National Taiwan University College of Medicine

- Founded in 1987 by Japan Colonial Government.
- The leading medical education institute in Taiwan
- 7 School, 28 Departments, 20 Graduate Institutes, and 4 Research Centers
- Affiliated hospitals:
  NTU Hospital
  NTU Cancer Hospital (Under construction)

National Taiwan University College of Medicine

- School of Medicine
- School of Pharmacy*
- School of Nursing*
- School of Clinical Laboratory Sciences and Medical Biotechnology*
- School of Dentistry*
- School of Physical Therapy*
- School of Occupational Therapy*

*with Graduate Institute

Departments Under School of Medicine

- Anesthesiology
- Anatomy and Cell Biology
- Biochemistry and Molecular Biology
- Dermatology
- Emergency Medicine
- Environmental and Occupational Medicine
- Family Medicine
- Forensic Medicine
- Internal Medicine
- Laboratory Medicine
- Microbiology
- Neurology
- Obstetrics and Gynecology
- Ophthalmology
- Orthopedics
- Otolaryngology
- Parasitology
- Pathology
- Pediatrics
- Pharmacology
- Physical Medicine and Rehabilitation Physiology
- Primary Care Medicine
- Psychiatry
- Radiology
- Social Medicine
- Surgery
- Urology

Graduate Institutes

- Anatomy and cell Biology
- Biochemistry and Molecular Biology
- Biomedical Engineering
- Clinical Dentistry
- Clinical Laboratory Sciences and Medical Biotechnology
- Clinical Medicine
- Clinical Pharmacy
- Forensic Medicine
- Immunology
- Microbiology
- Nursing
- Molecular Medicine
- Oral Biology
- Occupational Therapy
- Pathology
- Pharmacology
- Pharmaceutical Sciences
- Physical Therapy
- Physiology
- Toxicology

Dated: 20080930

Statistics

Full Time Faculty				
Professor	Associate Professor	Assistant Professor	Lecturer	Total
150	110	78	35	373

Courses Number		
	Sep-07	Feb-08
Undergraduate	395	401
Graduate	407	544
Total	802	945

Student

Undergraduate	Number
School of Medicine	904
School of Dentistry	220
School of Pharmacy	247
School of Clinical Laboratory sciences and Medical Biotechnology	148
Department of Nursing	155
School of Physical Therapy	136
School of Occupation Therapy	156
Total	1966

- The School of Medicine offers a seven-year course leading to the degree of Doctor of Medicine.
- The education and training of interns are given at NTU Hospital.

Graduate Institute	Graduate	PhD students	Total
Clinical Medicine	58	116	166
Clinical Dentistry	80	28	108
Pharmaceutical Sciences	51	36	87
Clinical Laboratory Sciences and Medical Biotechnology	57	32	89
Nursing	91	32	123
Physical Therapy	35	19	54
Occupational Therapy	31	7	38
Physiology	35	25	60
Biochemistry and Molecular Biology	47	47	94
Pharmacology	39	48	87
Pathology	12	13	25
Microbiology	81	64	145
Anatomy and Cell Biology	22	34	56
Toxicology	19	25	44
Molecular Medicine	63	46	109
Immunology	27	23	50
Oral Biology	40	0	40
Clinical Pharmacy	24	0	24
Forensic Medicine	41	0	41
Total	853	595	1448

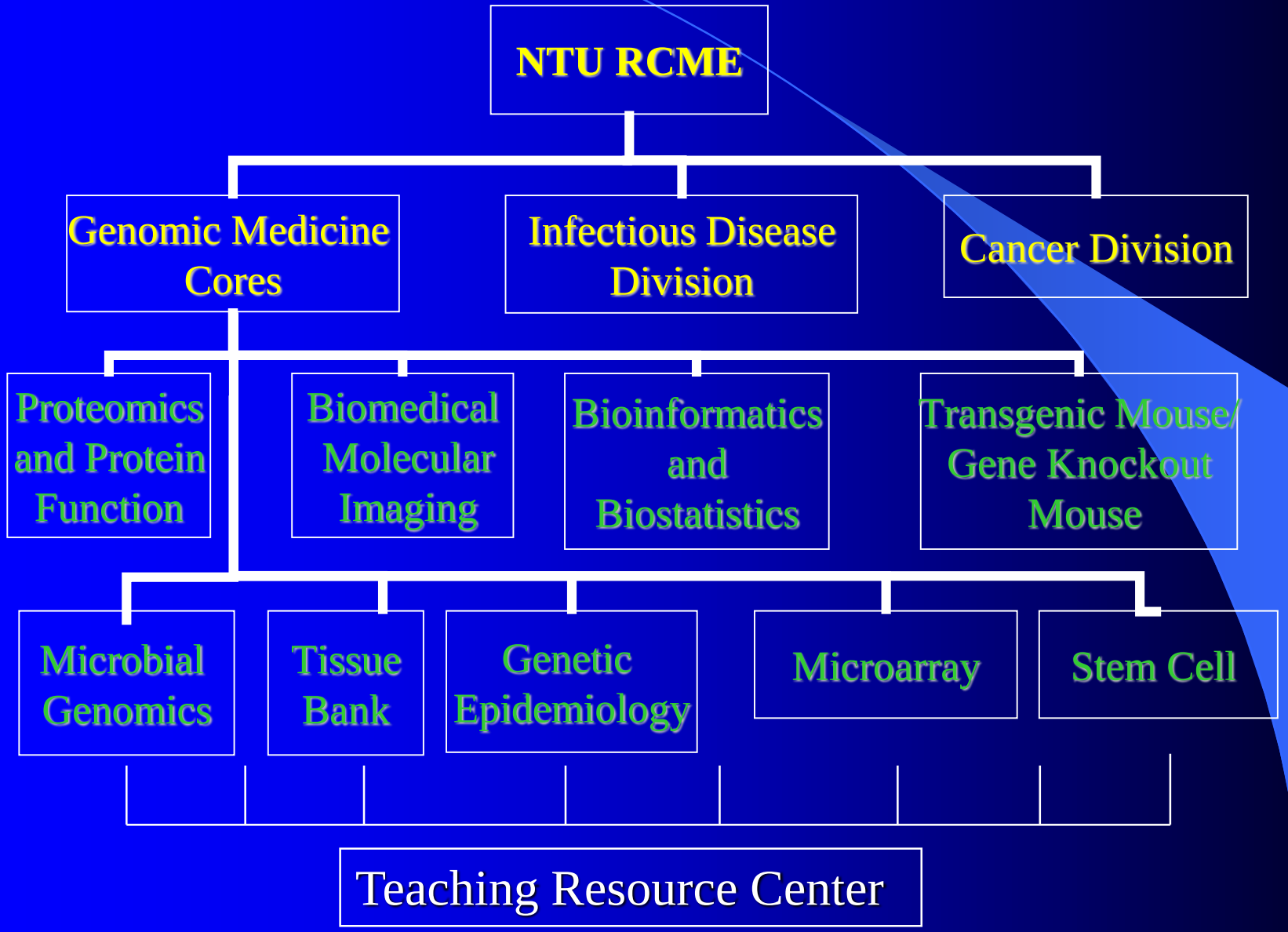
Passing Rate of National Examination

Genre		Year	Registered	Actual Number	Pass Number	Passing Rate	National Passing Rate
01	Doctor	2008	11	11	9	81.82	33.91
		2007	32	32	27	84.38	50.27
		2006	131	131	129	98.47	72.10
02	Doctor（1）	2008	130	128	107	83.59	69.99
		2007	107	104	86	82.69	59.04
03	Doctor（2）	2008	106	105	103	98.10	97.82
		2007	102	101	101	100.00	98.80
04	Dentist	2008	37	36	36	100.00	85.59
		2007	28	28	27	96.42	83.21
		2006	28	28	27	96.43	80.28
05	Pharmacist	2008	46	45	38	84.44	34.67
		2007	47	47	29	61.70	23.88
		2006	55	53	32	60.38	18.84
06	Medical Technician	2008	25	22	17	77.27	27.85
		2007	26	26	17	65.38	27.05
		2006	24	24	17	70.83	41.36
07	Nurse	2008	22	21	19	90.48	36.08
		2007	24	23	23	100.00	39.67
		2006	26	24	23	95.83	31.42
08	Physical Therapist	2008	25	23	21	91.30	20.14
		2007	30	30	27	90.00	20.77
		2006	15	14	13	92.86	26.45
09	Occupational Therapist	2008	23	21	19	90.47	41.05
		2007	27	25	24	96.00	41.94
		2006	29	28	28	100.0	48.27

Research Center

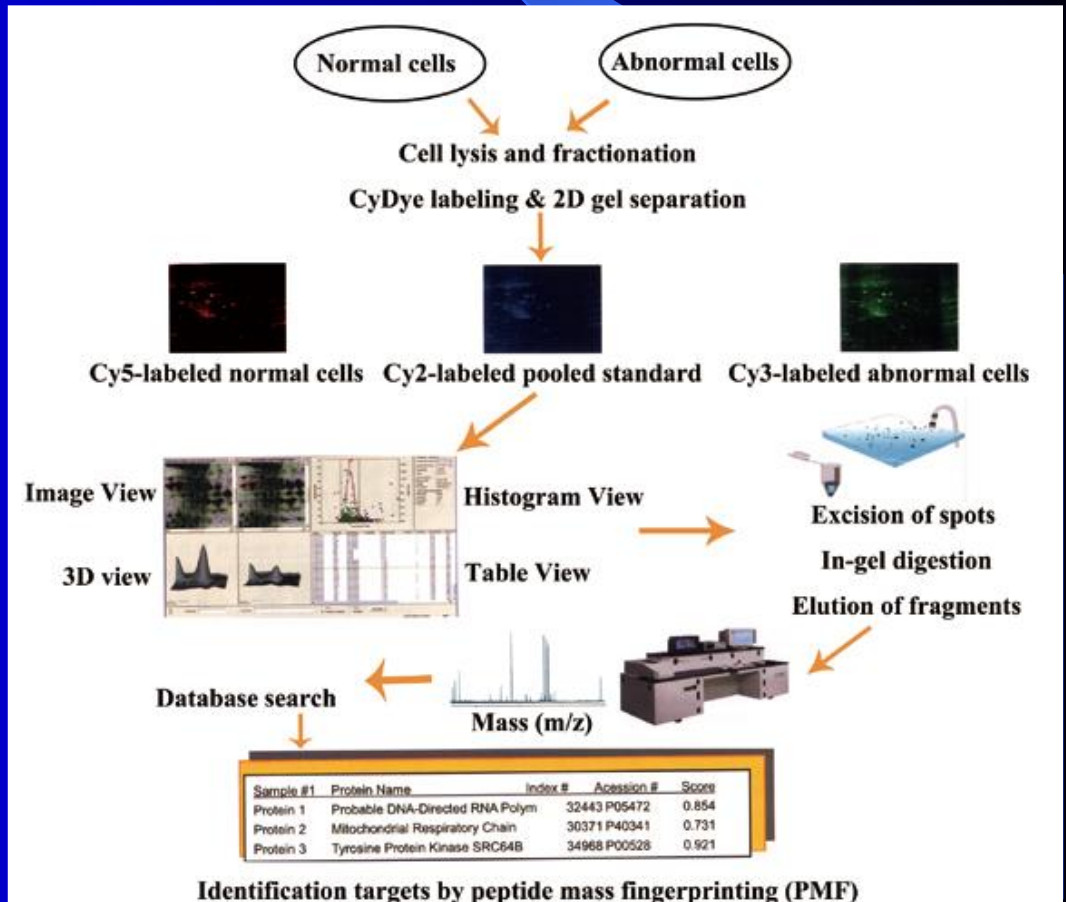
- Center for Optoelectronic Biomedicine
- Drug Research Center
- Cancer Research Center
- Center for Genomic Medicine
- NTU Research Center for Medical Excellence*

NTU Research Center for Medical Excellence



Proteomics and Protein Function Core Laboratory

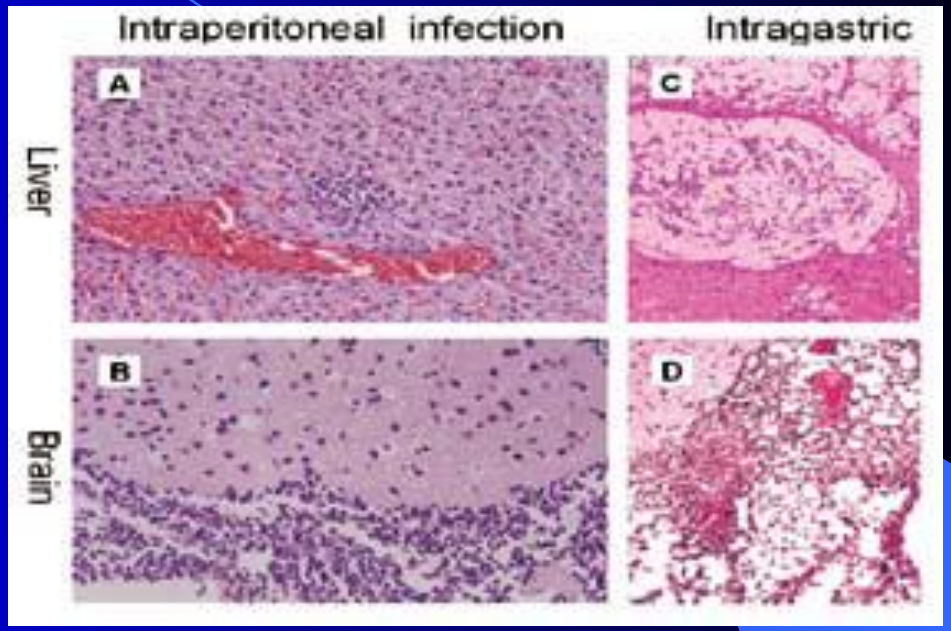
- Led by Professor L. P. Chow
- Provides fast, highly sensitive methods for protein identification using mass spectrometry.
- also provide technical support for protein separation, the study of protein-protein interactions, proteomic-related bioinformatics and data management.



Identification targets by peptide mass fingerprinting (PMF)

Microbial Genomics Core Laboratory

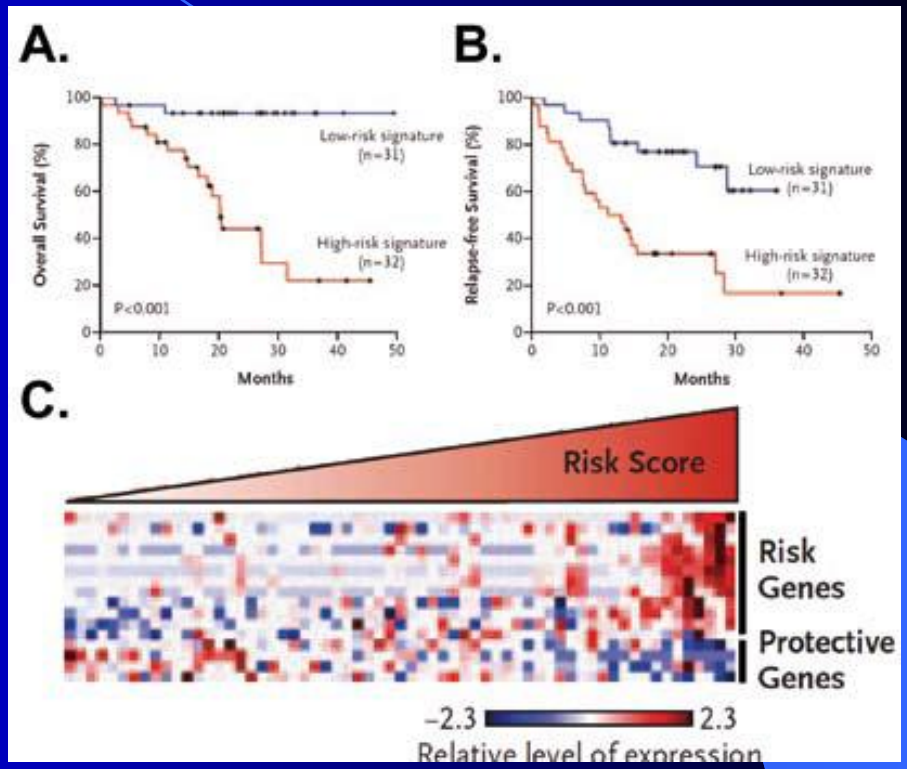
- Led by Professors P. J. Chen, and J. T. Wang
- Establishes clinical phenotype data and biosample banks for infectious diseases common in Taiwan, for the purpose of identifying host susceptibility genes and genes of infec tious agents.
- The genomic basis of different treatment outcomes will also be studied



The mice model for *K. pneumoniae* causing pyogenic liver abscess. (Fang et al., J. Exp. Med. 199:697-705, 2004).

Microarray Core Laboratory

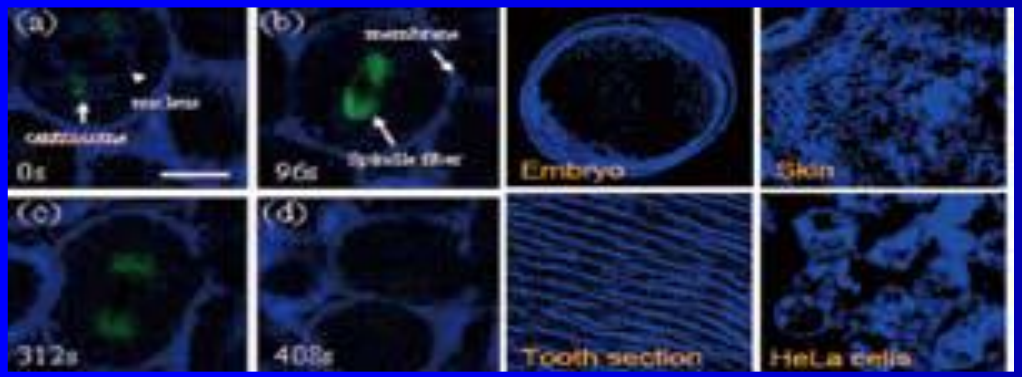
- Led by Professor P. C.Yang and Dr. Jeremy J. W. Chen
- Provides high quality microarrays for high throughput screening of differentially expressed genes, as well as basic bioinformatic analysis of array data.
- The microarray facility will also develop new technologies for cell-based arrays and promoter arrays for systematic analysis of gene regulation.

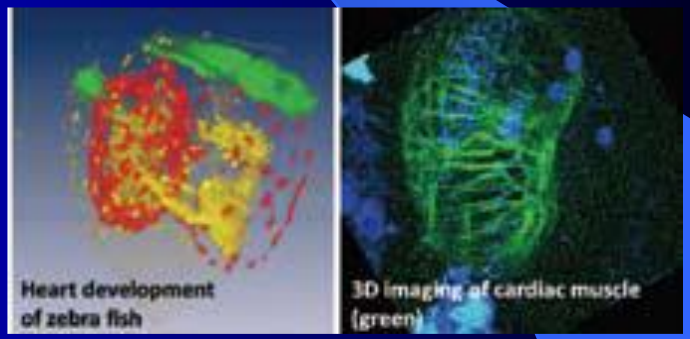


The 16-gene signature and sur vival of patients with NSCLC (A. training set; B. testing set; C. Risk Index of patients and 16-gene expressions).

Biomedical Molecular Imaging Core

- Led by Professors J. H. Chen, C. K. Sun, P. C. Li, F. H. Chang, C. M. Chen, Dr. C. Y. Dong and Dr. K.Y. Tzen
- Provides molecular imaging services and develops novel contrast agents that have specific targeting functions for disease models.

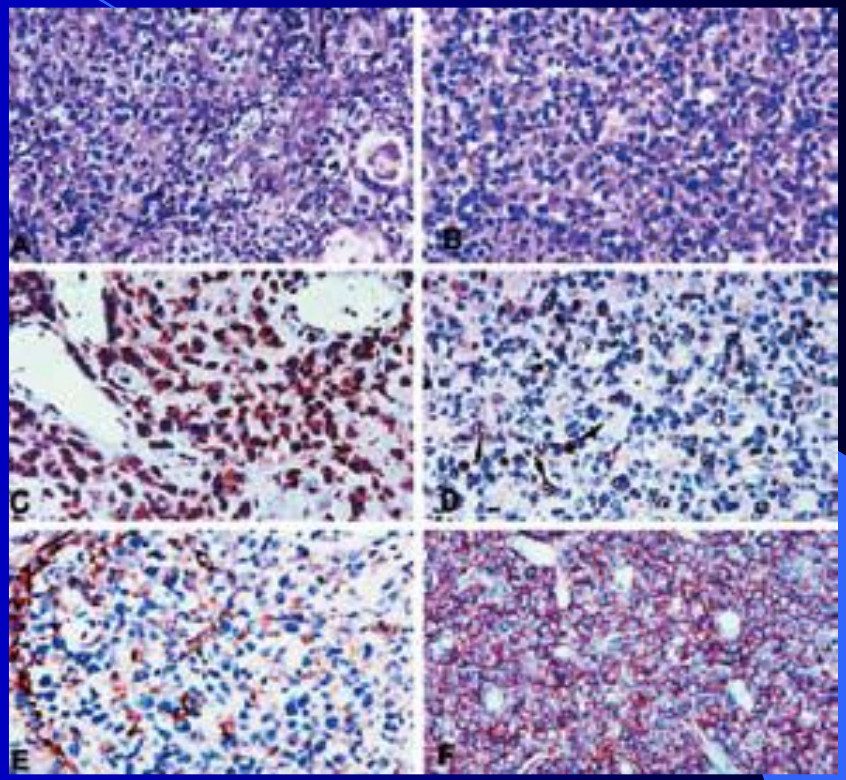




The application of optical molecular imaging. We offer the technology and instruments of optical molecular imaging, it could be applied in non-invasive diagnostic therapy for cancer research. Furthermore, the optical imaging offers the research of gene transfection, gene expression and embryonic development.

Tissue Bank Core Laboratory

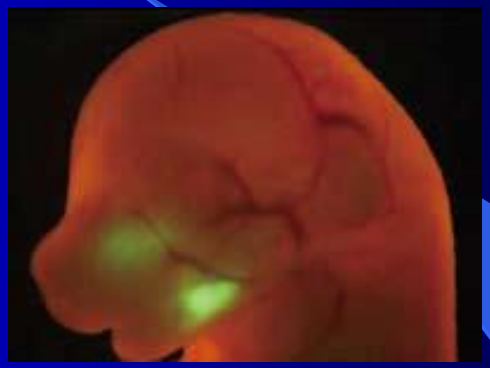
- Led by Dr. C.W. L i n
- Dedicated to establish a comprehensive clinical tissue bank and to providing primary cell lines, using established standard techniques for gene localization as well as laser capture micro-dissection, and immuno-histochemical staining.



Sinonasal lymphoma (SNL) : Histopathology (A&B), CDK6 (C&D) and CD44 (E&F) stains. Strong expression of CDK6 (C) with frequent loss of CD44 (E) is characteristic of SNL. (A). In contrast, peripheral T-cell lymphoma (B) shows the reverse pattern of weak CDK6 (D) but strong CD44 (F) expression

Transgenic Mouse Core Laboratory

- Led by Professors M. J. Su and Dr. C.Y. Chang
- generate transgenic mouse disease models for investigating mechanisms leading to cancer and common infectious diseases in Taiwan.
- Already eastablished 38 transgenic mice and breed more than 300 transgenic mice for the researchers.
- Having successfully rederived 66 strains of frozen embryo

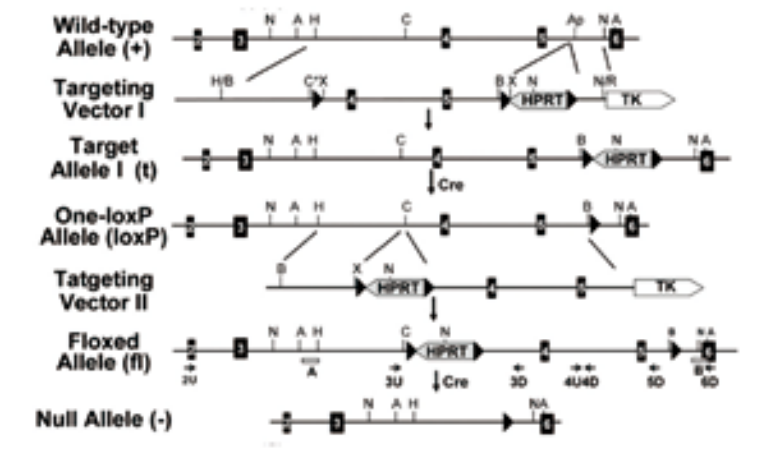


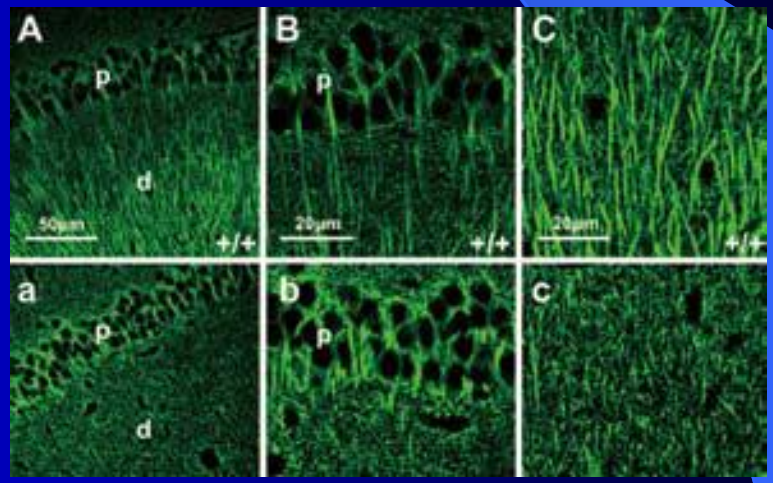
Mandibula GFP fluorescence

Mice with GFP luorescence of body surface.

Gene Knockout Mouse Core Laboratory

- Led by Prof. S.W. Lin, and Dr. I.S. Yu
- Services provides:
  1. ES cell gene targeting.
  2. Blastocyst microinjection and chimera production.
  3. Identification of targeted ES cell clones.
  4. Cre-loxP based ES cell gene targeting by the recombineering technology.

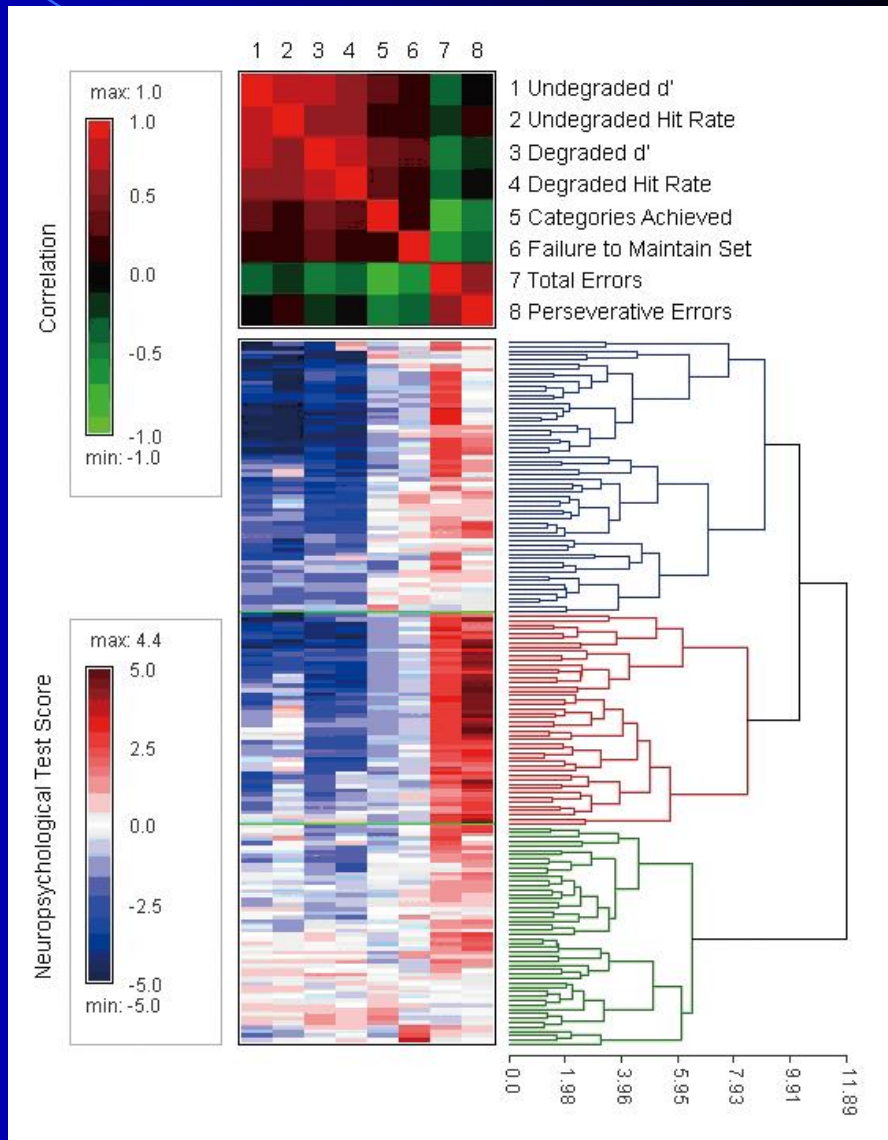




CRMP-1 k nockout strategy (left), abnormal MAP2 protein expression in the hippocampus pyramidal and dendritic layers (right, BC and bc are the higher magnifications of A and a, respectively).

Genetic Epidemiology Core Laboratory

- Led by Professors W. J. Chen and K. L. Chien, M.D., Ph.D
- Meant to establish DNA banks and followup systems for various disease phenotypes, as well as identifying single nucleotide polymorphisms (SNP) and other specific genetic markers in the Chinese population

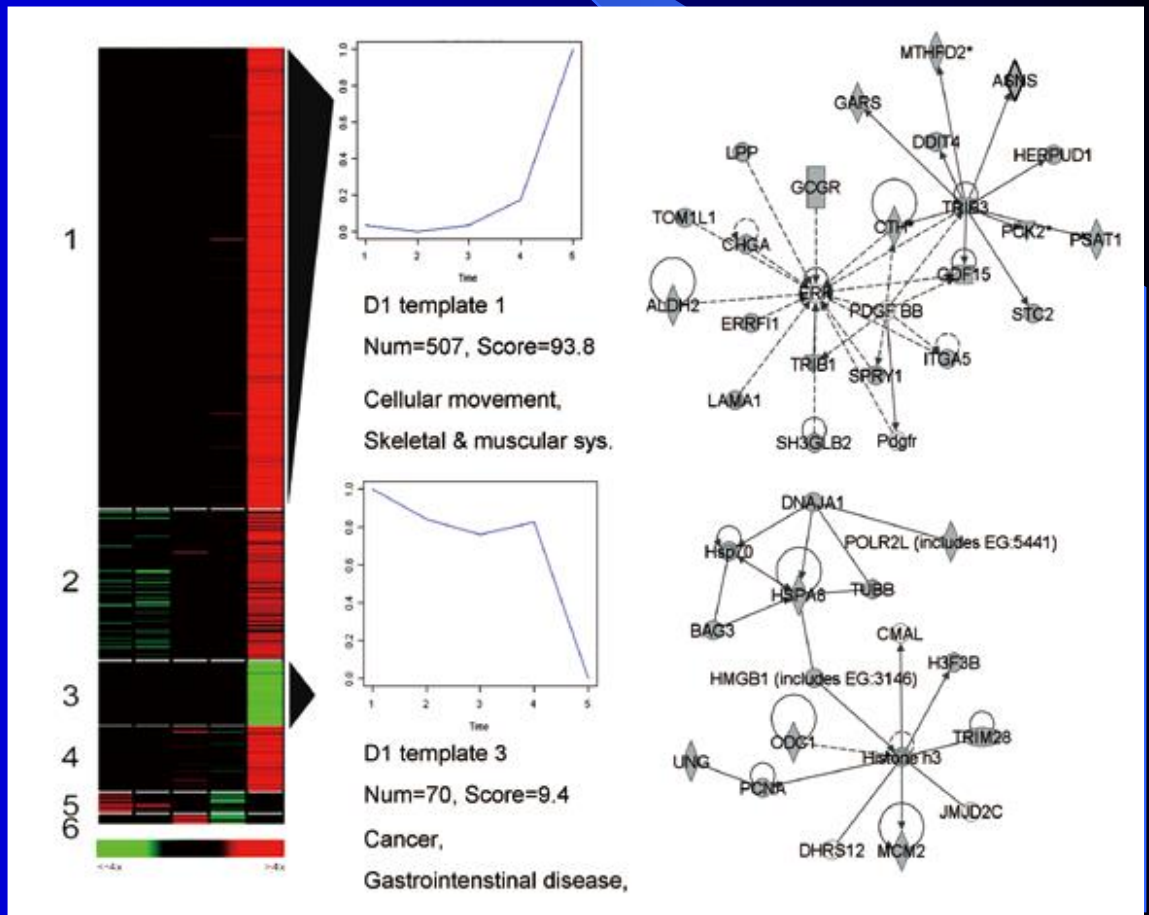


Results of family-based clustering analysis by means of the mean adjusted z scores of the affected siblings for each family.

Bioinformatics and Biostatistics Core Laboratory

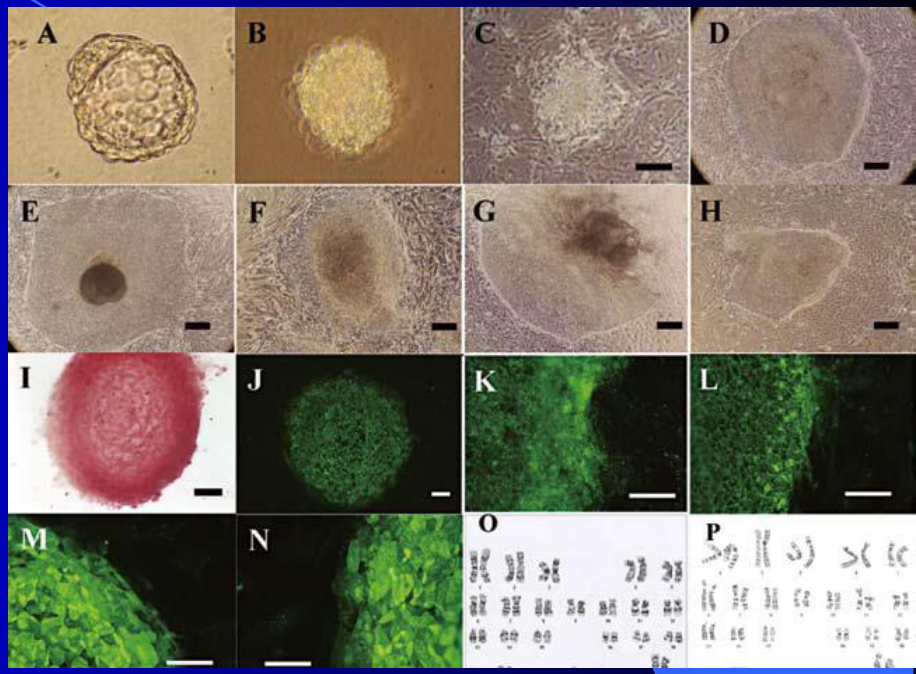
- Led by Professors Eric Y. Chuang
- Provides services for research study design, statistical analysis and develops methodologies for data mining and data analysis algorithms extracted for microarrays and proteomic cores.

Users can integrate various informations by searching databases and using analytic tools, such as hierarchical clustering, gene-gene interaction network, and signal transduction pathway, to form new knowledge.



Stem Cell Core Laboratory

- Led by Professors H.N. Ho and C. L. Chien
- Supply high-quality human embr yonic stem cells (hESC) for researchers within Taiwan.
- Three hESC lines (NTU1, NTU2, and NTU3) have been derived and well characterized in this borator y (Chen et al., 2007). More cell lines (especially xeno-free cell lines) will be derived and characterized to make sure our resource of hESC will not be running out in this project.



Derivation and characterization of human embryonic stem cell (hESC) lines. Frozen-thawed human embryos were cultured to blastocyststage, and hESCs were derived as described in Materials andmethods. (A) A blastocyst after treatment with proteinase to remove the zonapellucida. (B) The trophoblast cells appeared destroyed after immuno-surgery. (C) Seven days after plating the inner cell mass (ICM) on the feedercells. (D) NTU1 hESC line at passage 4. (E) NTU2 line at passage 7 transferred by mechanical method. This is a morphologically good colony. (F) NTU1 line at passage 11 transferred by collagenase type IV. (G) A morphologically fair colony. (H) A morphologically poor colony. (I–N)These are representative marker expressions for NTU1 line. (I) Alkaline phosphatase. (J) Oct-4. (K) SSEA-3. (L) SSEA-4. (M) TRA-1-60. (N)TRA-1-81. (O) Karyotype of NTU1 line (46, XX). (P) Karyotype of NTU2 line (46, XX). Scale bars, 200μm. (Cited from Chen et al., 2007)

Other Research Units

- Laser Medicine Research Center
- Center for Biomedical Engineering
- Biotechnology Research Group*
- Pharmaceutical Research Group
- Laboratory Animal Center

Pioneer Research Fields

- Hepatitis virus in Liver Diseases
- Transplantation Medicine
- EB virus in Nasopharyngeal Cancers
- Snake Venom in Pharmacology

Activities of Biotechnology Research Group

- Courses:

  Biotechnology Course and

  Summer Training Course

- Workshops:

  Transgenic and Knockout mice

  Drug Design and Computer Modeling

  Bioinformatic Data Base Usage

Goals of Biotechnology Research Group

- Training of Young Scientists for Biotechnology and Biomedicine
- Promoting the Quality of Biotechnology Products
- Promoting the International Collaboration
- Supporting Taiwan to be an Asia-Pacific Manufacturing Center

Faculties of Biotechnology Research Group

- **Anatomy**
- **Biochemistry**
- **Clinical Medicine**
- **Immunology**
- **Medical Technology**
- **Microbiology**
- **Molecular Medicine**
- **Pharmaceutical Sciences**
- **Pharmacology**

Facilities

- **Student Laboratories**

  Gross Anatomy, Pathology, Histology,

  Biochemistry, Physiology, etc.
- **Common Research Laboratories**
- **Medical Equipment Center**
- **Transgenic Core Facilities** (in preparation)

Perspectives

- Integration of Research Efforts
- Molecular Medicine
- Genome Therapy
- Domestic and International Collaborations