

Research at Asian Institute of Gastroenterology

*OMED Center of Excellence and Tertiary care Referral Center
DSIR Recognized Translational Research Center*



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Asian Healthcare Foundation (Registered Trust)

Research wing of AIG

- ❑ Recognized by Department of Scientific and Industrial Research, GOI**

- ❑ Affiliated to**
 - Dr NTR University of Health Sciences**
 - University of Hyderabad (Ranked1)**

Research and Training Activities

- Research grants obtained from federal agencies
 - ICMR
 - DBT
 - DBT-Wellcome Trust India Alliance

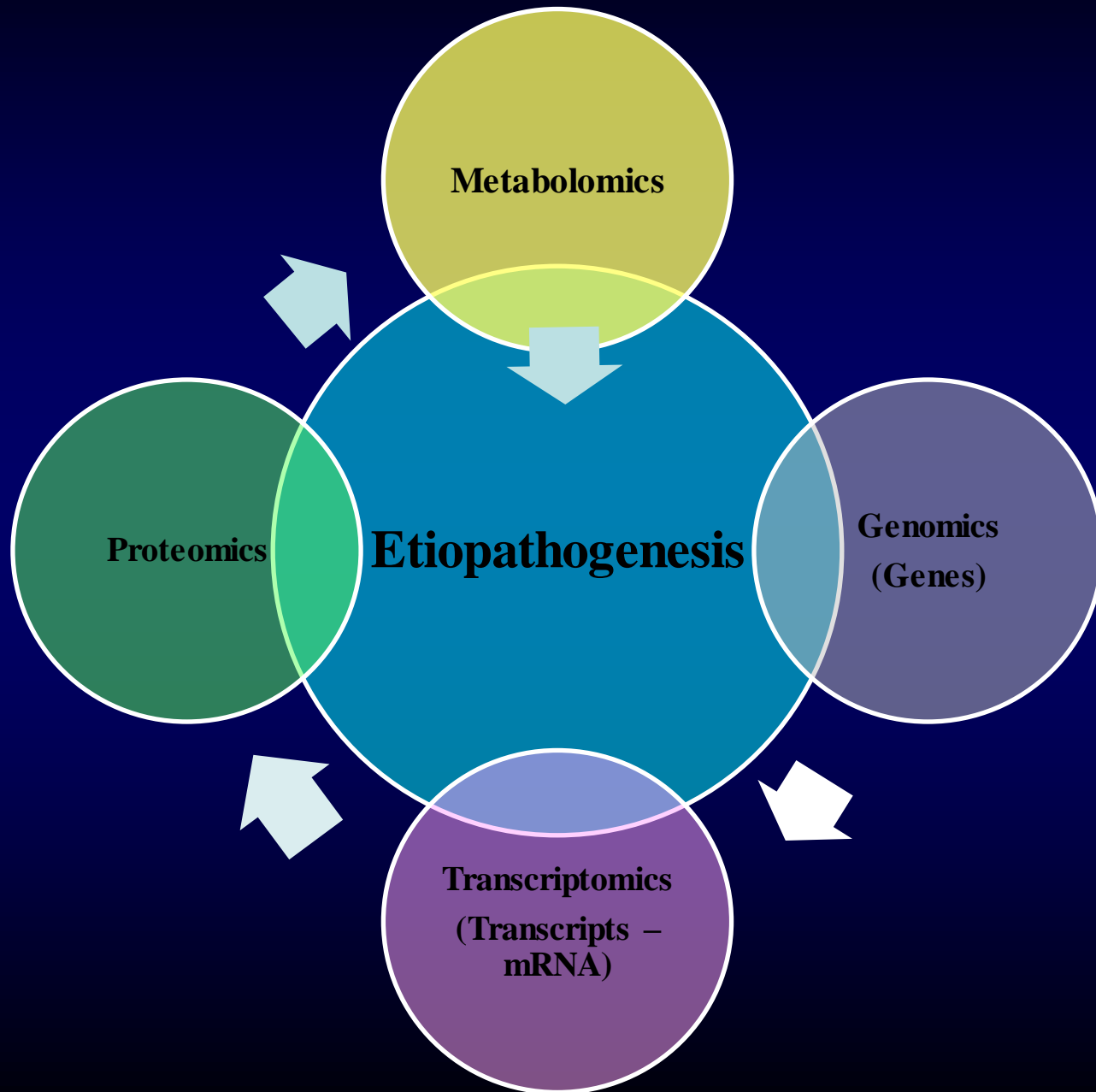
Areas of Research

- Inflammatory bowel disease: N=900
- Chronic pancreatitis: N=310;
- Gall stone disease: N=1200
- Liver disease including viral hepatitis N=4800
 - **Non alcoholic fatty liver disease**
- Periapillary carcinoma: N=40

Nature of data

- Patient information: Personal details, disease characters
- Clinical profiling:
- Investigations:
- Medications:
- Follow up

Systems Biology Approach



Basic Research

- Etiopathogenesis:

Targeted Therapies can be developed using
technological resources

Biomarkers:

Diagnosis or Prognosis

Intestinal Disease

- Much attention is being focused on
 - **inflammatory bowel diseases**
 - Increasing prevalence
 - Controversy (Auto immunity and Inflammation)
 - (*Ind. J. Gastroenterol* 2009; 28: 169-174).
 - (Journal of Gastroenterology and Hepatology, 2010; 26:694-699).

Meta Genomics

- We have thus embarked on obtaining detailed data on intestinal microflora in patients diagnosed for inflammatory bowel disease/Irritable bowel syndrome employing next generation sequencing. (BGI)

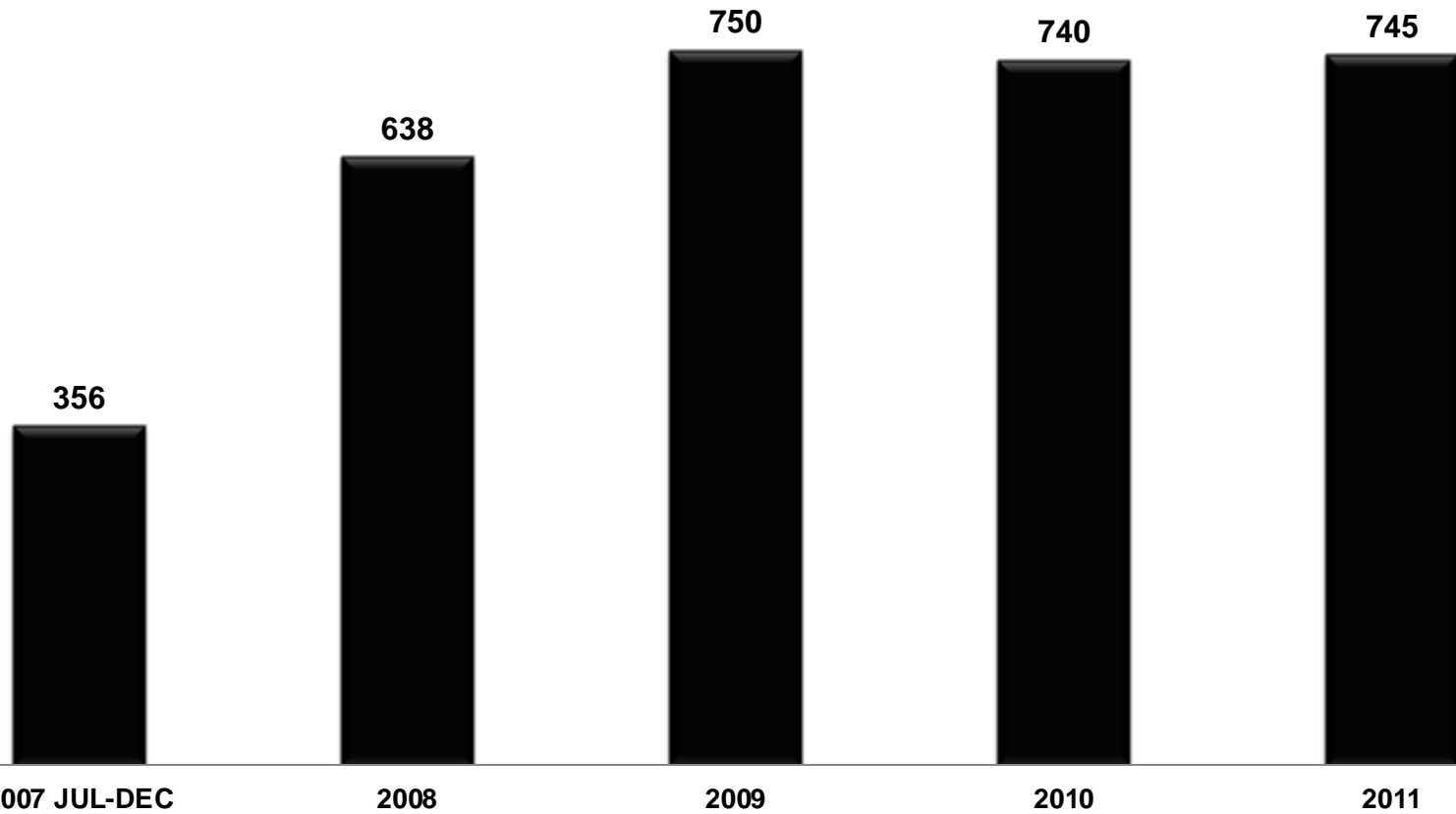


Specific objectives

- To find out **predominant bacterial phylotypes** associated with IBS. These bacteria may serve as biomarkers for IBS diagnosis.
- **Comparative profiling** of microbial flora in IBS and HCs.
- To identify the **ideal probiotic strain** for IBS patients.
- This project may help to develop and evaluate new **treatment alternatives** based on the microbiota alterations present in IBS patients.

Intestinal Tuberculosis

MTB



	A	F	G	H	I	J	
1	S.No	e	AFB	BACT Alert	PCR result	CF PCR	Biopsy report
2	1		Negative	Positive 8days	Negative	Positive	Chronic colitis. No evidence of Koch's or Crohn's
3	2		Negative	Positive 12days	Negative	Negative	Non specific chronic inflammatory changes
4	3		Negative	Positive 13days	Positive	Negative	Granulomatous lymphadenitis.
5	4		Positive	Positive 18days	Positive	Positive	Granulomatous peritonitis
6	5		Negative	Negative	Negative	Negative	Mild acute colitis.
7	6		Negative	Positive 13days	Negative	Negative	Hodgkin's lymphoma
8	7		Negative	Positive 6days	Negative	Negative	Granulomatous colitis
9	8		Negative	Positive 6days	Negative	Negative	Benign ulcer. No granulomas identified
10	9		Negative	Positive 6days	Negative	Negative	Benign ulcer. No granulomas identified
11	10		Negative	Positive 13days	Negative	Negative	Benign ulcer. No granulomas identified
12	11		Negative	Positive 12days	Negative	Negative	Non specific inflammatory changes noted
13	12		Negative	Negative	Negative	Negative	Non specific inflammatory changes noted. SRUS
14	13		Negative	Negative	Negative	Negative	Non specific inflammatory changes noted. SRUS
15	14		Negative	Positive 22days	Negative	Negative	Acute colitis(Mild)
16	15		Negative	Positive 22days	Negative	Negative	Acute colitis(Mild)
17	16		Negative	Positive 15days	Negative	Negative	Acute colitis. No granulomas identified
18	17		Negative	Positive 15days	Negative	Negative	Acute colitis. No granulomas identified
19	18		Negative	Positive 6days	Negative	Negative	Mild acute colitis. No granulomas identified.
20	19		Negative	Positive 14days	Negative	Negative	Non specific inflammatory changes
21	20		Negative	Positive 14days	Negative	Negative	Non specific inflammatory changes
22	21		Negative	Positive 14days	Negative	Weak Positive	Non specific chronic inflammatory changes. No granulomas identified
23	22		Negative	Positive 6days	Positive	Positive	Granulomatous colitis. Possibly of Tb
24	23		Negative	Positive 42days	Positive	Positive	Non specific acute on chronic inflammation
25	24		Negative	Positive 8days	Negative	Negative	Non specific inflammatory changes

> 3000 patients

Hepatitis B data at AIG

	21	3993	1.1	1.1			no
	207	475855					
A			1.5	1.5			
L		39995	1.74	1.74			
D	41	13124	0.92				
A	166	966					
	80	166					

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ANNALS of Hepatology

Identification of genotype B among Hepatitis B Virus-infected patients in Hyderabad, India

Rathindra Mohan Mukherjee, * Panyala Balkumar Reddy,
 Mitnala Sasikala, * Padaki Nagaraja Rao, ** Duvvuru Nageshwar Reddy**

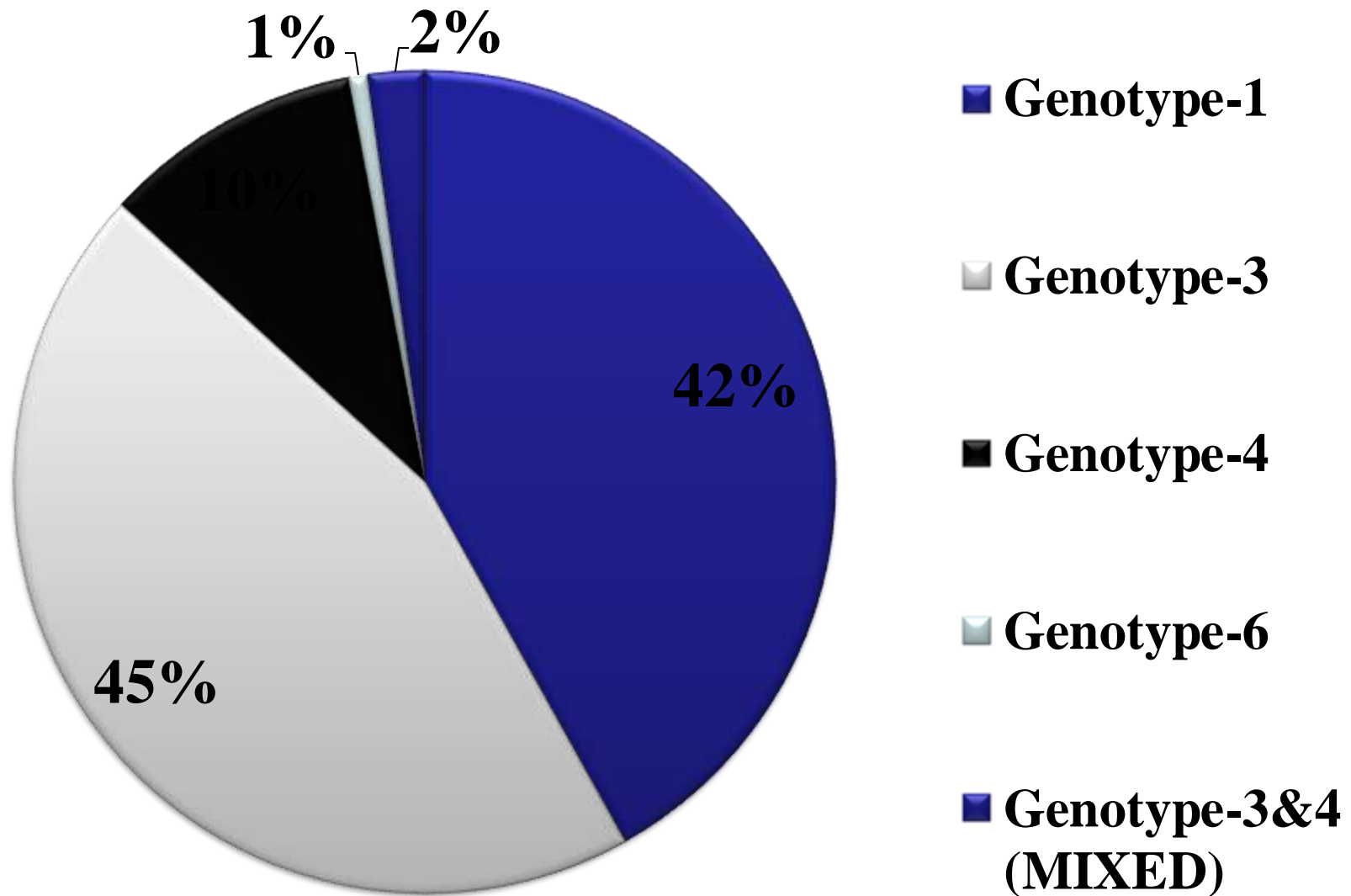
* Asian Health Care Foundation.
 ** Asian Institute of Gastroenterology.

							no	3.1	v./
							no	1.1	
			1.04				no	2.1	
							no	1.2	
			0.92	0.92			CHILD-A		
			1.47	1.47			NO	1	
	233	1356	1.38	1.38		233	no	5	
	17	99	1.02	1.02			NO	1	

Hepatitis B Virus genotype B identified in India-1st Report



Hepatitis C



Pancreas

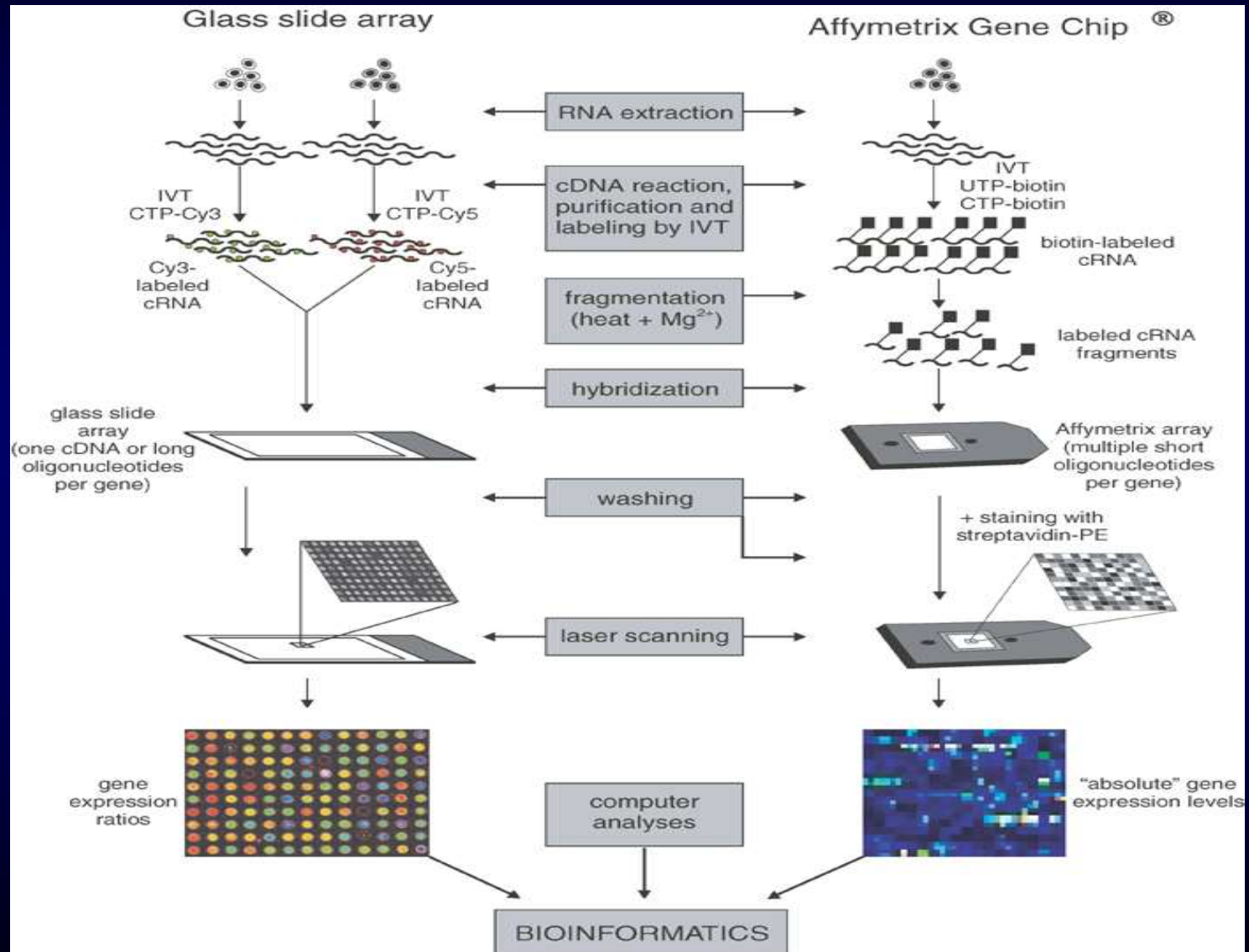
- **Chronic pancreatitis(Idiopathic:Tropical)**
 - **Predicting Prediabetes in chronic pancreatitis**
- **Periampullary carcinoma- miRNA profiling**
 - **Gene silencing**

T helper cell profiling in chronic pancreatitis

	A	C	D	E	F	G	H	I	J	K	
1	CP Patients										
2	S.No	CD 4 Cells			Non CD4 Cells		HbA1	FBS	1hr PBG	2hr PBG	c-peptide
3		Th1	Th17	Th1+Th17	Th1+Th17						
4	1	14.1	0.5	0.8	2.1		78	108	103	4.2	
5	2	16.5	1.5	1.8	5.6		120	136	140	0.9	
6	3	20.5	5.5	5.8	14.7		93	115	111	3.1	
7	4	17.9	3.6	4	11.4		82	120	101	3.9	
8	5	16.6	6.4	8.8	12		105	156	145	1.1	
9	6	19.7	1.7	1.8	6.4		113	132	108	2.4	
10	7	6.6	2.2	2.3	7.6		103	137	120	1.8	
11	8	12.6	5	4.9	11.4		79	105	97	5.6	
12	9	4.4	2.1	2.2	4.9		93	120	132	4.9	
13	10	2.7	1.9	2.2	2.2		91.8	110	102	1.99	
14	11	2.7	2	1.9	1.9		88.7	126	131	3.02	
15	12	3.6	1.4	1.4	1.4		94.5	117	106	10.19	
16	13	5.3	1.2	1.3	4.9		105	125	107	0.99	
17	14	4.4	1.7	1.8	9.4		114	132	110	1.7	
18	15	3.7	1.8	1.8	7.3		122	129	153	0.67	
19	16	3.4	1.8	2	5.4	8.7	127	135	120	3.22	
20	17	4.4	2.1	2.1	8.9		122	175	153	1.1	
21	18	6.9	1.4	1.6	5.8	7.5	106	165	157	3.63	
22	19	13	12.6	12.7	36.3		86	127	109	0.11	
23	20	6.9	6.9	6.9	46.2		92	118	112	3.88	
24	21	4.4	3.4	3.4	18.6	11.8	123	137	109	0.83	
25	22	4.5	1.9	3.1	37.2		98	152	143	4.55	
26	23	4.1	3.1	3.1	11.7		86	103	95	2.25	

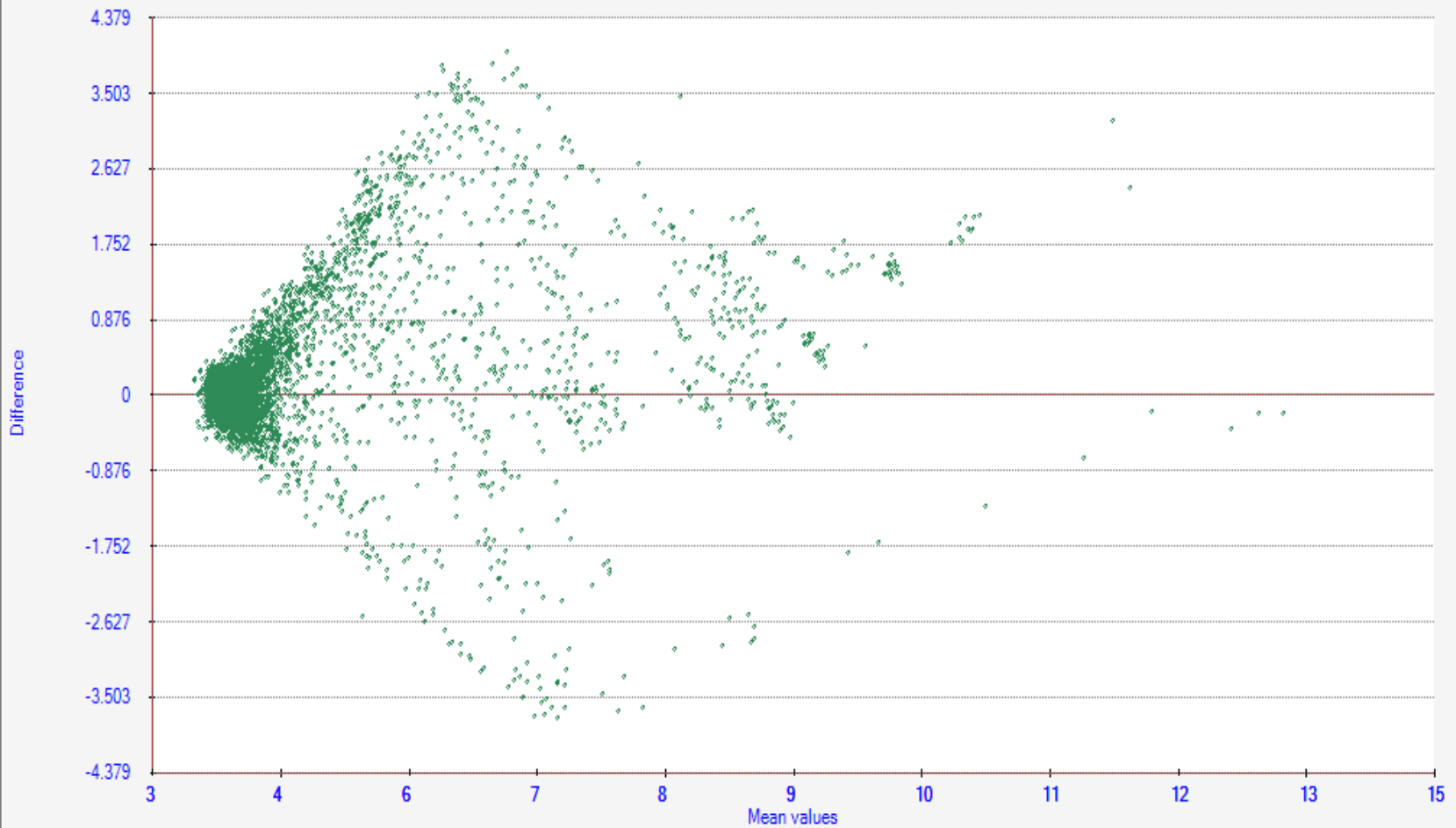
Subjects - >5000
Data set / Sub - 40

miRNA profiling in periampullary carcinoma



Micro array

After Summarization (Median Polish) - Log2 applied by process.



Quantitative Data

1	ProbeSet Name	1T-PAC	4T-PAC	6T-PAC	18T-PAC	29T-PAC	31T-PAC	23T-PAC	Average Tumor	12N-PAC	16N-PAC	17N-PAC	21N-PAC	23N-PAC	29N-PAC	30N-PAC	Average Normal	T test	Pr		
2	hsa-let-7a_st	8.725286	8.486124	7.395629	8.425462	8.009516	8.49392	6.98034	8.073753857	7.362159	9.668803	7.968306	8.403008	8.497613	7.799585	8.672275	8.338821286	0.491183	mi		
3	hsa-let-7b_st	12.84208	11.27791	10.61327	10.30726	9.63798	10.82971	9.061032	10.65274886	9.140639	11.53127	11.07936	10.10287	9.752503	9.034588	11.7488	10.34143286	0.627351	mi		
4	hsa-let-7c_st	9.350778	8.099303	7.682432	7.310908	7.973146	7.791619	7.088778	7.899566286	7.266441	9.644106	8.539869	8.736372	8.285339	8.107744	9.271132	8.550143286	0.134027	mi		
5	hsa-let-7d_st	8.219172	8.603424	8.079975	8.233541	7.840892	8.070867	7.007089	8.007851429	6.924962	8.370667	7.95125	7.12591	7.307927	7.287055	8.132131	7.585700286	0.16121	mi		
6	hsa-let-7e_st	7.683497	7.532406	8.248247	7.164117	7.977202	8.170741	7.310321	7.726647286	6.487443	7.69381	8.206832	5.433078	6.930176	5.999816	6.22961	6.711537857	0.034402	mi		
7	hsa-let-7f_st	5.179735	5.170923	5.884191	6.32015	5.374663	5.867441	7.16968	5.852397571	3.970519	6.310272	5.090649	6.849342	6.971545	6.799278	5.291198	5.897543286	0.931035	mi		
8	hsa-miR-15a_st	4.40328	4.510999	4.347817	4.384545	4.702571	4.781658	3.849918	4.425826857	4.004939	4.541565	4.334812	4.186614	4.229468	3.80358	4.759115	4.265727571	0.355212	mi		
9	hsa-miR-16_st	7.045934	7.165035	7.070282	7.153588	7.708467	7.615035	5.299356	7.008242429	7.352997	7.54956	6.817974	6.610211	7.30564	7.676263	8.34465	7.379613571	0.339016	mi		
10	hsa-miR-17_st	7.198468	7.386964	8.889332	8.048261	7.299517	847 miRNA					5.53	7.408493	5.291306	6.473186	7.002	7.372747	6.741105	0.024296	mi	
11	hsa-miR-18a_st	4.62325	5.102446	6.28516	5.68425	5.293154							9.937	4.818167	3.967235	3.931222	5.179446	4.700639	4.444130857	0.050865	mi
12	hsa-miR-19a_st	3.939717	4.004737	4.007823	3.793676	3.759634							9.008	3.648574	3.930266	4.342778	4.012635	4.016386	3.974101	0.608253	mi
13	hsa-miR-19b_st	4.784416	4.659357	5.383289	5.16818	5.804564	5.44821	4.296666	5.07/811/14	4.826642	4.8969	4.128838	4.838863	5.184515	4.211873	6.27212	4.908535857	0.622036	mi		
14	hsa-miR-20a_st	6.652068	6.23838	8.0996	7.391573	6.730081	6.965223	5.704033	6.825851143	5.620865	6.38931	6.424489	5.236416	6.39878	5.428328	7.112051	6.087177	0.081867	mi		
15	hsa-miR-21_st	5.596213	5.20318	5.43439	4.980724	6.66203	6.107435	3.847439	5.404487286	4.297662	4.72416	4.449955	4.122475	5.041104	4.13756	4.542168	4.473583429	0.033283	mi		
16	hsa-miR-22_st	6.364728	6.287759	5.5236	5.655938	6.451082	6.387489	4.365268	5.862266286	4.942132	6.076267	6.260768	6.533908	5.878559	5.666501	7.037777	6.056558857	0.619944	mi		
17	hsa-miR-23a_st	8.338712	8.801525	7.805084	7.595238	8.257508	7.902942	6.778193	7.925600286	7.696397	7.555879	7.318848	5.75169	8.005219	8.327033	7.418669	7.439105	0.242541	mi		
18	hsa-miR-24_st	10.27004	10.44152	9.515141	9.129171	9.838715	9.537204	8.906941	9.662676	8.82731	9.156148	9.965851	7.973776	8.933392	8.630952	8.910159	8.913941143	0.032673	mi		
19	hsa-miR-25_st	4.672992	5.355233	5.327355	4.978169	5.67026	5.371387	4.142941	5.074048143	3.982557	4.903994	5.012628	4.066221	4.631178	4.011763	5.424865	4.576172286	0.113912	mi		
20	hsa-miR-26a_st	9.833646	8.439098	8.245626	8.535626	8.896364	9.189715	6.870236	8.572901571	8.788469	8.81731	8.614459	8.615191	9.226567	8.755974	9.593302	8.915896	0.387047	mi		
21	hsa-miR-26b_st	4.042216	4.055328	3.985555	3.956018	4.00766	4.033327	4.224924	4.043575429	3.955829	4.331645	3.780839	4.184764	3.906517	4.269687	4.06037	4.069950143	0.759084	mi		
22	hsa-miR-27a_st	6.107972	5.991725	5.774364	5.32388	7.267287	6.045466	4.317737	5.832633	4.699849	5.681971	5.285961	4.484723	6.176921	4.645182	5.516317	5.212989143	0.161178	mi		
23	hsa-miR-28-5p_st	5.279515	5.445274	4.936726	4.854568	5.537758	5.216575	4.111641	5.054579571	4.258025	4.686812	5.26728	3.972497	4.289293	4.114587	4.902206	4.498671429	0.04956	mi		
24	hsa-miR-28-3p_st	4.895884	5.230601	4.365996	4.537302	4.986831	5.100549	4.087224	4.743483857	3.94888	4.709305	5.251394	4.132708	4.428163	3.797955	4.660163	4.418366857	0.215483	mi		
25	hsa-miR-29a_st	5.324522	5.096848	4.696047	5.113626	5.930449	5.795642	4.180748	5.162554571	4.139987	5.522836	5.241948	5.256869	5.503465	3.934356	6.080483	5.097134857	0.86375	mi		

Gallstone disease

AGE	SEX	MARITAL STATUS	LIPID PROFILE				PROFOR MA	SAMPLE COLLECTION			BILE CHOLESTEROL
			total cholesterol	HDL	LDL	serum tri- glycerides		blood	bile	stones	
45	Female	Married	159	49	85	126	Yes	Yes	Yes	Yes	395
53	Male	Married	114	26	56	110	Yes	Yes	Yes	Yes	51
75	Female	widow	199				Yes	Yes	Yes	Yes	520
42	Female	Married	141				Yes	Yes	Yes	No	385
21	Female	Married	128	51	62	77	Yes	No	No	No	-
48	Female	Married	-	-	-	-	Yes	-	-	-	-
63	Female	Married	178	62	98	90	Yes	Yes	Yes	Yes	260
49	Female	Married	197	58	112	136	Yes	Yes	Yes	Yes	370
35	Male	Married	167	36	113	90	Yes	Yes	Yes	No	220
68	Female	Married	-	-	-	-	Yes	Yes	Yes	Yes	55
48	Female	Married	223	62	134	132	Yes	Yes	No	Yes	
22	Male	Married					Yes	Yes	Yes	Yes	105

1268 patients

Data Analysis

Frequency distributions

Descriptive statistics

ANOVA

Correlation and Regression

Tests of significance – Parametric and Non-parametric

Survival analysis (Kaplan-Meir, Cox Regression)

Multiple Logistic regression

Software

SPSS, MS Excel and other software's for sample size estimations