

NRPB Human Disease iPS Cells Service Consortium

人類疾病誘導型多潛能幹細胞服務聯盟

-- A Heart for Missions

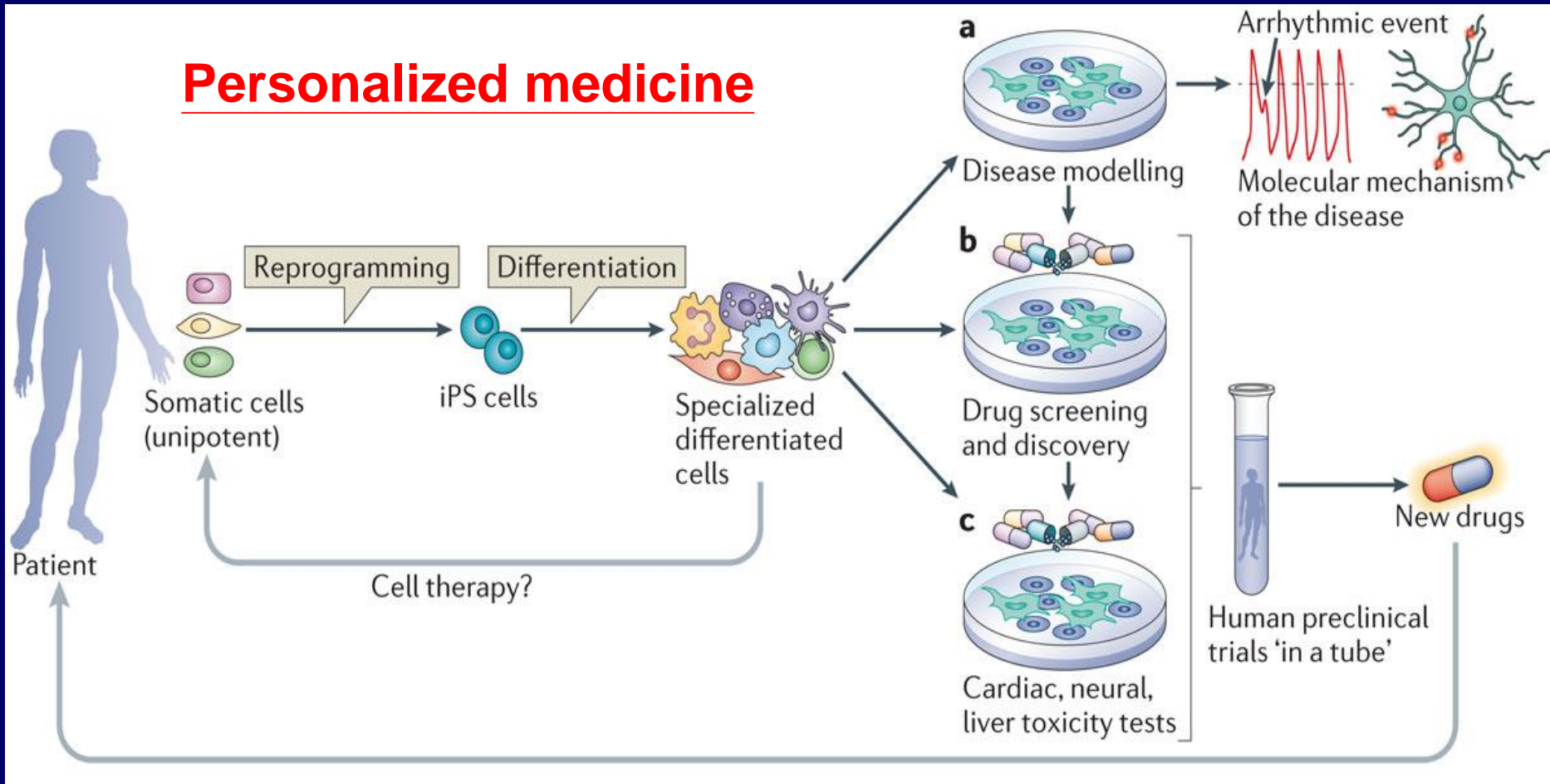
Patrick C.H. Hsieh (謝清河), MD, PhD, FAHA

Institute of Biomedical Sciences, Academia Sinica

中研院 生醫所

Human iPS cell derivation, differentiation and applications

Personalized medicine

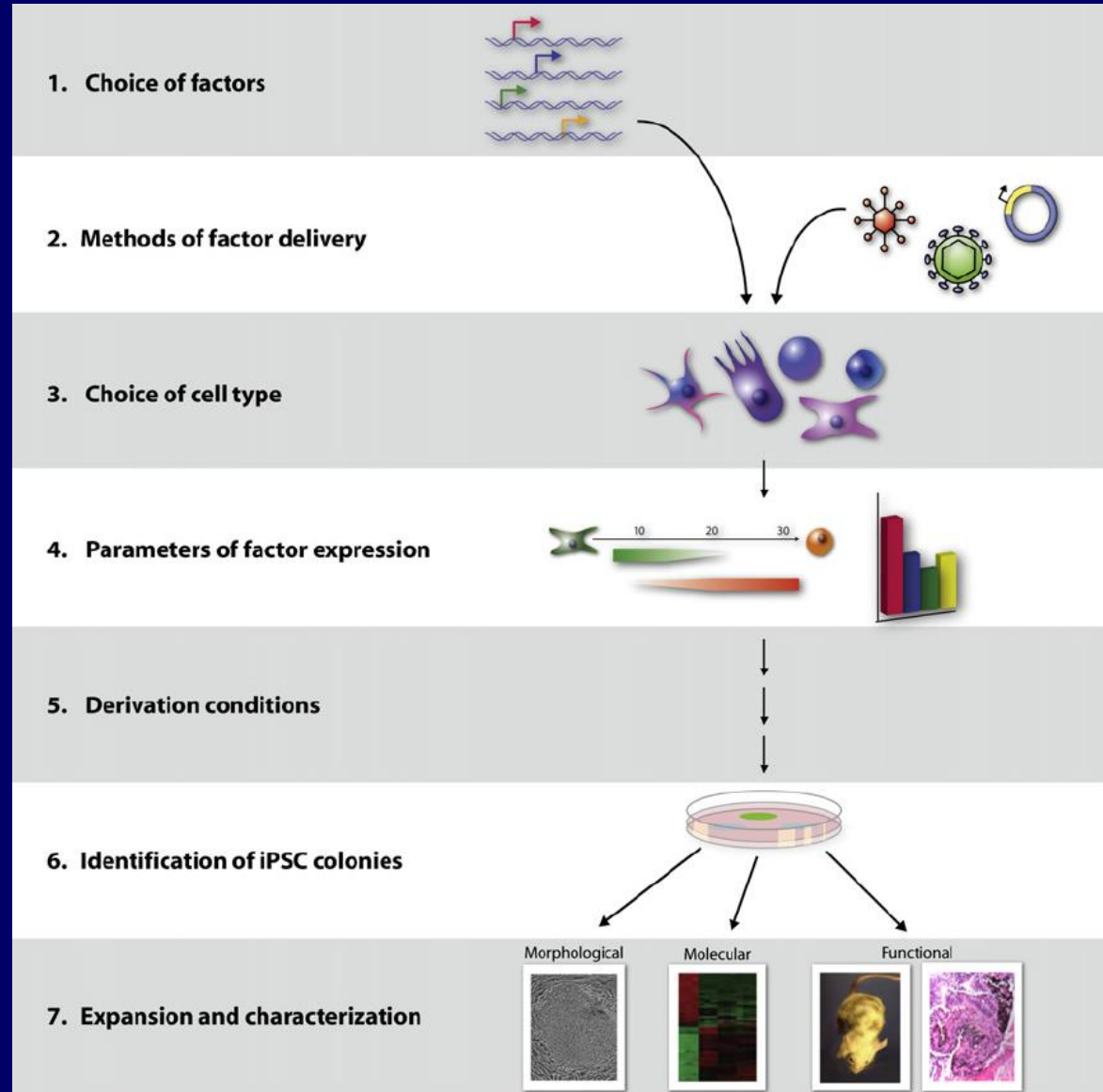


An overview of iPS cell generation

Yamanaka 4 factors

Sendai Virus- blood cells or fibroblasts
Episomal vectors-fibroblasts

Peripheral mononuclear cells
Fibroblasts

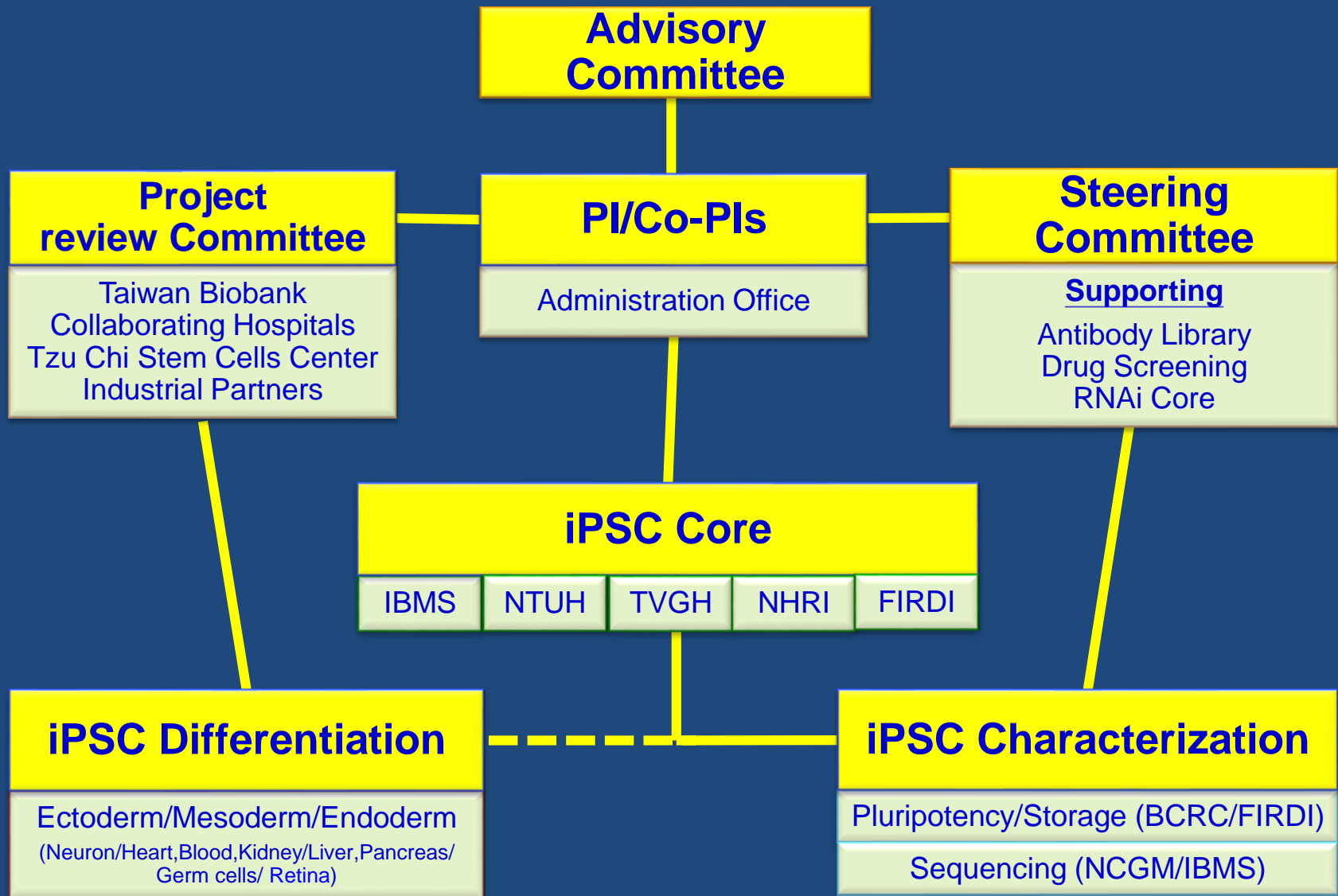


NRPB Human Disease iPS Cells Service Consortium

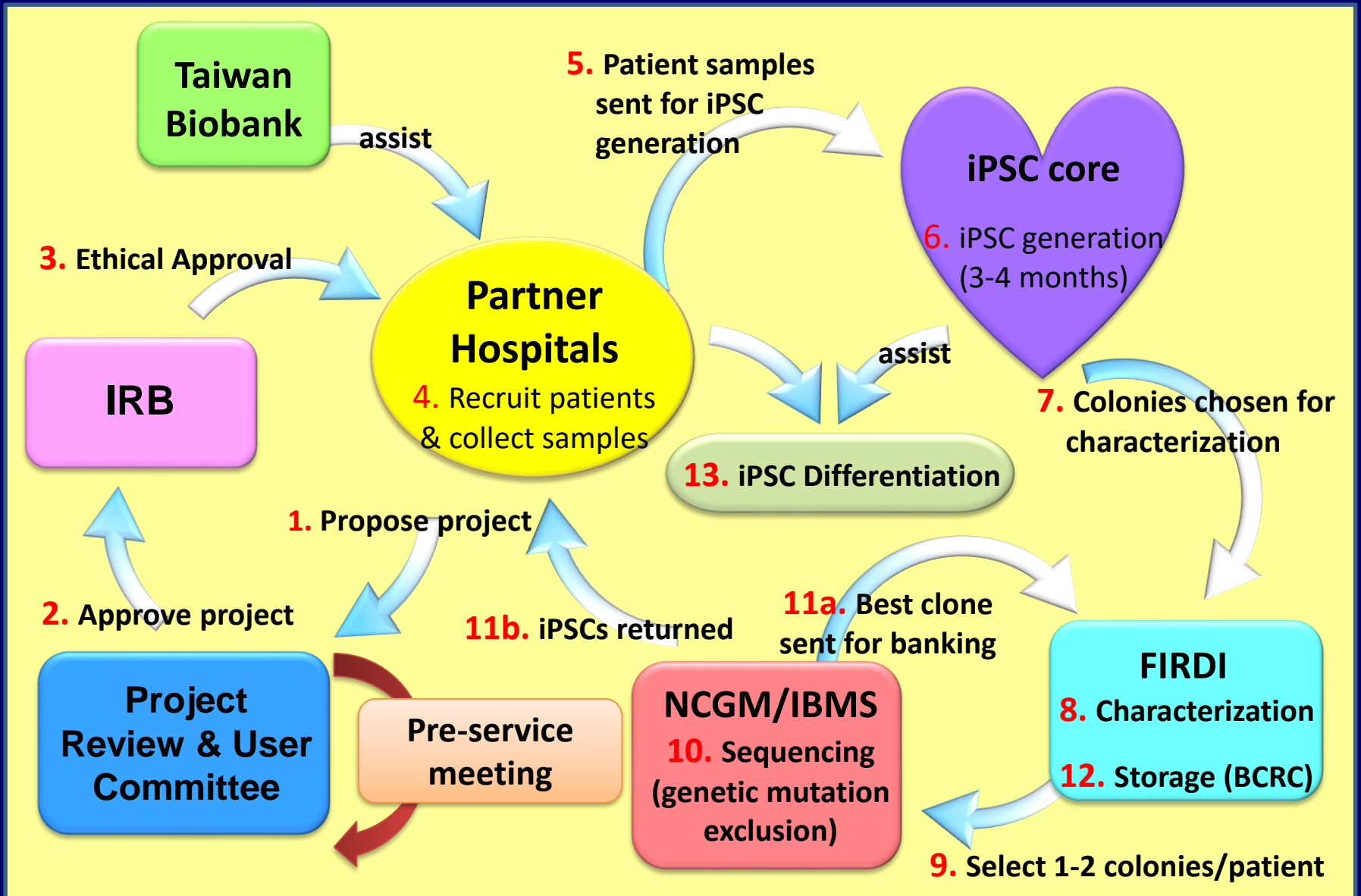
Why form an iPSC consortium in Taiwan?

- A unique pool of patients in Taiwan with different genetic disorders, responses to treatment etc.
 - public good & personalized medicine
- Collaborations for challenging projects
 - international competitiveness
- A resource center
 - service, education, training, consultation

What is the iPSC Service Consortium?



How does the iPSC Consortium work?



Which topics to focus on or start with?

Principles

For high quality, not for large quantity

Human disease samples, IRB approved

Project review committee approved,

Committed to being available to the public (priority)

Project selection criteria –

Current NRPB grants or MOST-funded major projects

Proven track history of high-impact research

Mission-oriented

Non-NRPB/MOST-funded projects for public good

Pre-screened by the consortium PI and co-PIs

Reviewed/recommended by the Project Review Committee

Which topics to focus on or start with?

Neurology-- neurodegenerative diseases

Cardiology-- cardiotoxicity

Hepatology-- anti-hepatitis drug resistance

Ophthalmology-- retinal degenerative diseases

Nephrology-- renal toxicity

OB/GYN-- premature ovarian failure, infertility

Hematology-- hematopoietic cell therapy

Others

Who are we and where to conduct?

PI: Patrick C.H. Hsieh, MD, PhD (謝清河, IBMS/AS)

Co-PI: Hong-Nerng Ho, MD, PhD (何弘能, NTUH)
Shiaw-Min Hwang, PhD (黃效民, BCRC/FIRDI)
Shih-Hwa Chiou, MD, PhD (邱士華, TVGH)
Hung-Chih Kuo, PhD (郭紘志, ICOM/AS)
Betty L. Yen, MD (顏伶汝, ICSM/NHRI)

Who are we and where to conduct?

Advisory & Steering Committee:

Dr. Fu-Tong Liu (劉扶東所長, IBMS/AS)

Dr. Yuan-Tsong Chen (陳垣崇院士, IBMS/AS)

Dr. Jeng-Jiann Chiu (裘正健所長, ICSM/NHRI)

Dr. Tao-Shih Hsieh (謝道時所長, ICOM/AS)

Dr. Min-Liang Kuo (郭明良院長, Biochemistry/NTU)

Dr. Yau-Huei Wei (魏耀揮校長, Mackay Medical College)

Dr. Jacqueline Whang-Peng (彭汪嘉康院士, TMU)

Dr. Cheng-Wen Wu (吳成文院士, Clinical Medicine/NYMU)

Dr. Joseph C. Wu (Cardiovascular Institute/Stanford U)

Dr. Jen-Hung Yang (楊仁宏院長, Tzu Chi Medicine)

Who are we and where to conduct?

Project Review Committee:

1. Composed of experts balanced in areas to provide neutral evaluation of proposals
2. Review and recommend projects for service
3. Appointed by NRPB

Dr. Bon-Chu Chung (鍾邦柱特聘研究員, IMB/AS)

Dr. Hsin-Fu Chen (陳信孚所長, Genom & Proteom/NTU)

Dr. Fu-Chou Cheng (陳甫州主任, Stem Cells/VGH-Taichung)

Dr. Yi-Juang Chern (陳儀莊特聘研究員, IBMS/AS)

Dr. Shih-Chieh Hung (洪士杰主任, Ortho Surg, IBMS/AS)

Dr. Chia-Ning Shen (沈家寧副主任, GRC/AS)

Dr. Hua-Lin Wu (吳華林講座教授, Biochemistry/NCKU)

Who are we and where to conduct?

Supporting:

- ***Antibody Library--***
Dr. Han-Chung Wu (吳漢忠副所長, ICOB/AS)
- ***Drug Screening--***
Dr. Wen-Shan Li (李文山副研究員, Chemistry/AS)
- ***RNAi Core--***
Dr. Joyce Jean Lu (呂仁助研究員, GRC/AS)
- ***Taiwan Biobank--***
Dr. Chen-Yang Shen (沈志陽執行長, IBMS/AS)
- ***Taiwan Stem Cell Bank--***
Dr. Shiao-Min Hwang (黃效民副主任, BCRC/FIRDI)
- ***National Center for Genome Medicine--***
Dr. Jer-Yuarn Wu (鄔哲源主任, IBMS/AS)
Dr. Ling-Hui Li (李玲慧助研究員, IBMS/AS)

Who are we and where to conduct?

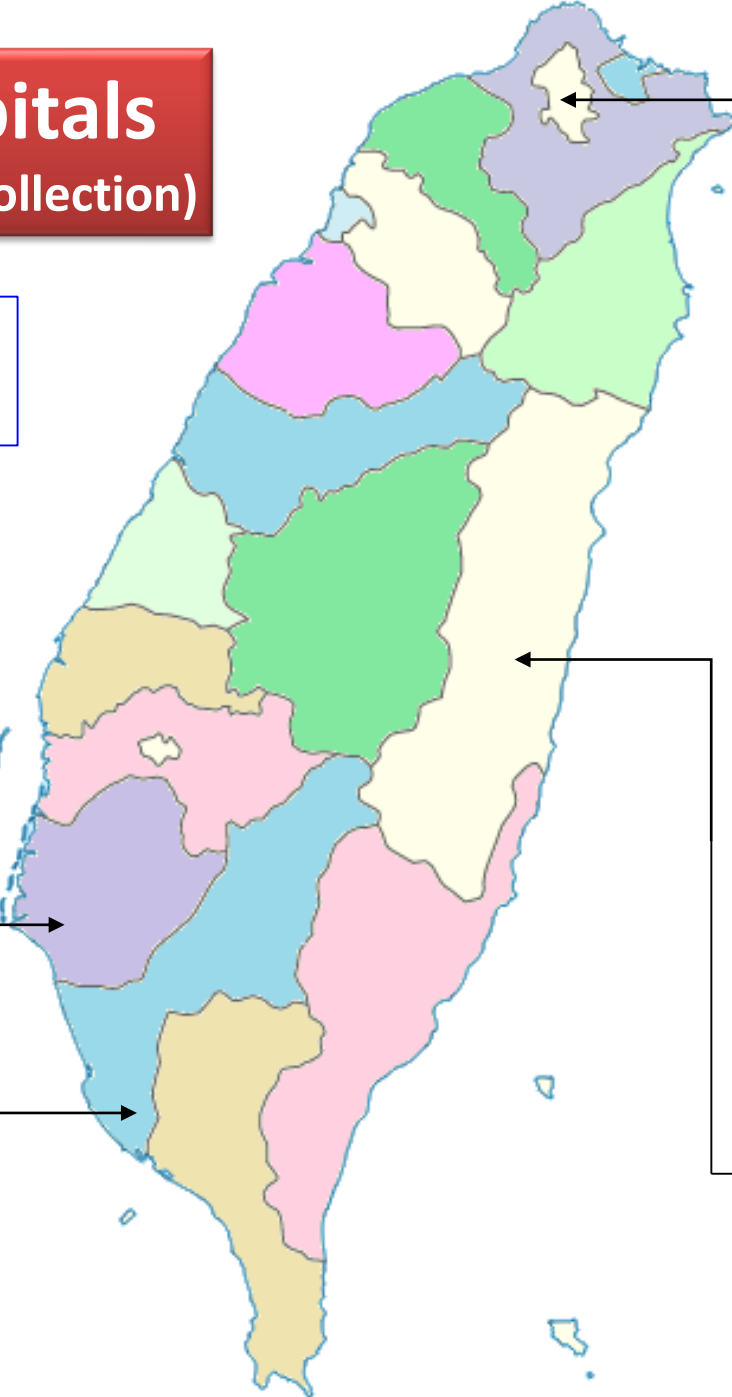
Expert consultants for iPSC differentiation

Field	Name
Neurology	Dr. Hung-Chih Kuo (郭紘志, ICOM/AS) Dr. Hong-Lin Su (蘇鴻麟, Life Sci/NCHU)
Cardiology	Dr. Patrick C.H. Hsieh (謝清河, IBMS/AS) Dr. Shiaw-Min Hwang (黃效民, BCRC/FIRDI)
Hepatology	Dr. Chia-Ning Shen (沈家寧, GRC/AS) Dr. Wann-Hsin Chen (陳婉昕, Biomed/ITRI)
Ophthalmology	Dr. Shih-Hwa Chiou (邱士華, Oph/TVGH)
Nephrology	Dr. Hung-Chun Chen (陳鴻鈞, Nephro/KMUH)
OB/GYN	Dr. Hong-Nerng Ho (何弘能, OBGYN/NTUH) Dr. Hsin-Fu Chen (陳信孚, OBGYN/NTUH)

Partner Hospitals

(nationwide sample collection)

Each disease:
3 donors/year



NTUH



TVGH



TCUH



NCKUH



KMUH



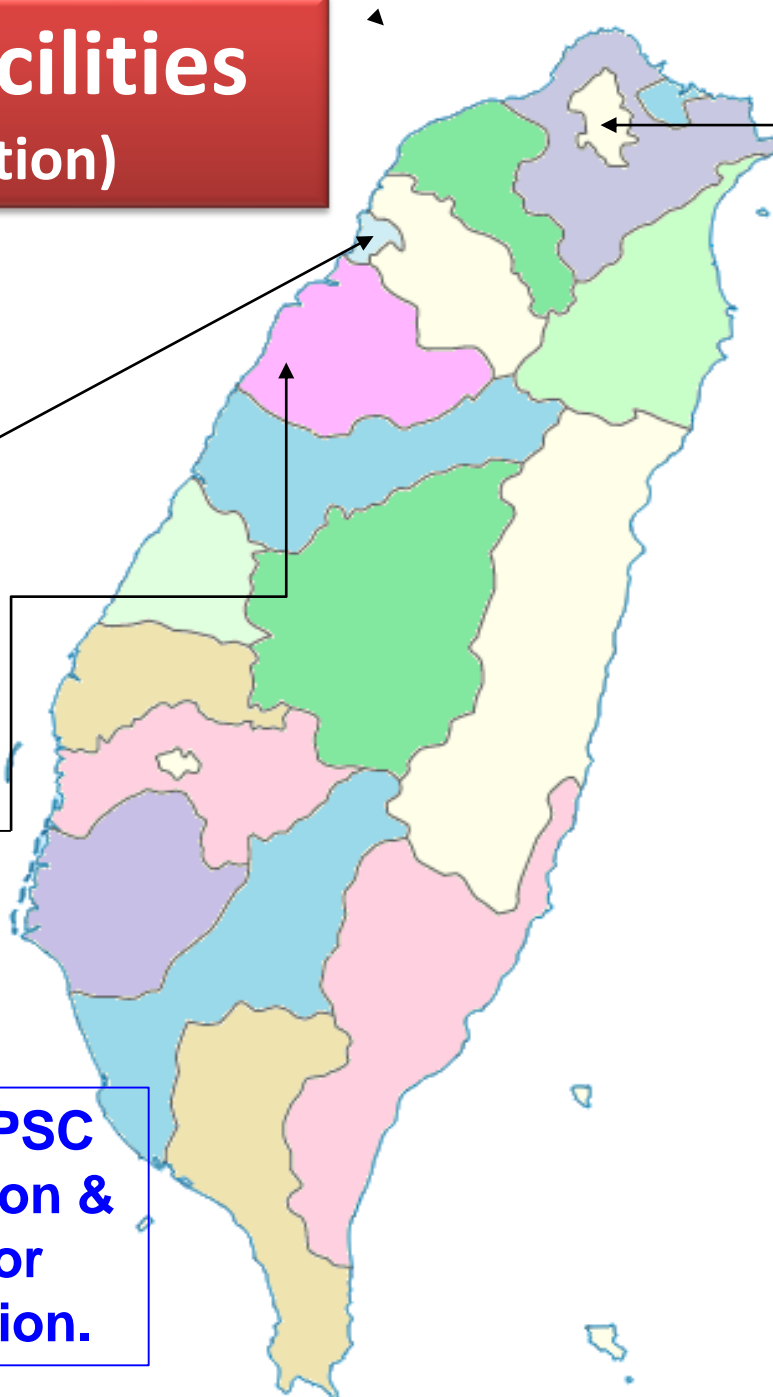
iPSC core facilities (iPSC generation)



FIRDI



NHRI



AS



NTUH



TVGH



For each donor, **10** iPSC colonies for expansion & **3** (at passage 8-10) for further characterization.

iPSC characterization and banking



FIRDI



3 iPSC colonies from each donor to be characterized at FIRDI.

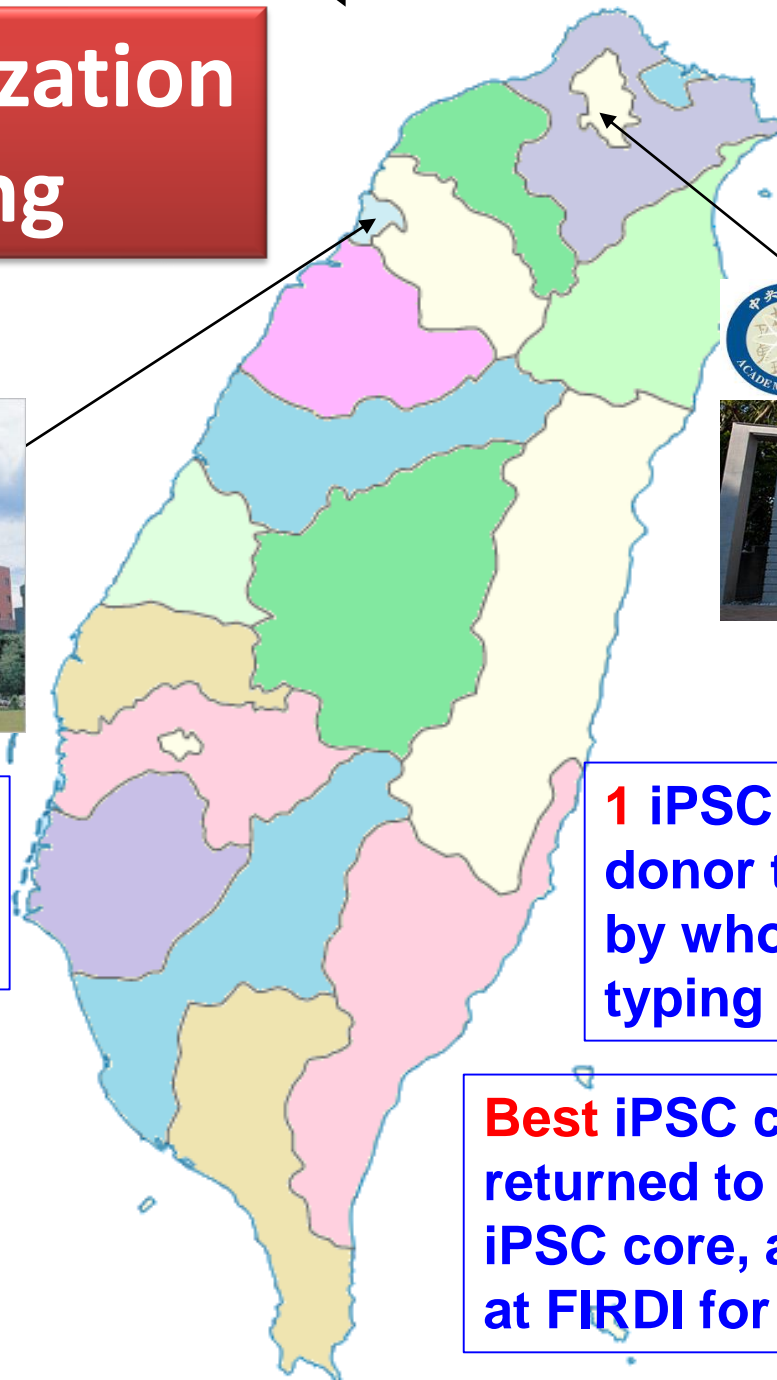


AS



1 iPSC clone from each donor to be confirmed by whole-genome typing at IBMS/AS.

Best iPSC clone to be returned to user and iPSC core, and stored at FIRDI for banking.



Service charge-- iPSC generation

Derivation service modules	Rate for NRPB/MOST grant
Module 1: Fibroblast from skin biopsy	NRPB supported
Module 2a: Reprogramming fibroblasts using Episomal vectors	NRPB supported
Module 2b: Reprogramming fibroblasts using Sendai virus	NRPB supported
Module 2c: Reprogramming blood cells (PBMC) using Sendai virus method	NRPB supported
Module 2d: Reprogramming somatic cells using Sendai virus method	NRPB supported

Service charge-- characterization & banking

Characterization service	Rate for NRPB/MOST grant
ICC, EB formation, gene expression, teratoma formation, karyotyping, mycoplasma examination	NRPB supported
Whole-genome SNP genotyping	NRPB supported
Cell banking service	Rate for NRPB/MOST grant
iPSC banking (public access)	FREE
iPSC banking (delayed public access-- 3 years)	50,000

Call-for-proposal

計畫說明

隨著醫學的進步，台灣地區人口結構趨於老化，國人的壽命延長，慢性病已逐漸取代過去的傳染病成為現在重要的公共衛生議題。自從山中伸彌(Shinya Yamanaka)教授於2006年發表誘導式多潛能幹細胞(induced pluripotent stem cells, iPSC)的成果以後，至今 iPSC 的研究與技術發展已漸趨成熟；許多研究也指出 iPSC 技術可用於疾病模式的探討，或藥物篩選、與細胞治療等用途。由於台灣民眾的遺傳基因具有其獨特性，且生活型態與致病因素和其他國家也有所不同，故建立台灣地區本土人類疾病誘導性多潛能幹細胞資料庫有其必要性，此一服務聯盟建立，將提供產製建立人類疾病誘導型多潛能幹細胞株之服務，使台灣研究者能藉由此平台之成功建立與後續人類相關疾病研究接軌，進而研究疾病發生成因與提供新藥物篩選與細胞治療可行性。在過去兩年間，本聯盟已成功建立19種疾病逾50株疾病 iPSC，為擴大疾病 iPSC 種類與特殊突變點 iPSC，擬公開徵求5件疾病 iPSC 產製計畫書(每件補助兩株 iPSC 之產製與定性)。

計畫徵求範疇

本次 iPSC 產製服務計畫申請徵求的研究範疇為能藉由 iPSC 平台進行特定或具代表性疾病發生成因、藥物篩檢、轉譯醫學、臨床前驗證或細胞治療等具潛力發展價值之研究。

Call-for-proposal

目前執行NRPB or MOST研究計畫之計畫主持人:

1. 申請者需為獲科技部NRPB或生科司補助研究計畫之計畫主持人
2. 申請者需具相關研究計畫或經費可延續iPSC產製後續實驗者
3. 所產製之iPSC將應用於具影響力且可追蹤病史之研究
4. 所提出之應用計畫需具特殊性及研究價值並獲本計畫審核委員會之推薦
5. 申請人同意將產製出之iPSC同時寄存於食工所以供其他研究人員申請使用
6. 服務計畫須同時經申請人及iPSC產製服務機構IRB審核通過

非執行NRPB or MOST研究計畫之計畫主持人:

1. 非執行NRPB或MOST研究計畫之研究人員或產業界研究者，若能提出有利於公眾福祉之研究，亦可以自費方式申請本聯盟之服務
2. 因學研界服務價格之人事、儀器折舊及管理成本由NRPB補助，自費之學研界申請人須同意將產製出之iPSC同時寄存於食工所以供其他研究人員申請使用。不同意寄存之申請人，將須以產業價格繳費

Application process

填寫計畫申請資格確認表

Pre-service meeting

提出計畫構想書與IRB申請

案件審查

公告申請結果與案件輪序

試驗者募集

disease iPSCs 產製

確認資格符合後與聯盟成員
面談討論需求

2015 Calendar-- NRPB iPSC Consortium

時間	事件	備註(地點)
01/28-01/30	iPSC training course	食品工業研究所
01/26-02/27	Information sessions	台大醫院、台北榮總、中醫大醫院、成大醫院、高醫大醫院、花蓮慈濟醫院
02/01-02/15	Project Review & User Committee meeting	中研院生醫所
03/01-03/31	Call for service proposal	將公告於NRPB網站
04/01-04/30	Proposal review	
05/01-05/10	iPSC site visit and QA/QC review	
05/15	Midterm progress report documents send to NRPB Program Office and MOST	
06/01	Midterm progress review meeting by NRPB Program Office and MOST	科技大樓
06/15	Announcement of service project review result	將公佈於NRPB網站
07/01	iPSC generation service starts	
08/03-08/10	Advisory Committee meeting	中研院生醫所
10/01-10/30	Project Review & User Committee meeting	中研院生醫所
10/16-10/17	iPSC Workshop	Satellite activity with TSSCR meeting at AS
10/30	Progress report documents send to NRPB Program office and MOST	
11/16-11/30	Annual progress report and review by NRPB	科技大樓

Contact information

IBMS, Academia Sinica (中研院生醫所)

- PI: Dr. Patrick C.H. Hsieh (謝清河)
02-2789-9074, phsieh@ibms.sinica.edu.tw
- PDF: Dr. Jennifer C.Y. Huang (黃靜瑩)
02-2652-3002, jennifer0820@ibms.sinica.edu.tw
- RA: Grace C.Y. Lee (李靜茵)
02-2789-9170, grass883014@yahoo.com.tw