Considerations in the planning step of Clinical trial

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Contents

- Strategy for the planning of Clinical trail
- Selection of Key Participants for Success of Clinical Trial
- Budgeting of Clinical Trial

Global Pharmaceutical Industry Market



출처 : 2012 IMS Health 세계 제약시장 분석보고서

High-Risk, High-Returr

High-Risk

- 글로벌 신약 평균 개발기간 12~15년, 평균 개발비 8억불
- 국내 신약 평균 개발기간 10.5년, 평균 개발비 430억 원

High-Return

- 독점적 매출로 특허 기간(출원부터 20년) 동안 독점적 사업권리 인정
- 세계 100대 의약품 기준 (1개 품목당)
 연평균 매출 8~10억불, 순이익 1.6~3억불

출처 : Data Monitor PharmaViitae Explorer, 한국보건산업진흥원 생명공학정책연구센터

연구개발

- ▶ (현황) '11년 전세계 제약 관련 R&D 지출 : 1,350억불로 추정
- ▶ 한 개의 신약 개발에 드는 비용 : 약 13억불 ('75년 1.38억불에 비해 약 10배 증가)
- ▶ 막대한 연구개발 비용에도 불구하고 연구 대상 후보물질 중 바이오의약품의 경우 4%, 저분자 의약품의 경우 14%만이 의약품으로 개발
- ▶ '11년 전세계적으로 35개의 신약이 출시되었으며, 3,200개의 후보물질이 다양한 단계에서 연구 개발 중
- ▶ 장애요인: 연구개발 비용 상승, 높은 실패율, 엄밀한 테스트 요건, 신약 승인 건수 감소
- ▶ 임상 3단계와 같이 연구개발 후반기에서의 신약 개발 실패는 임상 이전 단계에서의 실패보다 더 많은 손실을 유발

신약 연구개발 임상시험 단계의 복잡성

구분	' 99	' 05	증감율
임상시험계획서(Trial Protocol) 당 절차 (예 : 혈액검사, 정기검진, x-레이 등)	96건	158건	△65%
임상시험 기간	460일	780일	△70%
임상시험 참여 신청률 (임상시험 기준을 충족하는 자원자 중 비중)	75%	59%	▼ 21%
임상시험 참여 유지율 (임상시험 종료시까지 참여자 비중, %)	69%	48%	▼ 30%

기술이전 시장 동향

글로벌 제약사, 주요 제품 특허만료에 따른 매출급감 및 연구생산성 감소로 in-licensing 적극 추진

글로벌제약사의 위기

- ▶ 위기 1 : Patent Cliff (특허절벽)
 - 특허만료에 따른 급격한 매출 감소
 - . 2010~2015년 주요 특허만료 제품 매출비율 약 54%
 - . 2012년 기준 : 미국 210억\$, 유럽 100억\$ 매출감소
- ▶ 위기 2 : Innovation Gap(연구생산성 감소)
- 연구개발비 대비 신약 허가 감소에 따른 연구효율성 저하 신약승인 건수: 53건(1996년) → 38건(2012년)

위기 극복 전략

전략 1: in-licensing 확대

전략 2: M&A 적극 추진

글로벌제약사 기술이전 추이

▶ 개발 Pipeline 중 in-licensing 비율(2009년)



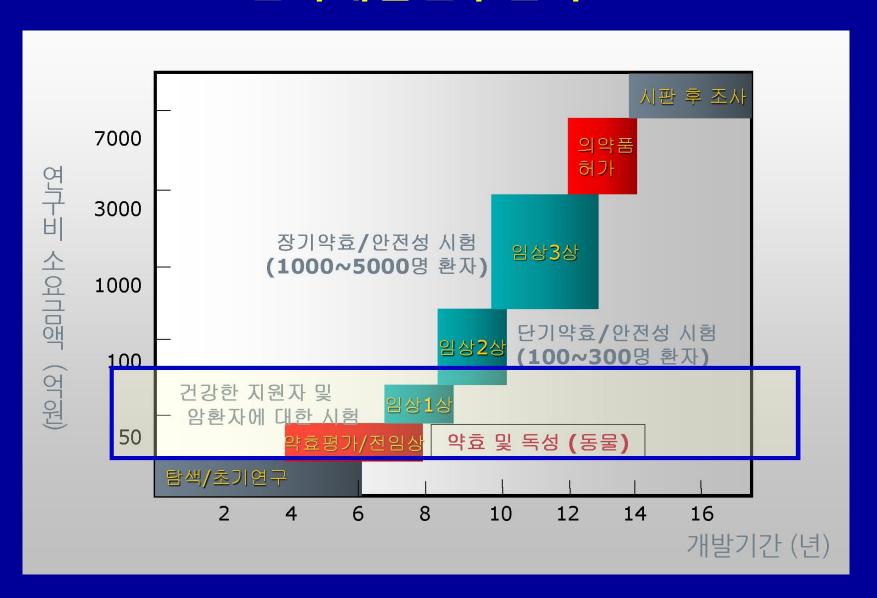
☞Sanofi: 매출의 75% 이상이 in-licensing에 의한 매출임

▶ 주요 글로벌제약사 in-licensing 비율



출처: Data Monitor PharmaViitae Explorer 2012.5

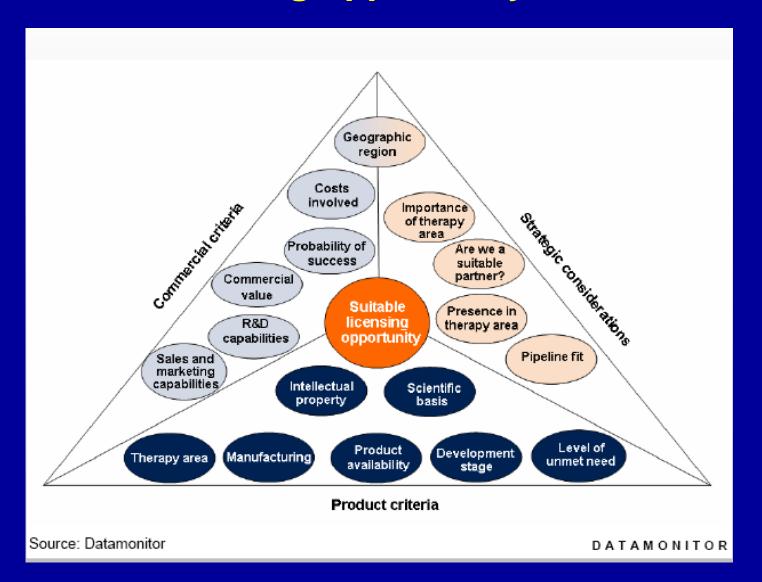
신약개발연구전략



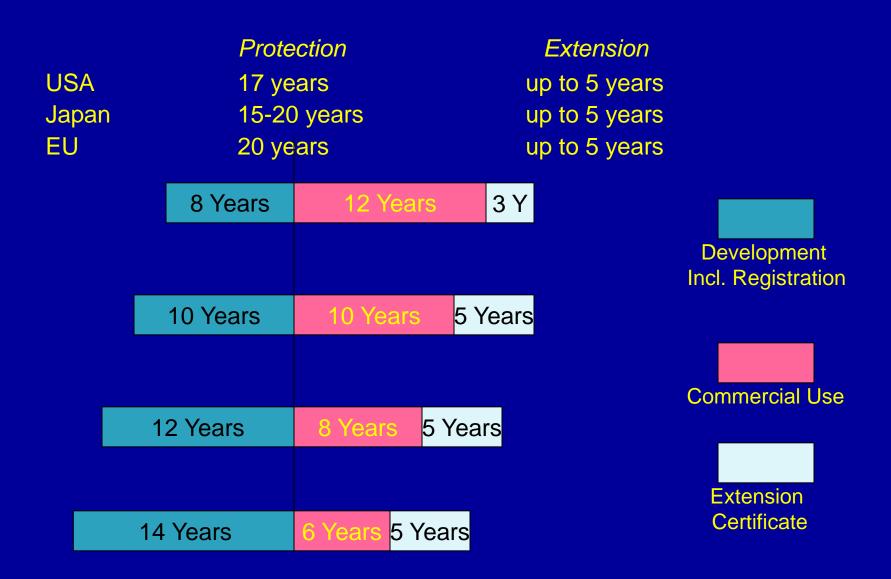
License out of Korean Pharmaceutical Company

Year	Company	Licensing Partners	Contents	
2004	Pacific	SCHWARZ (Germany)	Analgesic (PAC20030)	
	LG Life	Anadys (USA)	hepatitis B treatment (LB80380)	
	LG Life	Holling(Taiwan), Ache(Brazil), Aspen(South Africa), Tabuk(Saudi Arabia), Vero Pharm(Russia), Abdi Ibrahim(Turky)	Antibiotics-Quilolones (FACTIVE®)	
	Bu Kwang	Eisai (Japan)	Hepatitis B treatment (Clevudine)	
2005	Bu Kwang	Pharmasset (USA)	Hepatitis B treatment (Clevudine)	
	IL Yang	TAP (USA)	Antiulcer agent (Ilapazole)	
	Sam Jin	Imqust Pharmaceuticals (USA)	Antiviral agent	
2006	GreenCross	BIRD Project Gmbh (Germany)	Patent for Osteoporosis treatment (Tech. of Genetic Recombination)	
	Sam Jin	Imqust Pharmaceuticals (USA)	anticancer agent - Piperazine	
	Dong Bu Chem	Danube (USA)	Glaucoma treatment	
	Dong-Wha	Pacific Beach BioSciences (USA)	Quinolone antibiotic(DW-224a)	
2007	Dong-Wha	Procter & Gamble Pharmaceutical (USA)	Osteoporosis treatment (DW1350)	
	LG Life	Gilead (USA)	Liver disease treatment (LB84451)	
2008	Dong-Wha	Teijin Pharma (Japan)	Osteoporosis treatment(DW1350)	
2009	SK Lifescience	Addrenex Pharm.(USA)	Narcolepsy treatment(SKL0N05)	
2010	Hanall Biopharma	YSP SAH(Malaysia)	Atopic Dermatitis treatment (HL-009)	
	SK Biopharm	Shanghai Medicilon(China)	Bipolar disorder Candidate	
2011	Boryung	Stendhal(Mexico)	ARB medicine(Kanarb)	
	Dong-A	Meiji Seika Pharma(Japan)	Benign prostatic hyperplasia treatment(Zydena)	
2012	Dong-A	Alkem Lab. (India) Luye(China)	Diabetes treatment(DA-1229)	
2013	Binex	Pharmstandard(Russia)	Arthritis treatment (Remicade biosilmilar)	
2014	Dong-A ST	SKK-Sanwa Kagaku Kenkyusho, Suzuken Subsidiary(Japan)	Hematosis stimulant(DA-3880)	
	Qurient	Infectex(Russia)	Tuberculosis treatment(Q203)	

Key factors to be evaluated when identifying a suitable in-licensing opportunity



Patent Protection



Strategy for the planning of Clinical trail

Planning of Clinical Trial

- 1. Establishment for the purpose of Clinical Trial
- Short term Goal and Long term Goal considered in the development step
- Registration study: Phase I, II, III, Observational study, post marketing study, IIT
- 2. Planning for selection of vendor, CRO and site
- Main consideration which is reflected on the decision of partners (based on indication, clinical trial step, regulatory affairs, sponsor system etc.,
- Feasibility list, Review of information and capability, Visit schedule, Interview Questionnaire, etc.,
- 4. Pre-trial visit of CRO and Sites
- 5. Vendor selection
- Storage and delivery of IP
- Storage and delivery of test sample
- Central lab
- 6. Timeline and Budget

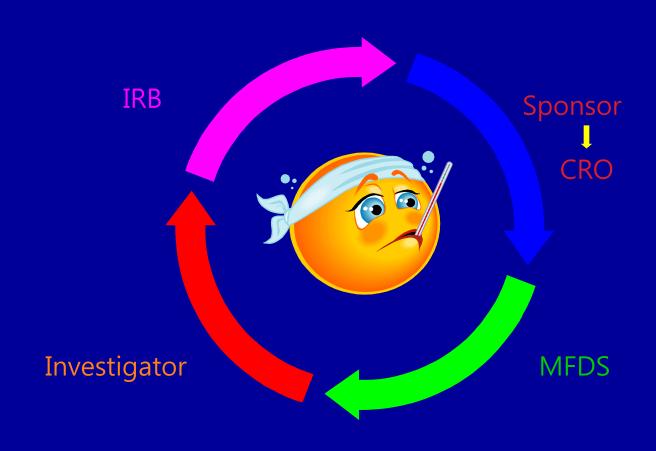
Strategy of Clinical Data Package

CDP Plan considered NDA

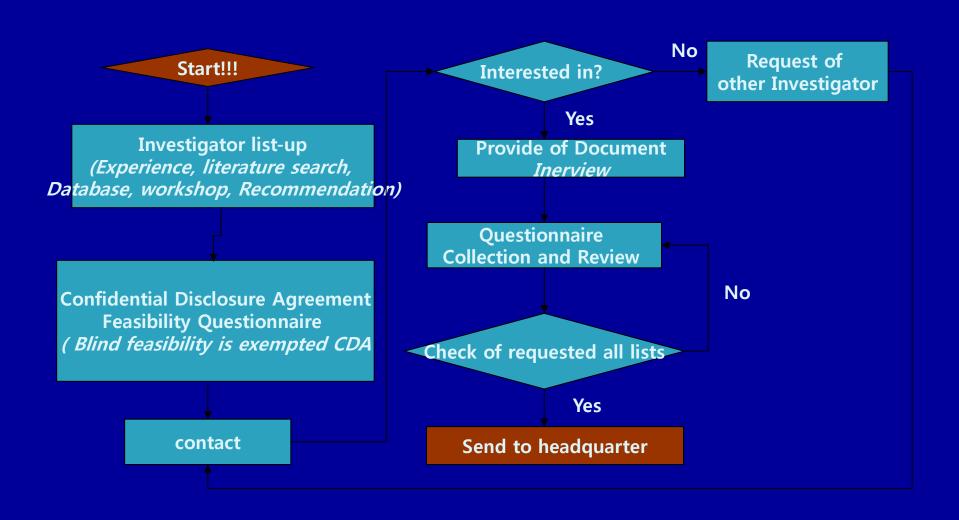
- > Pre-clinical data
- MOA for Biological activity
- Toxicological data based on dose, administration reflected on clinical trial plan
- Composition of Clinical Data Package for NDA
- Expected design for Phase I, II, III
- Design reflected on the latest guideline for clinical diagnosis, therapy, clinical evaluation
- Design reflected on the regulatory issues of Healthy Authorities.

Selection of Key Participants for Excellent Clinical Trial

Key Participants



Feasibility Process for selection of site



Assessment of Site

- Site Staff
- Site Facilities
- Clinical study experience
- Competition study
- Regulatory & Ethics discussion
- Essential Forms Initiated

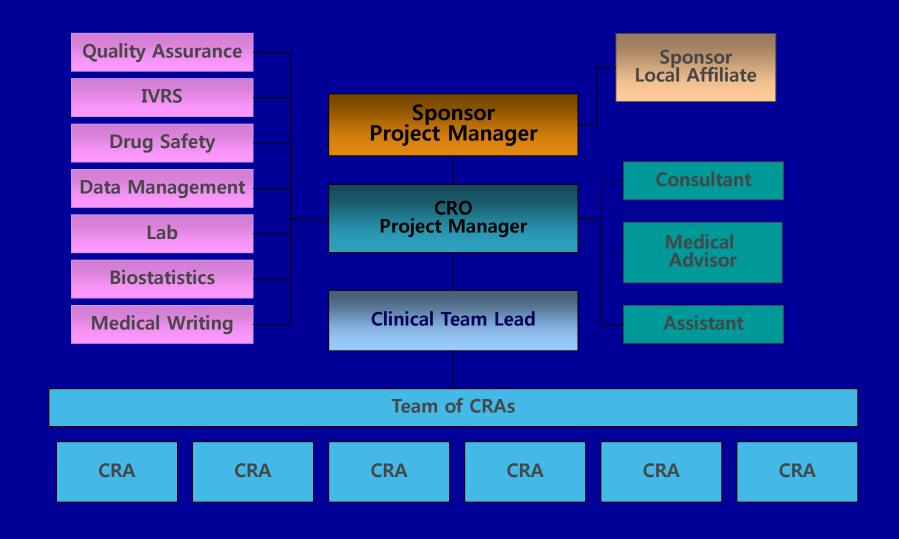


Discussions of Clinical Study

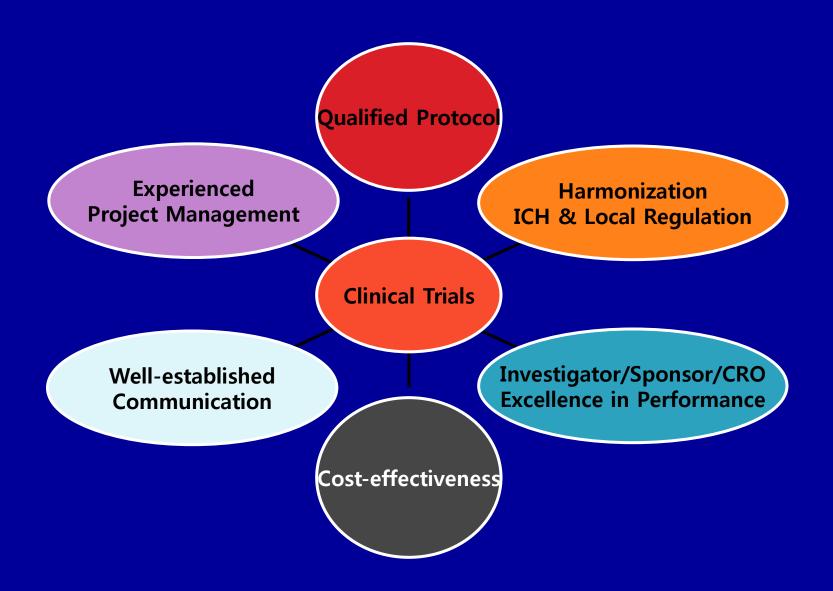
- Background of Investigational product
- Key aspects of Protocol
- IP handling/record keeping/disposition
- Randomization/allocation
- Emergency un-blinding procedures
- Study timeline
- Publication Plans
- Audits/Inspections
- Site specific agreements



Organization example



Success in Clinical Trials



Budget of Clinical Trial

Budget Planning (I), Key Factors

1. Experience

- sponsor, Type of Study, Expertise in Area
- 2. Subject population
- Level of care, Age, Gender, Ethnicity
- 3. Burden time
- Protocol review
- Subject control and therapeutic management, clincial data collection, CRF
- Negotiation time, Study set up, co-participants,
 Sponsor communication, Preparing for site initiation,
 Monitoring, Close out, visits, etc

Budget planning (II)

- 1. Cost for each service
- Time requested as Staff level (Training, meeting, etc.)
- 2. Add "Personnel Overhead"
- Maintenance of computer
- "Non-productive time" (training, communication)
- "not to be confused with institutional overhead"
- 3. Cost calculation time based

Study Hidden Costs

- Protocol review, IRB and Informed consent submission
- Revisions: Informed consent & protocol and/or amendments
- IRB document management
- Sponsor/Investigator meeting
- Scheduling & Rescheduling
- Screening and recruitment failure
- SAE reporting
- Preparing Monitors

Example of Top Uncompensated PI Costs

- Study supervision
- Investigator meeting attendance
- Case form report review
- Initiation visit attendance
- Adverse event management
- CRA meeting and interactions