

TECHNOLOGY TRANSFER: CHALLENGES AND OPPORTUNITIES

(WITH SPECIAL REFERENCE TO IRAN)
UNIVERSITY-INDUSTRY COLLABORATION TO PROMOTE
TECHNOLOGY TRANSFER
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Appropriate use of technology is the most
important factor in economic development
countries.

Key factors in technology transfer

- 1 - Defining the process
- 2 - Complete identification of process capabilities
- 3 - **Proportion** of process with the receiver
- 4 - **Proper** management of process changes

Key factors in technology transfer

- 5 - Setting up the expectations and moving forward them
- 6 - Project management and implementation and transition process
- 7 - Identification and management of interactions and working relationships

The main barriers to technology transfer in the **developing countries**

- 1 - Inappropriate social and political structure
- 2 - Small middle class of the society
- 3 - Illiteracy
- 4 - Population growth and the inefficient use of manpower
- 5 - Cultural Factors

The main barriers to technology transfer in the Third World

- 6 - Poor educational system
- 7 - Dependency
- 8 - Key resource looting of the Third World
- 9 - Poor infrastructure, including:
Transportation, Communications, Facilities,
Energy, Education and Information

Slide 6

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Dear User!, 10/30/2011

The main barriers to technology transfer in IRAN

- ❑ Shortage of skilled manpower in the field of technology transfer

Lack of appropriate contracts

Taking advantage of the lack of industry experience, research centers

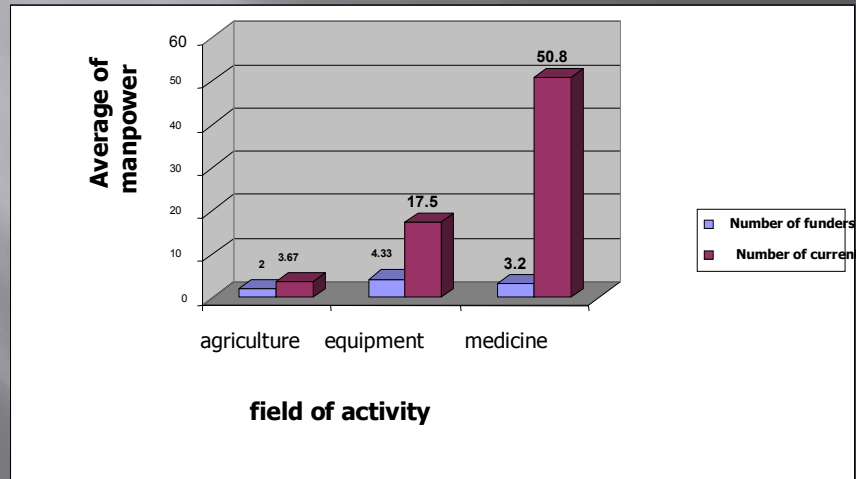
Due to lack of adaptation with the conditions of technology

Lack of adequate research budget

Privileges for Technology Transfer in Iran

- 70 million population of Iran (approximately 1% of the world's population but 1.5% of consumption)
- Populations of Economic United and neighboring countries totaling about 200 million 3%
- Iran is not a WTO member
- Looking forward independency
- Iran's membership in regional bodies such as ECHO and ...

Example of manpower



Case study

Technology transfer
in the field of **Biotechnology** In Iran

Current trends of Pharmaceuticals Biopharmaceuticals

About 80% of investigational products are pharmaceuticals

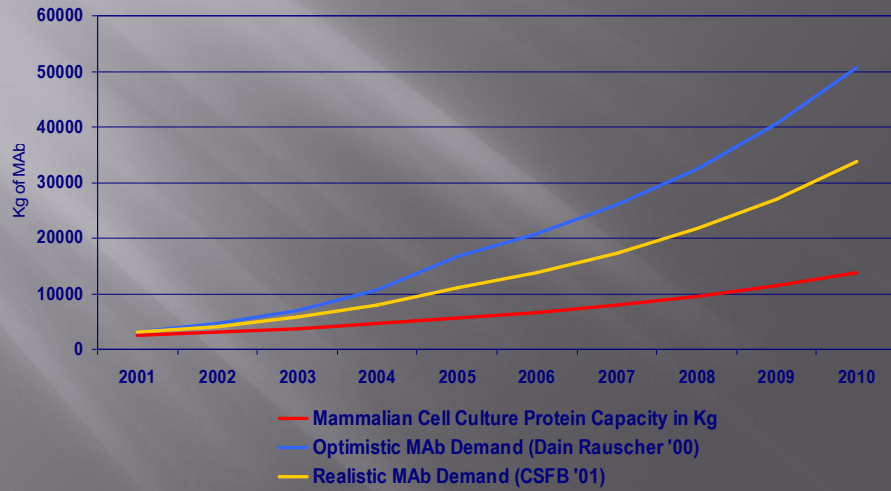
About 20% of investigational products are Biopharmaceuticals

Trends of Pharmaceuticals Biopharmaceuticals within 20 years

About 50% of investigational products will be pharmaceuticals

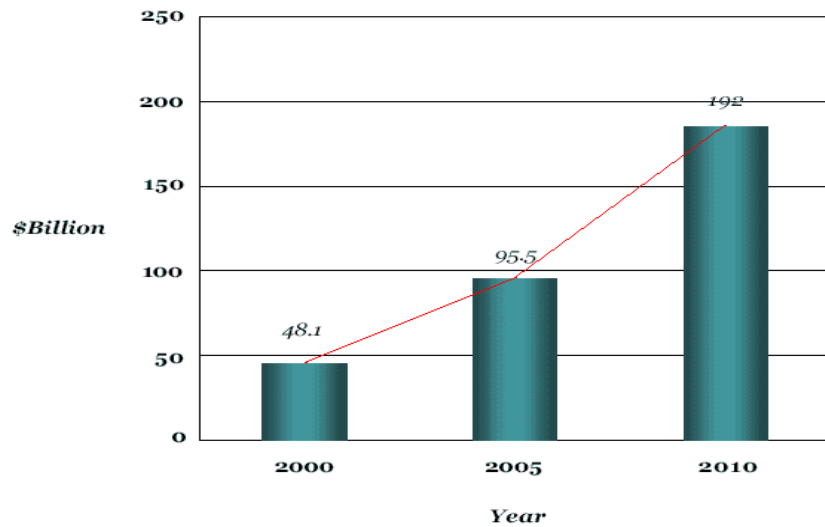
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Capacity Shortage



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World Market Size of Bioindustry I

barriers to technology transfer in the field of biotechnology

- ❑ Bio dependency on other technological fields.
- ❑ State's Economy.
- ❑ Development of public biotechnology companies.
- ❑ Lack of employment opportunities for graduates
- ❑ International sanctions.

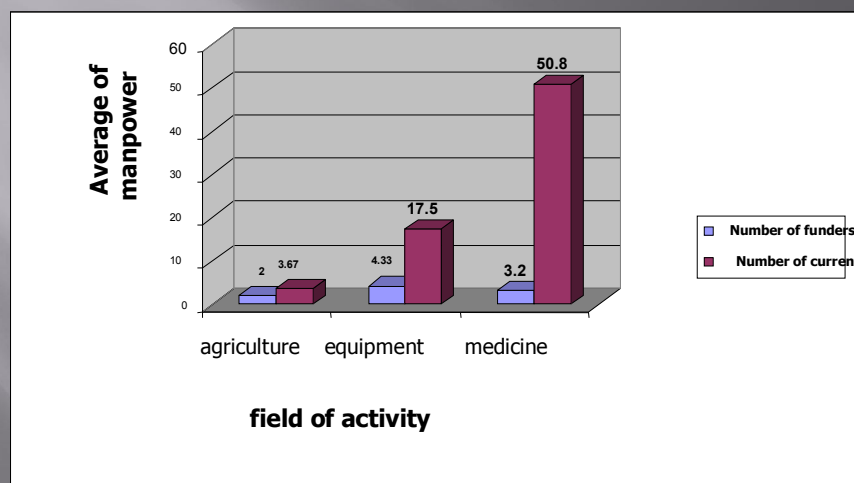
privileges for technology transfer in the field of biotechnology

- ❑ Novelty of technology and Iran's leadership in this technology in the Region
- ❑ Having the young generation to tap in the field of biotechnology
- ❑ Formation of the necessary knowledge to develop Biotechnology in the top managers
- ❑ Existence of complementary capabilities in some fields of engineering

Iran privileges for technology transfer in the field of biotechnology

- ❑ Iran has the infrastructure necessary for the production of biotech medicines and equipment
- ❑ Biotechnology priority in national policy and documents
- ❑ Diversity and enrichment of biological resources

Example of manpower



Biotech progress in Iran

	1995	2008
Number of Published papers in the international Journal	6	436
Ph.D Students in the related science	30	450
Molecular diagnostic kits	0	22
Molecular Genetic lab	0	More than 12
Recombinant medicine	0	9 8 in the pipeline
EIISA based diagnostic	0	3 whole produced and more than 18 partially manufactured
Stem cell Therapy	0	MS, Heart diseases,...
Private Biotech company	0	42 (16 are biopharmaceutical)

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Product	Year Registered	Doses imported	International price \$/dose	Saved in Currency \$millions
IFN alpha	1383	200,000	5	
G-CSF	1385	250,000	40	
EPO alpha	1385	800,000	10	
IFN beta 1a CinnoVex	1385	400,000	200	
PegIFN alpha	1386	10,000	270	
IFN beta 1a ReciGen	1387	650,000	80	
Epo beta	1387	300,000	25	
HGH	1387	827,000		
IFN gamma	1387	10,000	120	
Total				

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New Recombinant protein in the Pipeline in the next two years				
Product	Year Registered	Doses imported	International price \$	Saved in Currency \$millions
IFN beta 1b	1388	600,000	50	30
PTH	1388	10,000	700	7
Rituximab	1388	10,000	2000	20
HBS Vaccine	1388	8,000,000	0.5	4
Streptokinase	1388			3
FSH	1388	200,000	18	3.6
T-PA	1388	200,000	280	5.6
Enbrel	1389	40,000	240	9.6
Total revenue for products in the pipeline in next two years				82.8
Total revenue for products in the market				179.2
				262

Biotech progress in Iran				
	World	China	India	Iran
Recombinant biopharmaceutics	143	15	13	9
EPO (alpha and beta)				
IFN beta 1a (Cinnovex, Recigen)				
IFN alpha				
IFN gama				
G-CSF				
Peg IFN alpha				
HGH				
Peg-GCSF				
T-PA				
G-MCSF				
FSH				
Pipline		6	5	8
PTH				
Streptokinase				
HBS Vaccine				
Monoclonal antibodies				
Rituximab				
Enbrel				

Export of biotech Products

Product	Year Registered	\$ million per year	Country of Export
IFN alpha	1385	1	Pakistan
IFN beta CinnoVex	1387	0.3	Pakistan
EPO alpha	1385	0.5	Pakistan
IFN beta 1a CinnoVex	1388	0.5	Syria
	1388	3	Ukraine
Other biotech products such as Mab for blood group and molecular biology products	1385	1.5	To 5 countries
Total		6.8	

WHAT SHOULD WE DO?

- 1- Create a power brand .1
- 2- National priority vision .2
- 3- Create link with political allies .3
- 4- Well define strategy to create big, small and medium companies .4

