



# **National Health Research Institutes**

**October 2008**

# History

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- The founding of the National Health Research Institutes (NHRI) was first proposed in 1988 by members of Academia Sinica.
- In 1994 a preparatory committee was formed.
- NHRI was officially established in January 1996.
- NHRI relocated to its permanent campus in Zhunan in 2004.



# Objectives

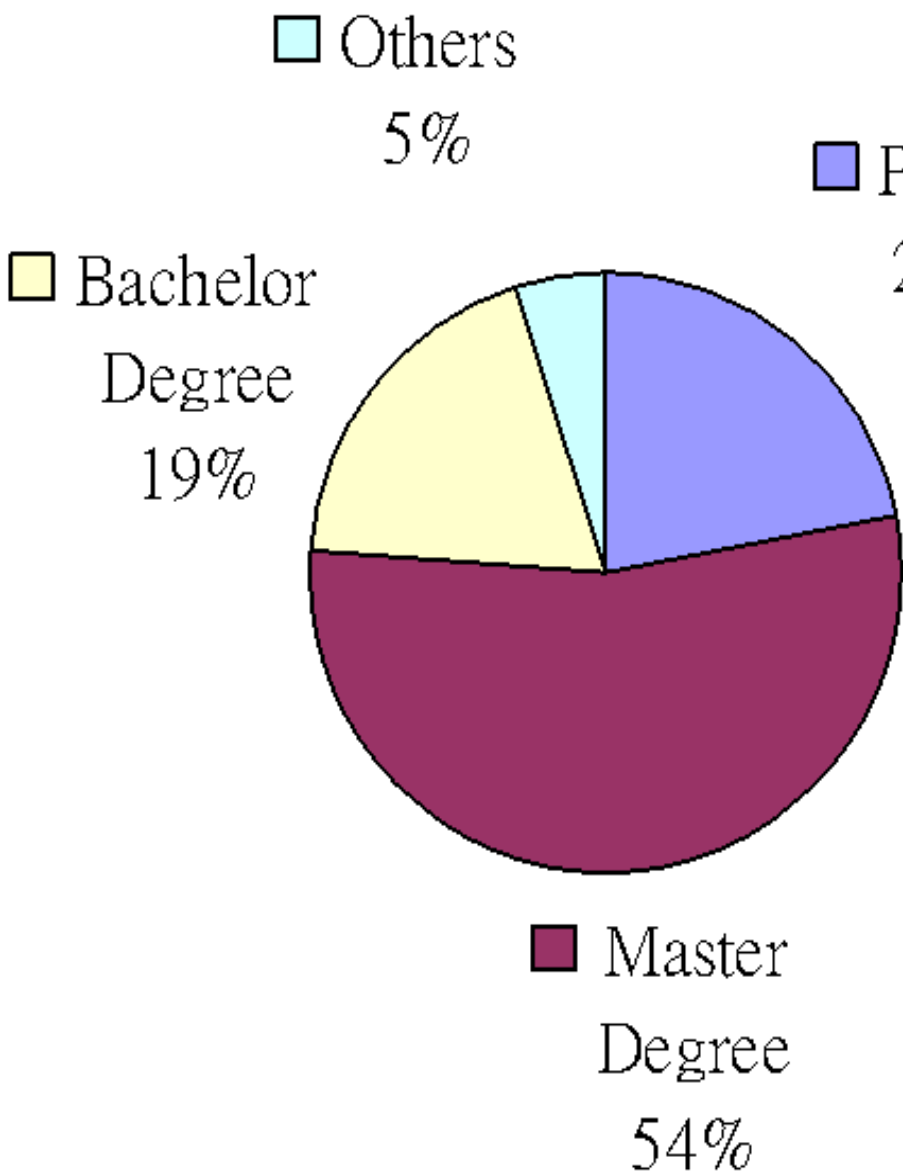
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- Improve the health and well-being of Taiwanese
- Enhance the quality of biomedical research and medical care
- Develop medical and pharmaceutical technology
- Train and cultivate biomedical researchers
- Promote health policy research and implementation





# Manpower



➤ Distinguished Investigator	14 (4MD)
➤ Investigator	22 (8MD)
➤ Associate Investigator	32 (3MD)
➤ Assistant Investigator	52 (5MD)
➤ Research Associate	11
➤ Postdoctoral Fellow	121
➤ Physician	5

- Total: 1170
- As of October 2008



# Scopes

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- A. Intramural Research Programs
- B. Cooperative Research Centers and Networks
- C. Extramural Research Grants & Training Programs
- D. Research Resources and Services
- E. Government Health Policy and Biomedical Research Think Tank

# A. Intramural Research Programs

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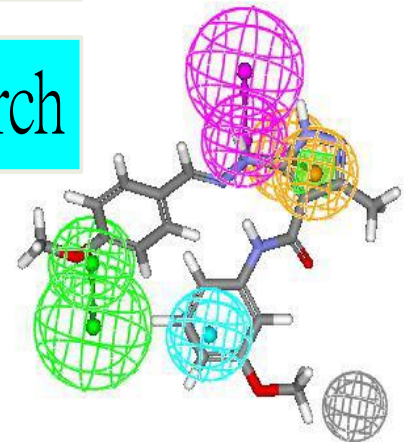
## Intramural Research Programs

Population Health Sciences

Molecular, Cellular and Genomic Medicine

Clinical and Translational Medicine

Biotechnology and Pharmaceutical Research





# A.1 Population Health Sciences

## Intramural Research Programs

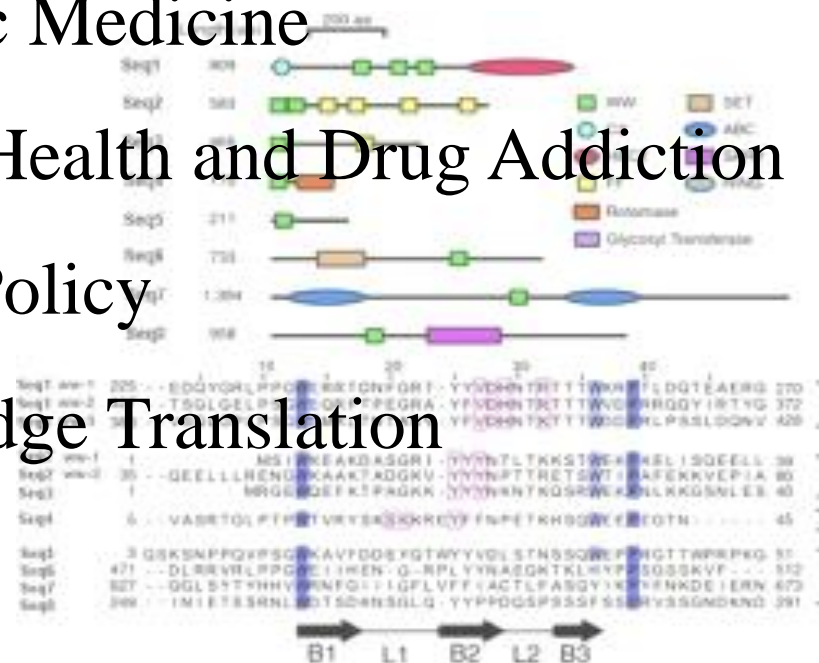
Population Health Sciences

Molecular, Cellular and Genomic Medicine

Clinical and Translational Medicine

Biotechnology and Pharmaceutical Research

- Epidemiology
- Clinical Trials
- Systems Biology
- Geriatric Medicine
- Mental Health and Drug Addiction
- Health Policy
- Knowledge Translation

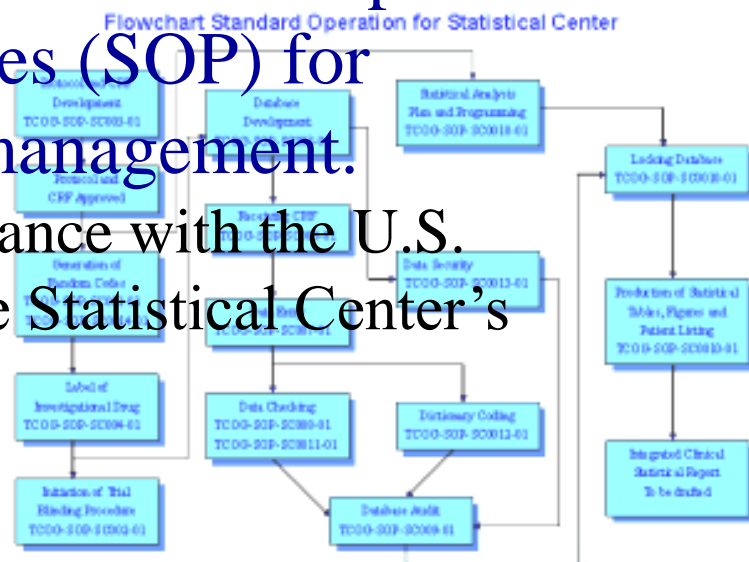




# A.1 Population Health Sciences

## 《Milestones and Highlights》

- A Clinical Trial Statistical Center has been developed for phase I–III cancer clinical trials.
  - The center collaborates with several international pharmaceutical companies.
- NHRI established the Clinical Research Information Management System to facilitate the conduct of all clinical trials and set up standard operating procedures (SOP) for clinical trial data flow and management.
  - The system is kept in compliance with the U.S. FDA's 21 CFR Part 11 by the Statistical Center's monitoring.



# A.2 Molecular, Cellular, and Genomic Medicine

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## Intramural Research Programs

Population Health Sciences

Molecular, Cellular and Genomic Medicine

Clinical and Translational Medicine

Biotechnology and Pharmaceutical Research

- Immunology
- Vascular Biology and Medicine
- Stem Cell Biology and Therapy
- Aging-Related Skeletal Diseases
- Environmental and Occupational Diseases



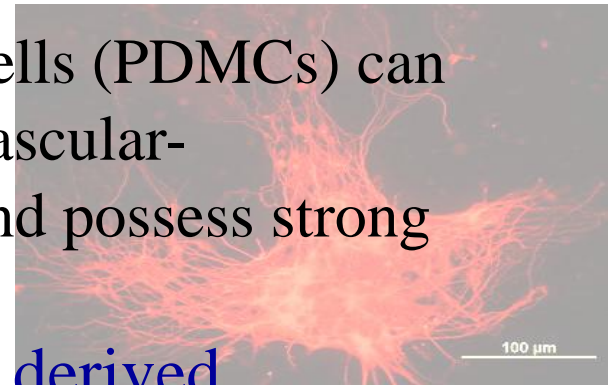
# A.2 Molecular, Cellular, and Genomic Medicine 《Milestones and Highlights I》

- Scientists have contributed to the DNA sequencing and genomic analysis of 33.3 megabases of chimpanzee chromosome 22.
- Collaborating with universities, NHRI has utilized positional cloning to map an autosomal dominant form of familial avascular necrosis of the femoral head to chromosomal 12q13 and successfully identified mutations in type II collagen gene in the patients.

# A.2 Molecular, Cellular, and Genomic Medicine 《Milestones and Highlights II》

➤ A population of multipotent cells from the human term placenta has been yield:

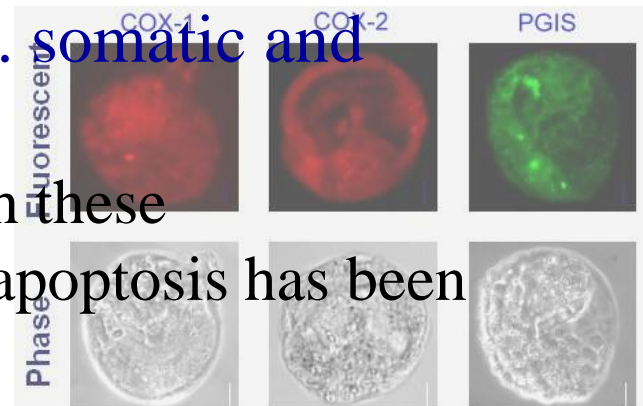
➤ These placenta-derived multipotent cells (PDMCs) can be differentiated into liver-, nerve-, vascular-chondrocyte- and bone-like cells and possess strong immune-suppressive properties.



➤ Different Cyclooxygenase-2 (COX-2) derived prostaglandins have been identified as important mediators of embryonic stem cell vs. somatic and cancer cell survival:

➤ The signaling mechanisms by which these prostaglandins confer resistance to apoptosis has been elucidated.

➤ These findings have clinical implications in stem cell expansion and *in vitro* fertilization.



## A.3 Clinical & Translational Medicine

### Intramural Research Programs

Population Health Sciences

Molecular, Cellular and Genomic Medicine

Clinical and Translational Medicine

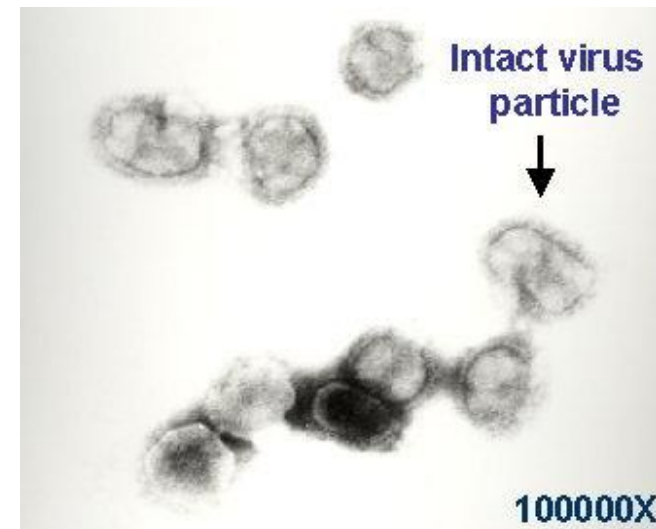
Biotechnology and Pharmaceutical Research

➤ Cancer Biology

➤ Infectious Diseases

➤ Addiction Medicine

➤ Geriatric Medicine





## A.3 Clinical & Translational Medicine

### 《Milestones and Highlights I》

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- NHRI joint research with hospitals analyzed the EGFR coding sequence in female lung adenocarcinoma patients and the responsiveness of gefitinib treatment:
  - The research team discovered that the East Asian population has a 50% greater response rate to gefitinib than the general population.
  - This novel finding has important implications for cancer treatment.

## A.3 Clinical & Translational Medicine

### 《Milestones and Highlights II》

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- Our surveillance of antimicrobial resistance in several important pathogenic bacteria in Taiwan has led to changes of health policy at the national level.
- Such as the Bureau of National Health Insurance's ban against the prescription of antibiotics in the treatment of acute upper respiratory infections (to minimize unnecessary antibiotic use).





## A.3 Clinical & Translational Medicine

### 《Milestones and Highlights III》

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- NHRI team has identified Coxsackieviruses A16 and Enterovirus 71, which are epidemic in Taiwan, have undergone gene recombination.
  - This finding will assist in the vaccine development.
- NHRI has discovered several novel microtubule inhibitors as potential anticancer drugs
  - as they function differently and have great potential in the management of various malignancies, particularly for patients with multi-drug resistance.



## **A.3 Clinical & Translational Medicine**

### **《Milestones and Highlights IV》**

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- Clinically, the NHRI research team has proven the feasibility of using antibiotic therapy as the first-line treatment for gastric high-grade MALT lymphoma
  - which means that chemotherapy, with its adverse side effects, can be minimized.

# A.4 Biotechnology & Pharmaceutical Research

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## Intramural Research Programs

Population Health Sciences

Molecular, Cellular and Genomic Medicine

Clinical and Translational Medicine

Biotechnology and Pharmaceutical Research

- Drug Discovery
- Biomedical Engineering
- Vaccine Research and Development
- Nanomedicine



## A.4 Biotechnology & Pharmaceutical Research 《Milestones and Highlights I》

➤ Drug candidates have been discovered and granted patents:

- 2 Potential novel anti-cancer drug candidates,
- 1 anti-diabetes candidate,
- 1 anti-obesity candidate,
- & several anti-viruses drug candidates.



➤ NHRI continues to promote industrialization through technology transfers and collaborate with biotech and pharmaceutical industries.

- Efforts are spent to move these drug candidates forward into pre-clinical and clinical trials to facilitate the domestic pharmaceutical industry.

## A.4 Biotechnology & Pharmaceutical Research 《Milestones and Highlights II》

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- NHRI has helped the government combat potential epidemics, such as SARS and Avian Influenza. Important steps in this effort include successfully
  - establishing an emergency production line for cell-based H5N1 vaccine (Pre-clinical animal toxicity test on the vaccine candidate had completed and shown efficacy as well as safety. First vaccine development program in Taiwan)
  - synthesizing Tamiflu from scratch and developing an anti-SARS synthetic compound.



## B. Cooperative Research Centers & Networks

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NHRI cooperates and collaborates with more than 20 leading universities / research institutes

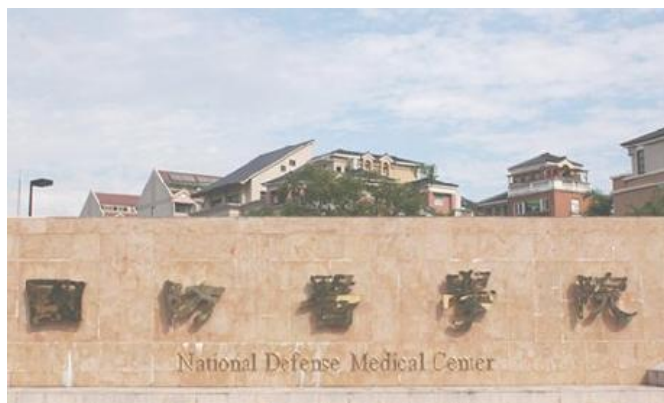


*Photo taken at National Chung Cheng University  
May 14, 2008.*

- Exchange of information;
- Sharing research resources and conducting integrated research programs;
- Graduate student training programs.

## B. Cooperative Research Centers

- Occupational Disease Research Collaboration Center at Kaohsiung Medical University
- National Cancer Research Center at National Cheng Kung University
- Translational Medicine Research Center at National Taiwan University
- National Defense Medical Center





## B. Graduate Training Programs

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- National Defense Medical Center's graduate institute of life sciences
- National Tsing Hua University's graduate program in biotechnology
- National Central University's doctoral programs in molecular medicine and environmental health
- China Medical University's graduate institutes of drug safety and immunology

## B. Research Networks

### Taiwan Cooperative Oncology Group (TCOG)

-- The first multi-center clinical trials organization in Taiwan

- to utilize patient resources effectively,
- ensure the safety and ethics of clinical trials,
- & establish therapies through a cautious monitoring system.



•TCOG covers 24 affiliated hospitals

• & serves more than 75% of Taiwan's cancer patients

1. Tri-Service General Hospital \*
2. Taipei Municipal Jen-Ai Hospital
3. National Taiwan University Hospital \*
4. Taipei Veterans General Hospital \*
5. Taipei Medical University Hospital
6. Koo Foundation Sun Yat-Sen Cancer Center
7. Mackay Memorial Hospital \*
8. Cathay General Hospital
9. Shin Kong Wu Ho-Su Memorial Hospital
10. Chang-Gung Memorial Hospital (Linkou) \*

11. Chung Shan Medical University Hospital
12. China Medical University Hospital \*
13. Taichung Veterans General Hospital \*
14. Cheng Ching Hospital
15. Kuang Tien General Hospital
16. Show Chwan Memorial Hospital
17. Changhua Christian Hospital \*

18. Chang Gung Memorial Hospital (Chiayi)
19. National Cheng Kung University Hospital \*
20. Chi-Mei Medical Center \*

21. Chang Gung Memorial Hospital (Kaohsiung)
22. Kaohsiung Veterans General Hospital \*
23. Kaohsiung Medical University Chung-Ho Memorial Hospital \*

24. Buddhist Tzu-Chi General Hospital

\* TCOG dispatching nurse

## **B. International Collaboration (I)**

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- **The Stanford Asian Pacific Program in Hypertension and Insulin Resistance**
- **University of Southern California Ultrasonic Transducer Resources Laboratory: Design and fabrication of array HIFU transducers**
- **International Collaboration with Genelabs**



## B. International Collaboration (II)

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### ➤ Collaborative Vietnam Virology Laboratory

-- initiated in 2006

-- Collaboration among Taiwan CDC, National Cheng Kung University Hospital, Children's Hospital No.1 (Ho-chi-minh City)

- Established Molecular Diagnosis Laboratory in Children Hospital No.1
- Study *Enterovirus* epidemiology, Milrinone trial for EV71 lung edema, and EBV-hemophagocytic syndrome
- Train technicians using Real Time-PCR to perform etiology identification
- Provide a platform for potential research on H5N1 *avian influenza*





# C. Extramural Research Grants, Awards, & Training Programs

## ➤ Grants

NHRI funds extramural research grants to outstanding scientists throughout Taiwan:

- . Integrated Biomedical Health Technology Research Grants
- . Innovative Research Grants
- . Career Development Grants

## ➤ Scholarships and Awards

- |                              |                            |
|------------------------------|----------------------------|
| . PhDs/MDs                   | . PhDs/DDSs                |
| . Senior research assistants | . Postdoctoral researchers |
| . Physician scientists       | . Research scholars        |
| . Health-policy researchers  | . Graduate students        |

## ➤ Specialty/Subspecialty Training & Fellowships

- . Medical, surgical, gynecological, & radiation-oncology training programs
- . Infectious disease training program
- . Geriatrics sub-specialty training program





## D. Research Resources & Services

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- NHRI Cell Bank
- National Health Insurance Research Database
- National Health Interview Survey
- Bioinformatics Services
- Laboratory Animal Center
- Clinical Statistical Program
- Micro-instruments
- Core facilities



Cell Sorter Core

## E. Health Policy Provider & Think Tank

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- Provide timely health policy recommendations to government and decision-makers
- Play an important role as “Think Tank”





**Thank you!**