Jubilee Mission Medical College and Research Institute, Thrisur, Kerala from 23rd - 24th March 2011.
2. Invited to deliver Keynote address on "Pretransfusion testing" in the Ortho circle meet held at Bombay Hospital, Mumbai, on the 30th of Sept 2011.
3. Invited as a Chairperson for a scientific session on Immunohaematology during the 36th Annual National Coference of ISBTI –Transcon 2011 held at Panchkula, Haryana, from 30th Oct to 1st Nov 2011.
4. Invited to give a lecturer entitled "An overview of the importance of clinically significant blood group systems in Transfusion Medicine" in the 34th Annual Conference of Gujarat Association of pathologists and Microbiologists – Gujarat Chapter – IAPM, at Ahmedabad on 27th Nov. 2011.

Dr Manisha Madkaiakar, Scientist E:

1. Attended 1st International conference on Primary Immunodeficiency Diseases held at New Delhi from 5th - 6th March 2011.
2. Invited to deliver a talk on "Flowcytometry: Basics & Applications" in the Workshop on "Techniques in Biotechnology" organized by Department of Clinical Pharmacology, TN Medical College & BYL Nair Ch Hospital on 14th May 2011.

3. Invited as speaker and delivered a lecture entitled "Advances in flowcytometric diagnosis of PNH" at 8th Clinical Cytometry Course held at Tata Memorial Hospital, Mumbai on 12th Aug 2011.
4. Attended 4th Annual Meeting of The Cytometry Society-India held at Chandigarh on 13th Oct 2011.
5. Invited as a faculty member at '12th Indo-US workshop on Advanced Flow Cytometry Techniques' held at Chandigarh from 13th - 16th Oct 2011.
6. Invited to deliver a lecture on 'Applications of flowcytometry for diagnosis of PID' at 12th Indo-US workshop on Applications of Laser Flow Cytometry in Biomedical Research held at Pune from 19th - 20th Oct 2011.

Dr A C Gorakshakar, Scientist E:

1. Delivered a lecture on "Hemoglobin electrophoresis and HPLC" in the Workshop on Thalassemia' conducted on 10th Nov during 52nd Annual Conference of ISHTM held at Chandigarh from 10th - 12th Nov 2011.
2. Participated as a guest faculty in CME on 'Sickle Cell Anemia' organized by IMA, Jalgaon Chapter at Jalgaon on 17th Dec 2011 and delivered a talk entitled "Sickle Cell Anemia: Epidemiology, Diagnosis and Prevention."

Dr Shrimati Shetty, Scientist E:

1. Organized a workshop at the Institute on "Laboratory Diagnosis of Bleeding Disorders" under the ICMR Translational Research project from 5th - 7th of July 2011.

Dr Malay Mukherjee, Scientist D:

1. Attended "34th Annual Conference of Mumbai Hematology Group" held at Mumbai from 5th - 6th March 2011.
2. Invited as a speaker in "Dr B C Kar Memorial International Conference & CME on Sickle Cell Disease" held at Burla, Orissa from 12th - 13th March 2011 and delivered a lecture on "Laboratory diagnosis on Sickle cell syndrome".

Dr. Anita Nadkarni, Scientist D:

1. Presented a paper entitled "Molecular Characterization of Hb H disease in India" at 12th International Conference on Thalassemia and Hemoglobinopathies and 14th International TIF conference for thalassemia patients and parents held at Antalya ``Turkey, 11th - 15th May 2011.
2. Participated as a faculty member in Dr B C Kar Memorial Conference and CME on Sickle Cell Disease held at Burla , Bhuwaneshwar from 12th - 13th March 2011 and delivered a lecture " Prenatal Diagnosis of Sickle cell disease".

Dr. Aruna Pawar, Scientist C:

1. Attended workshop on "Calibration, Biosafety and SIMS Workshop - PCI" from 10th – 12th May 2011.
2. Attended workshop on "EQAS I Round Panel Distribution" Workshop and delivered a lecture on "fire safety" on 27th July 2011.
3. Attended workshop on EQAS II Round Panel Distribution Workshop held on 13th Dec 2011.

Dr. Swati Kulkarni, Scientist B:

1. Attended 36th Annual National Coference of ISBTI –Transcon 2011 held at Panchkula, Haryana, from 30th Oct - 1st Nov 2011 and presented a poster entitled "D variants in apparently Rh D negative antenatal women".

1. Attended Mentorship workshop on Bio-CARe for women scientist on "How to write an effective scientific grant proposal" organized by DBT at University of Pune on 9th nov, 2011.

Dr. Bipin Kulkarni, Scientist B:

1. Delivered a lecture on "Hemophilia: carrier detection and antenatal diagnosis" at HFI, Rajkot Chapter on 9th June 2011 for the Hemophilia patient families and caregivers.
2. Attended ISHTM HAEMATCON 2011 and presented a poster entitled "Study of patterns of Microparticles in Thrombocytopenias" held at

Chandigarh from 10th - 12th Nov, 2011.

Dr. Prabhakar Kedar, Technical Officer:

1. Participated and delivered a talk on "Activities of NIIH" at Technical conference organized at NIOH, Ahmedabad from 11th - 12th Jan 2011.
2. Participated as a Faculty member in "Enzymology Workshop" conducted from 6th - 8thMay,2011 under the aegis of Haffkine Institute for Training Research and Testing, Parel, Mumbai

Students:

1. Dipti Upadhye attended ISHTM HAEMATCON 2011 and presented a poster entitled "Three non deletion alpha gene variants identified in neonates during newborn screening for sickle cell disorders" held at Chandigarh from 10th - 12th Nov, 2011.
2. Pooja Dabke attended ISHTM HAEMATCON 2011 and a presented poster entitled "The effect of Pre G globin haplotype on the clinical severity of Thalassaemia and Sickle Cell patients" held at Chandigarh from 10th - 12th Nov, 2011.

Awards

1. Dr K Ghosh, Director received the J.G.Parekh Oration Award at the Annual Meeting of Mumbai Haematology Group held at Mumbai on 6th March 2011.
2. Dr K Ghosh, Director received the Kunti and Om Prakash ICMR Award held at Nirman Bhavan, New Delhi on 8th November 2011.
3. Dr K Ghosh, Director received the J.B.Chatterjee Oration Award at ISHTM HAEMATCON 2011 held at Chandigarh on 11th November 2011.
3. Mr. Navin Pai, Ph.D student was awarded the JSTH Asian-Pacific Scholarship at the XXIII Congress of the International Society on Thrombosis and Haemostasis & 57th Annual SSC Meeting held in Kyoto, Japan from 23rd - 28th July 2011 for the work on "Phenotypic and Genotypic characterization of protein C deficiency cases from India"
4. Ms. Patricia Pinto, Ph.D student was awarded the 'Developing World Scientist Award' by the International Society on Thrombosis and Haemostasis (ISTH), for the work on 'Immune Response Gene Polymorphisms and Inhibitor Development in Severe Haemophilia A Patients in India', at the XXIII Congress of the International Society on Thrombosis and Haemostasis & 57th Annual SSC Meeting held in Kyoto, Japan from 23rd - 28th July 2011.
5. Ms. Sharda Shanbhag, Laboratory Technician won the 2nd prize for best poster in technical cadre for the work on "Molecular basis of severe Factor XIII deficiency: Seven novel mutations detected" at ISHTM HAEMATCON 2011, held at Chandigarh from 10th -12th Nov, 2011.
6. Ms.Selma D'silva, Ph.D student was awarded the "L.H. Hiranandani Award" for the best poster entitled "Cord Blood Bilirubin level in relation to U G T 1 A 1 gene polymorphism in neonates" at the 34th Annual Conference of Mumbai Hematology Group held at Mumbai from 5th - 6th March 2011.
7. Mr. Prashant P. Warang, Technical Assistant was awarded the "Dr J C Patel best paper award" for the work on "Understanding the biochemical and molecular basis of undiagnosed inherited hemolytic anemias and methemoglobinemia in India" at the 52nd Annual conference of the ISHTM HAEMATCON 2011, held at Chandigarh from 10th - 12th November 2011.
8. Ms. Snehal Mhatre, PhD student was awarded the "Lady Tata Memorial Trust Junior Research Scholarship" from 1st August 2010- 31st July 2011.
9. Ms. Snehal Mhatre, PhD student was awarded the "H.M. Bhatia Award" for best oral presentation entitled "Establishment of Whole Blood Flow cytometry based NK cell cytotoxicity assay for diagnosis of Hemophagocytic Lymphohistiocytosis (HLH)" at the 34th Annual Conference of Mumbai Hematology Group.
10. Ms. Snehal Mhatre, PhD student was awarded the

"Best Oral Presentation Award" for the paper entitled "Comprehensive evaluation of NK- cell function using Flow cytometry based assays for diagnosis of Hemophagocytic lymphohistiocytosis (HLH)" at 4th Annual Meeting of The Cytometry Society.

11. Mrs. Anita Mukherjee, Personal Secretary was awarded the 1st prize at the Conference on "Introduction of new management techniques in ICMR administration" held at NIRRH, Mumbai, for the paper entitled "Job Satisfaction".

Others

Dr.K.Ghosh, Director:

1. Conducted the CME on Immunodefciency as a part of Centenary Celeberation of ICMR on 1st February 2011.
2. Invited as a external member to conduct DM exams at Calicut on 12th - 13th February 2011.
3. Visited the site at Chandrapur with other members of ICMR and Parliament for the upliftment of Sickle Cell Disease at Chandrapur from 18th - 19th March 2011.
4. Invited to conduct DM Clinical exams at University of Calcutta on 20th June 2011.
5. Invited as a Selection Committee Member for the assessments and promotions in Department of Transfusion Medicine, SGPGI, Lucknow on 23rd October 2011.
6. Attended the ICMR Day Celeberations at Nirman Bhavan, New Delhi, on 15th November 2011.

Dr. Roshan B Colah, Scientist F:

1. Participated in the Interactive Panel Discussion on "Thalassemia" organized by Leela Mulgaonkar Foundation, Indian Red Cross Society, Mumbai on 26th March 2011.
2. Was nominated as an ICMR representative for the DSIR Inspection of Jaslok Hospital & Research Centre on 19th April 2011.

Dr. Malay Mukherjee, Scientist D:

1. Attended Innovation Update: "The Ion TorrentTM Personal Genome Machine" held at Pune on 20th October 2011.

Mr. Vijay G Padwal, ALIO:

1. Qualified Ph.D. Entrance Test (PET) in Library & Information Science at University of Mumbai in February 2011 and registered for the same.

Maya R Gupta, Technical Assistant:

1. Undergone a training at CCMB, Hyderabad for Mitochondrial DNA studies under Dr K Thangaraj from 15th March - 5th May 2011

Administration:

1. S.T.Dukhande, A. Mukherjee, A.A. Malgaonkar, S.A Rasam, W.Narkar, R Ghavnalkar, G.N. Gangurde, K Rajpurkar, P Pradeep, K Gorakshakar and D Medhekar attended a Conference on "Introduction of new management techniques in ICMR administration" held at NIRRH, Mumbai on 4th January, 2011. The following papers were presented;

   1. "Job Satisfaction" by Anita Mukherjee, PS.

   2. "Leadership Quality" by Preeti Pradeep, PA.

   3. "Communication Skill" by Kala Gorakshakar, UDC.

2. Mr. Swami Durai, Section Officer, superannuated on 30th April 2011 after completion of 33 years of service.
3. Mrs. Anita Mukherjee and Mr. Sunil Rasam attended a workshop on "Reservation and Concessions in Services, preparation and operation of post based reservation rosters" held at Bangalore from 20th - 22nd October, 2011.

2nd International Conference on Primary Immunodeficiency Diseases

2nd - 4th February, 2013

Venue: Hyatt Regency Hotel, Mumbai-India

Recent advances in the following areas will be covered during the conference.

- **Basic mechanisms of immune response**
- **Diagnosis of PIDs**
- **Molecular mechanisms of PIDs**
- **PID in India**
- **Therapy of PID**

For more details please visit the Website: http://www.niih.org.in

Conference Secretariat : Dr .Manisha Madkaikar

National Institute of Immunohaematology,13th Floor, New Multistoreyed Building, KEM Hospital Campus, Parel, Mumbai – 400 012. India

Email Id: madkaikarmanisha@gmail.com , pidcon2013@gmail.com

Workshop on Molecular and Prenatal Diagnosis of Hemoglobinopathies under ICMR Tribal Research Forum

Workshop on Laboratory Diagnosis of Bleeding Disorders under ICMR Translational Research Programme

Dr K Ghosh receiving Kunti & Omprakash award from Mr Ghulam Nabi Azad, Hon'ble Minister, Health & Family Welfare

Dr Srini Kaveri, Director, INSERM UMRS 872, Paris Delivering a Lecture

Student's participation in the Science day Celebration

Dr V M Katoch, Secretary, DHR & DG, ICMR addressing the THRF meeting

Dr V M Katoch, Secretary, DHR & DG, ICMR addressing the SAC meeting of the Institute

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