



가  
(genomics)

(OECD, 2000).

(, 2000).

20 가

(traditional bioindustry), (modern bioindustry), (genome-based bioindustry) (< 1> ).

< 1>

	20	,	,
	20		,
	21		,

: (2000)

가 20

가  
20 DNA (1953 ) DNA  
(1973 ) (1975 ) 가

1990

1990

가

21

가

가

가 . (post-genome) , ,  
 가 , , ,  
 가 . “ ”  
 . , 가  
 . 가 .  
 ( , 1992), , ,  
 , , 6  
 (techno-economic paradigm) (< 2> ).  
 (key factor) ,  
 (motive branches), (carrier branches), , ,  
 , (induced branches) .

< 2>

			가	
1	1770/ 80	1830/ 40		
2	1830/ 40	1880/ 90		
3	1880/ 90	1930/ 40	,	2
4	1930/ 40	1970/ 80		
5	1970/ 80	2010/ 20	,	
6	2010/ 20		?	

가  
 . , 6  
 (socio-institutional framework) . ,  
 (promotion) (regulation)  
 가  
 . ,  
 (windows of opportunity) 가 (Perez and Soete,  
 1988). ,  
 . , 가  
 가 .

2)

가가가 , 256K  
 1g 5 가가 60% ,  
 D 1g 360 가가 30% .  
 G-CSF(granulocyte-colony stimulating factor) 1g 54 ,  
 EPO(erythropoietin) 1g 67 가 .  
 가 .  
 1990 97 32% , 가  
 (< 3> ). DRI(Decision Resources Incorporation)  
 , 1995 2005 가 22.1% , (9.4%),  
 (9.1%), (6.9%), (3.5%), (1.4%) .

< 3>

:

	1997	2000	2003	2008
	313	540	740	1,250
	1,470	1,480	2,125	3,701
	7,070	9,210	12,340	21,320

: Ernst & Young(1998); Dataquest; KISDI

가 . , ,  
 , , , ,  
 가 , , 가 , . ,  
 , ,  
 (bioinformatics) 가 .

가  
 가 가

가 가 . ,  
(reverse engineering)

가 1 3 가  
가 . , 1998 99  
, 5 R&D 3  
가

10 15.8 9.0  
9.9 13.2 가 ( , 2000a).

(time lag)가  
가  
가 가

가  
가

가 , , 가  
가  
가  
가

5% ELSI(Ethical, Legal and Social Implications)

가

3.

1)

가 , 가 (focused targeting) 가 가 가 (< 4> ). 1999 (Amgen), (Genentech), (Biogen), (Chiron) , , , 10 (Wellcome Trust), (Glaxo Wellcome), (Novatis) 10 4,500 30 . < 4>

: , %

	Amgen	Chiron	Genentech	Genzyme	Alza	Biogen	Immunex
	2,470	1,164	1,017	592	464	434	190
	644	71	129	14	-261	89	-16
R&D	25.5	6.3	46.3	12.5	33.8	33.6	57.4

: Ernst & Young(1999).

. 1990 (Monsanto), (Novatis),  
 (Calgene),  
 , 1997 가  
 가 ,  
 ,  
 (Living Modified Organism, LMO) 가  
 LMO 64% , 1/3,  
 1/2 LMO . LMO LMO가  
 가 LMO  
 , 1998 9 LMO  
 19 2001 4 .  
 , , (hydrocarbon) (carbohydrate)  
 .  
 가 가  
 가  
 DNA , , Lab  
 . DNA 가  
 가 가 DNA 1 0  
 , 가 가  
 .  
 2)  
 1990  
 가

1990 , , 21

3 가 .

. 1988 “ ”(Biotechnology Coordination and Competitiveness Act) 1992 95 “21 ”(Biotechnology for the 21st Century)

“21 ” 13

. 1992 1993 1995

가

21 .

가 , , , (Office of Technology Assessment, 1995).

가 , (NIH)

가 , 114

(Biotechnology Center)가

EU . 1980

BEP(Biomolecular Engineering Program), BAP(Biotechnology Action Program), BRIDGE(Biotechnology Research for Innovation, Development and Growth in Europe)

EUREKA(European Research Coordination Agency)

20%

가 , ,

가 . 1995

Biotechnology Means Business , 2000 “

”(Genome Valley) . 1996 2,560 Ecu



3

Bio Regio

1991 96 Bio-Avenir

2 가

1990

1997

가 , 1999 (Helix)

, 1999

5 가 “

”, “ 가 ”

“ 가 ”

2010 1,175

1 25 가

1,000

가 ,

( , 2000b).

가

Canada)

2005

4

1999 “ ”(Genome

3

(Genome Canada

Task Force, 1999).

2000

“ 가

”

16%

2

5

(Commonwealth of Australia, 2000).

(Convention on Biological Diversity)

1992

6 UN (UNCED) 1993

(sovereign right)

가 가

(Biosafety Protocol)

(Bio-Pollution)

(Bio-Hazard)

2000 1

(Bio Property Right)

가

(Biological Ethics)

”(1990 ), “ ”(1990 ), “ ”, “ ”, “

”( 1994 )

가 , 1997 2 가

가

가

4.

1)

1990

20 30%

3 6 (5,085 )

1.1%,

. 1998

2.7%

, 1997

0.1 0.3% (< 5> ). , 1993 97

30.4% (1,683 4,246 ),

16.2% (299 541 )

가

1997 2003 32%, 2004 13 20%

2003 3.4%

, 2008 5.0%

(< 6>

).



: (2000).

, 가 60 70% (< 8> ).

< 8>

			( )	(%)
	3.3	2.3	4.4	65.7
	3.3	2.3	5.9	67.2
	2.8	2.0	4.5	69.0
	2.9	1.9	4.5	63.9
가	3.5	2.4	6.9	62.9

: , , , , 1 5

: 가 (1999).

가 ,

. 1999

4,934 2,368 50 , 9  
 453 80 , 1 . , 9  
 1,608 ( 450 ) ,

가

가

가

1983

“ ” 1994 “ (Biotech 2000)” , 가

가

LMO

가

가

2)

, ,



가 가

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“(가 ) 가

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5.

가 가

가

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가

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< >

(2000), “2000 ”.

(1992), < > ,

(2000), “ ”.

(1999), < > .

(2000), “ ”.

(2000), < 5 > ,

(2000), < > ,

(2000a), “21 ”.

(2000b), “ 가 ”.

가 (1999), < > .

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