

Issue Paper

2003. 6. 10.



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:
(yskoh@seri.org)
02-3780-8173

1.

가

- 2003 4,962

1

• 1 IT

- LG " "가
(FDA) 가

• 150 가

- 「 」 가

• 가

• , , ,

- 「 」

• , • 「 」

」

-
• () 가 6 ,

-

(Platform)

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2.

「 」

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가

• ()
가 ,

-

(Gap)

•

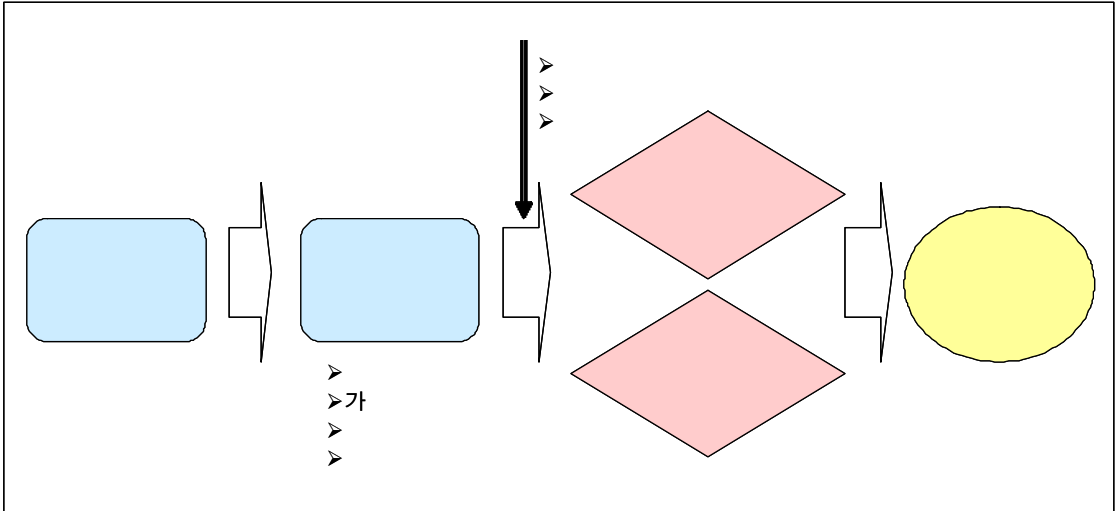
-

가 가

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-

-



1.

350 (2001)

- R&D (負)

60

- 70%

(, , , %)

	34,874	25,319	7,533	1,021	1,001	72.6
R&D	16,427	11,532	4,244	474	175	70.2
	-5,933	-4,799	-608	-507	-19	80.9
	188,703	141,000	34,180	7,005	6,518	74.7
	622	342	104	85	91	55.0
	3,662	1,115	1,775	331	441	30.4
	4,284	1,457	1,879	416	532	34.0

1: 2000 10 ~ 2001 9 1

2: - Frost & Sullivan 2001 ' ' ,
 4,370 (1,790 , 270 , 690 ,
 1,150 , 450)
 - IMS Health 2001 ' ' 4,006 (2,036 ,
 165 , 1,019 , 469 , 316)
 - PharmaExec.com 2002 ' ' 4300

가

(): E&Y(2003)

況 4,370

(2001)

- 가

-

· ' ' 가 가

(2001)
(, %)

		/			()	
	4,370	3,000	530	430	230	180
	100	69	12	10	5	4

1: , ,
: Frost & Sullivan , Naik(2002)

2.

가가

- R&D , , 6 가 88%

-

· , R&D , ,

가 R&D

(%)	44.0	15.4	8.5	8.0	7.0	5.0	2.9	2.2	7.0

: Kermani(2002)

- 47%가
(www.reutersbusinessinsight.com)
- ' 39%, ' 14%
- 1 (Pfizer) 7.1%(2001)
- 2000
-
- (Generic) (Fast Follower)
- 2~3

(:%)

	1987	1990	1994	1997	2000	2001
No.1	3.4	4.0	4.9	4.6	7.3	7.1
Top 10	27.5	28.7	31.8	36.2	45.7	42.7
Top 20	45.0	46.4	48.9	55.7	64.6	60.3

: Morris(2002)

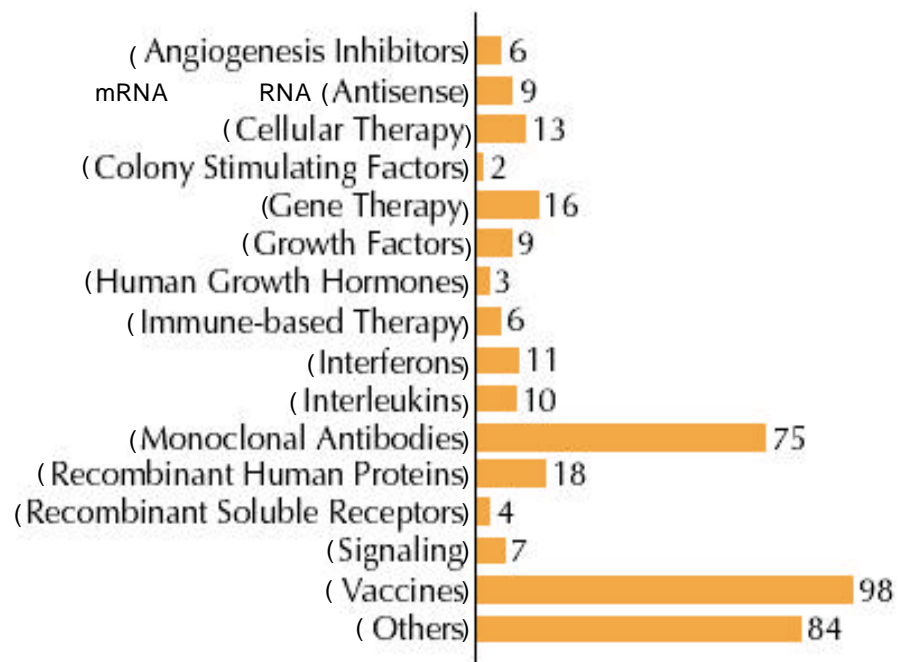
가

- 95 (2002 9 ,)
- 2002 1,774 (PhRMA a, 2002)
- AIDS 98 , 400 , 200 , 120
 , 176 , 780
- 674 (2002 , SG Cowen
 Research, 2002)
- 239 , 1 141 , 2 175 , 3 97 , 22

가 (PhRMA b, 2002)

가 가

가



: PhRMA(2002)

3.

2001 16.9% 가 1,720
(IMS Health, 2002,)

- 45% (2000)

- .
•

(, 2002)

1	(Pfizer, 美)	283	(Amgen, 美)	49.9
2	GSK(英)	282	(Genentech, 美)	21.6
3	(Merck, 美)	216	(Serono,)	15.3
4	(AstraZeneca,英)	178	(Biogen, 美)	11.4
5	(Aventis, 佛)	173	(Elan,)	11.1
6	J & J(美)	172	(Genzyme, 美)	9.1

: www.pharmaexec.com

2001 300

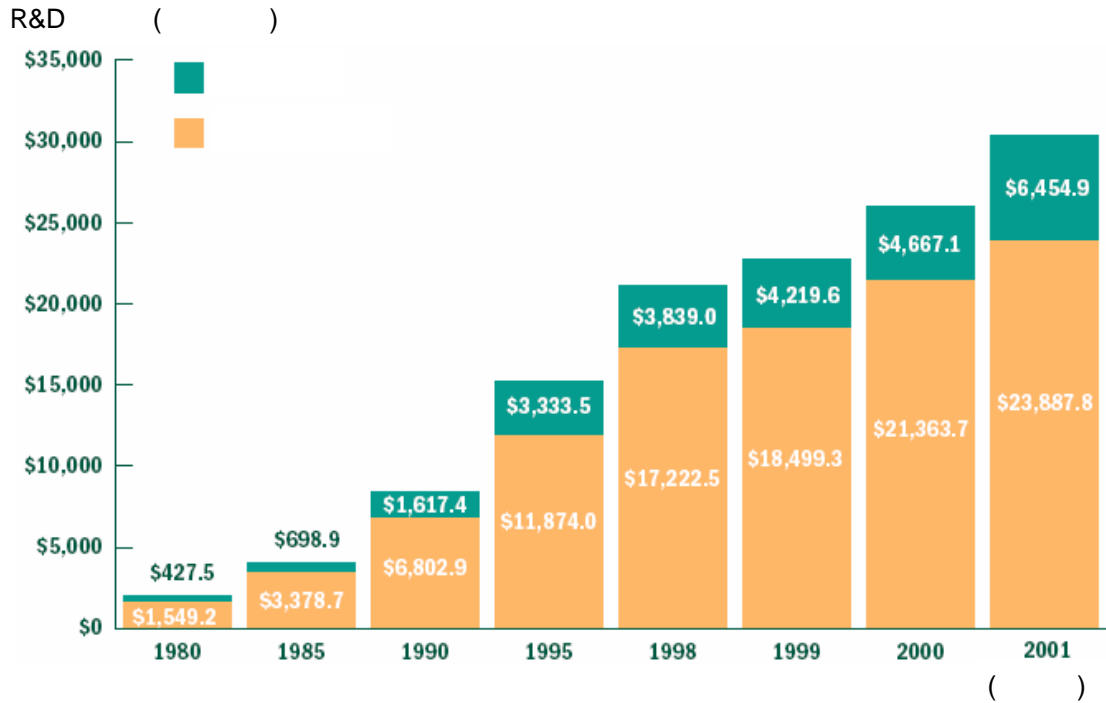
- 1995

-

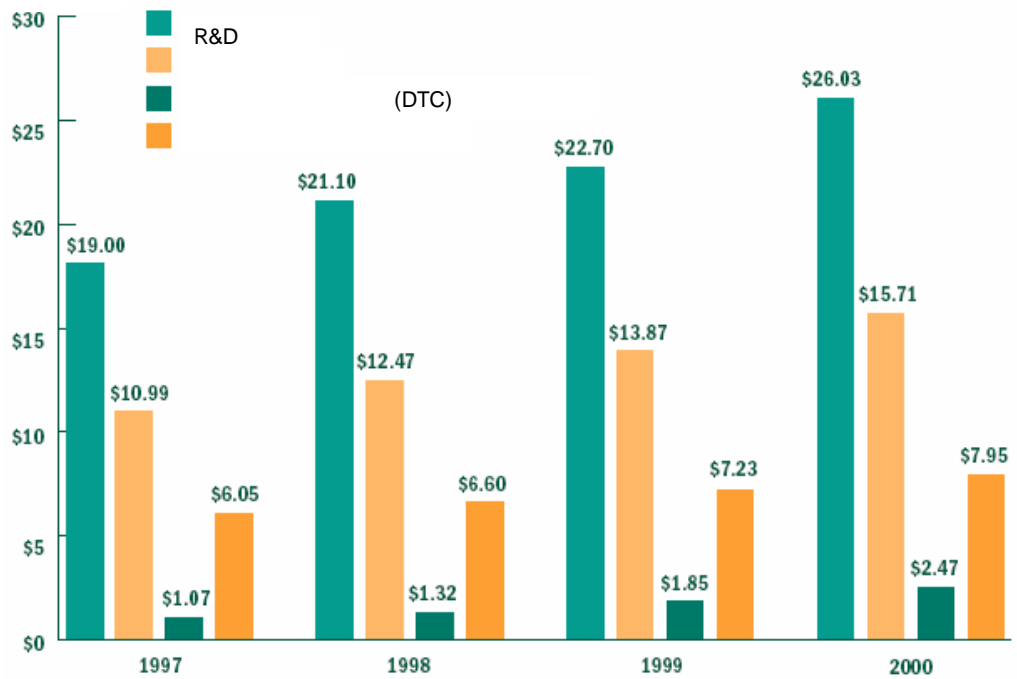
-

• (2000) : (50%),
(26%), (16%), (5%),

(3%) (Frank et al, 2002)



:PhRMA(2002)

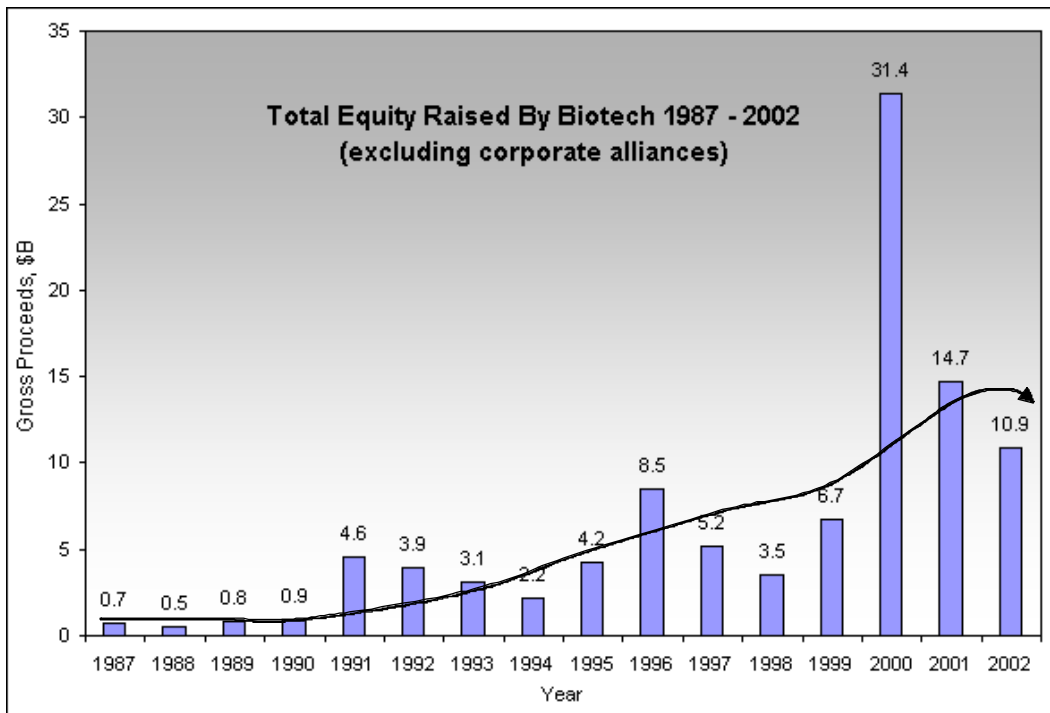


:PhRMA(2002)

- IT

- 가 2002
• 2000 ,

(10)



1:

2: 2002 (28.2)

: Van Brunt(2002)

-

가
• (美) 2001 (Immunex, 美)
20 (Bayer, 獨)

- 가 가 가

• 3 : 2001 BMS(美)
(ImClone, 美) (Erbitux) (20
)

• : 2001
(CuraGen, 美) (13.4)

.

1.

(Liebeskind et al, 1996, Engelhard 2002)

- (Hypercompetition) :

- (Uncertainty) ;
가

- (Appropriation Problems) :
가 가

- (Intellectual Resource) : 가

• • ,

가(E&Y, 2002)

-
• 1960~1997 69.7 76.5 가

- ,
• 가 12%(1.74)

- 가
• 가 1人 56

- ,

- (One - Size - Fits - All) ()

•

- 가 (Value Chain)

2.

1980

-
• (PCR), ,

- 가 가
• 가

- 가 (Entrepreneurship)
• 가

-
•

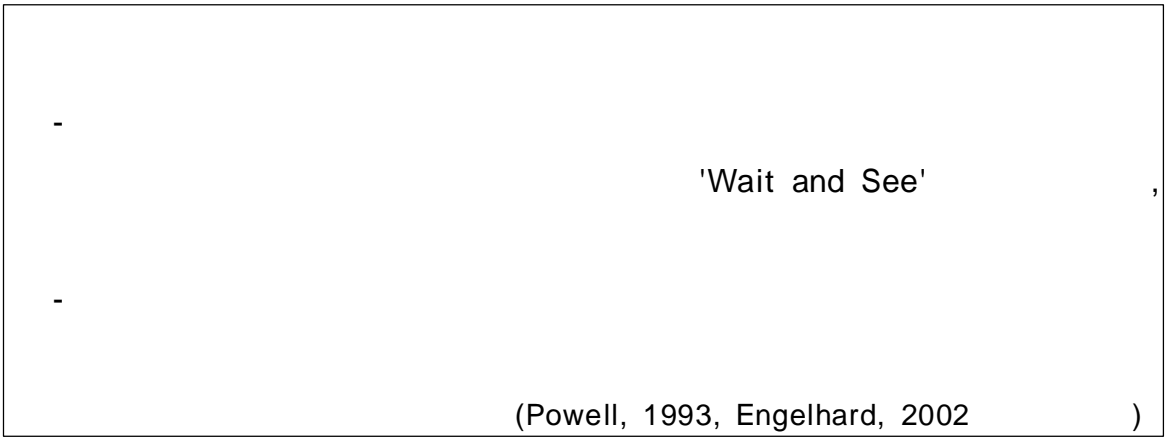
() -

- 1980
•
• (,), ()

- 1990 가 (Tool
Company) 가
•
가
• (Incyte, DB), (Affymetrix, DNA Chip),
(Celera,)

- 1990
(Hybrid)
•
• (Millennium, 美), HGS(美) 가

-
-



-
-

(Arora, et al, 2000)

가

R&D

		EU	
		37.6 %	87.4 %
		56.8 %	11.5 %
		5.6 %	1.2 %
		4.8 %	1.7 %
		2.7 %	0.4 %
		9.5 %	11.0 %
		965	776

1: 1989~1999 EU R&D 1,741

2: 1 90

90 19.95%()

-

가

가

•

-

種

-

•

(

, SNPs)

,

-

		~ '00 '02 '04 '08 '10	
			HGS, Millennium, Celera, Incyte, Genset
			HGS, Millennium, Lexicon, Exelixis, Curagen, Gene Logic
	/SNPs		Orchid Biosciences, Millennium, Sequenom, HGS
			Variagenics, Millennium, Genaisance Pharmaceuticals
	Lead /		Vertex, Abgenix, Medarex, Millennium, MorphoSys
	(CROs)		Quintiles, Covance, Parexel
	DNA Chip		Affymetrix
			Double Twist, Compugen, Genomica
	(HTS)		LJL Biosystems, Evotec, Aurora Biosciences
	/		Invitrogen, Qiagen, Sigma Aldrich

: PWC, 2000, E&Y 2002, PhRMA

가

		()	
		, DNA Chip	
		, IT	
		,	
	CRO	,	
	CMO		
	CSO		
		, 가	Medicare, Medicaid
			가 가
	•	,	, FDA
			,
		•	

4.

(- -) -
-

(Target)

(Target Identification)

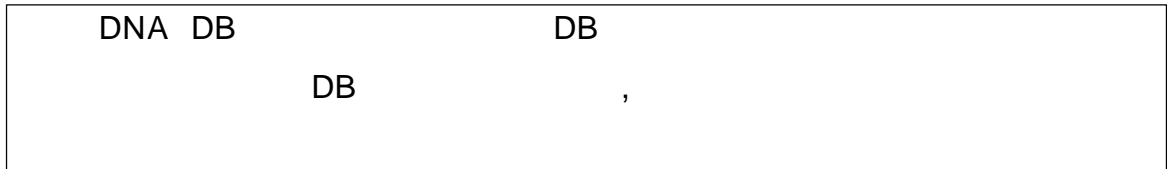
- mRNA, DNA, ,

가

•

- (Small Molecules)

- (NIH) (NCBI, National Center for Biotechnology Information)
• HGS, (GeneLogic, 美)社



- DNA (Microarray)
•

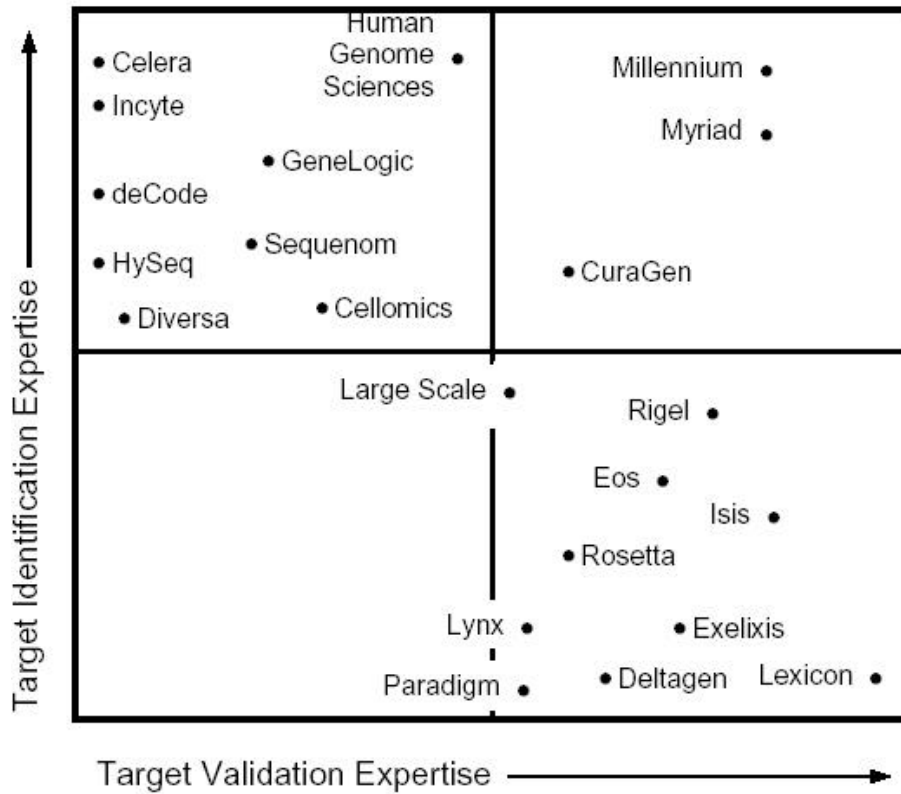
- (SNP, Single Nucleotide Polymorphism)
(Genotype)

(Target Validation)

- • DB 가

• (Knockout Mouse)

-



: Weintraub(2001)

- (Lead) (Lead Identification & Optimization)가
- (Recombinant Protein) (Monoclonal Antibody)가
- (Combinatorial Chemistry)
- X
- (Gene Therapy) 가
- 가

- 3
(Proteomics)

가

		HGS, Celera Genomics, Incyte Genomics, GeneLogic, Tularik,, LION Bioscience, Genset, Hyseq, CuraGen, Compugen, Myriad Genetics, Lynx Therapeutics, deCODE Genitics, Rosetta Inpharmatics, Lexicon
	Micro Array	Affymetrix, Agilent Technologies, Corning, Motorola, Incyte Genomics, Rosetta Inpharmatics, GeneLogic, LION Bioscience, Aclara BioSciences, SEQUENOM, Nanogen, Caliper Technologies, Illumina, Packard BioScience,
	SNPs	SEQUENOM, Orchid BioSciences, Variagenics, Celera Genomics, CurGen Corporation, Genaissance Parma
		Genentech, Deltagen, Paradigm Genetics, Lexicon Genetics(Knockout Mouse), Exelixis()
		Isis(), Rigel(Retrovirus)
		Abgenix, Medarex
		Vertex, 3-D Pharmaceuticals, Syrrx, Structural GenomiX, GeneFormatics, Novartis
		Targeted Genetics, Genzyme, Gencell, Transkaryotic Technologies, Vical, Cell Genesys, Invitrogen,
		Myriad Genetics, Millennium, Applied Biosystems, Nycomed Amersham, CuraGen Corporation

가

-

3

-

(SNP)
(Pharmacogenomics)

-

•

- , IDEC

	(Preclinical)		FDA	(Clinical)			FDA	4
		Test	IND	1	2	3	NDA	
	/			- -20~30	- ~3	- ~5		
	5	3	1	1.5	2	3	0.5	
	5%	2%	85%	71%	44%	69%	80%	
	0.02%	0.3%	15%	17%	24%	55%	80%	
	- (5.3)	- (0.9)	- (2.6)	- (1.65), (0.4)	- (2.05), (1.2)			

: PhRMA(2002), E&Y(2002), Dimasi(2002)

5.


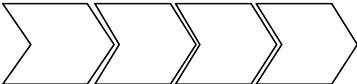

가 ,

- 가

- (CRO) (CSO) 151
(2003) , 5 14% (Advest, Inc)

-

-

	1 st Wave	2 nd Wave	3 rd Wave
	19	1960	2000
가			
가	- - -	- - -	- - -
		-	- -
	- - -	- - -	- / - -
	Lilly) (Pfizer, Eli	(Amgen, Zenentech)	

가

가

-

가

-

가

- 90

•

Novartis	Ciba Geigy + Sandoz	1996
Aventis	Hoechst + Rhone Poulenc Rorer	1998
AstraZeneca	Astra + Zeneca	1998
Pharmacia Corp	Pharmacia&Upjohn + Monsanto	1999
Pifzer	Pifzer + Warner Lambert	2000
GSK	Glaxo Wellcome + SmithKline Beecham	2000

-

•

가

100

R&D

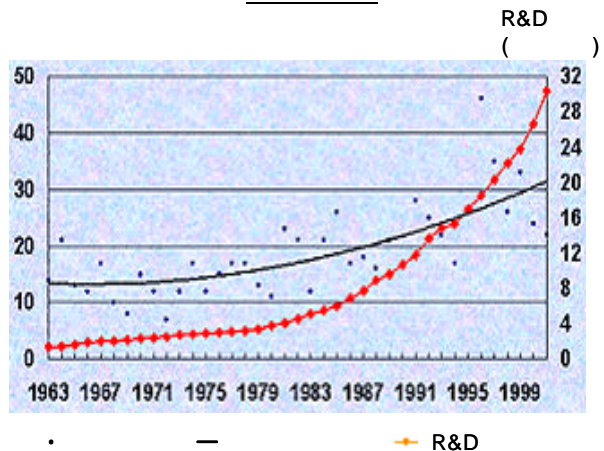
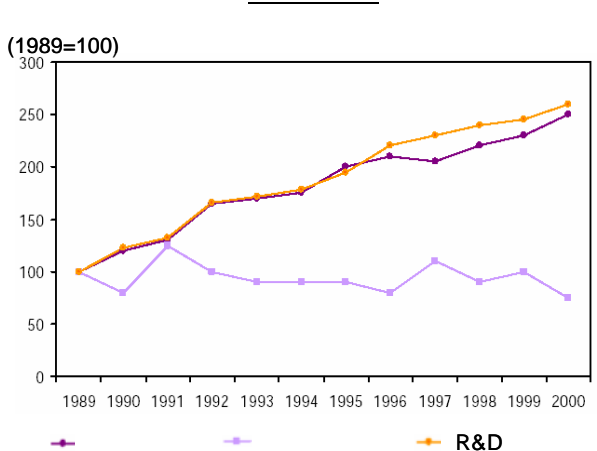
- R&D

• 1990

R&D

가

R&D



1:

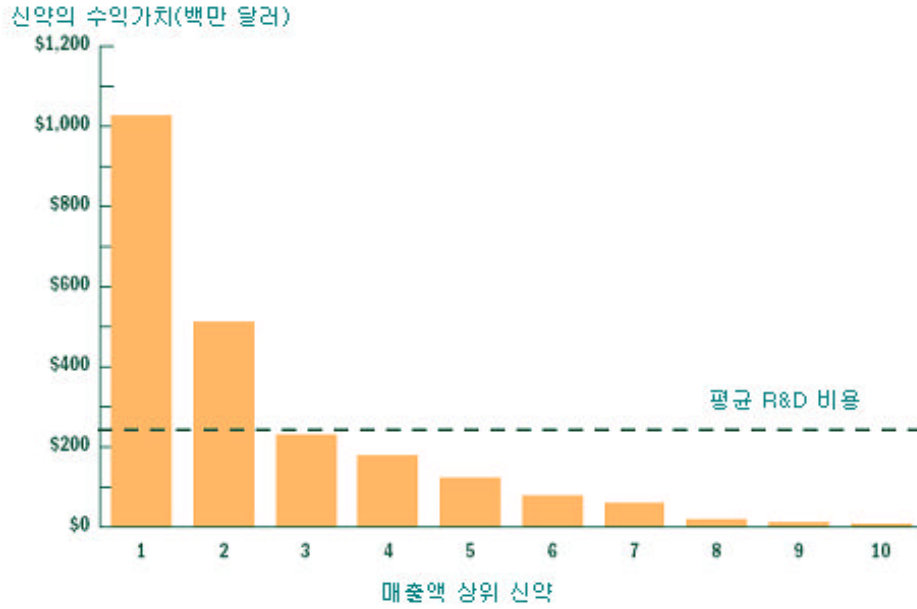
R&D

2001

가

: Morris(2002,), Dimasi(2002,)

30%



- 1: 가 R&D 1990 가 , 1980~1984 10
 - 2: BCG Group 1990 R&D 5
- : Grabowski and Vernon(1994)

- 가

1970	138	84	54
1980	318	214	104
1990	802	336	466

: 2000 가
: Dimasi(2002)

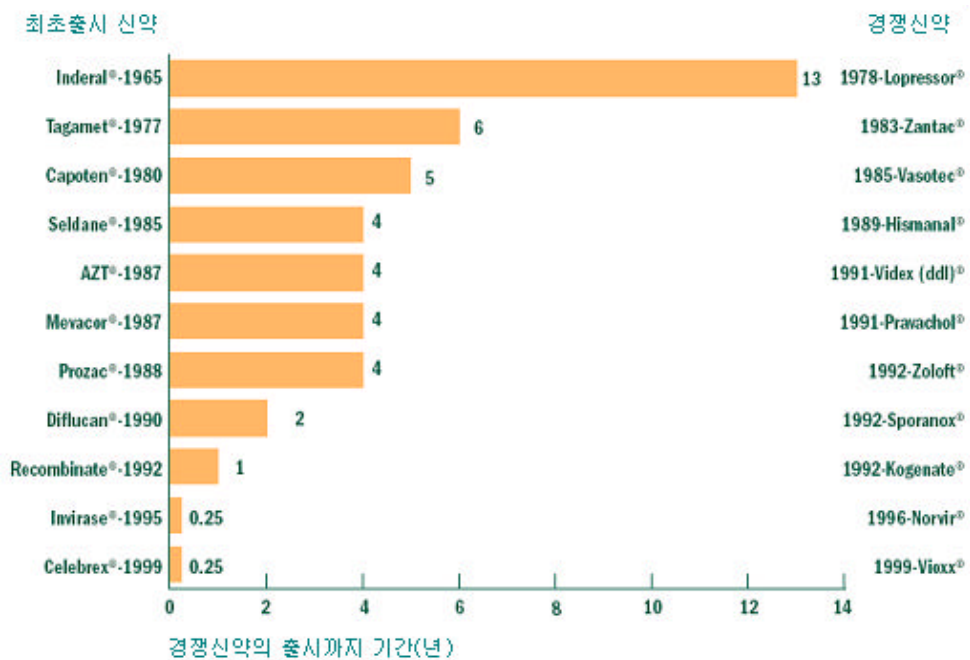
- 가

()

	1960	1970	1980	1990
	8.1	11.6	14.2	14.2
	3.2	5.1	5.9	6.1
	2.5	4.4	5.5	6.3
	2.4	2.1	2.8	1.8

: J. A. Dimasi, "New Drug Development in U.S. 1963~1999", Clinical Pharmacology & Therapeutics, 2001, PhRMA(2002)

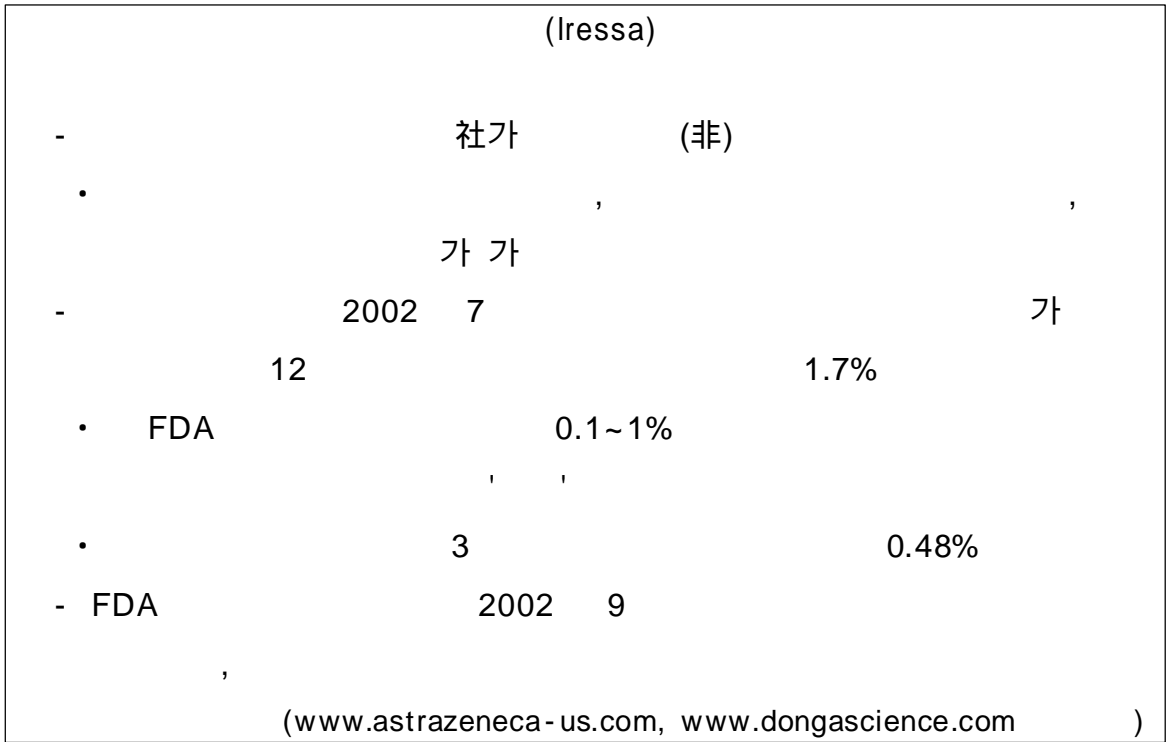
- 0.25



:PhRMA(2002)

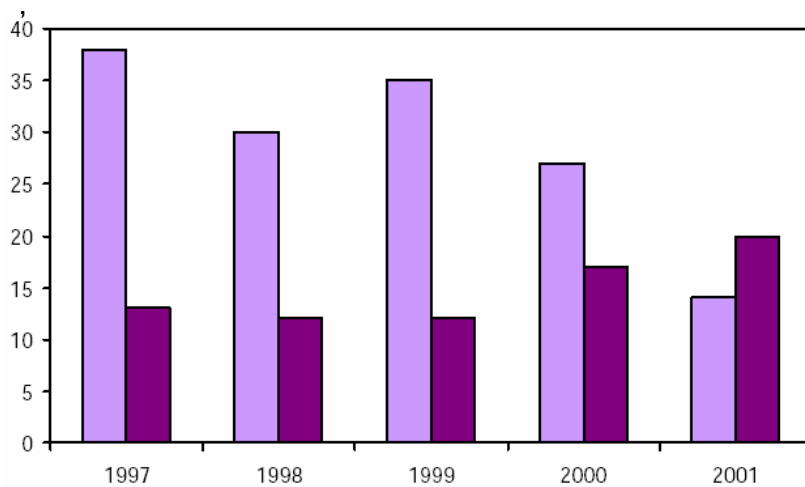
- 가 FDA

- 가 3,567 (1990~1992) 5,621
 (1998~ 2001) 가 가
 (Dimasi, 2002)



- ,

FDA



: Lehman Brothers Equity Research 2001, Morris(2002)

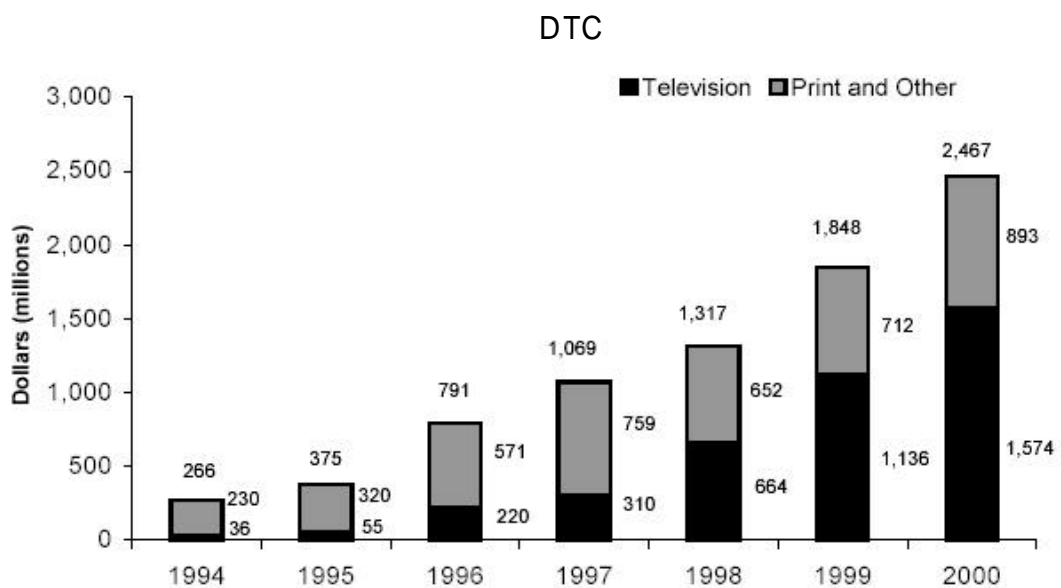
- 가
- GDP 12%(1.3)가

- Medicare
- Medicaid 가
- 가 (Generic)

- 가
- , , , 가

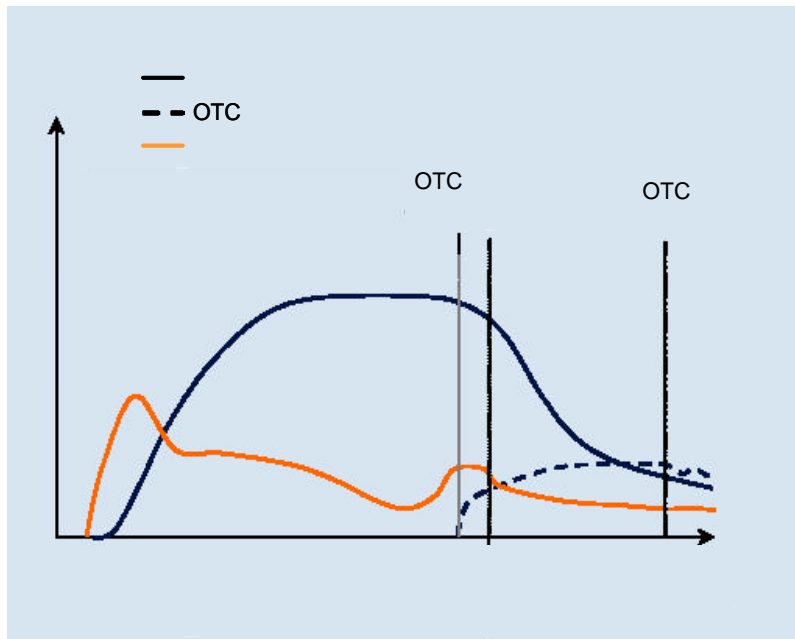
- , TV 가
- 77.5%가

- DTC(Direct-to-Customer)



: Frank, et al(2002)

- (OTC, Over-The-Counter)
 - 가 • FDA
- OTC 가 ()
 - 가 가
 - OTC



: "Maxximizing the Drug LifeCycle", www.reutersbusinessinsight.com, 2001

- 가 OTC
 - OTC ,
 - , GSK
- OTC 2002 785 , 2007
 - 6.5%

OTC

(, %)

	1997	2000	2001	2002	(1997~2002)
	174	201	205	221	4.8
	204	222	241	253	4.4
	112	134	148	165	8.1
	161	148	144	146	-1.2
	651	705	738	785	3.8

: "The OTC Outlook to 2007", www.reutersbusinessinsight.com, 2003

OTC ()

- FDA OTC

3

가 (Hatch-

Waxman)

- OTC

•

OTC

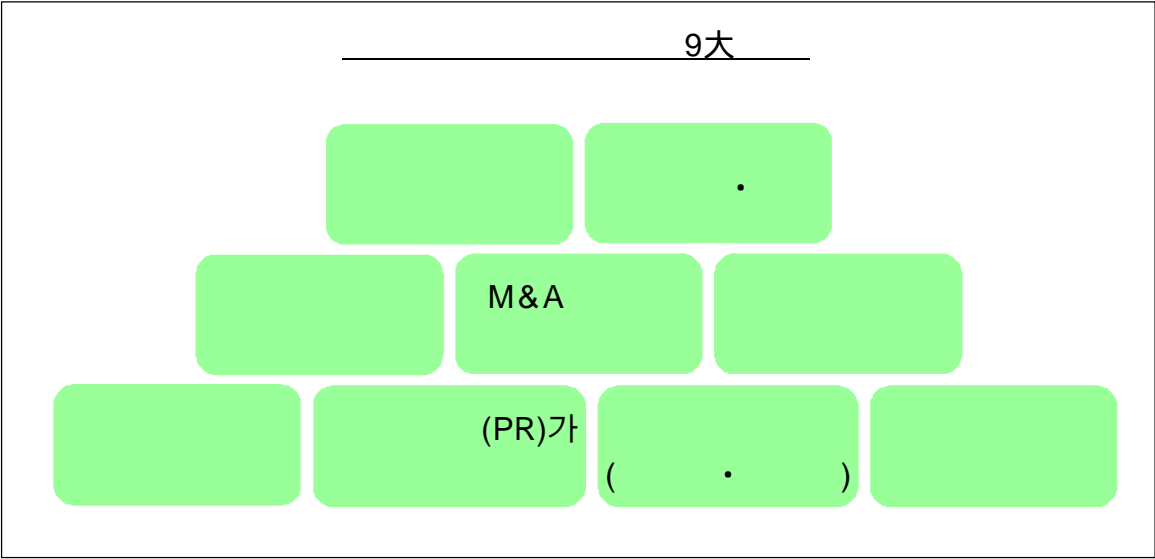
OTC	
-	(Losec) OTC
2001	가
- OTC	
(Nexium)	

- OTC

가

(Kraushaar, 1999)

.



1.

- 가 가 . 가

- 가

- R&D

. , ,

- .

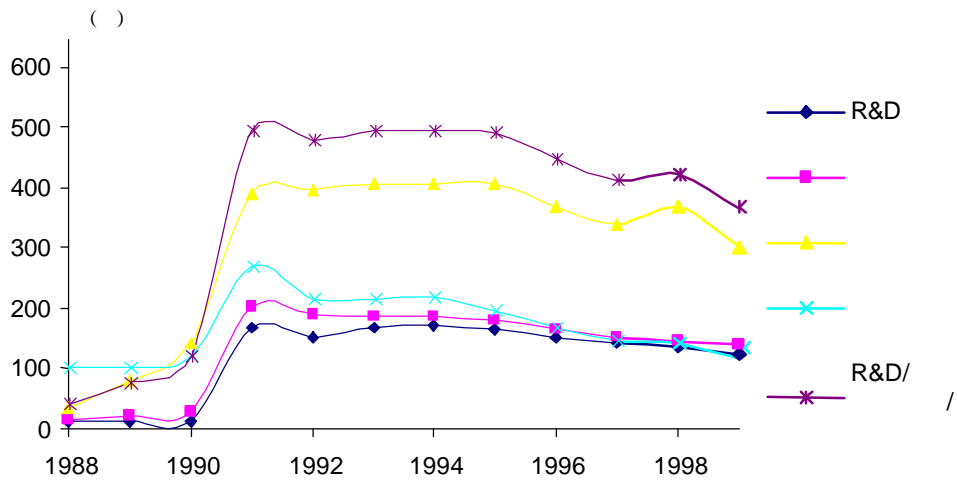
- 가 ()
 • ,
 •
 R&D, , , • , ,
 6 가

- R&D • 가 ,
 가 가

R&D		, ,
		,
		,
/	FDA 가	, ,
		,
	가	가 가

: Powell, et, al, www.fek.umu.se/dpcc/powell.pdf

- 1990 가
 • 가 가



: Powell, et, al(2002)

가

-

• 가

-

가

가

•

가 (' 가 ') , R&D

가 (Lemons Hypothesis)

' , , ' , .

가 ,

' 가 ' , 2002

(George A. Akerlof) 가 1978

가
'가 (Robinson and Stuart, 2000)

- 가
(Incomplete Contract)'

- ' (Reputation)'
'가 (Powel, et al, 2001)

•

- R&D

- ' ' 가

•

(Powell et al, 1999)

- , R&D 가 , , R&D

•

가

-

가

-

•

가

가

,

가
(Decreasing Returns
to Scale)

가

(Powell et al, 1999)

(Decreasing Returns

-

•

가 가
가

가

-

•

가

가

가

,

Uzzi 1997)

(Powell et al, 1999)

(Burt, 1992, Granovetter, 1985,

2.

가

-

•

),

, www.reutersbusinessinsight.com)

가

(304),

(114) (

2001

- (217),

3/4

~2002

- (63

2/4

-

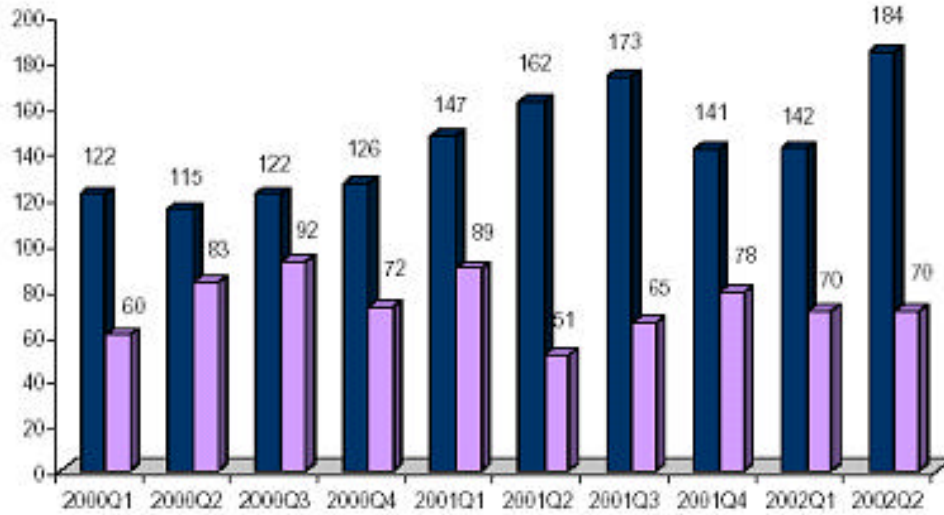
' (Relationship)'

가

(Transaction)

가

()



: "Pharmaceutical Strategic Alliances", www.reutersbusinessinsight.com, 2002

가

가

1

가

62%

(: %)

27.3	20.5	7.7	6.1	10.9	8.4	3.0	2.5	13.6

: 2000 3/4 ~2001 2/4 1

: www.reutersbusinessinsight.com

2

가

(: %)

1990~1999	49.8	12.3	5.2	7.0	6.1	19.6
2000 3/4~2001 2/4	27.3	28.2	6.1	10.9	8.4	19.1

: 1990~1999 Robinson and Stuart(2002), 2000~2001 Reuters Business Insight(2002)

- 50 17
 35%
 • 1963~1999 FDA 38%가
 (Nicholson, et al, 2002)

- : , ,
 , , ,
 , , (),

- 가 , • (Cross- Licens ing),

•

가

- 가 가 가

(Lerner and Tsai, 1999)

BioChem

	BioChem
	BioChem (SRP)
	5 (가 3 1 2)
SRP	- BioChem SRP 8 4 - (1) 가 (1) - 50%
	2 3
/	- 6 3 (Milestone Payment) - FDA IND , 2 , FDA NDA , FDA
	BioChem
	SRP
	- BioChem , , - BioChem 15%
	- SRP - : 3 - : 3 - BioChem (BioChem)

: Robinson and Stuart(2002)

-

가 가

• R&D

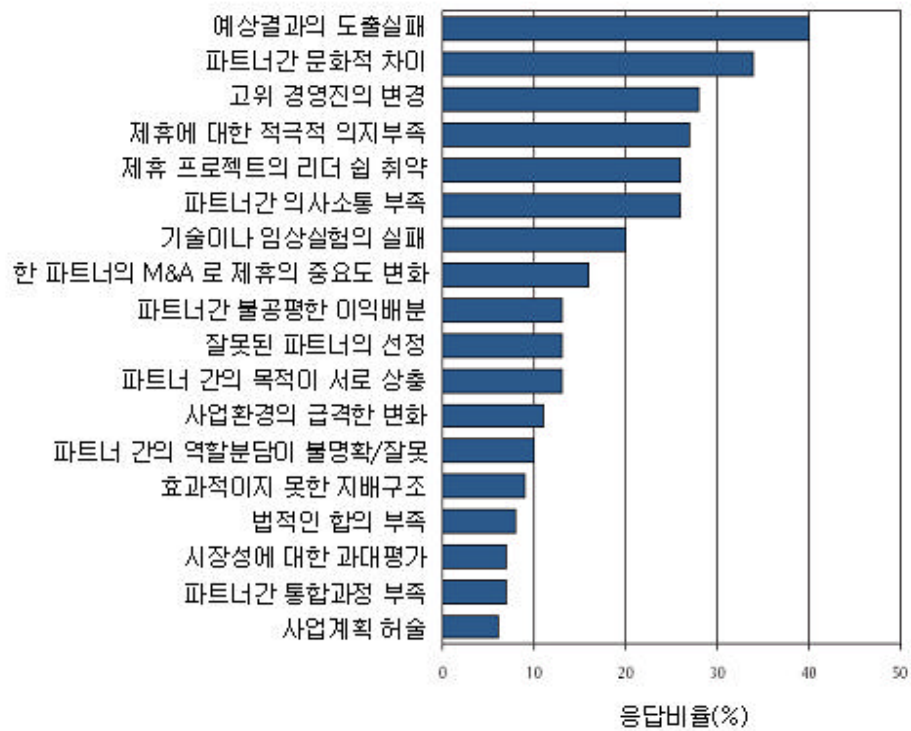
- , 가 가 가
(Lerner, et al, 2003)

- 가
가(Robinson et al, 2000)
• ' ' 가

	- 가 가 가 가
	-
1)	- 가 가 가 가 가 가
	- .
	-

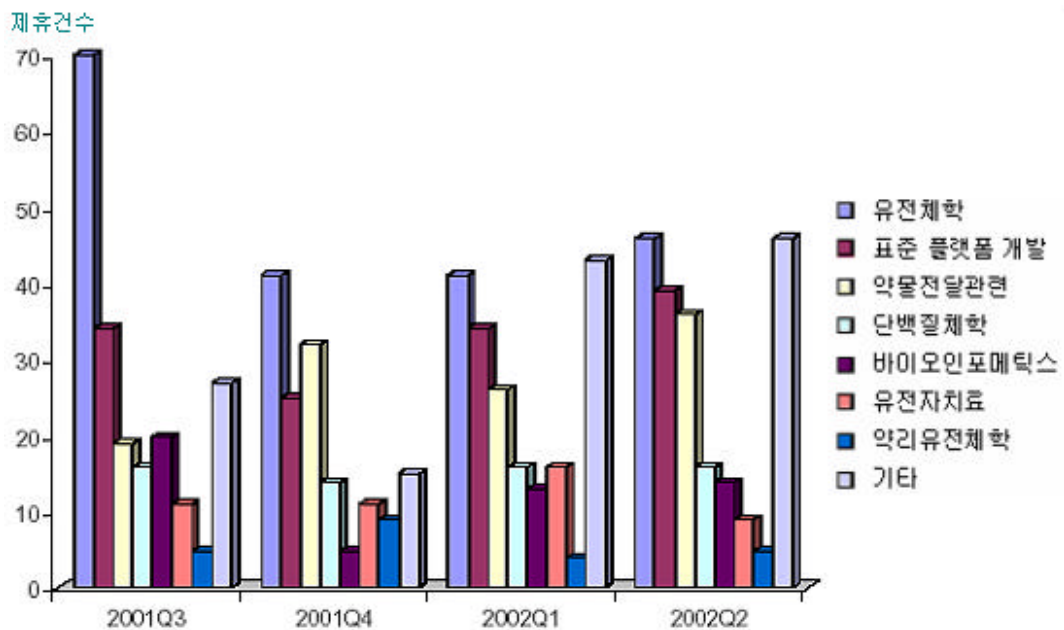
1: FDA () 가
() 가
: Lerner, et al(2003)

- " 가 (Rebecca
Henderson, E&Y, 2003)



: PWC(2000)

(Genomics)



: 2001 3 ~ 2002 2

: www.reutersbusinessinsight.com

- 가 32%

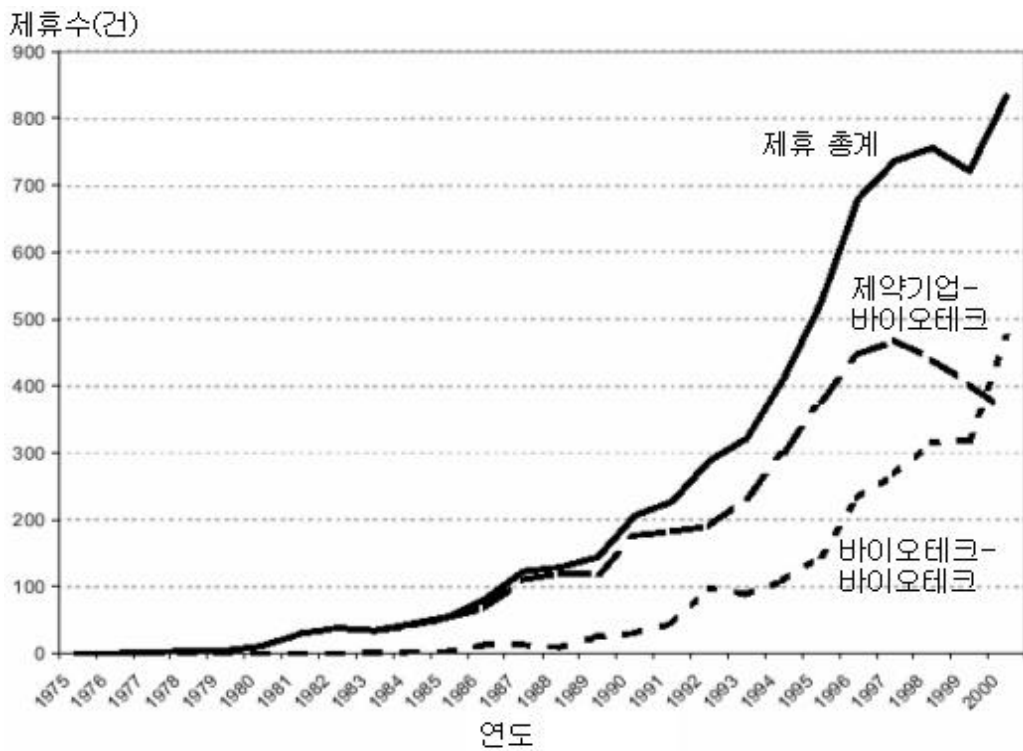
- 가 가

- (Bioinformatics) 가
• 2.2

3. (Big Pharma)

() 가

- 2001 - (550)
- (480)



: Filson and Morales(2002)

- 20% 가

(Halious, 2002)

2001

- 2
- 30%, 7% (www.Signalsmag.com) 63%,
- () 가
- " " 가
- 5 가

2002	Accupril, Axid, Cipro, Claritin, Cordarone, Duricef, Intron-A, Lotensin, Nolvadex, Primaxin, Relifex, Suprax
2003	Biaxin, Camptosar, Ceftin, Flixotide, Flonase, Lescol, Fosamax, Keftab, Lamictal, Norvasc, Procardia XL, Prozac, Serzone
2004	Casodex, Diflucan, Duragesic, EPO, Rocephin
2005	Activase, Cellcept, Lamisil, Paxil, Proscar, Recomb Hep B, Retrovir, Zithromax, Zocor, Zolof, Zyrtec

: Goldman Sachs, 2000, John Morris, 2002

-

5

Merck(美)	28%	AstraZeneca(英)	55%
Eli Lilly(美)	27%	Bristol_Myers Squibb(美)	35%
Novartis()	18%	GSK(英)	15%
Roche(獨)	13%	Pfizer(美)	12%

: Ernst & Young(2002)

-

가 (Nicholson et al, 2002)

-

(Signal) (Niosi, 2000, Nicholson et al, 2002)
가

-

가 30~60%

-

가

-

-

-

가
(Robinson and Stuart, 2002)

•

20

(%)

	1988~1990	1991~1993	1994~1996	1997~1998
~	72.9	65.4	64.0	71.7
~	15.3	19.0	16.9	10.6
~	11.8	15.7	19.1	17.7
	100	100	100	100

: Recombinat Capital RDNA Database, Nicholson et al(2002)

R&D

(Filson et al, 2002)

- 가

• , 가 ,

가 가

- 가

가

- 가

• , ,

(Integration)

• " 가 가

.(Recombinant Capital Edwards)

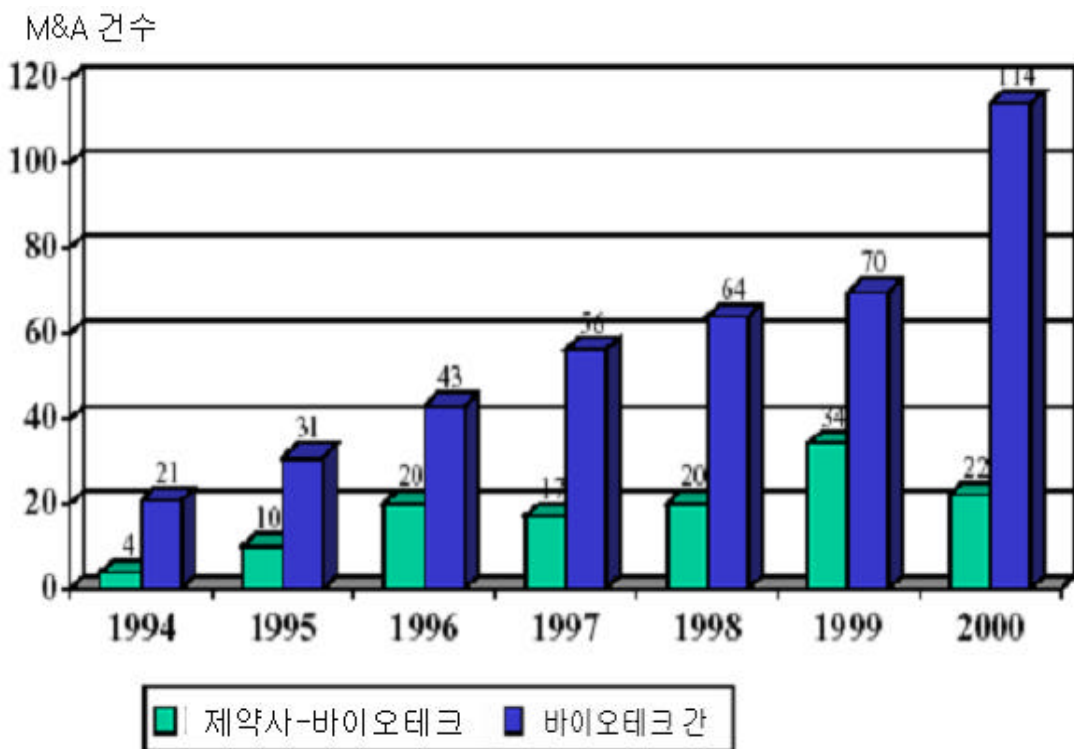
4. M&A

M&A

- M&A

가

M&A



: Goldman Sachs(2000), Knyphausen-Aufses and Engelhard(2002)

-

M&A 가

•

가가

M&A

-

(Recombinant Capital, 2002)

•

M&A

M&A

(,)

		'99	'00	'01
	-	46	77	52
	-	12	7	4
	-	54	63	232
	-	120	27	10
	-	1.2	0.8	4.5(1.4) ¹⁾
	-	10	3.9	2.5

1: (美) 160 (Immunex, 美) M&A가
 (1.4)
 : Recombinant Capital , E&Y(2003)

M&A

- M&A R&D ,

- M&A 가

- M&A

- R&D ,

M&A 가

- 가

- , , ,

•

- •

- 가

M&A

- 가

• 1998 Bayer가 Chiron Diagnostics(美) Chiron

-

- 가

• , 가 , , ,

CEO

M&A

- 1998

CEO

가

CEO

(2000)

GSK가

5.

•

가

- 가 , , (Engelhard, et al, 2002)

- 1) , 2) , 3)

-

•

•

-

- 1984 'Hatch-Waxman' 가
(PhRMA, 2000)

-

• 14 , 11~12

-

가 (, PTEA)

5

- (Generic) 가 •

• FDA
가
5
(5~10)

- 2001
9.9% (E&Y, 2002)

• 'Hatch - Waxman'
3~4
가

• 35% 100%
(Huang et al, 2000)

- : (, ,)

• 1980 가
1

- : 가
(, HGS)

PR

- • ,
• (Cross - License)

가

-

-

-

-

가 가

-

-

6. •

•

-

13%

(Arora, et al, 2000)

-

•

•

•

(Spin Off)

-

•

•

-

(Owen-Smith et al, 2002)

•

•

•

•

7.

가

(Davila, et al, 2001)

-

(1st round)

•

가

- ()

(2nd, 3rd, 4th round)

•

-

•

(Treu, 2002)

-

-

- 1)

, 2)

3)

4)

5)

6)

8.

가

•

가

-

-

•

가

•

-

-

• MBio(Eli Lilly , 1995), MPMx(Becton Dickinson , 1999)

- 가

(2000~2001)

-

70

• 20~30

•

•

35%

(: Champion, HBR, 2001)

(Social Networks)

(Liebekind, et al, 1996)

-

- 가

-

-

- , ,

- 가 MBA가

- CEO 가

J&J()

- J&J 1998
 - : " "
 - (• "www.jnj.com/careers")
 - ("eferral") J&J
 - "Recruitment Talk" •
- 50% 가,
33% 가, 1/3
(: Ellen Gilbert, 2002)

9. (PR)

, 가

- 가

•

- ,

•

- (GMO, Genetically Modified Organism)

•

GMO

•

- GMO 가 (68%), (22%),
(6%), (3%) 4

-

가

•

(Gaucher)氏 病

「HOPE」

-

•

가

-

IR

PR

•

•

(%)

	1996	1997	1998	1999	2000
가	12.9	13.8	13.7	11.8	11.8
	1.2	1.5	1.6	1.8	2.2
	14.2	15.3	15.3	13.7	14.0

: Frank, et al (2002)

.

가

가

가						
			가			

가

가

가

가

- 1)

.

:

.

:

(

),

(DNA

),

(Perkin Elmer,

.

)

• : (CRO), (CMO), (CSO)

- 2) :

• , IDEC, , HGS

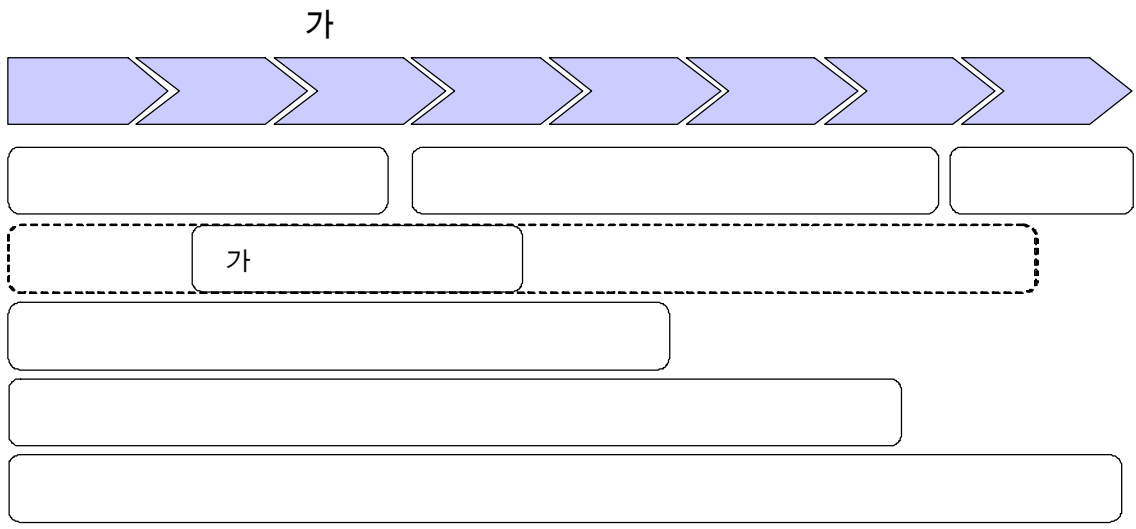
- 3) 가 : •
가

• (Cytos,), 가

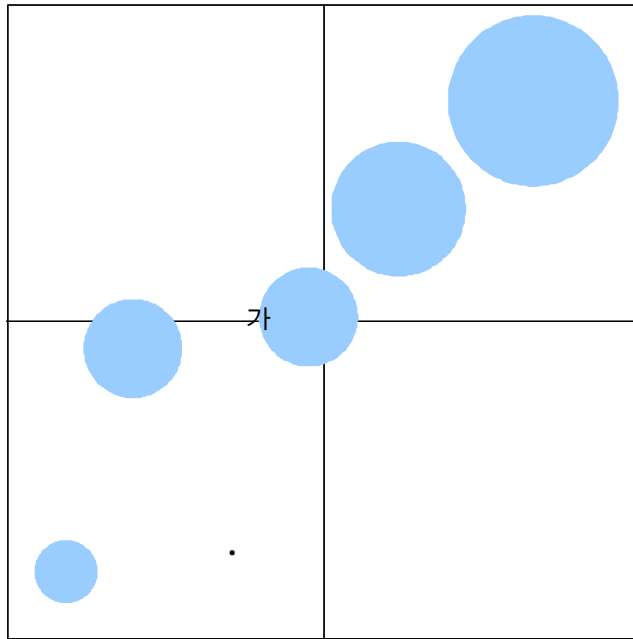
- 4) :

• , , ,

- 5) :



가 -
(Trade Off) (Halious, 2002)



:
: Halioua(2002)

가

- , , M&A

- , , (Out - Licensing),

가

- :

• 가 가 가

- :

- DB
(MedImmune, 美) , (Cambridge Antibody Technology, 英)
(Lexicon Genetics, 美)

-

- 가 가
- 가 , 가

- (InterMune, 美)
- (Exelixis, 美) BMS社

- M&A : M&A

- FDA Flumist
(Aviron, 美) 20 (2001)

Amgen			
-	(Immunex, 美)	(2001)	21
•	Epogen, Neupogen	Enbrel	가

,
 •
 •
 - :
 • (Gilead Sciences, 美)
 OSI (美)
 - (Spin Off) :
 •
 • 50가
 (Perlegen Sciences) (2001)
 - , , ,
 가
 - (Out-Licensing) :
 •
 - •
 •
 1.
 가

-

-

가

•

,

가

(, %)

	184(26.0)	394(55.6)	131(18.5)	709(100)
	223(17.5)	703(55.2)	348(27.3)	1,274(100)
	15(15.8)	57(60.0)	23(24.2)	95(100)
	422	1,154	502	2,078

:

-

,

가

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-

-

: Arora, et al(2000)

(Niche)

-

10

•

-

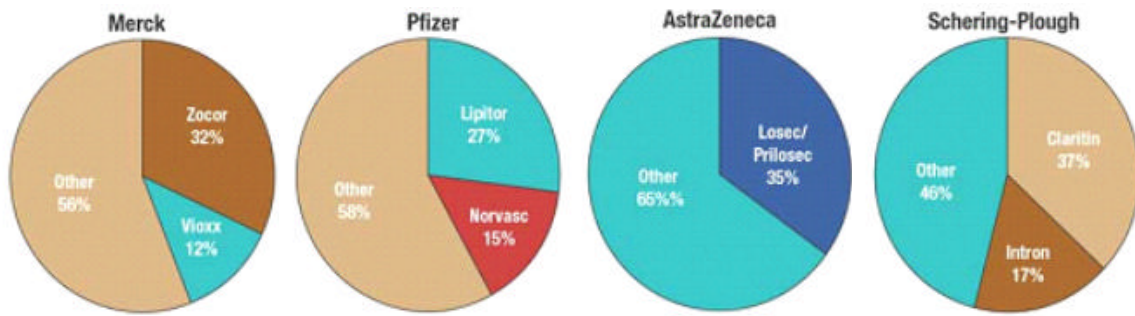
가

-

가

•

가



: Franco and Kaitin(2002)

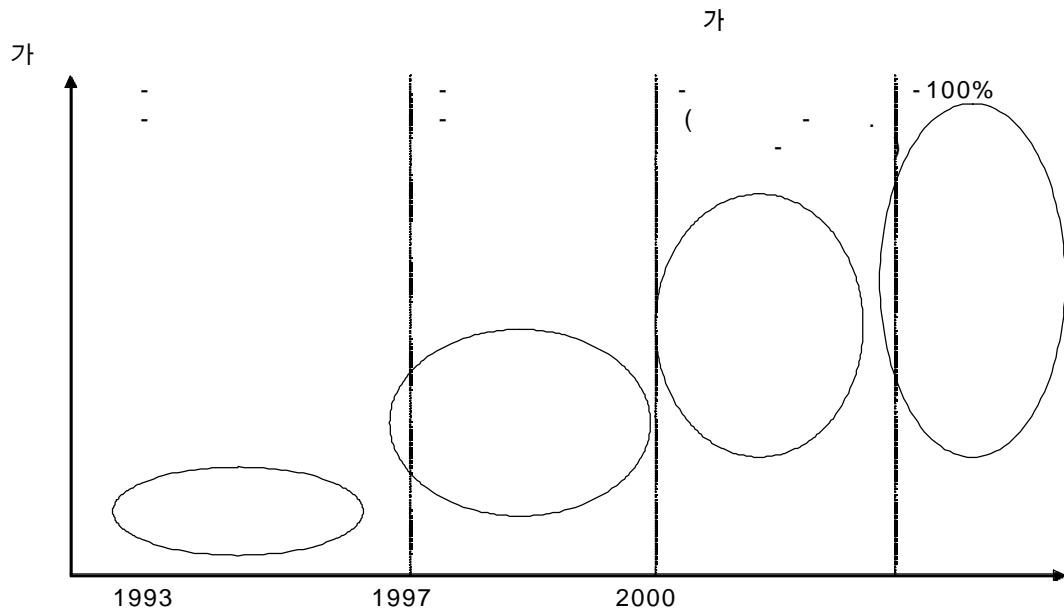
가

- ,
- , ,
(Blauvelt, 2003)

	가
•	
•	R&D
	(Business Intelligence)
	•

: Blauvelt(2003)

• " 가 ,
 가 가
 "(Mark Levin, CEO)



: HBR, June, 2001

- •

3.

• • 가

- (Competition) (Cooperation)
 (Coopetition) (Velasco, et al, 2002)

- 가

-

- 가 ()

-			
-			-
		×	×
-		×	×
(,)			

: , - , ×
: Velasco(2002)

R&D

- R&D
- 가

R&D

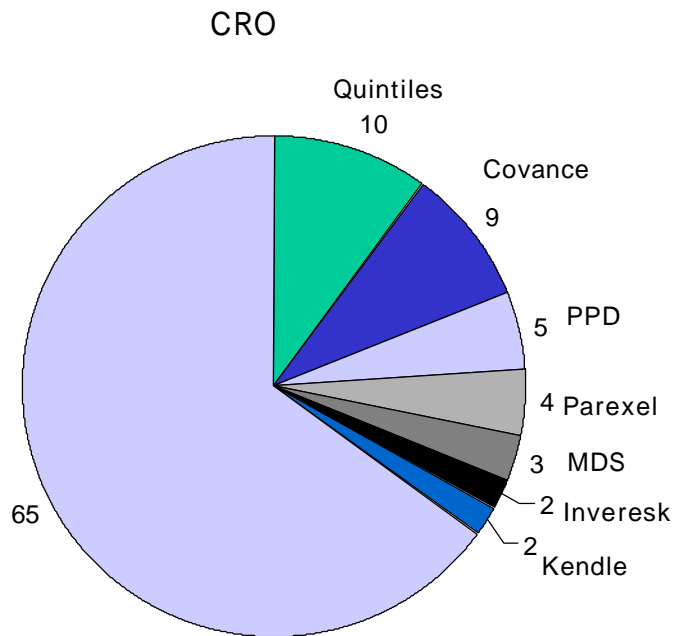
()

	1998	1999	2000	2001	2004	2006	2008
	436	464	516	560	725	869	1,052
	375	395	434	467	586	681	792
	61	70	82	93	139	188	260
	14.0%	15.1%	15.9%	16.6%	19.2%	21.7%	24.7%

: 2004~2008 RBI
: www.reutersbusinessinsight.com

-

- R&D (Quintiles, 美) (CRO)



: www.reutersbusinessinsight.com

-

가 , R&D , CRO ,

4.

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- 가

- Gilead Sciences(美)

NeXstar (美) (1999)

-

- NASDAQ

-

- 가

- ,

가

가

-

가

- WTO TRIPS(Trade-Related Aspects of Intellectual Property Rights)

- 가

- 가 (EMA, European Medicines Evaluation Agency) 가

- FDA EMEA

가 가

- 2001

Harmonisation)

(ICH, International Conference on (CTD, Common Technical Document)

, ,

가

- (psoriasis) (Amevive)

CDT

- 2003

CDT

(ICH)

1990

, EU,
·
3

(CTD)

가

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가 가

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가

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가 가

,

(E&Y, 2002)

·

가

18

(PhRMA, 2002)

-

·

()

:

(Proteomics) : 3 , ,

,

(SNPs) : 가 ,

(Monoclonal Antibody) : 가

()

(Big Pharma) : Big Pharmaceutical Company
가 10

, Novartis, Merck, J&J, Pfizer

(Microarray) :

()

, DNA , (SoC),

. Affymetrix社 GeneChip

가 ,

가

(Generic) : 가

,

(Bioinformatics) :

,

(Biotechnology) : (Recombinant DNA),

, ()

(OTA, Office of Technology Assessment, 1998)

(Biotech Company) :

:
(Blockbuster) : 1
: (DNA)
()
(Gene Therapy) :

(Recombinant Human Proteins) :
(Recombinant DNA)

(Small Molecules) :
가 .
가 ,
가
가

(Preclinical) :

(PCR) :

: Prescription Drug Ethical Drug .

(Pipeline) :

(Platform) : • , ,

(Combinatorial Chemistry) : ()
가 가

CMO : Contract Manufacturing Organization ,

CRO : Contract Research Organization ,
 , CSO, CMO, ,
(Monoclonal Antibody),

CSO : Contract Sales Organization ,

DTC : Direct-To-Customer,

FIPCO : Fully Integrated Pharmaceutical Company ,
 가
 , Big Pharma FIPCO

IND : Investigational New Drug Application ,

30 가

mRNA : RNA (DNA)

NDA : New Drug Application, 3 ,
 가 FDA ,
FDA 6 NDA

SME : Small to Medium-Sized Companies .

Tool Company : Genomics, Proteomics, Bioinformatics

VIPCO : Virtually Integrated Pharmaceutical Company ,
 가 가 ,

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www.recap.com