

**Pediatric Allergy and Immunology Unit, Advanced Pediatrics Center, Post Graduate Institute of Medical Education and Research, Chandigarh, India**  
**AND**  
**Department of Immunopathology, 4th Floor Research Block A, Post Graduate Institute of Medical Education and Research, Chandigarh, India**

Our institute has the privilege of being designated as a Centre for Advanced Research (CAR) in Primary Immunodeficiency Diseases by the Indian Council of Medical Research. The unit is recognized by, and affiliated to, the Jeffrey Modell Foundation (JMF; [www.info4pi.org](http://www.info4pi.org)) for Primary Immunodeficiencies, USA. It is also designated as a Regional Centre for Diagnosis and Treatment of Primary Immunodeficiency Diseases by the Foundation for Primary Immunodeficiencies, USA (FPID; [www.fpid.org](http://www.fpid.org)). Our Institute has a ratified Memorandum of Understanding with the FPID in this regard.

Laboratory services are being provided by the Pediatric Allergy Immunology Laboratory. These are supplemented by the Department of Immunopathology which has been existence since 1972. This department provides the necessary laboratory back-up required for the diagnosis of systemic and organ specific autoimmune diseases and immunodeficiency disorders. The Department also has the requisite infrastructure, expertise and trained personnel for conducting state of the art research in field of immunology and immunopathology.

Blood sample in EDTA and plain vial is needed, and turnaround time is (1-3 days for Nephelometry ELISA and Flow assays) for molecular testing around 5-10 days are needed

<b>Technique based on</b>	<b>Test available</b>	<b>Cost to patient</b>	<b>Code</b>
<b>Nephelometry-based assays</b>	Serum Immunoglobulin estimation IgG, A, M	Rs 100 each	PD 141-142
	Serum immunoglobulin G subclass estimation (IgG1, G2, G3, G4)	Rs 500 each	PD139
	Serum Complement C3 and C4 estimation	Rs 125 each	PD 143-144
	CRP	Rs 100	PD021
	ASO	Rs 50	PD020
	RF	Rs 100	PD109
	<b>Enzyme-linked immunosorbent- based assays</b>	Serum IgE	Rs 250
Antibody response polysaccharides		Rs1500	PD087
Anti diphtheria antibody		Rs 100	PD036
Anti tetanus antibody		Rs 100	PD037
Functional assessment of complement by ELISA (CH50, AP50 and Cl sterase)		Rs1500	PD078
Soluble CD25 (IL2R) for HLH		Rs1500	PD088
Anti ds DNA		Rs 250	PD 136
Soluble FASL for ALPS		Rs1500	PD089
Estimation of serum complement components		Rs 3000	PD086
<b>Indirect immunofluorescence</b>		ANA (antinuclear antigen)	
	Anti ds DNA by CLIFF method	Rs 250 Rs 200	PD079

Immunodot	ANA and Myositis Immunodot	Rs 1000 each	PD138
<b>Flowcytometry based assays</b>	<p><b>Surface expression</b></p> <p>Lymphocyte subset analysis: T, B and NK T cell subsets (CD45, CD3, CD19, CD56)</p> <p>T cell subsets (CD3 CD4 CD8)</p> <p>Memory and Naive T cells (CD3, CD4, CD8, CD45RA, CD45RO)</p> <p>Double negative T cells (CD3, TCR<math>\alpha</math>3, CD4, CD8)</p> <p>CD18, CD11a, CD11b (LAD1)</p> <p>CD 132 (common <math>\gamma</math> chain SCID)</p> <p>CD 127 (IL7Ra) for SCID</p> <p>b558 (gp91phox/p22phox) for (CGD)</p> <p>HLA DR (MHC class II deficiency, Omenn) on CD3</p> <p>IFN<math>\gamma</math>R1, IL12R<math>\beta</math>1 expression (MSMD)</p> <p>CD40L expression on activated T cells (X-HIGM)</p> <p><b>B cell immunophenotyping for CVID</b></p> <p>Naive and Memory B cells Switched and unswitched memory B cells Transitional cells Plasmablasts CD 19+ CD21low</p>	<p>Rs 900 Rs 900</p> <p>Rs1200 Rs1200 Rs</p> <p>300 each</p> <p>Rs 300</p> <p>Rs 300 Rs 600 Rs</p> <p>600 Rs1500 Rs</p> <p>900</p> <p>Rs1200</p>	PD091

	Senescent T cells	Rs1200	Pd150
	CD62L shedding assay	Rs 1000	
	Treg cells	Rs 900	
	CD20 (for patients receiving Ritiximab)	Rs 300	
	NBT (Nitrobluetetrazolium dye reduction test)	Rs 50	PD 015
<b>Intracellular antigens</b>	Btk expression on monocytes (XLA)	Rs1000	PD080
	WAS protein on lymphocytes (Wiskott-Aldrich syndrome)	Rs1000	PD081
	p47phox, p67 phox (CGD)	Rs1000	
	Perforin on NK cells and Cytotoxic T cells (HLH)	Rs1500	PD085
	DOCK8 (ARHIES)	Rs1000	
	CTLA4	Rs 900	
	HLAB27	Rs1200	
<b>Urine microscopy</b>	For: Nasal smear for eosinophils Hair microscopic examination Urine for eosinophils	Free	
Flow cytometry	<b>Functional assays</b> Dihydrorhodamine assay (DHR) (CGD) Granule release assay (CD 107 a) for HLH	Rs 300 Rs1500	PD076 PD085
	Molecular assays - Gene sequencing including prenatal diagnosis BTK, CYBB, WAS, STAT3, IL2RG, CD40L, NCF1 GT deletion, RAG1, RAG2, DCLER1C, PRF1, C1QA, NOD2, NLRP3, IL7R, COPA, SERPING1	Rs 1250 for each reaction	

Multiplex Ligation Dependent Probe Amplification (MLPA)	For Autosomal recessive Hyper IgE syndrome (DOCK8)	Rs 2000	PD 146
	DNA cross link repair 1C	Rs 2000	PD 145
	Di George	Rs 2000	PD 147
NGS panel for PID genes	<p>ADA, AICDA, AIRE, ATM, BTK</p> <p>C1QA, C1QB, C1QC, CD40, CD40LG</p> <p>CFH, CFP, CTLA4, CYBA, CYBB</p> <p>DOCK8, FAS, FASLG, FOXP3, GATA2, ICOS, IFNGR1, IFNGR2, IL10RA, IL10RB, IL12RB1, IL17F</p> <p>IL17RA, IL2RG, IL7R, ITGB2, JAK3</p> <p>LIG4, LRBA, NCF1, NCF2, NCF4</p> <p>PRF1, RAG1, RAG2, STAT1, STAT3</p> <p>STX11, WAS</p>	Rs12000	PD133

**Tests available in the Department of Immunopathology**

Technique based on	Test available	Code	Sample required	Turnaround time
Nephelometry	Serum Immunoglobulin estimation IgG, A, M	IM027	2mL blood in plain vial	15 days
	Serum immunoglobulin G subclass estimation (IgG1, G2, G3, G4)	IM124	2mL blood in plain vial	15 days
Flowcytometry	<b>Lymphocyte subset profile</b> (T/B/NK cells)	IM105/IM102	2mL EDTA blood	2 days
	<b>T cell subset profile</b> (Th/Tc cells)	IM102/IM103	2mL EDTA blood	2 days
	B cell analysis	IM105	2mL EDTA blood	2 days
	Double negative T cell analysis		2mL EDTA blood with control	2 days
	<b>SCID workup-</b> Common $\gamma$ Chain analysis (CD 132)		2mL EDTA blood with control	2 days
	<b>MSMD workup -</b> IFN $\gamma$ R1 IL12RJ31 pSTAT1		2mL EDTA blood with control	2 days
	<b>HyperIgM workup-</b> CD 40 CD 40 ligand		2mL EDTA and 2ML Heparinized blood with control	2 days
	<b>CVID Panel-</b> Class switched B cells (IgM, IgD) Naive B cells (IgD <sup>+</sup> , CD27) Marginal zone like B cells (IgD <sup>+</sup> , Cd27 <sup>+</sup> ) Class switched memory B Cells (CD27 <sup>+</sup> , IgM <sup>+</sup> , IgD) Transitional B cells (CD21 <sup>+</sup> , IgM <sup>+</sup> , CD38 <sup>-</sup> ) Plasmablasts (CD19 <sup>10W</sup> , CD21 <sup>kt</sup> , IgM <sup>h/t</sup> , CD38 <sup>+</sup> CD21 <sup>10W</sup> cells (IgM <sup>+</sup> , CD38 <sup>10W</sup> , CD21) <sup>10W</sup> CD81, BAFFR, ICOS		3mL EDTA and 2ML Heparinized blood with control	3 days

	Hyper IgE Syndrome workup- Th17 cell Memory B cells pSTAT3		2mL EDTA and 2ML Heparinized blood with control	3 days
	CGD workup- DHR		2ML Heparinized blood with control	2 days
	CMC workup- Th17 pSTAT1		2mL EDTA and 2ML Heparinized blood with control	3 days
Gene mutation analysis	STAT3 gene		2 mL EDTA blood	3-5 months

**Request for specific test for patient from other hospitals/colleges can be sent on this emailed along with clinical details of the patient. • Email id: [coe.pid2016@gmail.com](mailto:coe.pid2016@gmail.com)**

#### **Indoor Bed Strength**

Pediatric Allergy and Immunology Unit 15 beds  
Dept of Pediatrics, Advanced Pediatrics Centre, PGIMER, Chandigarh

#### **Clinic Details:**

Pediatric Rheumatology Clinic: One clinic/week on Tuesdays  
Pediatric Immunodeficiency Clinic: One clinic/week on Fridays  
Follow-up and counselling Clinics Monday and Wednesday

#### **Day Care facility:**

The unit has excellent facility of day care for children with primary immunodeficiency disorder. It is manned by one DM senior resident and one staff nurse. Administration of IVIG is a routine and is given under continuous monitoring in day care. In India currently Punjab, Haryana, Himachal Pradesh and Madhya Pradesh are the states providing IVIG freely to these children and some nongovernmental organization as well as philanthropists donate IVIG.

#### **Hematopoietic Stem Cell Transplantation Facility:**

We have also state of the art facility for bone marrow transplant for PID in our institute. There is a separate BMT unit with DM program in the institute. We have carried out stem cells transplant for severe combined immunodeficiency and chronic granulomatous disease and Wiskott-Aldrich syndrome in the past.

#### **Any degree course in Immunology: affiliation to university and details of how to apply and website to look out for information.**

This unit has the distinction of offering a 3-years postdoctoral training programme (DM) in Pediatric Clinical Immunology and Rheumatology. This is the first, and so far the only, such training programme in India. This course was initiated in January 2014. Entrance exam is held twice a year in the months of June and December. For the advertisement please check the link give below for the

advertisement [www.pgimer.edu.in](http://www.pgimer.edu.in). Applications are out in months of May and November for each session.

**Work load details approximately.**

We provide outpatient services for primary immunodeficiency twice in a week and approximately 20 new patients of PID are registered in every month. Apart from routine OPD services we do provide counseling services and have a separate clinic for counseling of these patients each Monday. We also have a 15 bedded indoor unit for these patients. The above mentioned tests are carried out routinely in our laboratory

**Educational courses conducted by institutions in PID**

DM Clinical Immunology and Rheumatology

DHR-ICMR PGI Primary Immunodeficiency Disease work shop twice a year for clinicians and a laboratory workshops for hands on training.

PhD courses in Laboratory Immunology and Rheumatology

**Additional intramural as well as extramural projects sanctioned by various funding agencies:**

- Genetic basis of early onset systemic lupus erythematosus funded by Department of Science and Technology, Govt, of India. (INR- 24,82,560)
- To study the nuclear role of WASP in non -erythroid blood cells compartments of patients with Wiskott Aldrich syndrome, funded by Department of Biotechnology, Govt of India. (INR-49,27,028)
- Gene expression profiling of selected autophagy related genes in patients with X-linked and Autosomal recessive CGDf unded by intramural grant of the institute. (INR-4,30,000)
- To investigate chromatin remodeling complex interaction with WASP in patients with Wiskott Aldrich syndrome funded by intramural grant of the institute. (INR-4,30,000)
- Exploration of the differentially expressed mRNA transcripts in the activated CD4+ helper T cells of the X- linked Hyper IgM patients by RNA-seq based whole mRNA transcriptome profiling" funded by Hyper IgM Foundation, USA. (5000 USD)