"POLICIES TO TRIGGER ENTREPRENEURSHIP AND TECHNOLOGICAL INNOVATION IN DEVELOPING COUNTRIES: AN ANALYSIS OF THE CHILEAN SITUATION"

Conference
INTERNATIONAL FORUM "CHILE - KOREA"
INSTITUTO ESTUDIOS INTERNACIONALES, UNIVERSIDAD DE CHILE
Santiago, Chile
December 11, 2007

Prof. Dr. Ricardo B. Maccioni
Centro Internacional de Biomedicina (ICC)
& Universidad de Chile &
NEUROINNOVATION

www.neuroinnovation.cl

Conference
“ASIA PACIFIC FORUM”, Santiago, Chile
INSTITUTE OF INTERNATIONAL STUDIES
December 11, 2007

THE ROUTE SHEET

- THE KNOWLEDGE SOCIETY AND THE SOCIETY OF INNOVATION

- THE CYCLE: RESEARCH-TECHNOLOGICAL INNOVATION-ECONOMICAL GROWTH-QUALITY OF LIFE

- OUR MAJOR CHALLENGES AS A COUNTRY

- THE SITUATION IN CHILE

- FUTURE PERSPECTIVES

- Innovation impacts in the economic network of our society
- Intelectual property protection of human creativity
- Several emerging economies like ours experience difficulties in assuring intellectual property protection.
- Our economies have not been able to incorporate into the innovation phenomena. Experience of Finland, Ireland, Singapoor and others have been successful.
- Their legal mechanisms have not adapted to the dynamics of modern technological society.

THE SEARCH OF NEW PARADIGMS IN SCIENTIFIC KNOWLEDGE

Creativity in science has grown explossively during the past 5 decades. Unpredictable technological developments have been attained. However, some of the major problems of mankind are still present.

¿Is the scientific process dissociating from the human condition?

PROSPERITY IS DETERMINED BY HUMAN CAPITAL

"NOWADAYS HUMAN CAPITAL IS MORE IMPORTANT BECAUSE OF THE RISING OF THE RELEVANCE OF SCIENTIFIC KNOWLEDGE…."

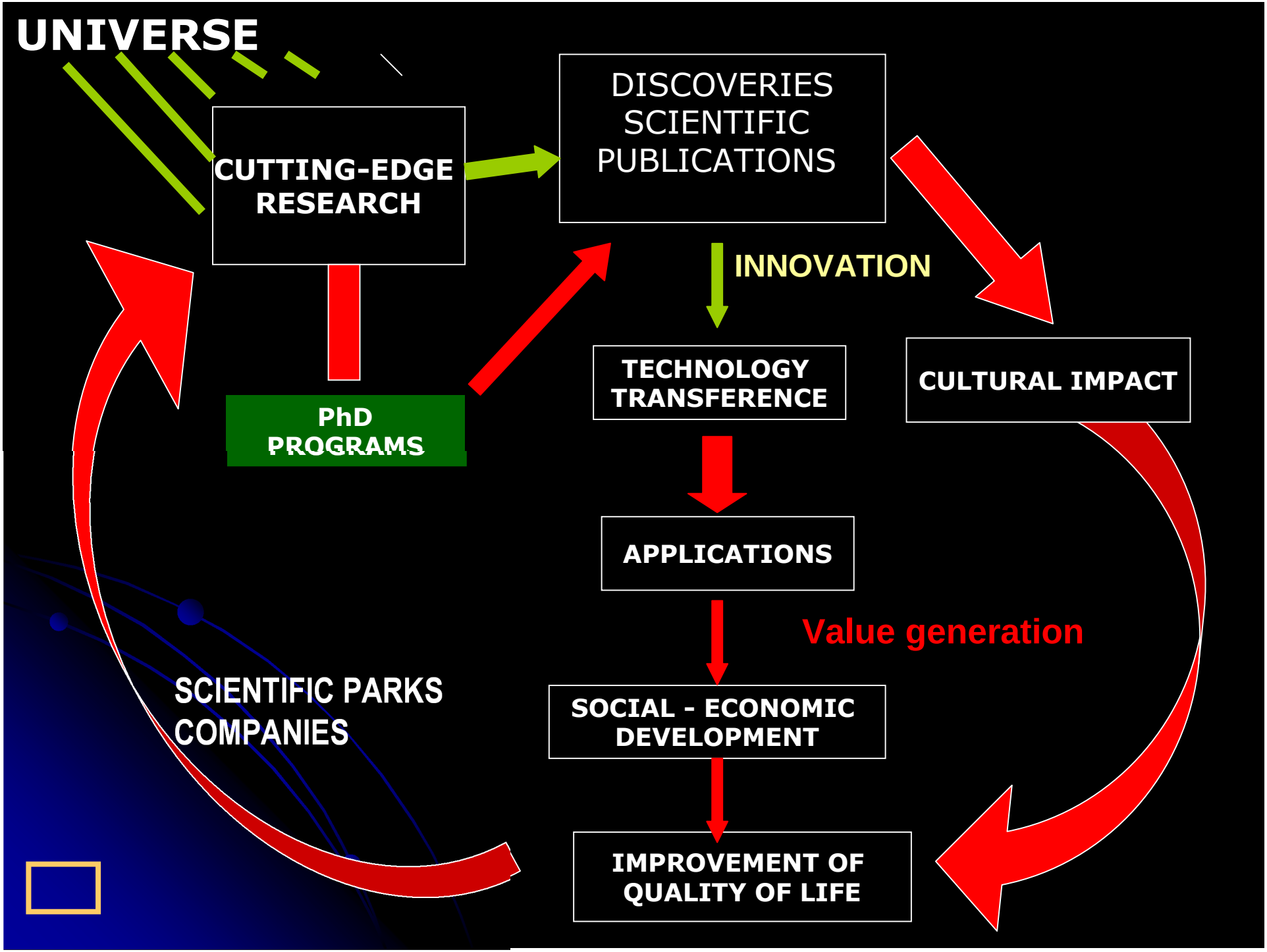
G. Becker
Nobel laureate (Economy)

At the beggining of the XX century, great innovations came from the domain of physics. Now, it is possible to assist to the revolution of biological sciences and its potential for innovation, a situation not predicted by G.S. Stent (1978). Nanotechnology and nanorobotics together with biotechnology are the main strengths at the doors of XXI century.

KNOWLEDGE SOCIETY: Generate knowledge as the basis for technological development (last steps of XX century)

SOCIETY OF INNOVATION: Generate knowledge, increasing the dynamics of transference to produce value, economical growth and improvement of the quality of life of human beings. Nowadays innovation is a committment for emerging economies such as Chile.

Ref: Maccioni, RB (2007) "La Sociedad de la Innovación". Ed Mediterráneo, Santiago, 149 pp.


UNIVERSE
CUTTING-EDGE RESEARCH
DISCOVERIES SCIENTIFIC PUBLICATIONS
INNOVATION
PhD PROGRAMS
TECHNOLOGY TRANSFERENCE
CULTURAL IMPACT
APPLICATIONS
Value generation
SCIENTIFIC PARKS COMPANIES
SOCIAL - ECONOMIC DEVELOPMENT
IMPROVEMENT OF QUALITY OF LIFE

WEAK "ACCOUNTABILITY" OF CHILE´S INVESTMENT IN SCIENCE/TECHNOLOGY

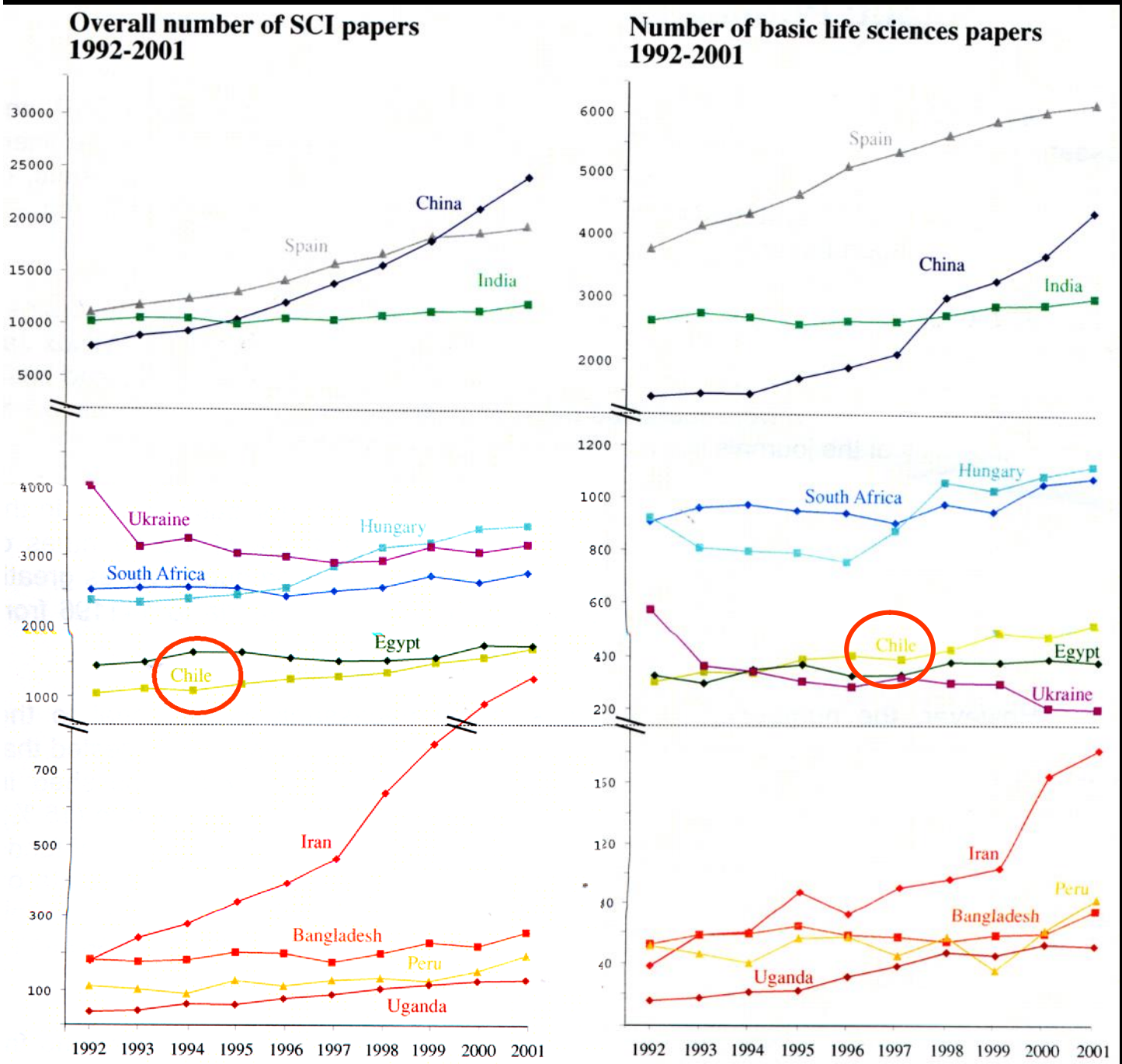
Nations that 2 decades ago showed similar economical parameters to Chile, now are very successful models of development, and their economies depends on technological products rather than raw materials.
¿What are the reasons for this success?

- EDUCATION
- INTELLIGENT POLICIES IN R&D&I

SCIENTIFIC PRODUCTIVITY (1996-2006)

	INVESTMENT (USD MM)	Pub/year/million hab	Patents/y/million h
• CHILE	620	117	0.8
• IRELAND	740	670	67.0
• N.ZEALAND	705	1.097	195.0
• FINLAND	960	2.300	253.0

Maccioni (2007) "The Society of Innovation"

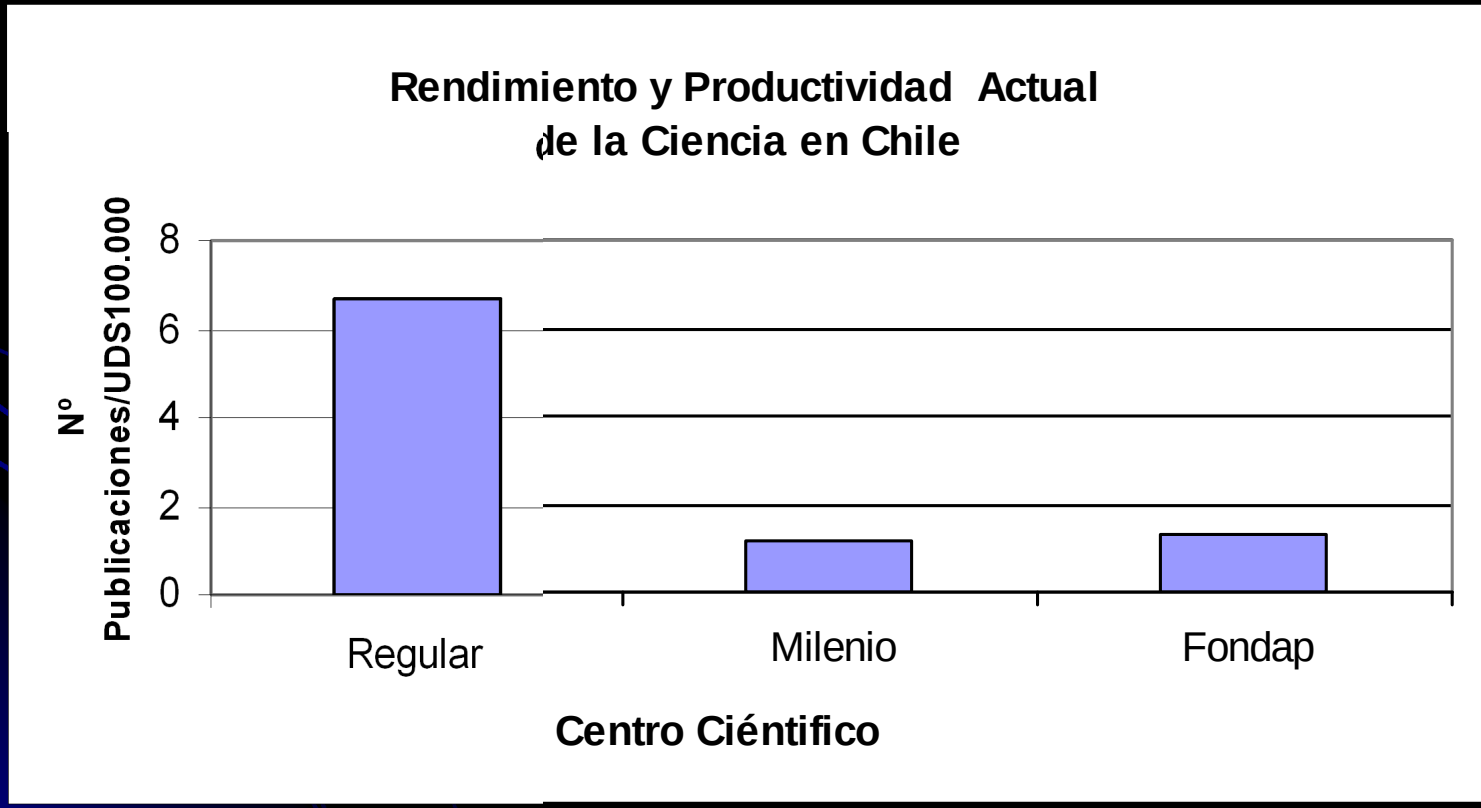


ISI PUBLICATIONS OF 12 COUNTRIES WITH RESTRAINED ECONOMIES (1992-2001)

Source:

"SCIENCE IN COUNTRIES WITH RESTRAINED ECONOMIES" by EMBO, TWAS, HUMAN FRONTIERS & WELLCOME TRUST" (2003)

THE FONDAP AND MILENIO CENTERS HAVE HAD POOR RESULTS. AS A PARADOX, GOVERNMENT PROVIDED THEM MORE FUNDS.
IT IS DIFFICULT, ALMOST IMPOSSIBLE, THAT AN INCREASE IN THE INCOME PER CAPITA OF CHILEANS RELIES ON FUNDING THESE CENTERS



Fuente: Kawax, Conicyt, Chile

EDUCATION

% Students over the baseline in Math./Sciences

- **SINGAPORE** **73%**
- **SOUTH KOREA** **66%**
- **JAPAN** **57%**
- **NETHERLANDS** **38%**
- **SWEDEN** **21%**

....

- **EGYPT** **5%**
- **IRAN** **2%**
- **CHILE** **2%**

THE MAJOR CHALLENGE

To reach a marked impact in the scientific development in order to trigger entrepreneurship and technological innovation as a platform for the economic growth of Chile.

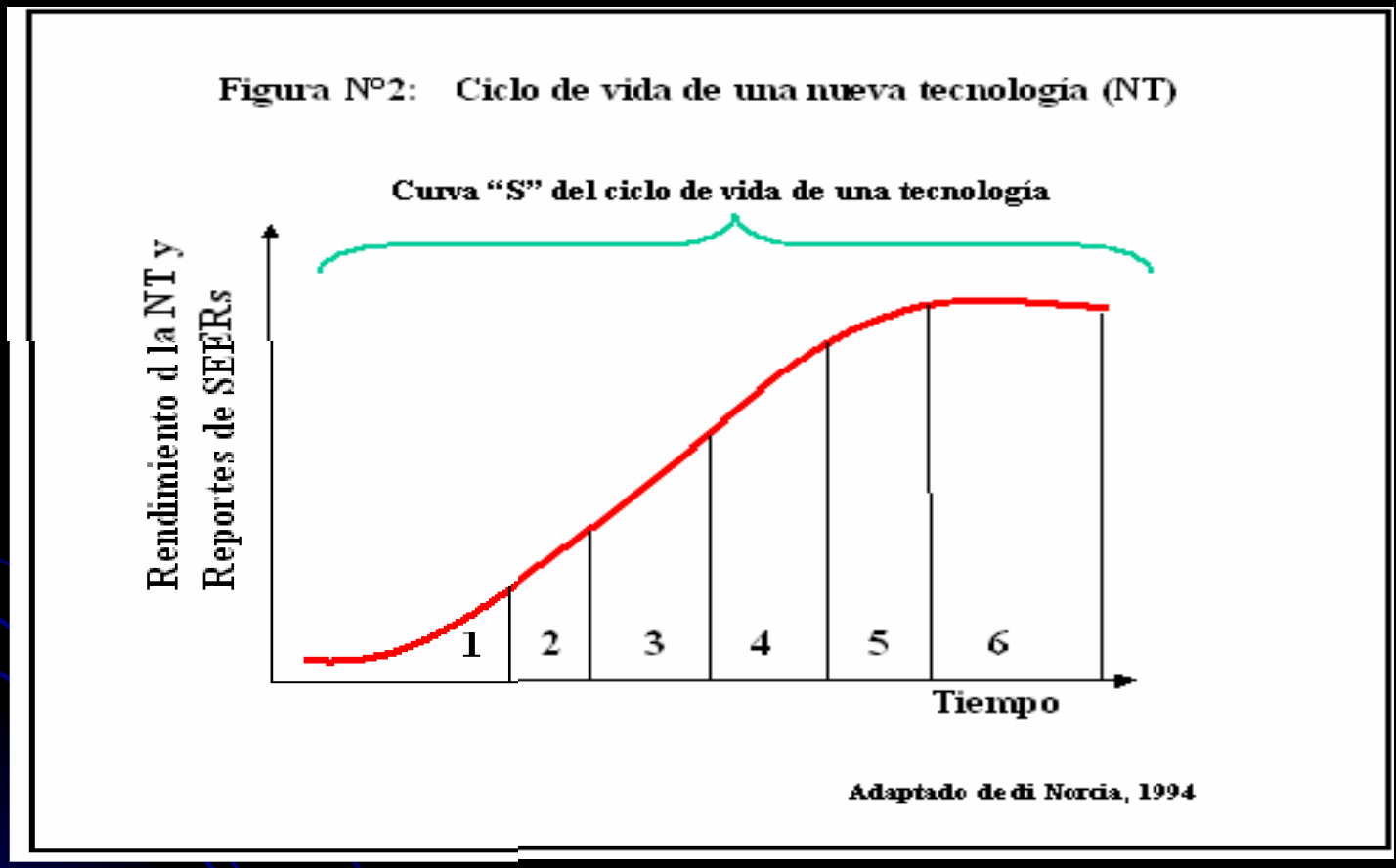
www.neuroinnovation.cl

• Innovation relies on creativity. Entrepreneurship derives from the commitment of human beings to assume challlenges in order to obtain economic benefits. Both impact in the social - economical network of society

• Protection to intellectual property is requeired. Legal mechanisms in Chile are not adapted to modern societies.

Economies like ours experiences difficulties in protecting intellectual propoerty. This has been one of the elements that has preventing Chile to incorporate into the innovation phenomena.

Technological processes are cyclic

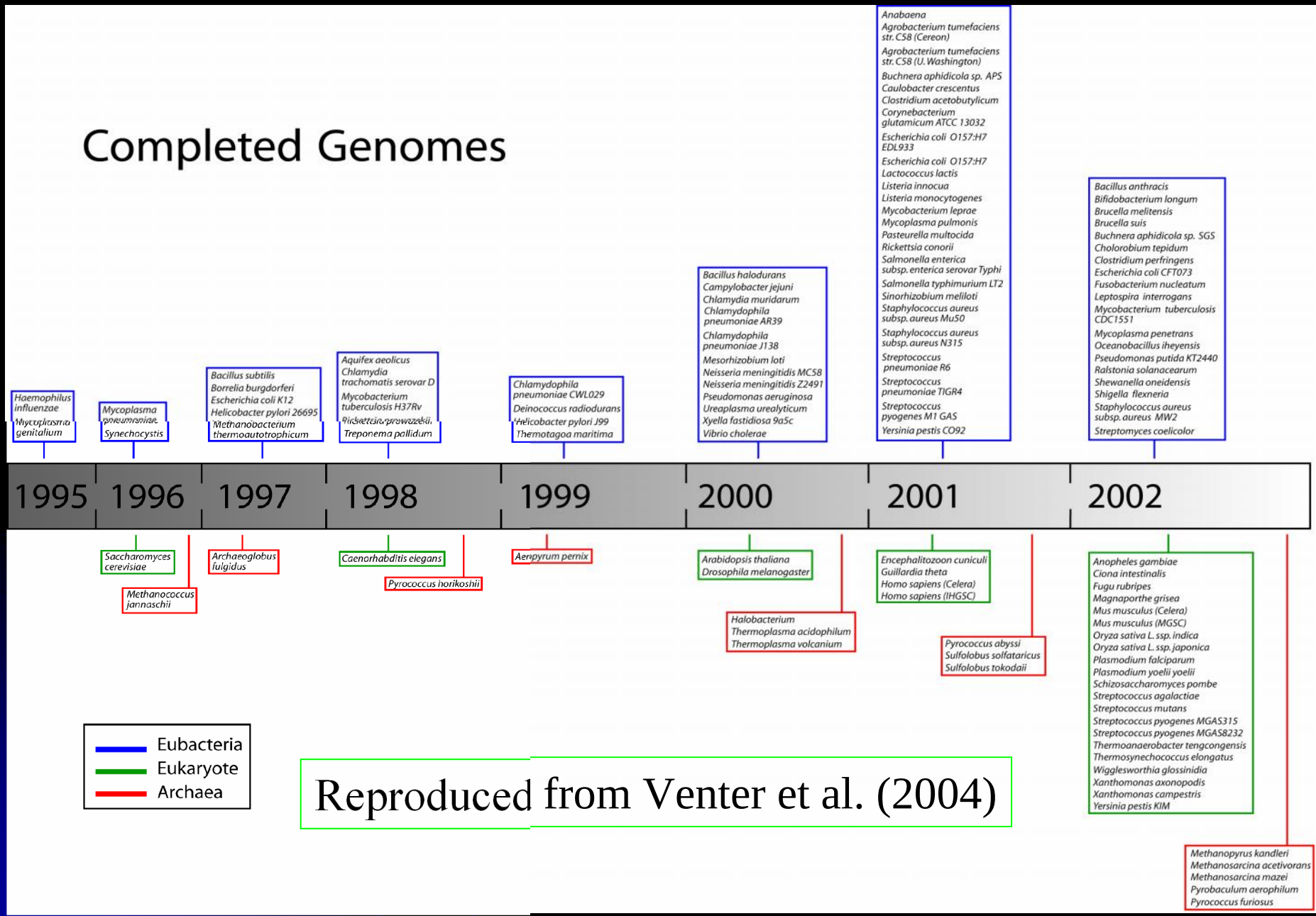


From: Maccioni & Rojo (2007) "Ethical aspects of technological innovation". Ed. F. Lolas. Editorial Universitaria., Santiago

GENE SECUENCES OF THE HUMAN GENOME: 33,000 genes

February 2001

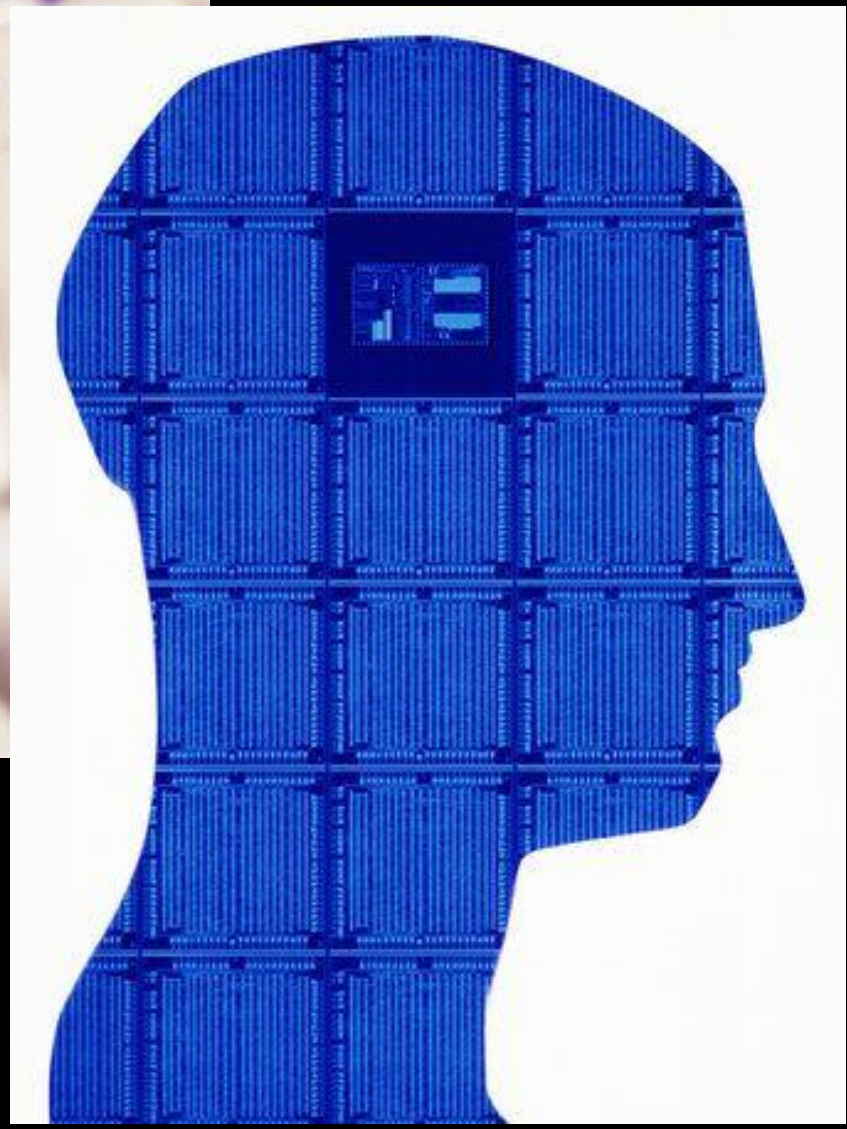
Completed Genomes



Reproduced from Venter et al. (2004)

GENETICS IN THE 2050

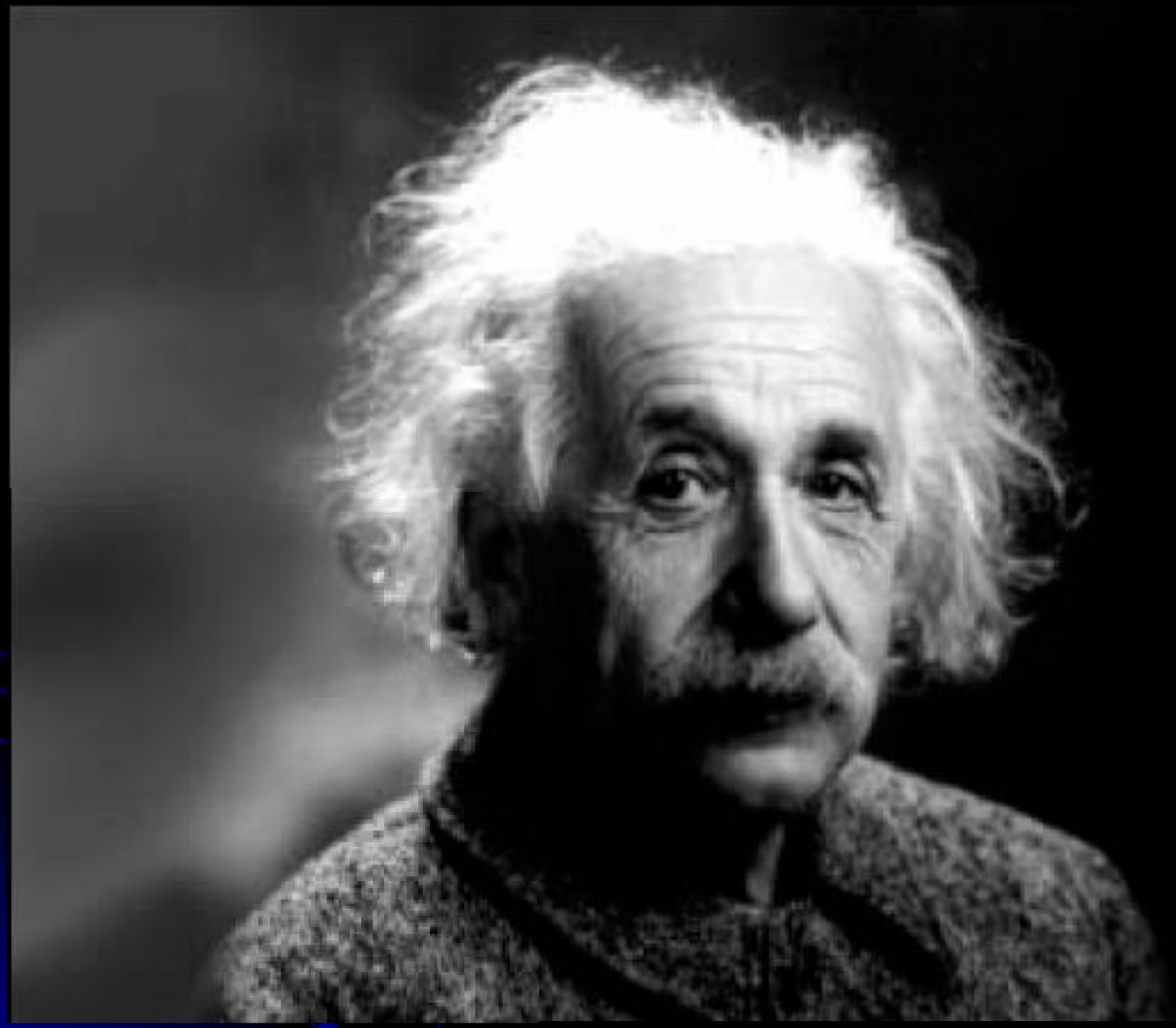
- Transference of genes and gene therapy vía nanotechnology.
- Elucidation of the Human Proteomas.
- Intelligent cards with the genomic map of each individual: vulnerability to different pathologies.
- Elucidation of genes responsible for memory processing, as the basis for cognitive sciences.



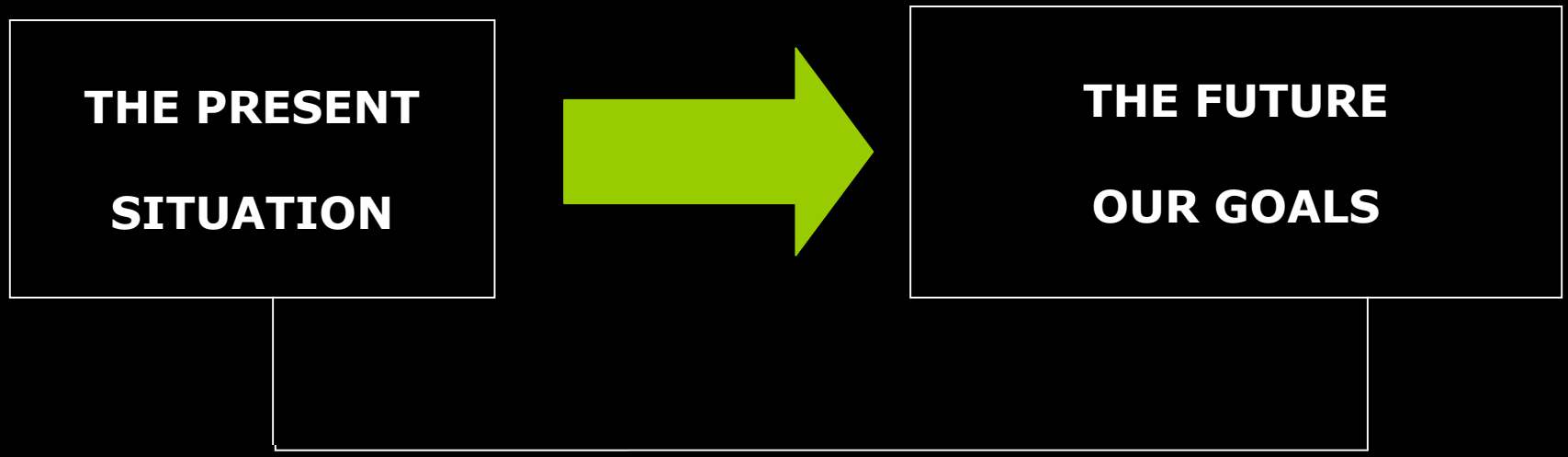
NANOBOTS WILL ALLOW US TO EXPLORE HUMAN BRAIN AND TO KNOW ON MIND PHENOMENA

www.neuroinnovation.cl

the innovators can see what others have missed



CONDITIONS TO INNOVATE: projection to future



THE GAP

- We can diminish the gap by choicing an innovative behavior
- The creative tension move us to the change

WHAT TO DO IN CHILE?

- Technological cycles open oportunities that have to be used.
- To incorporate into global booms: nanotechnology, genomics.
- Impact in the economy must activate the cycle already presented here

- To have benefits from this opportinities requires successful innovations.
- Private area and companies must be the main actor
- Enterprises should invest in R&D&I. Taxable conditions should be more stimulant
  - Entrepeneurships and "pymes" potentiate economical impact
  - Establishing a C*lusters* dynamics science-enterprise is critical

  - HOWEVER THE GOVERNMENT MUST PROVIDE STABILITY
  - Macroeconomic stability and discipline in the governmental institutions
  - Generation of educated talents to contribute to this process
  - A pro-innovation environment: desregulation, taxes incentives to Companies.

KNOWLEDGE TRANSFERENCE

- Technology commercialization
- Entrepreneurship activities (Spin-offs and start up, fund rising)
- R&D collaborations
- Social networking (groups of relevant stakeholders)
- Education to community (outreach, logistic cooperation with entrepreneurships)
- Economic and social needs of relevant knowledge (*Third stream activities*)

Dissemination of knowledge is critical

ICC INTERNATIONAL CENTER FOR BIOMEDICINE

FACULTAD de MEDICINA

November 22 - 25, 2007 / Reñaca, Viña del Mar, Chile

Co-CHAIRMEN

Drs. Ricardo B. Maccioni & Patricio Fuentes (University of Chile)

The event enlists the participation of scientists working on topics of major relevance in the neurological sciences, psychiatry, and biology of Alzheimer's disease (AD).

The Conference is focused in the molecular and biomedical aspects of AD and their impact in the clinical sciences. This interdisciplinary focus has been chosen considering the major advances in this field during the last few years. The aim of the conference is to provide an updated view and to achieve an

International Conference

CURRENT HYPOTHESES ON ALZHEIMER'S DISEASE

SUMMARY OF PUBLIC POLICIES FOR CHILE´S DEVELOPMENT ON THE BASIS OF THE KNOWLEDGE ECONOMY

TO SUPPORT THE SCIENTIFIC TEAMS OF PROVEN ACHIEVEMENTS, INSTEAD OF CONTINUING SUPPORTING WEAK AND UNPRODUCTIVE GROUPS.

AN INTELLIGENT STRATEGY PLUS A SENSE OF URGENCY

A CONSTRUCTIVE SCIENCE-ENTERPRISE DIALOGUE

CREATION OF SCIENTIFIC PARKS (Scientists and entreprises) ORIENTED TO GENERATION OF ADVANCED TECHNOLOGIES AND PRODUCTS

THE RIGHT TO THINK DIFFERENT

"To generate innovation requires freedom. A regime that only favor politically - related groups, is the worst environment for creativity and innovation".

MUCHAS GRACIAS A LA AUDIENCIA

THANK YOU VERY MUCH!

Thanks to Prof. José Morandé,

Director of the Instituto de Estudios Internacionales