



NTU Center of Genomic Medicine

臺大基因體醫學研究中心

Director: S.C. Chang (張上淳)

Deputy Director: C.L. Chien (錢宗良)



NTU Center of Genomic Medicine (NTU-CGM)

- **2002/10/30** CGM approved and funded by the Ministry of Education
- **2003/04/02** CGM provided technological supports for SARS Research Group
- **2004/04/01** CGM core facility started operation
- **2005/12/01** CGM renamed as NTU Research Center for Medicine Excellence
- **2007/07/27** NTU Molecular Imaging Core officially started services
- **2008/09/12** Stem Cell Core joined and started operation
- **2009/09/09** YongLin Healthcare Foundation donated equipment
- **2009/12/15** Applied Biosystems Company donated Next Generation Sequencing equipment
- **2010/03/19** Metabolomics Core started operation
- **2010/08/01** Research Center for Medicine Excellence renamed back to NTU CGM
- **2010/11/20** CGM collaborated with NTUH to establish platforms for the translational medicine
- **2012/01/22** “I-RiCE Project” was granted by the National Science Council and collaborated with MD Anderson Cancer Center through international cooperation



臺大基因體醫學研究中心

NTU Center of Genomic Medicine

主持人: 張上淳 院長 黃冠棠 院長 陳為堅 院長

Directors: S.C. Chang G.T. Huang W.J. Chen

Genomic Medicine Cores

執行長: 錢宗良教授
Deputy Director: C.L. Chien

Cancer Division

楊泮池教授
P.C. Yang

Infectious Disease Division

陳培哲教授
P.J. Chen

Administration Office & Teaching Resource Center



Proteomics

周綠蘋
L.P. Chow

Microbial Genomic

陳培哲
P.J. Chen
王錦堂
J.T. Wang

Microarray

楊泮池
P.C. Yang
俞松良
S.L. Yu

Tissue Bank

林中梧
C.W. Lin

Transgenic & Knockout Mouse

陳惠文
H.W. Chen
林淑華
S.W. Lin

Genetic Epidemiology

陳為堅
W.J. Chen
簡國龍
K.L. Chien

Bioinformatics Biostatistics

莊曜宇
E.Y. Chuang
蕭朱杏
C.S. Hsiao

Stem Cell

何弘能
H.N. Ho
錢宗良
C.L. Chien

Metabolomics

郭明良
M.L. Kuo
曾宇鳳
Y.J. Tseng
郭錦樺
C.H. Kuo

NTU Center of Genomic Medicine

Mission

To establish state-of-the-art core facilities, support cutting edge genomic research for scientists in NTU

Our Focus

Disease-based translation research, emphasize on **cancer** and **infectious diseases**

Bench Mark

Top-ranking university in Asia-Pacific area
Osaka University, Melbourne University

Milestone Achieved

- Fully function core facilities in genomic research
- Facilitate multidisciplinary collaborations in NTU
- Support NTU PIs publish high ranking research
50 papers/year, 2 patents/year
- Educational programs and workshops
- Undergraduate students summer workshop
- International credibility and collaboration

International Collaborations

Barry Marshall
Nobel Laureate Medicine 2005
At 112th Anniversary
Symposium
26.6.2007



Dr. Barry Marshall
The 2005 in Medicine

It has been a most interesting and impressive visit. Thank you for showing us NTU Medical Center.

Best wishes,

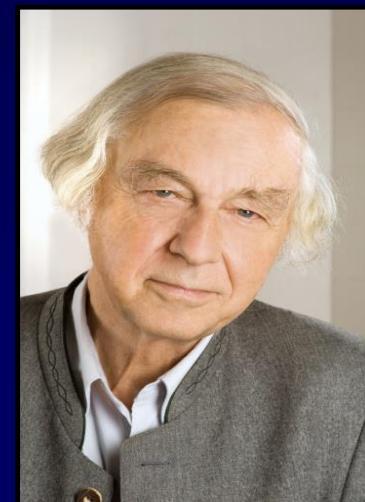
Joh. Deisenhofer
Aug. 15, 2008



Dr. Johann Deisenhofer
The 1988 in Chemistry

A most interesting tour showing the
NTU Research Center of Medical excellence, thank you,
Robert Huber
(ROBERT HUBER)

10. Nov. 2008



Dr. Robert Huber
The 1988 in Chemistry

NTU-CGM Summer Workshop 2005-2013



Biomarkers for Non-Small-Cell Lung Cancer

The NEW ENGLAND JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

JANUARY 4, 2007

VOL. 356 NO. 1

A Five-Gene Signature and Clinical Outcome in Non-Small-Cell Lung Cancer

Hsuan-Yu Chen, M.Sc., Sung-Liang Yu, Ph.D., Chun-Houh Chen, Ph.D., Gee-Chen Chang, M.D., Ph.D.,
Chih-Yi Chen, M.D., Ang Yuan, M.D., Ph.D., Chiou-Ling Cheng, M.Sc., Chien-Hsun Wang, M.Sc.,
Harn-Jing Terng, Ph.D., Shu-Fang Kao, M.Sc., Wing-Kai Chan, M.D., Han-Ni Li, M.Sc., Chun-Chi Liu, M.Sc.,
Sher Singh, Ph.D., Wei J. Chen, M.D., Sc.D., Jeremy J.W. Chen, Ph.D., and Pan-Chyr Yang, M.D., Ph.D.

EDITORIAL



Molecular Signatures of Lung Cancer — Toward Personalized Therapy

Roy S. Herbst, M.D., Ph.D., and Scott M. Lippman, M.D.

(Chen HY et al, NEJM 2007; Yu SL et al, Cancer cell 2008)

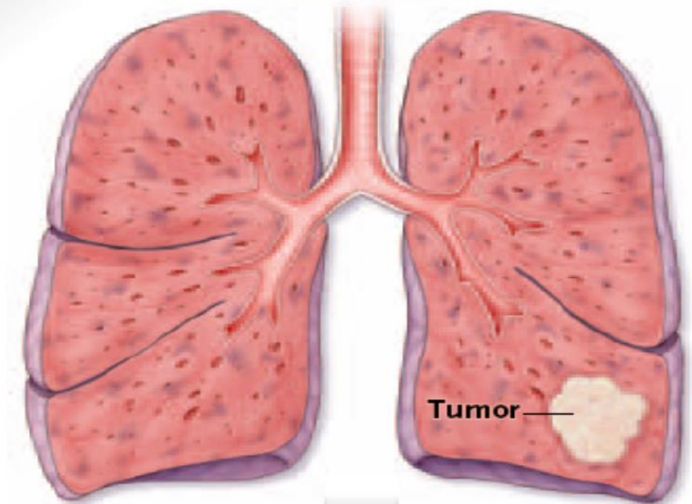
Phase 1: Genomic signatures
Stored specimens plus clinical data

Phase 2: Validation
Prospective trials

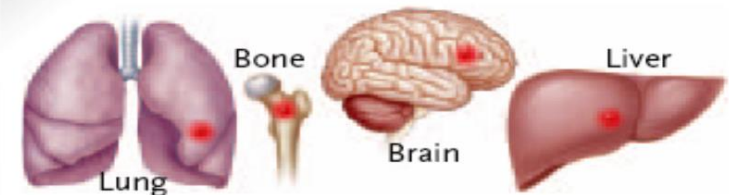
Phase 3: Expansion of genomic signatures
Preclinical and clinical studies

Algorithm

Clinical characteristics
Molecular imaging
Proteomics
Genomics

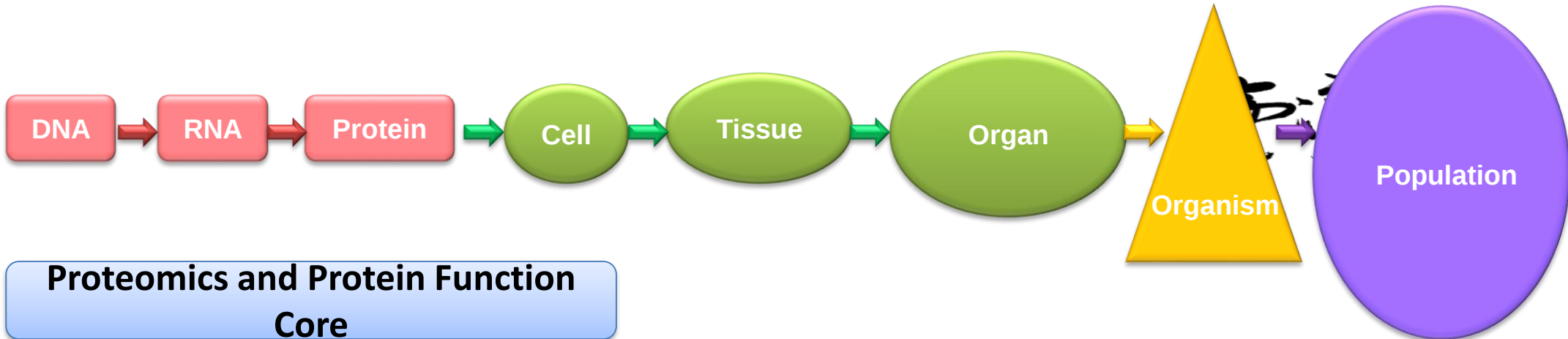


Prediction of metastasis



Prediction of drug sensitivity or resistance

Phase 4: Personalized therapy



DNA

RNA

Protein

Cell

Tissue

Organ

Organism

Population

**Proteomics and Protein Function
Core**

Microarray Core

Microbial Genomics Core

Biomedical Molecular Imaging Core

Tissue Bank Core

Transgenic and Gene Knockout Mouse Core

**Genetic Epidemiology
Core**

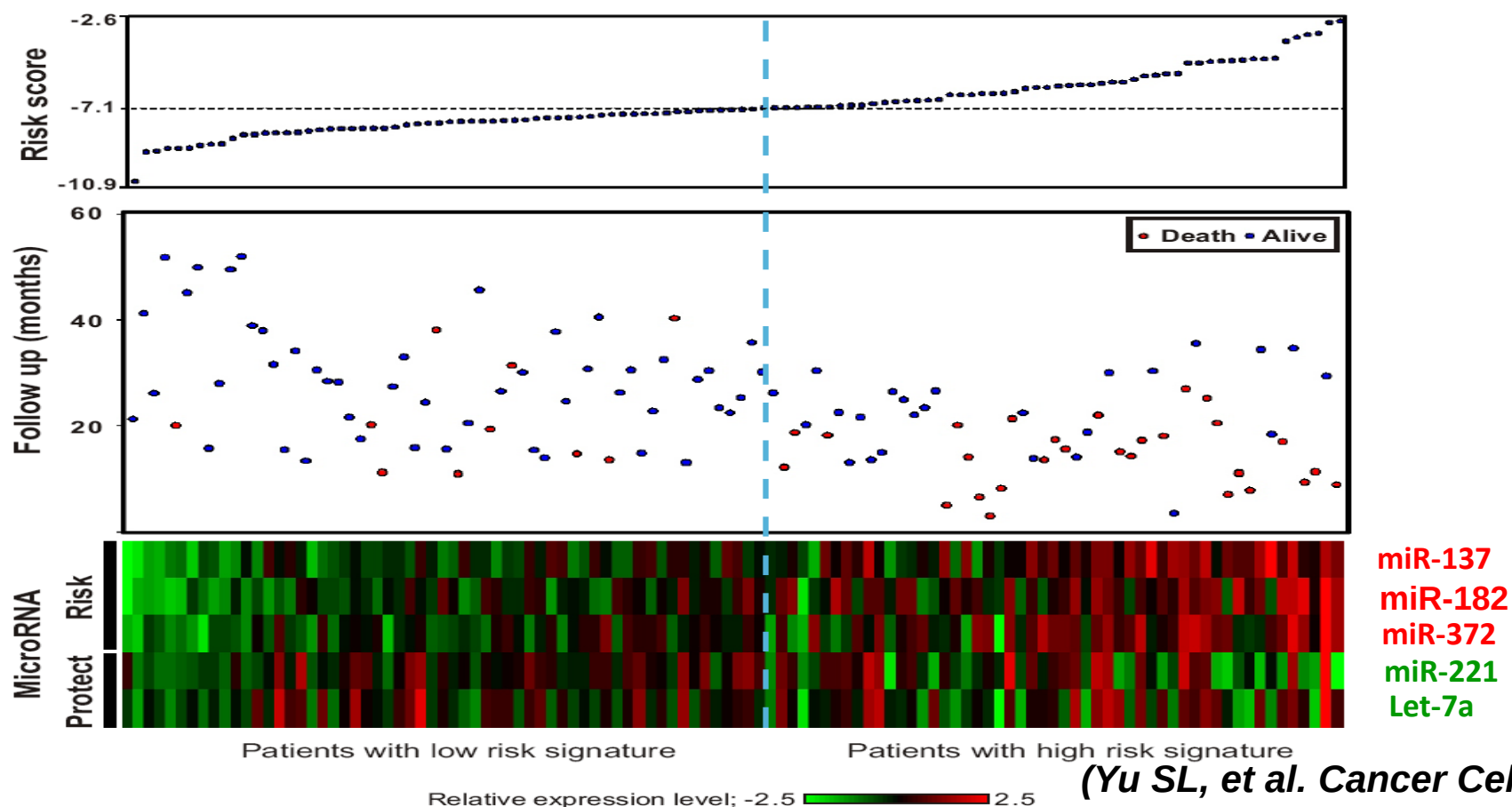
Bioinformatics and Biostatistics Core

Stem Cell Core

Metabolomics Core

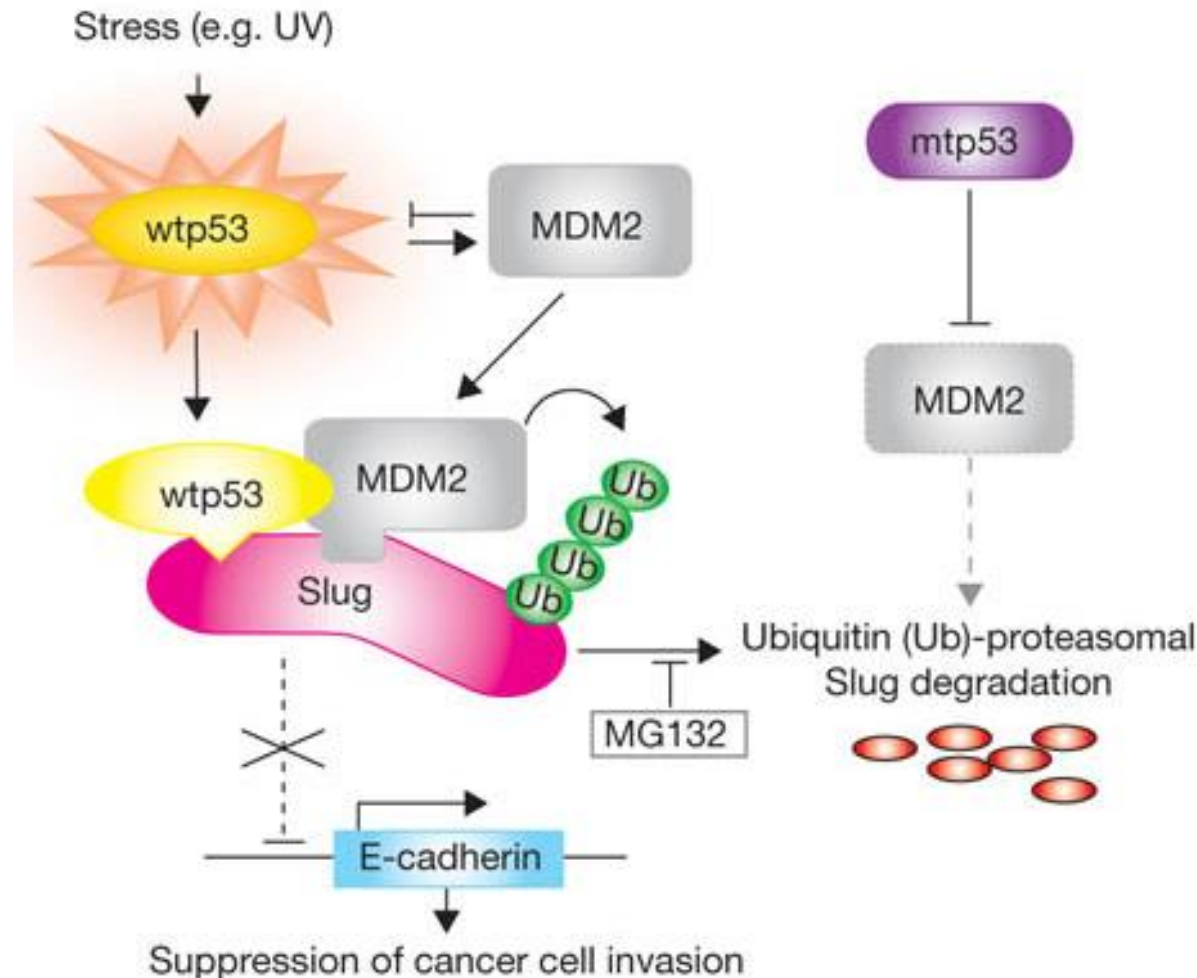
MicroRNA Signature Predicts Survival and Relapse in Lung Cancer

Sung-Liang Yu,^{1,2,3} Hsuan-Yu Chen,^{2,6,7} Gee-Chen Chang,^{9,11} Chih-Yi Chen,^{10,12} Huei-Wen Chen,¹³ Sher Singh,¹⁴ Chiou-Ling Cheng,² Chong-Jen Yu,⁴ Yung-Chie Lee,⁵ Han-Shiang Chen,^{15,16} Te-Jen Su,^{2,11} Ching-Cheng Chiang,² Han-Ni Li,² Qi-Sheng Hong,² Hsin-Yuan Su,² Chun-Chieh Chen,² Wan-Jiun Chen,¹³ Chun-Chi Liu,¹¹ Wing-Kai Chan,³ Wei J. Chen,^{2,6} Ker-Chau Li,^{7,17,18} Jeremy J.W. Chen,^{2,11,18} and Pan-Chyr Yang^{2,4,8,18,*}



p53 controls cancer cell invasion by inducing the MDM2-mediated degradation of Slug

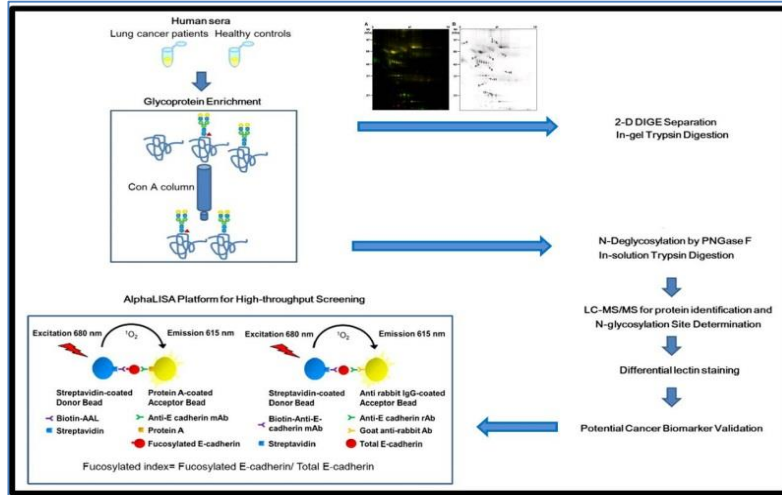
Shu-Ping Wang¹, Wen-Lung Wang¹, Yih-Leong Chang², Chen-Tu Wu², Yu-Chih Chao¹, Shih-Han Kao³, Ang Yuan⁴, Chung-Wu Lin⁵, Shuenn-Chen Yang⁶, Wing-Kai Chan⁷, Ker-Chau Li⁸, Tse-Ming Hong^{9,11} and Pan-Chyr Yang^{4,6,10,11,12}



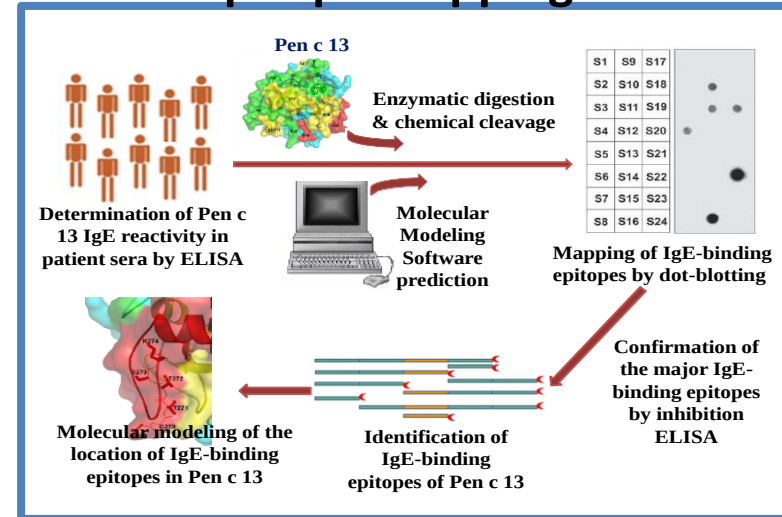
Proteomics and Protein Function Core Laboratory

Proteomics strategies for clinical research

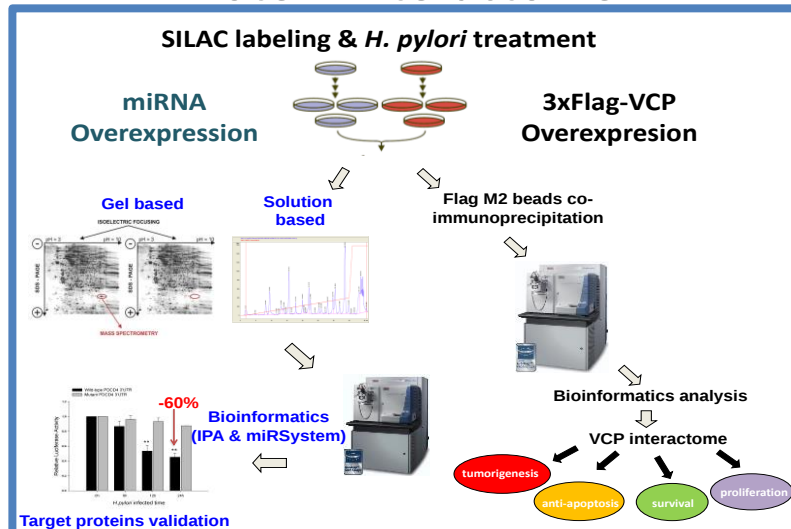
Glycoproteome for marker discovery



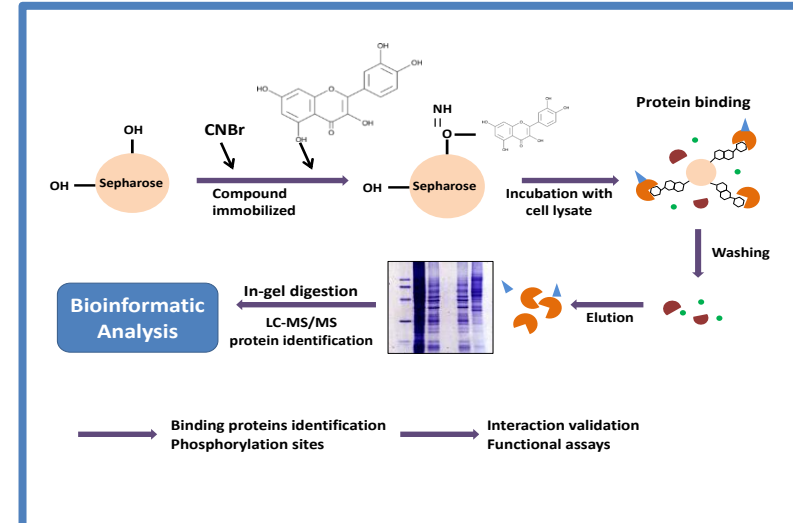
Epitope mapping



Protein interactome



Chemical proteomics

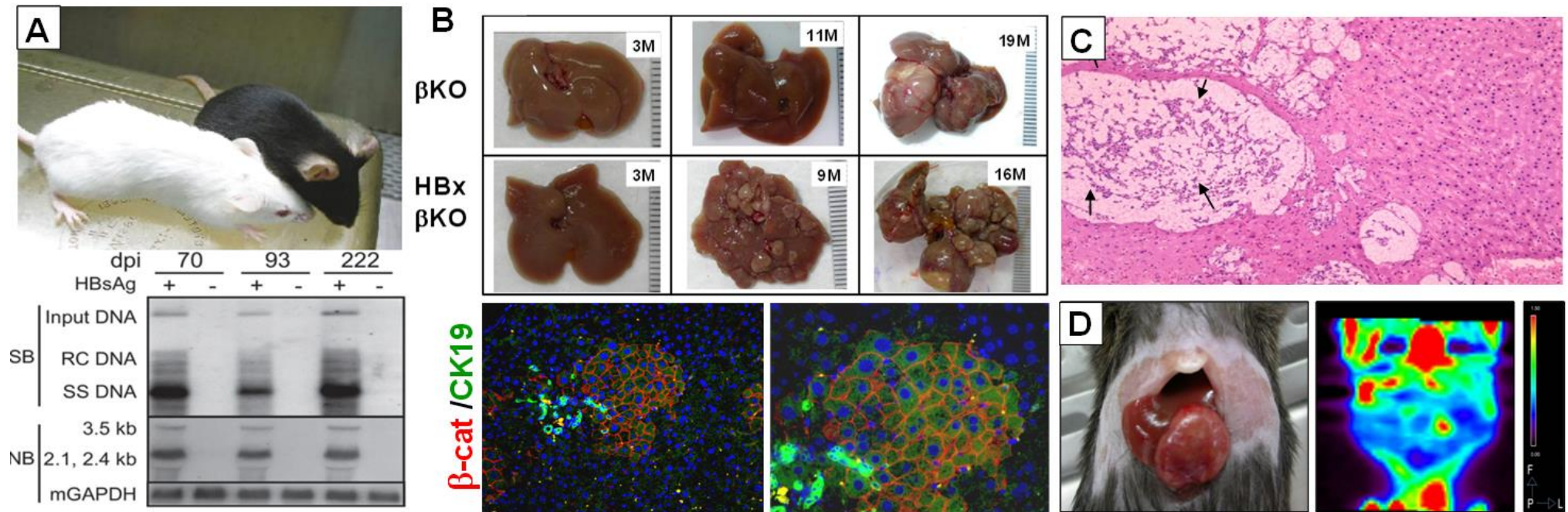


Microbial Genomics Core Laboratory



Establish animal models for infectious diseases

- (1) Immunocompetent mouse model for chronic HBV infection
- (2) Orthotopic HCC mouse model → Gene therapy and drug development
- (3) The knockout mouse model for viral protein induced HCC from progenitor cells
- (4) Woodchuck models for hepatitis virus infection and HCC
- (5) The mice model for *K. pneumoniae* causing pyogenic liver abscess



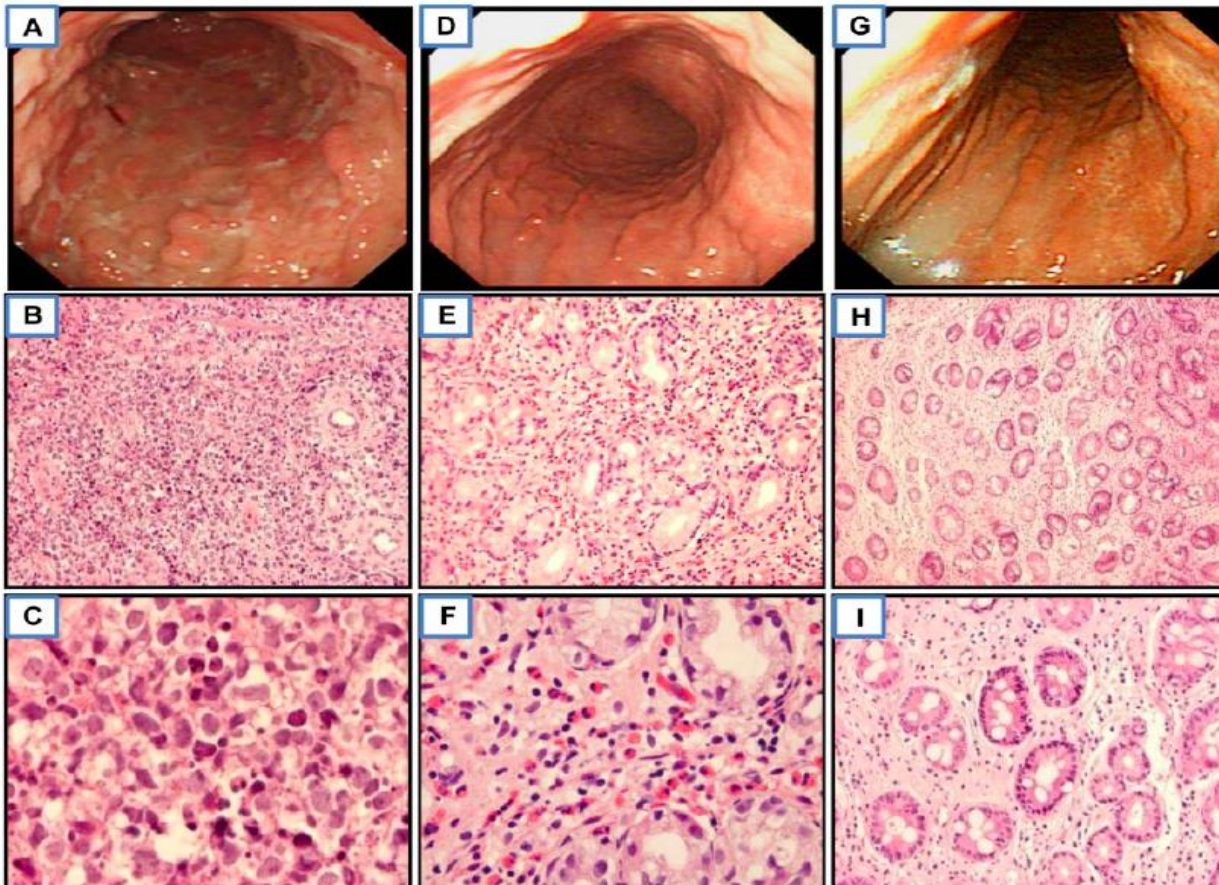
Lin YJ, et al. *Proc. Natl. Acad. Sci. USA*. 2010
 Fang CT, et al. *Infect Immun*. 2012
 Huang KW, et al. *Proc. Natl. Acad. Sci. USA*. 2010
 Wang EY, et al. *Proc. Natl. Acad. Sci. USA*. 2011
 Lin YJ, et al. *J. Virology* 2012

Tissue Bank Core Laboratory



Helicobacter pylori eradication therapy is effective in the treatment gastric diffuse large B-cell lymphomas

Kuo SH, Yeh KH, Wu MS, Lin CW, Hsu PN, Wang HP, Chen LT, Cheng AL. Blood. 2012 May 24;119(21):4838-44.
(Invited speech by Dr SH Kuo at 2013 annual meeting of American Society of Hematologist)



A,B,C: before treatment

**D,E,F: partial resolution
after after treatment**

G,H,I: complete remission

Conclusion:

**Some DLBCLs need
only antibiotic treatments.**

Stem Cell Core Laboratory

- ⊙ To supply hESC for the researchers within NTU campus
- ⊙ To supply the technical supports for stem cell researchers nationwide and provide routines for characterization of hESC
- ⊙ To integrate the service provided by the core laboratories
- ⊙ To promote the international collaboration of stem cell research
- ⊙ **To establish iPS cell lines for disease models**



Stem Cell Core Laboratory Education

International Medical Students Training (arranged by the International Federation of Medical Students' Association (IFMSA))

Year	Nationality	Subtotal
2008	Thailand, Spain (2), Poland, Slovenia, Serbia (2)	7
2009	Spain, Portugal, Hungary, Italy	4
2010	Thailand, Netherlands (2), Spain, Greece, Italy, Austria, Hungary	8
2011	Thailand, Slovenia, Hungary (2), Italy, Tunisia	6
2012	Thailand, Mexico, Canada, Portugal, Egypt	5
Total		30

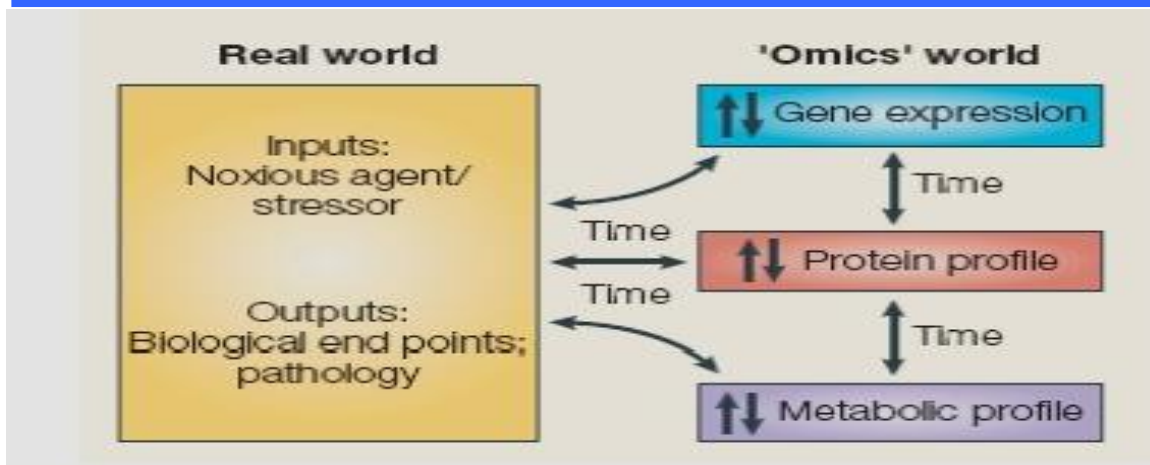
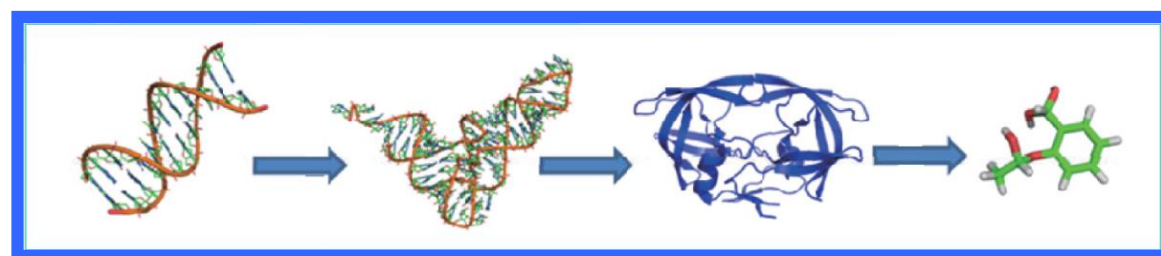


代謝體核心實驗室

Metabolomics Core Laboratory

臺灣大學

- Serve as a bridge for basic research and clinics concerning the potential and benefits of metabolomics impacting the personalized medicine.
- To provide metabolomics knowledge infrastructure to improve personal health and quality of life.



International Collaborations

臺灣大學

“I-RiCE Project” was granted by the National Science Council and collaborated with MD Anderson Cancer Center (2012/01/22)



**President Ronald DePinho from MD Anderson Cancer Center
(2013/11/22)**

Future Directions

- Backup new Graduate Institutes:
Cancer, Genomics, Neuroscience (IBMS)
- Promote the Multidisciplinary Translational Research
- Promote the International Collaborations
(MD Anderson, Terry Fox, Peking University, etc.)
- Enhance the New Research and Facility:
Metabolomics
High throughput sequencer
Novel drug design for target therapy
Molecular Imaging & Medical devices, etc.

Thank you for your attention

