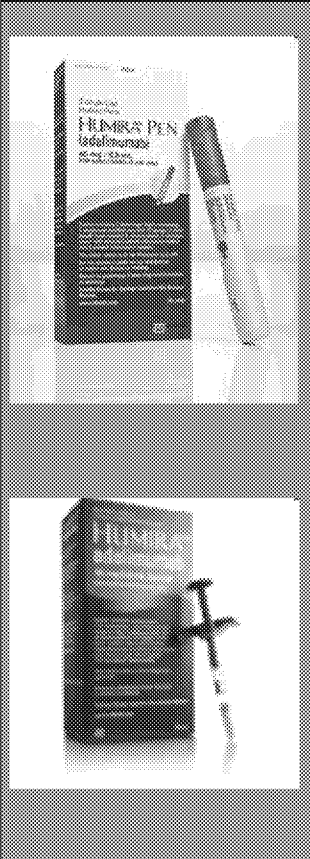


PRELIMINARY



CONFIDENTIAL

## Assessing the Risk to Humira from Biosimilars and JAK-3



Proposed Project Approach  
August 24, 2010

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## CONTENTS FOR TODAY'S DISCUSSION

- **Our understanding of project context and objectives**
- Proposed approach / deliverables and working model
- Why McKinsey?
- Summary of McKinsey perspectives on biosimilars

## CONTEXT FOR THIS EFFORT

PRELIMINARY

- Humira continues to be the major revenue driver for Abbott with expected 2010 revenues of ~\$6.5B (~25% of total revenues)
- However, the potential entry of both biosimilars and oral DMARDs (in particular Pfizer's JAK-3 inhibitor) puts Humira at risk across its key markets
- Abbott has established a working team that has been assessing the nature and timing of the threat to Humira and modeling the impact on the LRP of both biosimilars and the JAK-3 compound. This internal team has identified a projected decline in revenue of ~\$8.5B in 2019 off baseline projected LRP revenues of ~\$12B
- Given the extent of the projected decline, it raises a number of tough decisions that you will face for the brand and company. As a result, you have asked us to work with your team to reassess the threat and timing of both biosimilars and JAK-3 on the Humira LRP (US and ex-US) and what could be done to minimize that risk
- In addition, based on our assessment of the biosimilars markets in the US and other key markets, you are seeking a perspective on whether biosimilars could be an attractive market for Abbott to enter and, if yes, the best approach to do so

- ① Develop country-by-country assessment of the likely **impact of biosimilars on Humira in key markets** based on detailed evaluation of key factors, including
  - Regulatory environment / IP landscape (e.g., assess level of regulatory risk, current / projected pathway and how it might change, likely development requirements, implications on innovators and entrants, etc. )
  - Market access issues (including listing / reimbursement, likely payor reactions, etc.)
  - Evolution of MD treatment patterns (including conversion drivers by segment, impact of persistency)
  - Pricing
  - Competitive landscape, including likely number of entrants, impact of other biosimilar products and implications on pricing
- ② Identify **potential actions** that could be taken by Abbott to **sustain Humira usage** post- biosimilar entry, including policy / government affairs, development (e.g., new formulation), commercial levers (e.g., pricing / contracting, counter-detailing, switching, etc.)
- ③ Determine **likely impact of Pfizer's JAK-3 compound**, including assessment of likelihood of approval in US and key EMEA markets, likely positioning and strategy and projected impact on Humira in key markets
- ④ Develop **integrated financial model** quantifying risk to Humira from biosimilars and JAK-3 compound through 2019 (and relative to current LRP), as well as potential impact of Abbott "defense" strategies (where possible)
- ⑤ Conduct **assessment of attractiveness to Abbott of entering the biosimilars** market as well as potential entry options

# OVERVIEW OF KEY MARKETS FOR HUMIRA

PRELIMINARY

	Market	FY10 Update \$M
Markets included in ABT initial deep-dive assessment	US	2,742
	Germany	497
	UK	341
	Spain	293
	France	289
	Canada	242
	Netherlands	232
	Italy	221
	Japan	104
	Sweden	94
	Rest of WE*	688
	Lat AM**	444
	AAAME***	223
	CEE****	102
	RIC	10
	<b>Total</b>	<b>6,520</b>

- Ten markets covered by ABT working team represent 77% of Humira revenue
- Recommend our assessment covers US, EU5 and other select important markets in Scandinavia and Benelux that are aggressively pushing biosimilars (e.g., Sweden or Norway, Netherlands)
- Also recommend including one “low cost” biosimilar market to serve as “testing grounds” for whether biosimilars at a lower price point could drive volume uptake, assuming market access could be improved, e.g.,
  - Brazil (top 10 market)
  - China or Columbia (biosimilar TNFs on market today)
- Recommend not including
  - Japan—tough biosimilars market due to very strict regulatory pathway and negative MD perceptions
  - Canada—recently finalized biosimilars guidance; similar dynamics expected as other developed markets

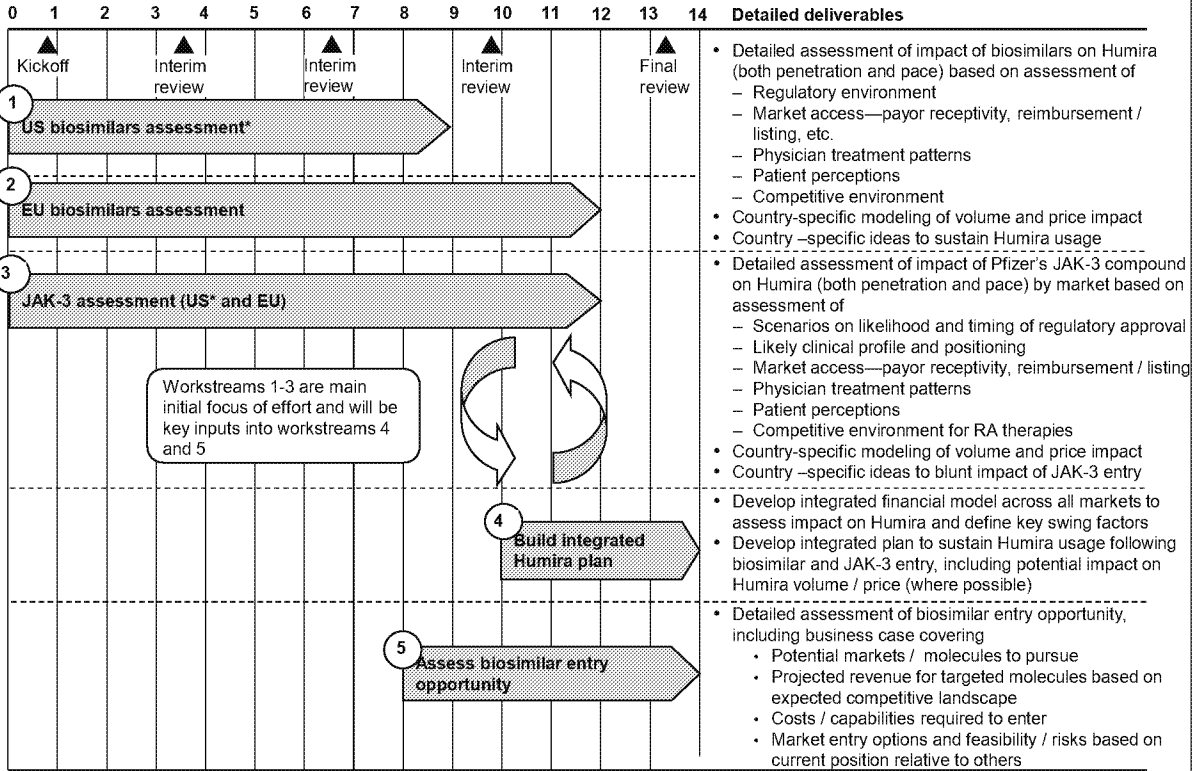
\* Biggest remaining market Belgium at \$109M  
 \*\* Biggest market Brazil at \$213M  
 \*\*\* Biggest market Australia at \$118M  
 \*\*\*\* Biggest market Czech Republic at \$29M

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# OVERALL PROJECT APPROACH AND DELIVERABLES

PRELIMINARY



\*US team also to address Brazil

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# PROPOSED DETAILED PROJECT APPROACH AND ACTIVITIES (1/3)

PRELIMINARY

1/2

Biosimilars assessments – US and ex-US

Timing*	Key activities
9-12 weeks total	<ul style="list-style-type: none"> <li>• Define current status of regulatory pathway, potential evolution and implications for biosimilar development requirements, substitutability / interchangeability, market entry, penetration and pricing through assessment of existing and pending legislation, guidance, etc., interviews with country-specific market experts and, for US, interviews with McKinsey and external regulatory experts</li> <li>• Define projected market scenarios for timing of product entry, potential number of competitive entrants and model likely impact on pricing for key markets (based on market scenarios, case studies, expert interviews)</li> <li>• Conduct interviews with relevant payor(s) and / or payor experts in each market to determine stance on biosimilars (in general and for RA) and likely impact on listing, pricing, reimbursement, etc.</li> <li>• Conduct interviews with physicians in each market to determine likely impact of biosimilars on treatment approach—develop preliminary physician segmentation and patient flow, including assessment of persistency risk</li> <li>• Conduct quantitative survey of physicians across key markets to determine impact of biosimilars on treatment patterns in RA (depending on different profiles for potential biosimilar entrants—e.g., data, etc.)</li> <li>• Model degree of impact by market on Humira volume and price, including pace of change based on market specific incidence / prevalence (assuming MDs unlikely to switch existing patients)</li> </ul>

\* Overall project 14 weeks; workstreams 1-3 overlap with workstreams 4 and 5



## PROPOSED DETAILED PROJECT APPROACH/ACTIVITIES (2/3)

PRELIMINARY

3

JAK-3  
assessment – US  
and EU

Timing*	Key activities
12 weeks	<ul style="list-style-type: none"> <li>• Develop scenarios on likelihood and timing of approval for Pfizer's JAK-3 compound based on expert interviews</li> <li>• Conduct interviews with physicians in each market to determine views on existing and future treatment patterns for RA and expected clinical profile and positioning of key products (with particular focus on perceptions and impact of Pfizer's JAK 3 compound) and assess likely impact on Humira—develop preliminary physician segmentation and patient flow</li> <li>• Conduct interviews with payor(s) and / or payor experts to determine perspectives and likely management related to current and future RA treatments (with particular focus on perceptions and impact of Pfizer's JAK 3 compound) and assess likely impact on Humira</li> <li>• Review analyst expectations of Pfizer's JAK-3 (as well as other potential JAK-3 entrants) where available</li> <li>• Develop perspective on expected strategy / positioning for Pfizer's JAK-3 based on likely clinical data in light of other likely RA products on market and key stakeholder perceptions</li> <li>• Conduct quantitative survey of physicians across key markets to determine impact of Pfizer's JAK-3 on treatment patterns in RA (depending on different profiles for potential biosimilar entrants—e.g., data, etc.)</li> <li>• Model degree of impact by market of Pfizer's JAK-3 on Humira volume and price based on projected market-specific adoption curves</li> </ul>



\* Overall project 14 weeks; workstreams 1-3 overlap with workstreams 4 and 5

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## PROPOSED DETAILED PROJECT APPROACH AND ACTIVITIES (3/3)

PRELIMINARY

	Timing*	Key activities
<p>4</p> <p><b>Build integrated Humira plan</b></p>	4 weeks	<ul style="list-style-type: none"> <li>• Build integrated financial model across all markets to assess impact on Humira of both biosimilars and JAK-3 and determine key swing factors in model—identify key assumptions / swing factors / scenarios for forecast (both globally and for specific markets)</li> <li>• Synthesize and assess market specific ideas to sustain Humira usage following biosimilars and JAK-3 entry</li> <li>• Determine applicability of global programs, actions against either threat</li> <li>• Where possible, model impact of potential actions to blunt impact of biosimilar and JAK-3 entry</li> <li>• Develop integrated plan to sustain Humira usage</li> </ul>
<p>5</p> <p><b>Assess biosimilar entry opportunity</b></p>	6 weeks	<ul style="list-style-type: none"> <li>• Conduct detailed assessment of biosimilar market entry opportunity, including                             <ul style="list-style-type: none"> <li>– Project size of overall biologics opportunity by market and molecule</li> <li>– Determine likely market share based on likely timing of entry and number of competitors</li> <li>– Determine likely pricing / margin based on industry / expert interviews</li> <li>– Develop full P&amp;L, including estimates for development costs, COGS, SG&amp;A, partnership terms, any depreciation / amortization on capital outlays, etc.</li> <li>– Assess key risks, including                                     <ul style="list-style-type: none"> <li>• Market / competitive risk</li> <li>• Patent / regulatory risk</li> <li>• Execution risk</li> <li>• Partnership risk</li> </ul> </li> </ul> </li> <li>• Assess potential market entry options, including potential partners as appropriate</li> </ul>

\* Overall project 14 weeks; workstreams 1-3 overlap with workstreams 4 and 5

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## KEY QUESTIONS TO ADDRESS AS WE GET STARTED

FOR DISCUSSION

### Project sponsorship and governance

- Interactions with Rick [REDACTED]—weekly / bi-weekly updates?
- Who should be on Steering Committee? How often should it meet?
- Should we involve any other key PPG functional leaders or business heads and if so when / how (e.g., ~2 individual discussions with key other senior staff to get input and discuss findings)?
- Who should be on working team? Should we involve key individuals from countries?

### Project timeline and working model

- When should we get started? 14 week project will be completed on either 12/10 or 12/17 based on early to mid Sept. start date (e.g., 9/7 or 9/13)?
- Where should we locate our 2 project teams in US (assumption onsite at Abbott Park) and EU?
- How should we interact with ABT working team?
- Should we have a project kick-off? Who would we involved and what would goal of meeting be?

# SUGGESTED ROLES AND RESPONSIBILITIES

## McKinsey working model

- 2 project teams—one in US and one in EU
- [REDACTED] and [REDACTED] will be deeply involved with both teams ([REDACTED] 50% of time) and will also work with [REDACTED] (50%) and [REDACTED] (50%) to integrate learnings / findings across teams
- US team focused on US and Brazil biosimilar and JAK-3 assessments as well as integrated model and biosimilar entry
- EU team focused on biosimilar and JAK-2 assessments in key EU markets

## Steering committee

- Rick Gonzalez
- [REDACTED]
- [REDACTED]
- Others?

- Set project objectives
- Guide overall effort
- Review and refine findings
- When necessary provide access to appropriate contacts

## Working teams – US

### McKinsey Abbott

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED] (Engagement manager)
- 2 associates

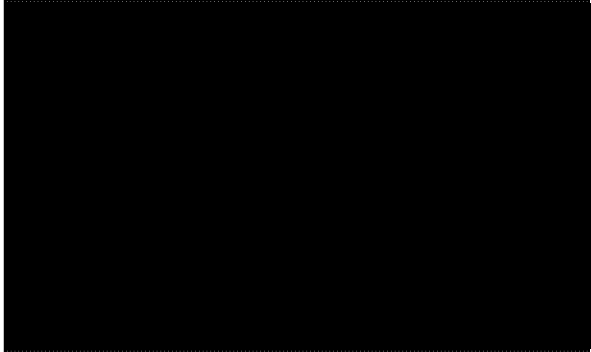
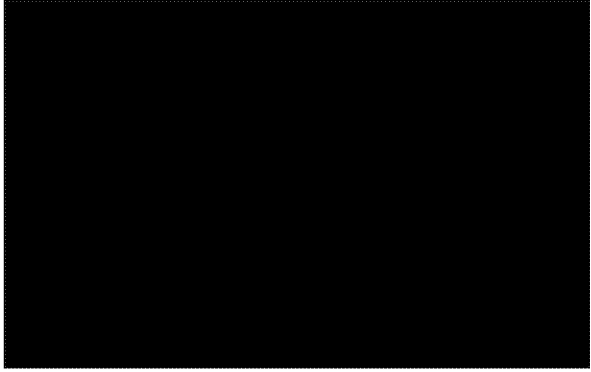
## Working teams – EU

### McKinsey Abbott

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED] (Engagement manager)
- 2 associates

- Drive the problem solving
- Conduct analyses and interviews
- Provide access to key ABT personnel / external contacts
- Gather and synthesize facts
- Develop preliminary findings
- Prepare communication materials
- Additional McKinsey experts will provide topical expertise as needed (e.g., additional biosimilars, RA, country-specific knowledge, etc.) as well as support to integrate across teams

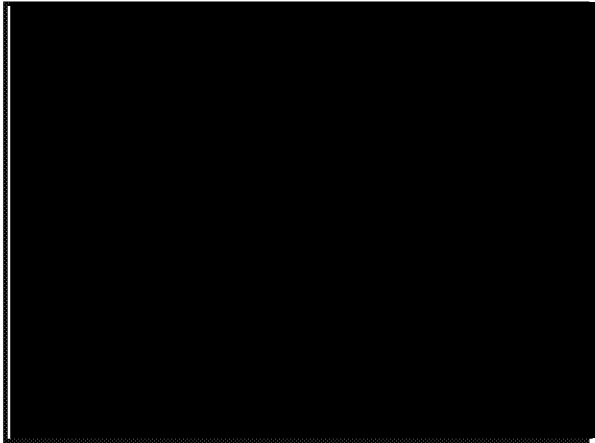
**WHO WE ARE – MCKINSEY PROJECT LEADERSHIP (1/2)**



## WHO WE ARE – MCKINSEY PROJECT LEADERSHIP (2/2)



In addition to experts on project team, we will also leverage other key McKinsey experts on biosimilars and RA across markets



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- Summary of McKinsey perspectives on biosimilars

## WHY MCKINSEY?

### Deep expertise in biosimilars across markets

- McKinsey has been at the forefront of developing industry-leading perspectives on biosimilars, publishing several topical white-papers on key issues
- We have deep expertise working across all major biosimilars markets on both innovator and market entry strategies
- We have extensive biologics expertise in each key functional area, e.g., clinical, operations, commercial, regulatory, etc.
- We have proprietary methodologies for evaluating biosimilars market opportunities as well as existing knowledge on regulatory landscapes, market sizing, etc. that we can leverage to jump-start effort

### Broad expertise across healthcare spectrum

- We have deep expertise working with leading payors, national health systems and key regulatory agencies across global markets
- McKinsey has established a Center for US Healthcare Reform in Washington, D.C. as well as a Health Systems Institute in London to ensure that we are at the forefront of understanding health care reform and impact on our clients
- We also supplement our own knowledge and experts with panels of relevant leading outside experts that are aligned with McKinsey only, e.g., regulatory, health policy, etc.

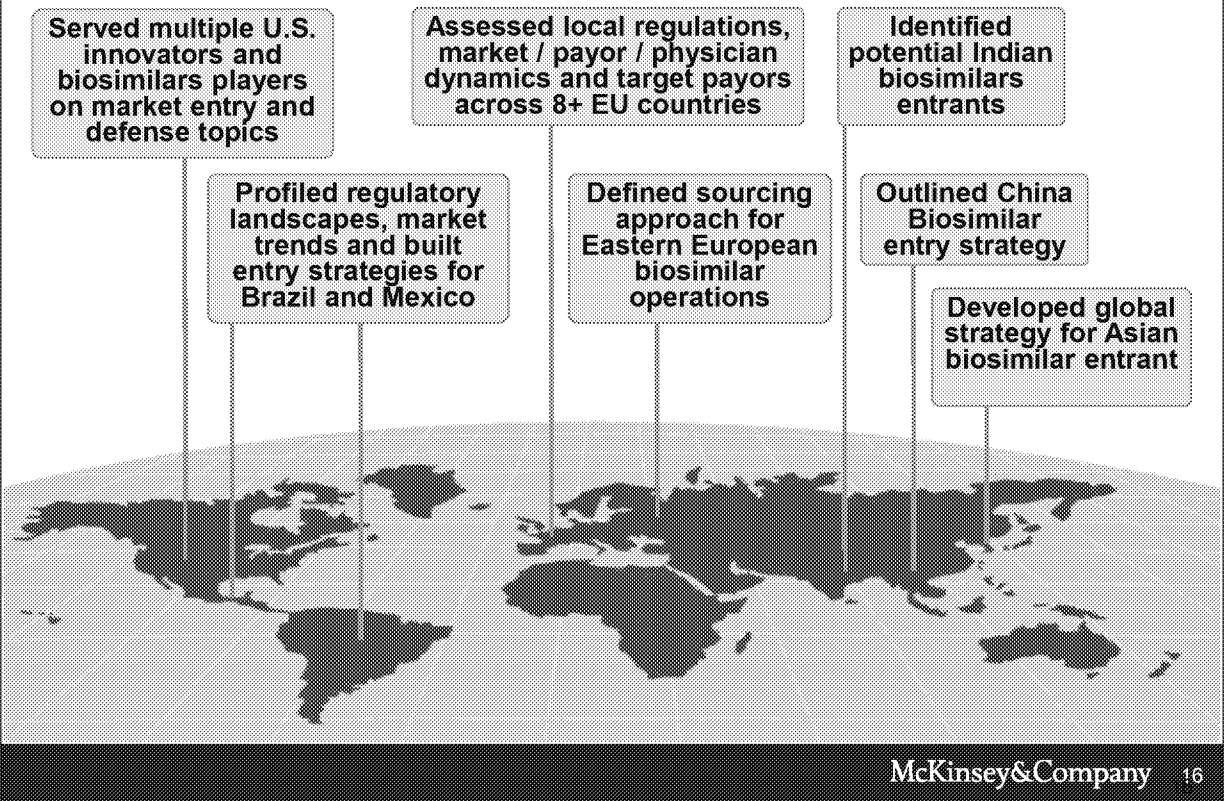
### Deep knowledge of Abbott

- History of service to Abbott corporate leadership and key businesses
- Client service team leadership brings expertise in managing complex cross-country international growth strategies for Abbott



# WHY MCKINSEY? – DEEP EXPERTISE IN GLOBAL BIOSIMILARS MARKETS

Example engagement topics



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## SUMMARY OF CURRENT MCKINSEY PERSPECTIVES ON BIOSIMILARS

- Biosimilars market is growing rapidly and is expected to reach ~\$30B in size by 2020. As a result, it is drawing attention from a large number of players and that is reflected in level of deal activity
- Recent US healthcare legislation opens pathway for biosimilars in U.S. but U.S. environment likely to be innovator friendly, and details still to be worked out. From biosimilar entrant perspective, EU regulatory landscape is most attractive, followed by US regulatory landscape while Japan regulations are least attractive
- However, several business and execution risks are inherent in the biosimilar market. In addition, high investment levels are required for clinical trials and manufacturing to target major markets
- Biosimilars space is likely to be very competitive with only 4-6 players being profitable (compared to 10-15 players attacking innovator products)
  - High investment level in trials (irrespective of product sales potential). As a result most players will need to focus on major products with branded sales of >\$2-3B to be profitable
  - Small number of products with branded sales >\$2-3B will result in high competition
- Significant competition expected for biosimilars for major products and innovators should have diligent competitive intelligence efforts to understand development stage and efforts of various competitors pursuing key products
- Innovators should consider a range of defense strategies including but not limited to legal challenge, formulation/delivery change, pricing action etc.
  - Formulation changes is one potential defense strategy.
  - Further, several new entrants – especially smaller players - will lack IP capabilities, and thus adopting and aggressive IP/legal stance can benefit innovators

# GLOBAL BIOSIMILAR MARKET EXPECTED TO GROW RAPIDLY TO REACH ~\$30 BILLION BY 2020...

ROUGH ESTIMATE

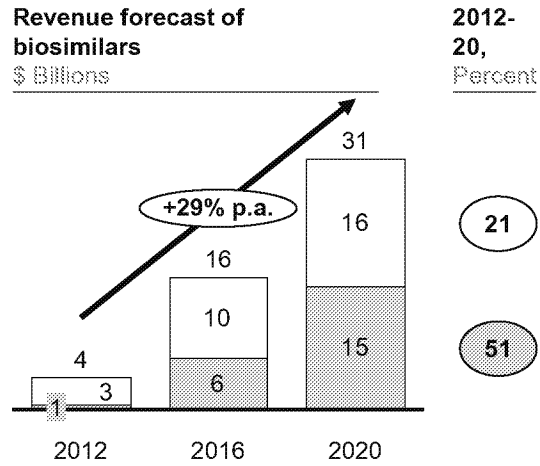
Other biologics Monoclonal antibodies

## Key driving forces for growth

- Multiple blockbuster biologics with combined annual revenues over \$75 billion will go off patent during 2010-20
- Opening of biosimilar regulatory pathway in US
- Significant payor pressure to control healthcare expenditure in US & EU
- Relatively lower price erosion of biosimilars expected compared to small molecule generics

However, there are high entry barriers due to clinical trial costs for U.S./E.U. trials and manufacturing requirements

Global biosimilar market is expected to reach ~\$30 billion by 2020, driven by growth of monoclonal antibodies



Source: VisionGain (2009); Nature biotechnology; Industry interviews; Team analysis

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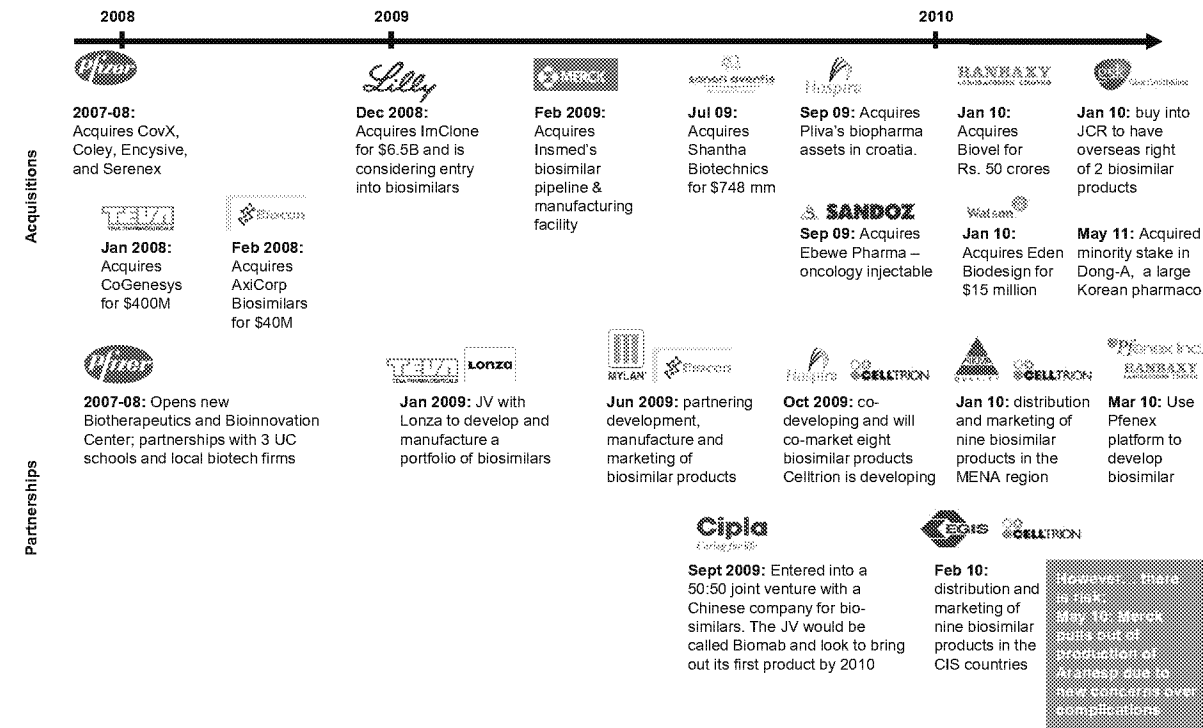
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... AND IS DRAWING ATTENTION FROM A LARGE NUMBER OF PLAYERS AS IS EVIDENT IN RECENT DEAL ACTIVITY

NOT EXHAUSTIVE



Source: Literature search, company press releases, annual reports, team analysis

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# RECENT US LEGISLATION OPENS PATHWAY FOR BIOSIMILARS BUT REGULATORY SITUATION REMAINS INNOVATOR FRIENDLY

○ Low  
● High

Current status	Description of guidelines	Biosimilar "friendliness"	
<ul style="list-style-type: none"> <li>No FDA pathway currently established for biosimilars</li> <li>Biosimilar bill approved by House and Senate in Mar 2010</li> <li>Biotechnology lobby (BIO) continuing to influence policy in favor of innovators</li> </ul> <p><b>Key uncertainties/risks:</b></p> <ul style="list-style-type: none"> <li>Lack of a dedicated FDA Biogenics office will likely favor innovators</li> <li>FDA expected to create a clear pathway for biosimilars by Oct 2010</li> </ul>	<b>Interchangeability</b>	<ul style="list-style-type: none"> <li>FDA likely to require rigorous switching studies to show same expected clinical effect as reference drug</li> </ul>	
	<b>Nomenclature</b>	<ul style="list-style-type: none"> <li>Unique nomenclature required for biosimilars</li> </ul>	
	<b>Exclusivity</b>	<ul style="list-style-type: none"> <li>12 years of data exclusivity for innovators after mkt authorization, plus 6 mo. pediatric extension</li> <li>1-year market exclusivity for first biosimilar, but may require comparable immunogenicity</li> </ul>	
	<b>Clinical data requirements</b>	<ul style="list-style-type: none"> <li>Immunogenicity, PK/PD trials for safety, purity and efficacy likely required for all indications</li> <li>US may be open to EU-based clinical trials</li> <li>Reference product must be authorized in US</li> </ul>	
	<b>Post-market surveillance</b>	<ul style="list-style-type: none"> <li>Risk management plan likely required, though FDA has not determined detailed clinical requirements</li> </ul>	
	<b>Manufacturing requirements</b>	<ul style="list-style-type: none"> <li>US cGMP certification required</li> <li>Comparability study likely required after mfg site transfer, though exact requirements not defined</li> </ul>	
<b>Pricing and reimbursement</b>	<ul style="list-style-type: none"> <li>Interchangeable FOBs receive same Medicare part B billing code as reference drug</li> <li>Pricing for non-interchangeable FOBs set at ASP+6%</li> </ul>		

Source: Regulatory expert interviews; UBS Biogenics report; US House and Senate bills

## HIGHLIGHTS OF NEW US BIOSIMILAR LEGISLATION



### Regulatory pathway

- FDA authorized to develop detailed regulatory guidelines for biosimilars
- Both analytical testing and clinical studies required for approval
- Biosimilars need to pay user fee similar to NDAs and are subject to same REMS requirements as innovators

### Interchangeability

- Allowance for interchangeability with reference product if biosimilar demonstrates comparable safety, efficacy and immunogenicity to reference product with switching with biosimilar during clinical trials
- 1 year marketing exclusivity permitted for first interchangeable biosimilar

### Innovator exclusivity period

- Innovators receive 12 year data exclusivity (i.e., biosimilar companies cannot leverage safety and efficacy data for their application)
- Biosimilar applications not permitted within 4 years of licensure of reference product
- Clauses in place such that innovators cannot make incremental/non-clinically significant changes to extend exclusivity

### Patent litigation

- Outlined patent certification process by which key patents for dispute are identified in advance to biosimilar companies

### Medicare Part B reimbursement

- Reimbursement policy in place to remove financial incentives for physicians to prescribe more expensive innovator products
- Biosimilar products reimbursed at ASP (of biosimilar product) + 6% of reference product

Source: Biologics Price Competition and Innovation Act (2009) enacted in March 2010

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## IMPLICATIONS OF NEW US BIOSIMILARS LEGISLATION FOR KEY STAKEHOLDERS



### Biosimilar companies

- Clinical and cost burden to market entry can be quite significant (upto 6 years and \$100+ Million per indication, based on TA)
- Interchangeability and 1-yr market exclusivity provision can significantly drive adoption for first interchangeable biosimilar entrant
- Regulatory strategy should consider clinical risk vs. commercial upside tradeoffs for achieving interchangeability
- For non-interchangeable biosimilars, a hybrid (i.e., generic/innovator) commercial model is likely required

### Innovator companies




- 12-yr data exclusivity period provision enables innovators to generate returns from their R&D investments and allows time to convert patients to their next generation therapies
- The interchangeability provision has potential to rapidly drive down revenues of their reference product; however the likelihood of a biosimilar entrant gaining interchangeability status is unknown

### Payers

- Biosimilars offers significant opportunity to control cost for high growth/high cost biologics
- Payors are likely to manage utilization of biosimilars e.g., through step edits, prior authorizations, formulary tiers



# EU REGULATORY LANDSCAPE IS MOST ATTRACTIVE FOR BIOSIMILARS FOLLOWED BY REGULATORY LANDSCAPE WHILE JAPAN REGULATIONS ARE LEAST ATTRACTIVE

	Current status	Expected progress	Implications for Player
 <b>EU</b>	<ul style="list-style-type: none"> <li>• EMEA established biosimilars pathway in 2003</li> </ul>	<ul style="list-style-type: none"> <li>• EMEA expected to issue MAb specific guidance by 2013</li> </ul>	<ul style="list-style-type: none"> <li>• <b>6 biosimilar drugs have already been approved under current guidelines</b></li> <li>• <b>Key hurdles for biosimilars:</b> <ul style="list-style-type: none"> <li>– Interchangeability decision at country level</li> <li>– Reference product must be EU authorized</li> <li>– Immunogenicity studies required</li> </ul> </li> </ul>
 <b>US</b>	<ul style="list-style-type: none"> <li>• Biosimilar bill approved in March 2010</li> </ul>	<ul style="list-style-type: none"> <li>• More detailed FDA guidance timing expected by October 2010</li> </ul>	<ul style="list-style-type: none"> <li>• <b>New regulations/guidelines still being defined</b></li> <li>• <b>Key hurdles for biosimilars:</b> <ul style="list-style-type: none"> <li>– FDA guidelines still not finalized</li> <li>– Interchangeability has strict clinical trial requirements</li> <li>– 1-year exclusivity difficult to achieve</li> <li>– Separate nomenclature for biosimilars likely</li> </ul> </li> </ul>
 <b>Japan</b>	<ul style="list-style-type: none"> <li>• MHLW<sup>1</sup> issued biosimilar guidance in May 2009</li> <li>• Pricing guidance announced in early 2010</li> </ul>	<ul style="list-style-type: none"> <li>• New manufacturing/production guidelines expected by 2014</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Biosimilars will be priced at 70% of original drug price; and likely to be tough market for generics</b></li> <li>• <b>Lengthy clinical trials requirement</b></li> <li>• <b>Key hurdles for biosimilars:</b> <ul style="list-style-type: none"> <li>– In-market preclinical and clinical trials required</li> <li>– No exclusivity or interchangeability allowed</li> <li>– Widespread perception among physicians that biosimilars have lower quality/safety/efficacy</li> </ul> </li> </ul>

<sup>1</sup> Japan's Ministry of Health, Labor, and Welfare

Source: EMEA Mab concept paper; US Library of Congress; Japan biologics paper; Press search; Regulatory expert interviews; team analysis

## HOWEVER, SEVERAL BUSINESS AND EXECUTION RISKS EXIST IN THE BIOSIMILAR BUSINESS FOR NEW ENTRANTS

NOT EXHAUSTIVE

	Description of potential risks	Actions entrants are likely to take mitigate the risk
<b>Market risk</b>	<ul style="list-style-type: none"> <li>Overall market is unfavorable to biosimilars, affecting adoption rate and pricing</li> <li>Competition overly intensifies, diminishing likely market share, affecting order of entry, or price</li> </ul>	<ul style="list-style-type: none"> <li><b>Monitor market evolution</b> around biosimilars to respond in a timely manner (market intelligence)</li> <li><b>Develop competitive intelligence</b> capability and make investments in a stage-gate manner</li> <li><b>Form alliance with partners</b> with strong sales and marketing capabilities</li> </ul>
<b>Patent/regulatory risk</b>	<ul style="list-style-type: none"> <li>Key patents and regulation prevent/ slow biosimilars to gain market access</li> <li>Originator challenges</li> </ul>	<ul style="list-style-type: none"> <li><b>Run IP assessment early</b> and leverage experienced IP/legal resources to develop effective IP strategy</li> <li><b>Develop working relationships</b> and open dialogs with local regulatory bodies early on</li> </ul>
<b>Execution risk</b>	<ul style="list-style-type: none"> <li>Clinical trials execution is delayed, affecting order of entry</li> </ul>	<ul style="list-style-type: none"> <li><b>Hire key capabilities</b> experience with clinical trials and regulatory affairs in EU and US</li> <li><b>Support necessary resources</b> to accelerate research &amp; development (e.g. incentive system tied to milestones)</li> <li>Have <b>investment review process</b> that accommodates market challenges</li> </ul>
<b>Partnership risk</b>	<ul style="list-style-type: none"> <li>Inability of smaller entrants to find strong partner to enter major markets (US/EU)</li> </ul>	<ul style="list-style-type: none"> <li><b>Improve value proposition</b> to potential partners (e.g. expand portfolio, accelerate clinical trials)</li> <li><b>Hire key BD talents</b> with strong existing BD network</li> <li><b>Approach</b> broad set of potential partnership candidates <b>aggressively and early</b></li> </ul>

In addition, investment requirements are high with clinical trial costs for U.S./E.U. trials (in many cases ~\$100M per molecule, not correlated with product sales potential) and manufacturing requirements (potential upfront CAPEX or lower margins)

# MOST ENTRANTS HAVE HIGHER CHANCE OF ACHIEVING PROFITABILITY ONLY IF THEY FOCUS ON BIOLOGICS WITH PEAK SALES >\$2-3B

▨ Risk unadjusted NPV > 0

Step 1 : NPV analysis based on peak sales

Step 2 : Attractive peak sales analysis to identify screening criteria for portfolio candidates based on market size

## Overview

- Analyzed NPV of a target biologic based on peak year sales (i.e. sales after partnership fee)
- Based on the NPV analysis, **peak year sales of \$40M - \$60M were required for positive NPV**

## Assumption

- 30-40% biosimilar adoption
- 30% price discount
- 40% revenue sharing with partner

## Biosimilar player sales in peak year in million USD

Biosimilar player market share<sup>1</sup>

▼ Base case M/S

	5%	10%	15%	20%	25%
500	<5	<10	10 - 15	15 - 20	15 - 25
1,000	<10	15 - 20	15 - 25	25 - 35	30 - 40
1,500	10-15	15 - 25	30 - 40	40 - 50	45 - 65
2,000	10-20	25 - 35	40 - 50	50 - 65	65 - 85
2,500	15-25	30 - 40	45 - 65	65 - 85	80 - 105
3,000	20-25	40 - 50	55 - 75	75 - 100	95 - 125

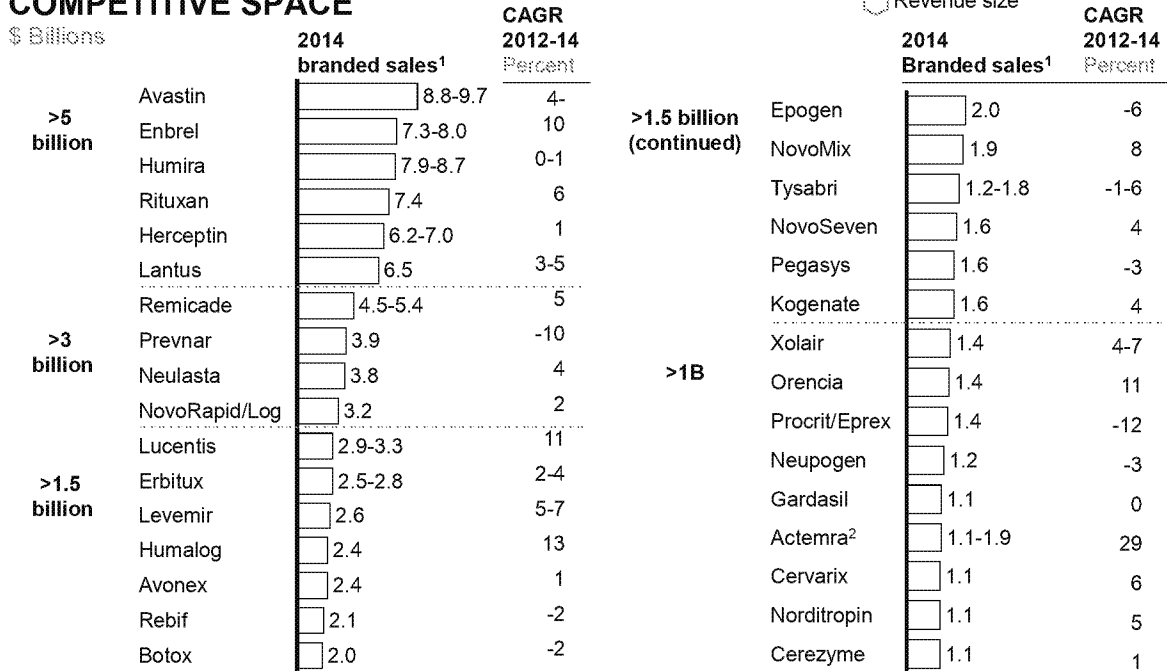
Target branded biologics peak year sales

1 Assuming simultaneous entry along with other competitors, market share scenarios translates into # of competitors in the market – 1 competitor (50% market share), 2 competitors (30-40%), 3 competitors (20-30%), 4 competitors (~20%), 5 competitors (10-20%), etc

2 Biologics with 2014 branded sales > \$1B are also considered in the selection process to be more comprehensive  
 Note: For NPV analysis, terminal value is not considered for NPV analysis, but sales are extrapolated till 2025

# LIMITED NUMBER OF BIOLOGICS WITH SALES >\$2-3 BILLION LIKELY TO CREATE AN INTENSELY COMPETITIVE SPACE

BIOLOGICS WITH LOE BEFORE 2020 WITH SALES > \$1 BILLION



1 Forecasted sales can differ by research firms; 2014 branded sales are ranged if there are notable discrepancies between different sources  
 2 Actemra launched in early 2010; and will have data exclusivity in US that will be until 2021; and also given early stage of launch sales estimates uncertain

Source: Datamonitor; Evaluate; press search; company websites; analyst reports; team analysis

# SIGNIFICANT COMPETITION EXPECTED FOR BIOSIMILARS OF MAJOR BIOLOGICS AND DILIGENT COMPETITIVE INTELLIGENCE NECESSARY ON POTENTIAL ATTACKERS (1/2)

HERCEPTIN EXAMPLE

## Current progress of competitors in Herceptin

Company	Country of origin	Current progress		
		Research Varies	Phase I 6-9 months	Phase III 1.5-2 years
CELLTRION <sup>1</sup>	Korea	██████████	██████████	██████████
Hanwha	Korea	██████████	██████████	██████████
YUSAXIS	Korea	██████████	██████████	██████████
SCHINELL	Korea	██████████	██████████	██████████
AJCR	Japan	██████████	██████████	██████████
ZENTECH	India	██████████	██████████	██████████
Mycenax Biotech Inc.	Taiwan	██████████	██████████	██████████
biogen idec	USA	██████████	██████████	██████████
DONGA PHARMACEUTICAL	Korea	██████████	██████████	██████████
Shenzen Wanle pharma <sup>2</sup>	China	██████████	██████████	██████████
LONZA	Israel/ Swiss	██████████	██████████	██████████
CURAXYS	Spain	██████████	██████████	██████████
GTC <sup>3</sup> Biotherapeutics	USA	██████████	██████████	██████████

• ~13 known players competing for Herceptin biosimilar market, with likely more competitors researching or developing Herceptin due to its attractiveness

• Competitors likely to start accelerating the process in coming years given the patent expiry date of 2014 – 2015 in US/EU

1 Celltrion announced that it completed non-clinical research on Herceptin in 2Q 2009; so we assume it has completed Ph 1 already in last 12 months  
 2 Shenzen Wanle pharma submitted pre-IND application in Dec.3, 2009, currently under SFDA review; expect 3-4 years until market entry  
 3 GTC Biotherapeutics announced its plan to file IND for Herceptin in 2012

Source: Press search; Analyst reports; Industry insiders; Company websites; IMS patent focus; Team analysis

# SIGNIFICANT COMPETITION EXPECTED FOR BIOSIMILARS OF MAJOR BIOLOGICS AND DILIGENT COMPETITIVE INTELLIGENCE NECESSARY ON POTENTIAL ATTACKERS (2/2)

ENBREL EXAMPLE

	Company with biosimilar Enbrel	Country of origin	Enbrel progress	Current progress			# of non-Enbrel mAbs	Company size <sup>3</sup>	Marketed without biosimilar regulation
				Research Varies	Phase I 6-9 months	Phase III 1.5-2 years			
Tier I Established biosimilar giant	Teva/Lonza	Israel/Swiss	Research	██████████			5	Large	
	Sandoz	Germany	Research	██████████			1	Large	
Tier II cGMP players with portfolio	LG Life Science	Korea	Phase I	██████████	██████████		3	Large	
	Celltrion	Korea	Research	██████████			6	Medium	
Tier III Stable business with portfolio	Hanwha	Korea	Phase I	██████████	██████████		3	Large	
	CPGJ	China	Marketed	.....	.....	.....	3	Small	.....
Tier IV Strong brand but limited portfolio	Samsung	Korea	Research	██████████			TBD <sup>4</sup>	Large	
Tier V Local players without financial backing	Shanghai Celgen	China	Marketed	.....	.....	.....	0	Small	.....
	Hisun	China	Phase III	██████████	██████████	██████████	1	Medium	
	Mycenax	Taiwan	Phase I	██████████	██████████		1	Small	
	Protalix	Israel	Pre-clinical	██████████			1	Small	
	Green Cross	Korea	Pre-clinical	██████████			1	Medium	
	Daewoong	Korea	Pre-clinical	██████████			1	Medium	
	Shanghai Biomab	China	Research	██████████			0	Small	
	Dong-A	Korea	Research	██████████			2	Medium	
Aprogen <sup>1</sup>	Korea	Research	██████████			3	Small		

1 Bought by Schnell Biopharmaceuticals in 2009      2 R=Research, P=Pre-clinical, I=Phase I, III=Phase III; Based on press search  
 3 Revenue >\$1B = large, Revenue > \$100M = medium, Revenue < \$100M = small      4 Announced they will add ~7 molecules mostly inorganically

Source: literature search; company websites; team analysis

# INNOVATORS CAN TAKE A RANGE OF ACTIONS TO DEFEND THEMSELVES AGAINST THE THREAT OF BIOSIMILARS

○ Low  
● High

	Level of threat to biosimilar player	Example actions taken by innovators
1. Differentiate the product through extensions / next-gen products	●	<ul style="list-style-type: none"> <li>Development of pre-filled formulations or injection pens (less preparation than freeze-dried formulation)</li> <li>Genentech starting PIII trials of T-DM1, next gen version of Herceptin</li> </ul>
2. Delay/block biosimilar entry through legal/ lobbying actions	●	<ul style="list-style-type: none"> <li>BIO members spent over \$20M on US lobbying efforts in 2008-9 targeting healthcare reform provisions dealing with biosimilars</li> <li>Aggressive litigation against new entrants to prevent US market entry (e.g., against Shire's Dynepo in 2006)</li> </ul>
3. Shape physician/ patient/ payor perceptions	●	<ul style="list-style-type: none"> <li>Advertising in medical journals or company websites to suggest need to manage safety risk of follow-on biologics</li> </ul>
4. Lower price to capture share	●	<ul style="list-style-type: none"> <li>Innovator lowered price of Eprex (Epo) in E.U. by 15% to defend against new entrants</li> </ul>
5. Compete in generics market	○	<ul style="list-style-type: none"> <li>In future, some innovators could decide to enter with generics competitors</li> </ul>

Source: Literature search; Company websites; Clinicaltrials.gov; Team analysis

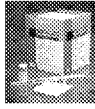


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# FORMULATION CHANGE IS ONE TACTIC INNOVATORS SUCCESSFULLY EMPLOY TO DIFFERENTIATE PRODUCTS

ENBREL EXAMPLE

	Freeze-dried (vial)	Pre-filled syringe	Injection pen (SureClick)
			
<b>Year of launch</b>	1999	2003	2006
<b>Description</b>	Solid powder	Stable liquid formulation	Stable liquid formulation
<b>Patent expiry</b>	2009-15	2023-27	2023-20
<b>Administration</b>	Administered by HCP	Self-administered by patient	Self-administered by patient
<b>Cost</b>	Low cost	Same cost as vial	~2x cost of vial/syringe
<b>Convenience</b>	Difficult to mix/use; Requires costly physician visit	Easy to use; Needle-associated anxiety/pain	Very easy to use; Lower anxiety

Increasing ease of use

Source: USPTO, JPO, and EPO websites; IMS Patent Focus; EvaluatePharma; team analysis

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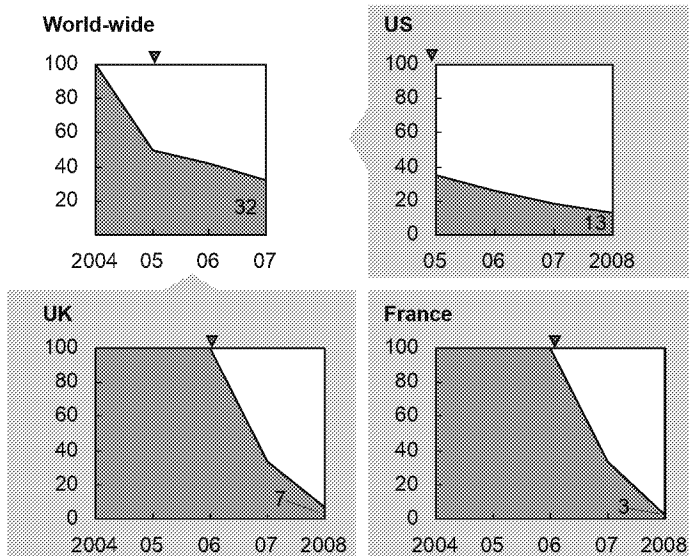
# TRANSITION TO NEW FORMULATION IS RAPID GIVEN THE CONVENIENCE AND SIMILAR PRICE POINTS

ENBREL EXAMPLE

- Pre-filled + pen
- Freeze-dried
- ▼ Pre-filled introduced

Pre-filled Enbrel formulation comprises more than 75% of global sales, and likely ~90% in developed markets (e.g. US, UK, FR)

Percent of total Enbrel sales (except world wide, which is in units)



Pre-filled's cost competitiveness likely to accelerate adoption in RoW as well

Country / formulation	Price
<b>Korea</b>	
• 25 mg, vial	KRW 134,316
• 25mg, syringe	KRW 134,316
<b>Russia</b>	
• 25mg, vial	EUR 1,130
• syringe	N/A
<b>Turkey</b>	
• 25 mg, vial	TL 1,002
• 50mg, sureclick	TL 1,002
<b>India</b>	
• 25mg, vial	INR 9,065
• 25mg, syringe	INR 7,983

Transition to syringe likely to happen even in RoW given the pricing policy (e.g. same price for freeze-dried and syringe)

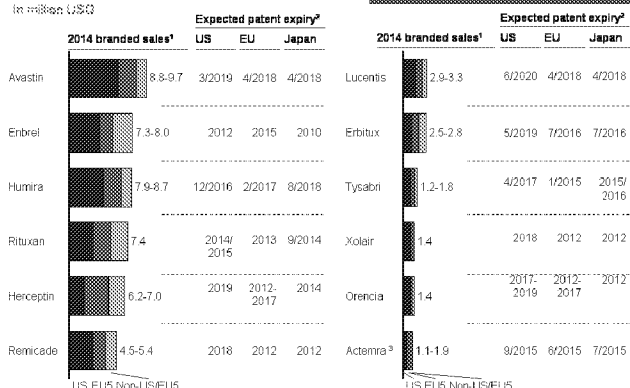
1 Pre-filled syringe patented in US (2027), EU (2023), Japan (2023), Turkey (2023). Patents not found in Brazil, India, Mexico, Russia

# SEVERAL NEW ENTRANTS – ESPECIALLY SMALLER PLAYERS – WILL LACK IP CAPABILITIES, AND THUS ADOPTING AGGRESSIVE IP/LEGAL STANCE CAN BENEFIT INNOVATORS

## Challenges in understanding IP rights

- Unclear what patents define possible entry date for biosimilars as multiple patents exist per product
- Different data sources (e.g. Vision gain, IMS) publish different IP expiry dates
- IP rights are often extended by new filings or litigation by the originator

Estimated patent expiry dates in major markets for top 12 mAbs and fusion proteins



<sup>1</sup> Forecasted sales can differ by research firms; 2014 branded sales are ranged if there are notable discrepancies between different sources  
<sup>2</sup> Patent expiry based on analyst view and need to be validated through IP/legal assessment. <sup>3</sup> Longer timeframe due to 12-year data exclusivity  
 SOURCE: Datamonitor; IMS patent focus; press search; team analysis



# Humira IP Discussion

25 January 2011

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Goals and Objectives/Agenda - [REDACTED]

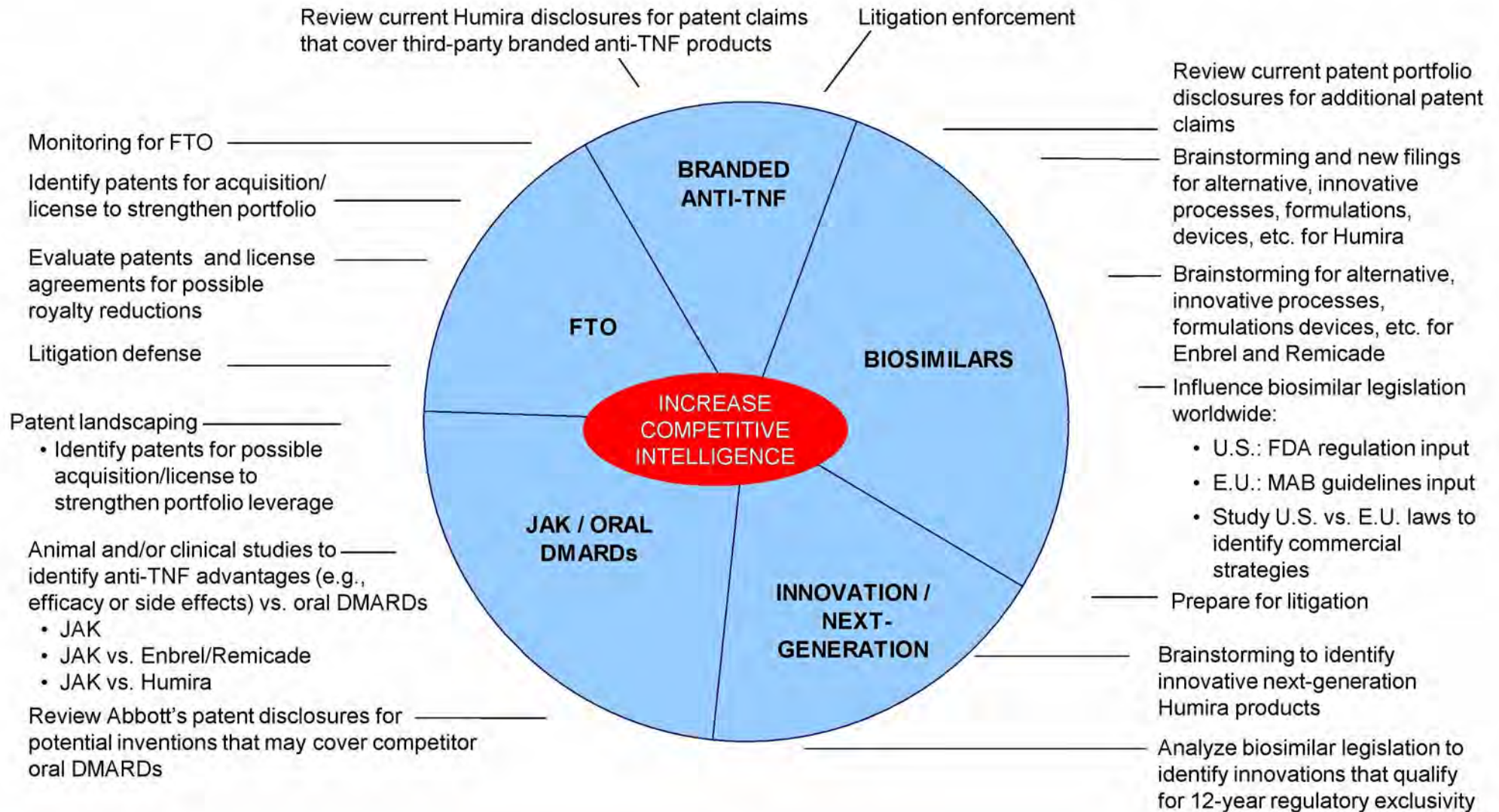
Humira Strategy Overview/ Mckinsey Conclusions- [REDACTED]

Humira IP Development: Technical Plans/ Current Status – [REDACTED]

Next Steps - [REDACTED]



# IP Strategy Development Activity At A Glance



# Executive Summary

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- According to McKinsey, the two biggest threats to HUMIRA are:
  - Biosimilar HUMIRA
  - Tasocitinib (Pfizer's JAK3)
- Focus of GPO-led initiative is mitigation of biosimilar HUMIRA threat
- Identify commercially significant opportunities and innovate solutions
  - a. Improved methods for manufacture of the current HUMIRA API
  - b. Improvements to the HUMIRA API itself
  - c. Improvements to the HUMIRA drug product
    - Enhancements
- Patenting the innovations
  - provides Abbott with business opportunities
  - gives Abbott a competitive advantage

**Redacted**

# Progress to Date

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- Multiple patent applications have been submitted since 2003
  - API: 1 granted (2011) and 2 pending
  - Drug Product: 2 granted (2004, 2010) and 11 pending
- Kick-off efforts for New IPs
  - Generated over 200 ideas at the brainstorm meeting (Oct 2010)
  - Developed top proposals (Dec 2010), ready for Sr management review
  - Launched Humira Idea Submission Incentive Program to encourage patent ideas from scientists (Dec 2010)

# Brainstorm Meeting

## Worcester Oct 4-5 2010

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Sponsored by [REDACTED] and [REDACTED]

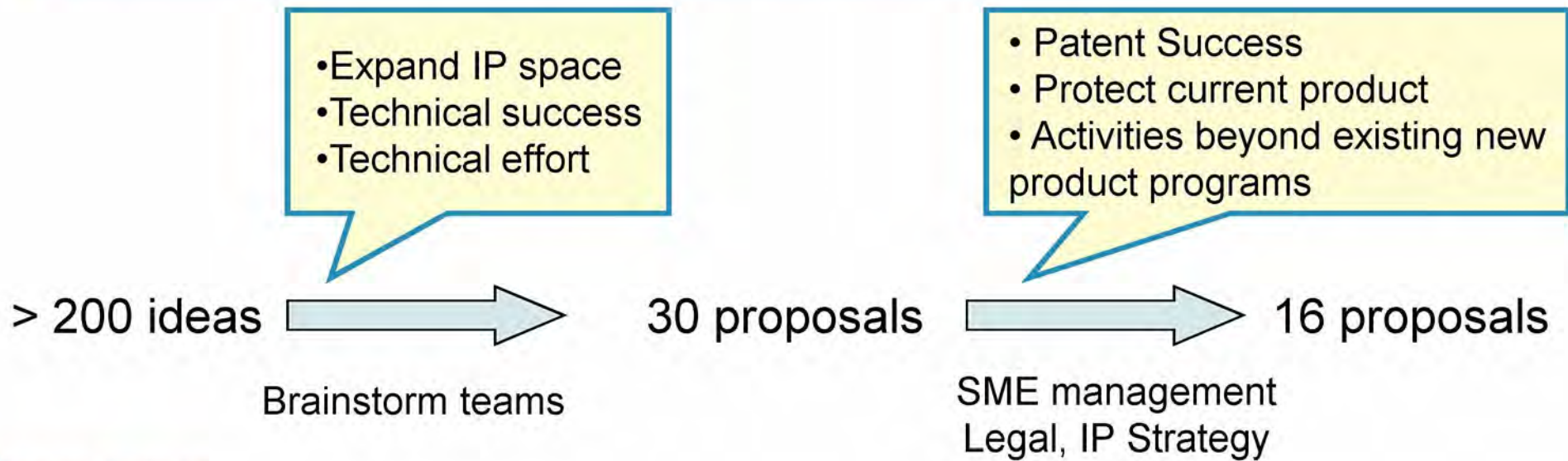
- Objective: Generate ideas to broaden our Humira patent estate in response to Biosimilars
- Brainstorm Approach:
  - In the eye of biosimilar makers....
    - How would they manufacture HUMIRA?
  - In the eye of innovator ...
    - What are our know-how's and our improvements

42 participants from five locations: Lake County, Worcester, Puerto Rico, Redwood City, Ludwigshafen

GPRD / GPRA	GPO	Corporate Legal	ADD
➤ Devices	➤ Process Sciences	➤ Patents	➤ R&D
➤ Formulations	➤ Mfg Sciences	➤ IP Strategy	
➤ Biologics, CMC	➤ MS&T	➤ Outside Counsel	

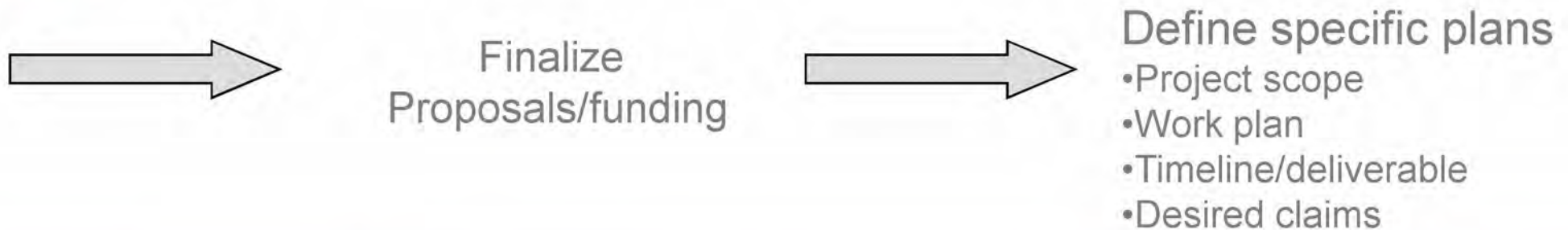


# Development of Technical Proposals



Completed

TBD



# Proposals

Category	Function	Project Name	Objectives	Technical Success Score (5 High)	Patentability Success Score (5 High)	Total Score			
Purification									
New Process	[REDACTED]	Existing Humira Process	Broaden the current IP to include the widest possible operating ranges to control product quality and removing Humira specific impurities	[REDACTED]	[REDACTED]	[REDACTED]			
	[REDACTED]	Protein A Purification Platform	[REDACTED]	[REDACTED]					
	[REDACTED]	Non-Protein A Purification Platform	[REDACTED]	[REDACTED]					
	[REDACTED]	Non-Process Conditions	Enable IP to create non-process conditions to control product quality	[REDACTED]					
	Cell Culture								
	[REDACTED]	Existing Humira Process	Broaden the current IP to include the widest possible operating ranges to control product quality (oligo or charge variants)	[REDACTED]					
	[REDACTED]	Cell Culture Media components	[REDACTED]	[REDACTED]					
[REDACTED]	Commercial Cell Culture Media	[REDACTED]	[REDACTED]						

# Proposals

Category	Function	Project Name	Objectives	Technical Success Score (5 High)	Patentability Success Score (5 High)	Total Score
Protein Characterization						
Improved API	[REDACTED]	Lysine Variant	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	Profiling TNF:Humira Complex	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	Detection assay for Anti-drug antibodies	Enable IP or publication on the detection method to measure Humira and antibodies to Humira. This enables further development of a potential detection kit that can help physicians to monitor patients	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	Method to detect impurities by cytokine release	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Biologics						
Improved API	[REDACTED]	Lysine Variant	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Formulation						
Product Improvement	[REDACTED]	High Concentration formulation	Enabling IP generation on new dosing regimen with less pain (excluding preclinical and clinical studies)	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	High Concentration formulation	Enable IP on monthly dosing based on high concentration formulation (excluding preclinical and clinical studies)	[REDACTED]	[REDACTED]	[REDACTED]
Device						
Product Improvement	[REDACTED]	Plastic Pre-filled syringes	Plastic prefilled syringes with Humira formulations	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	Improved Glass Primary Package(including glass cartridge)	Identify accessories/improvements for existing glass syringe and vials: identify possible partners	[REDACTED]	[REDACTED]	[REDACTED]

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# Summary of Cost and FTE Proposed

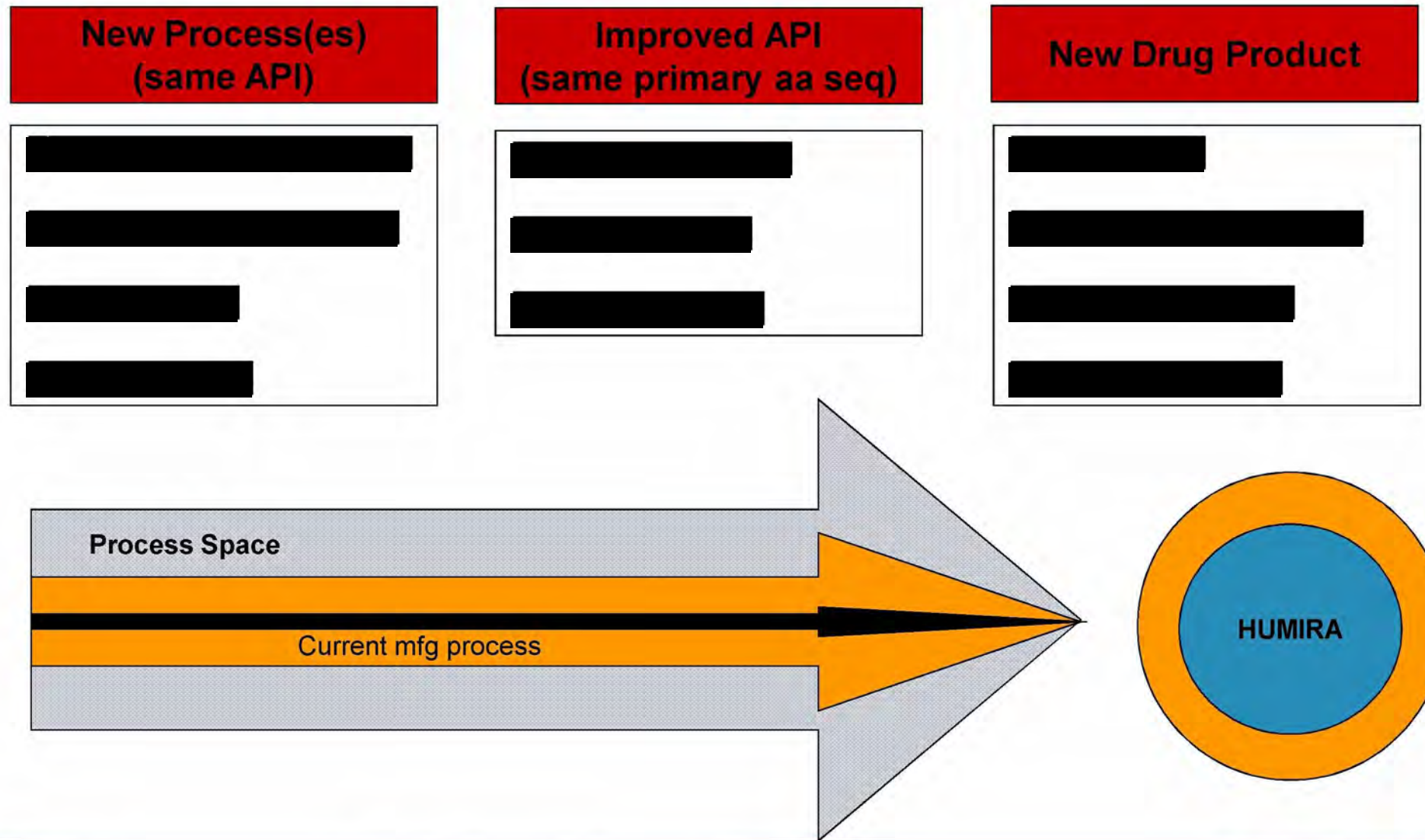
Function	Incremental FTE (2 years)	Total Costs
GPO API	6	\$ 2,979,000.00
GPRD Formulation	6	\$ 2,844,000.00
GPRD Device	1	\$ 537,000.00
Grand Total	13	\$ 6,360,000.00

- Biologics and Legal not included
- Dedicated Legal Support Required

# Humira Idea Submission Program Established

<b>Objective</b>	<ul style="list-style-type: none"><li>• Provide a significant incentive program to target audience in order to increase the patent coverage for Humira</li></ul>
<b>Target Audience</b>	<ul style="list-style-type: none"><li>• 70-75 technical employees from GPO, GPRD and ADD</li></ul>
<b>Key milestones</b>	<ul style="list-style-type: none"><li>• Three levels of awards established (drawings from all participants)<ul style="list-style-type: none"><li>–i-phone or i-Touch - Idea Generation</li><li>–i-pad - Patent Submission</li><li>–Apple computer - Patent Award</li></ul></li></ul>
<b>Approvals</b>	<ul style="list-style-type: none"><li>• Technical Advisory Board to approve Ideas [REDACTED]</li><li>• Senior Review Board to determine Patent Award based on impact [REDACTED]</li></ul>

# Projects Fall into 3 Categories with Distinct Value Propositions



# One of 3 Herceptin patents listed in Genentech's last 10K

(12) **United States Patent**  
Basey et al.

(10) **Patent No.:** US 6,339,142 B1  
(45) **Date of Patent:** Jan. 15, 2002

(54) **PROTEIN PURIFICATION**

WO WO 89/05157 6/1989  
WO WO 96/33208 10/1996

(75) Inventors: **Carol D. Basey**, Winters; **Greg S. Blank**, Menlo Park, both of CA (US)

### OTHER PUBLICATIONS

(73) Assignee: **Genentech, Inc.**, South San Francisco, CA (US)

Carter et al., "Humanization of an anti-p185<sup>HER2</sup> antibody for human cancer therapy" *Proc. Natl. Acad. Sci.* 89:4285-4289 (May 1992).

What is claimed is:

1. A composition comprising a mixture of anti-HER2 antibody and one or more acidic variants thereof, wherein the amount of the acidic variant(s) is less than about 25%.

2. The composition of claim 1 further comprising a pharmaceutically acceptable carrier.

3. The composition of claim 1 wherein the anti-HER2 antibody is humMAb4D5-8.

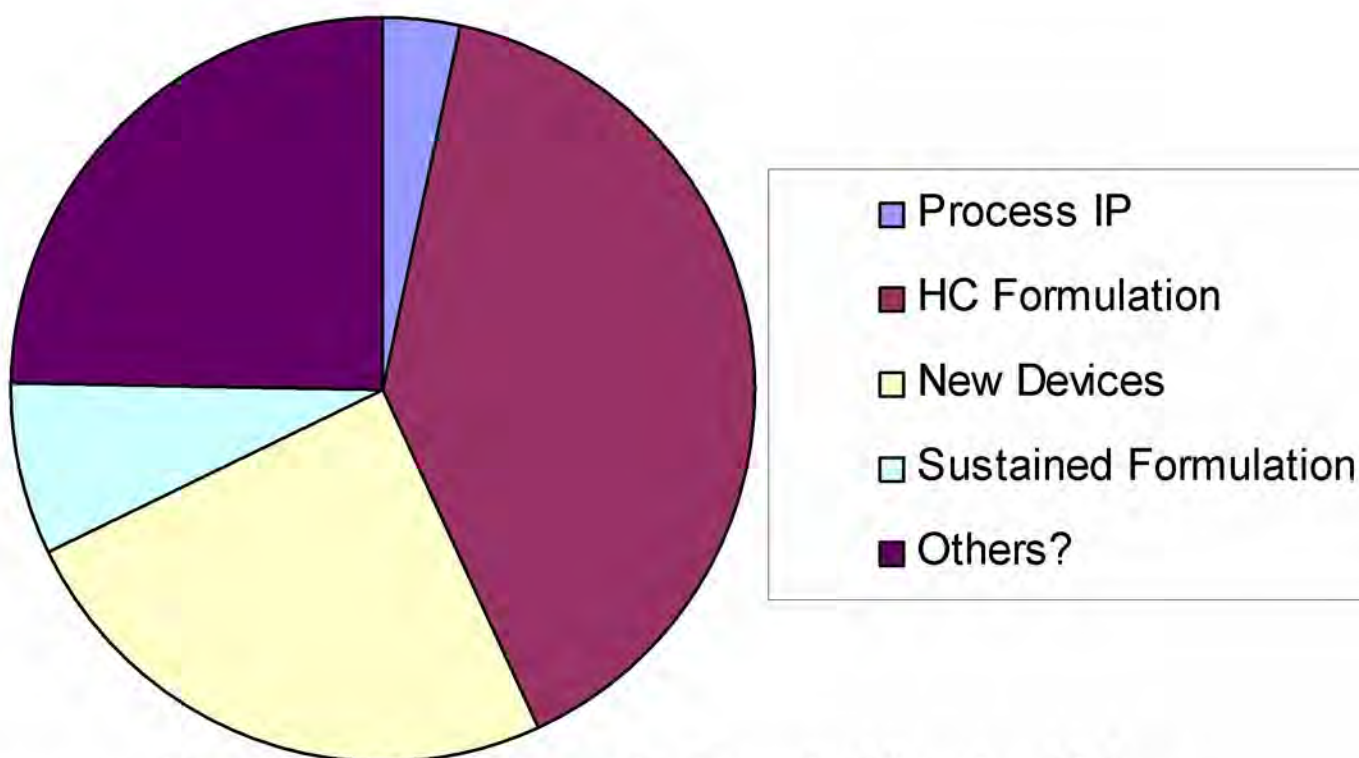
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# Process IP is one of many value creating options

- Need to review and assess all programs, total spend and prioritize value



Potential Options and Existing Programs to Create Humira Value

## Agenda – Day 1 (Bldg 71, Room 308)

- |  |                    |
|--|--------------------|
| • Welcome & Introductions  | 9:00 – 9:15        |
| • Review commercial strategic priorities for Enhancements                      | 9:15 – 9:45        |
| • Provide an "early directional read" on ongoing market research               | 9:45 – 10:00 BREAK |
| • <u>High Concentration Formulation</u>  | 10:15 – 11:45      |
| • Review formulation development of HC program , including activities/plans to |                    |
| – Strengthen IP  |                    |
| – Understand the causality of pain reduction                                   |                    |
| – Potential strategy/options for monthly dosing                                |                    |
| • <u>Sustained Release</u>   | 11:45 – 12:30      |
| • Discuss objectives and plans for developing a sustained release formulation  | LUNCH BREAK        |
| • Formulation(s) in development and potential other formulation approaches     | 1:00 – 2:15 BREAK  |
| • Dosing frequency options (1 month & 2 month efforts, discuss 3 mos dosing)   |                    |
| • <u>Room Temperature</u>  | 2:30 – 4:00        |
| • Ongoing and planned CMC activities/timing                                    |                    |
| • Commercial considerations for dual chamber syringe/pen                       |                    |
| • Agree on strategic path forward  |                    |
| • <u>Wrap-up</u>   | 4:00 – 4:30        |
| • Define Agenda for next day   |                    |
| <br>Group Dinner ( [REDACTED] )  | <br>start 6:30 PM  |

[DateTime]

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## Agenda – Day 2 (Bldg 71, Room 304)

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- Welcome & Recap from Day 1 8:30 – 8:45
- Agenda will be driven by outcome from Day 1
  - High Concentration project 8:45 – 9:35
    - Monthly dosing
    - Pain topic / IP protection 10 min BREAK
  - Sustained Release 9:45 – 10:35
    - Timeline review up to Phase 1
    - Clinical development program plans 10 min BREAK
  - Room Temperature (Lyo project) 10:45 – 11:35
    - Combination of Stability/Storage options
    - Limited room temperature for HC 10 min BREAK
- Wrap-up 11:45 – 12:00
  - Decisions and next steps

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[DateTime]

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DRAFT VERSION AS OF 6-10-13



# Perspectives on the Pharmaceutical Industry


# abbvie

AbbVie Board Meeting  
June 19<sup>th</sup>, 2013

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## Context for discussion

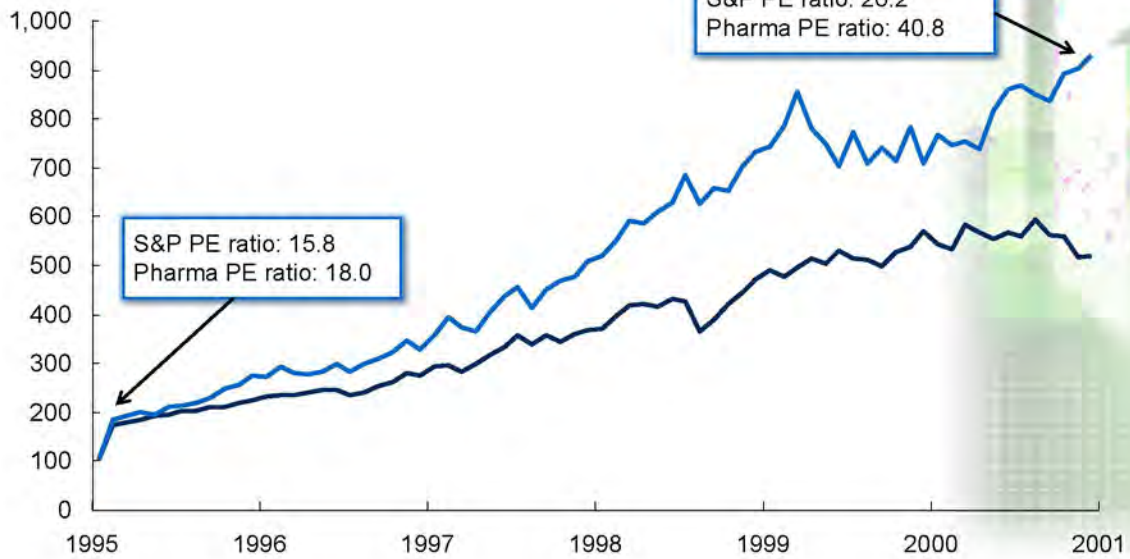
- 
- The pharma industry has faced unprecedented change in the last ten years as many competitors faced both steep LOE declines and fundamental changes to their core markets through health reform, macro-economic slowdowns and changes in the regulatory and payor landscape
  - However, the industry now appears to be rebounding, as most players are changing their approach to compete in this new reality
  - AbbVie is uniquely positioned to succeed in this era of transition. With the separation, AbbVie has the reason and momentum to re-examine everything that it does and make those changes that will be required to succeed. In addition, AbbVie can do this from a position of strength given the continued success of Humira, the world's leading therapy

## Historically, investments in pharma industry have garnered significant returns vs S&P...

— S&P 500 Composite  
— US Pharma

Pharma "Golden Times" outperformed S&P 500 between 1990 and 2000

TRS, indexed to 1990 = 100



SOURCE: Compustat, Datastream

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...driven by multiple factors

**Drivers of “Golden Times” pharma growth between 1990 and 2000...**

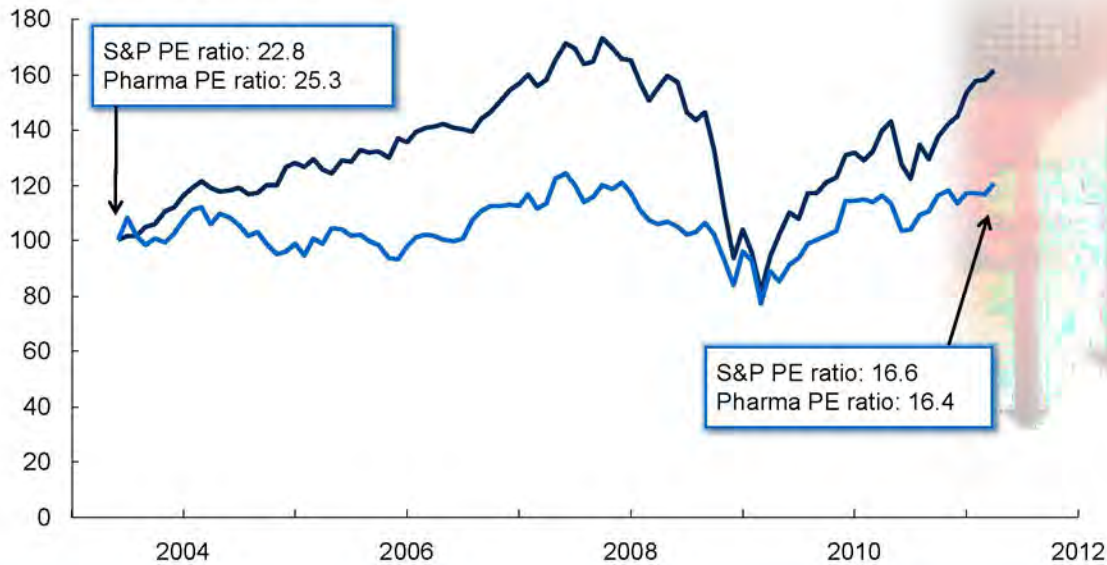
- **Highly successful R&D model targeting “known biology & chemistry”**
- **Primary care “blockbusters”**
- **Successful “me too” products with limited differentiation**
- **Larger and larger salesforces to access physicians and drive high levels of therapy adoption**
- **Little resistance to growth from payors**
- **Aging and increasingly wealthy population**
- **Strong underlying growth in GDP and healthcare spending**
- **Overall globalization of the Pharma industry into new markets**

# However, recent trends have been less favorable...

— S&P 500 Composite  
— US Pharma

**The industry has faced sharp, recent declines below the S&P 500**

TRS, indexed to mid-2003 = 100



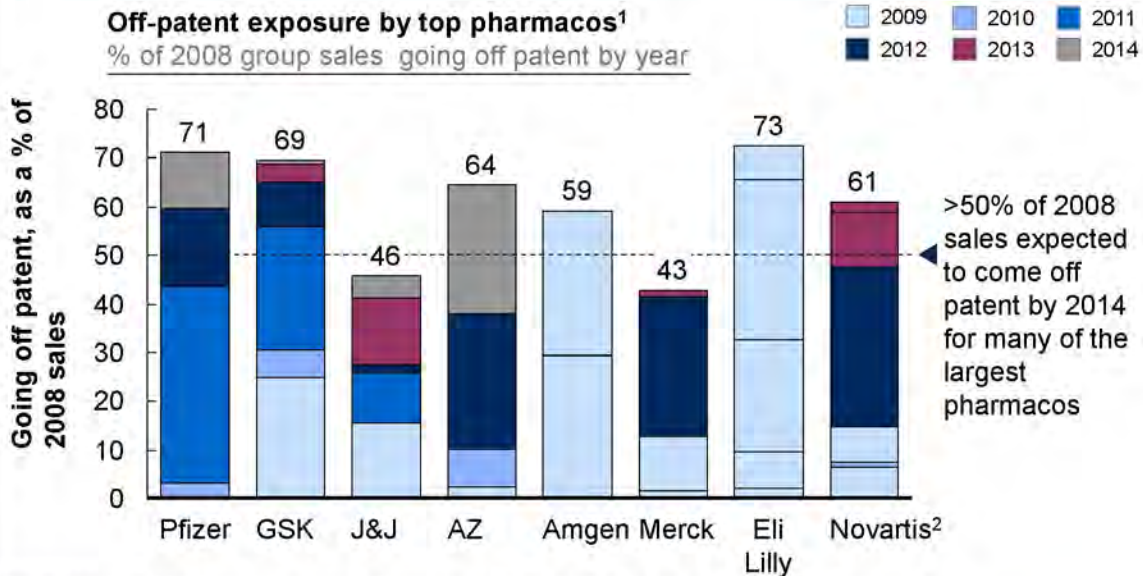
SOURCE: Compustat, Datastream

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**Top pharmacos have faced huge “patent cliffs”, with many losing over average half of their top sales sources between 2009 and 2014**

**~50% of top 10 pharmacos' sales are at risk due to expected patent cliff**



<sup>1</sup> Selected based on 2008 sales revenue. Does not include Roche as most patent loss not expected till 2014 or beyo not ex  
<sup>2</sup> Merck excluding Schering-Plough

SOURCE: Evaluate, team analysis

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This analysis examines how much revenue of the top pharma companies is at risk of going off patent and in which years. For example, Amgen is forecast to have difficult years in 2012 and 2013, whereas Pfizer's exposure is highest in 2011, primarily due to Lipitor's patent expiration.

... due to several industry “headwinds”

**Headwinds driving sub S&P 500 performance for the pharma industry**

- **Declining R&D productivity driven by:**
  - Exhaustion of “easy targets” for new compounds
  - Increase in higher risk development opportunities (i.e. “unvalidated” targets/pathways and compounds)
- **Large wave of loss of exclusivity for previous blockbusters**
- **Declining access to physicians**
- **Increased regulatory scrutiny, impacting both ability to gain product approval and oversight of committee activities**
- **Strong push back from payors (both government and commercial) on costs and growth**
- **Slowing GDP growth in developed markets**

## As a response, pharmacos are repositioning themselves on 6 fronts to succeed in this new, more challenging environment

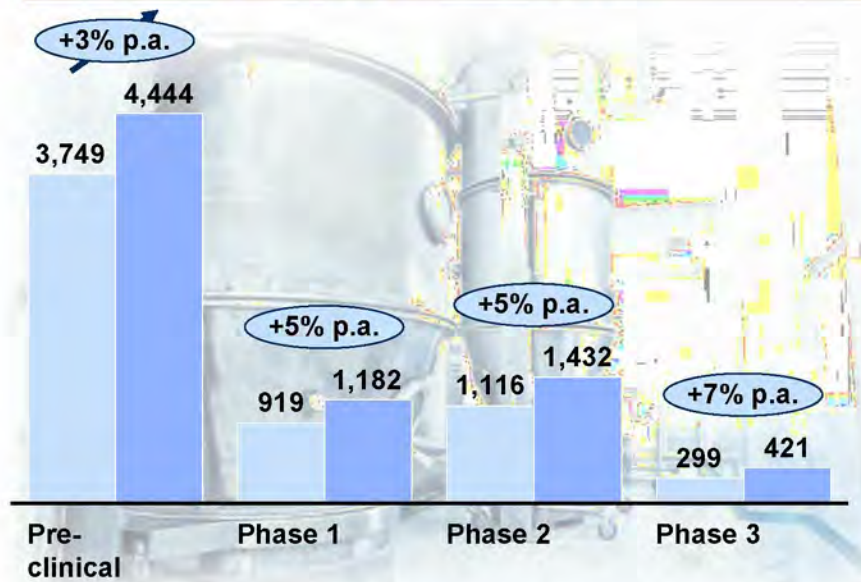
- 1 Increasing “shots on goal”
- 2 Innovating – transition from “me-too” primary care focus to **specialty drugs** by leveraging scientific advances in **personalized medicine** while broadening access to **external sources of growth** (e.g. AMCs, VCs)
- 3 Increasing **operational efficiency** and cost reduction (e.g. reducing commercial footprint, streamlining manufacturing, etc.)
- 4 Building **market access, HEOR capabilities, and big data / information technology** to prepare for new challenges
- 5 Positioning themselves to take advantage of the **spectrum of growth opportunities** (emerging and developed markets and across different product segments)
- 6 Continuing to focus on **unmet needs of an aging population** (e.g. oncology, rheumatology, CNS diseases, and diabetes)

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1 Industry is taking more “shots on goal” across every phase of development

2007  
2012

Number of compounds in pipeline, 2007 vs 2012



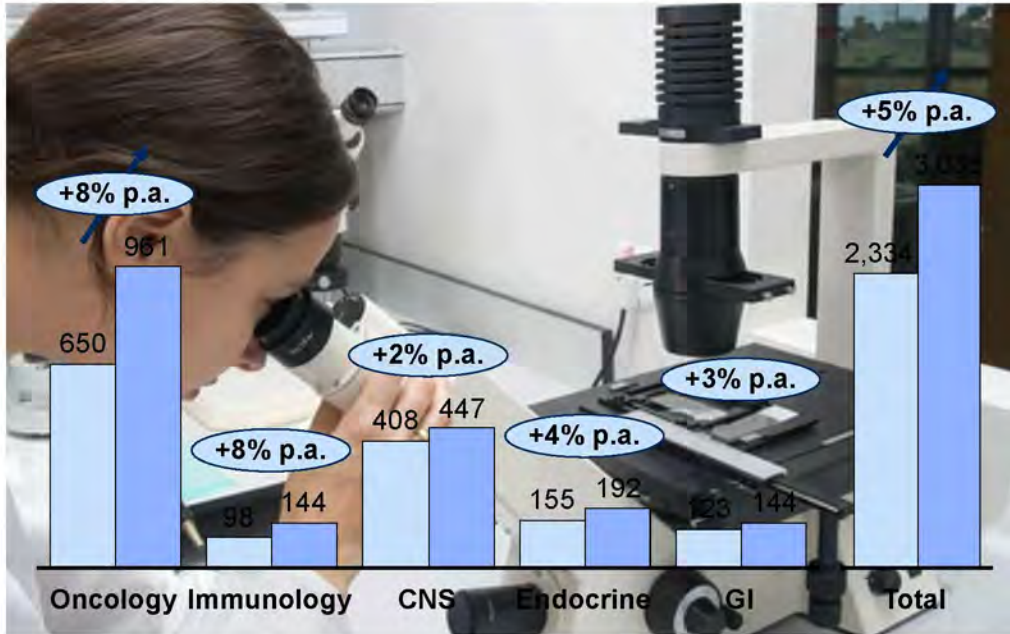
SOURCE: PharmaProjects, McKinsey analysis

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**1 Pharma has steadily grown its pipeline with a particular focus on growing Oncology and Immunology**

2007  
2012

Total number of compounds in clinical development (phase I-III), 2007-2012



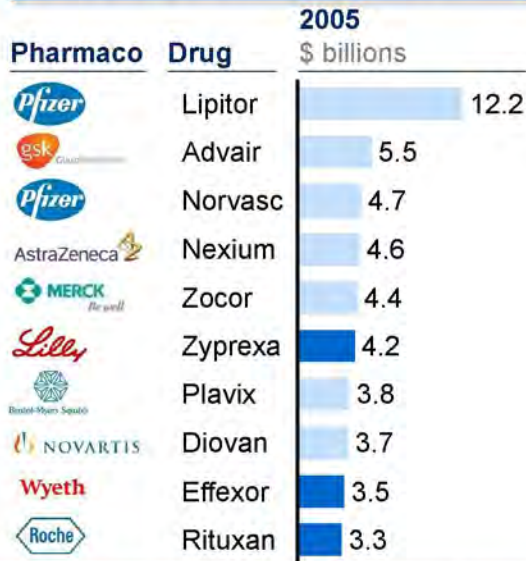
SOURCE: PharmaProjects; McKinsey analysis

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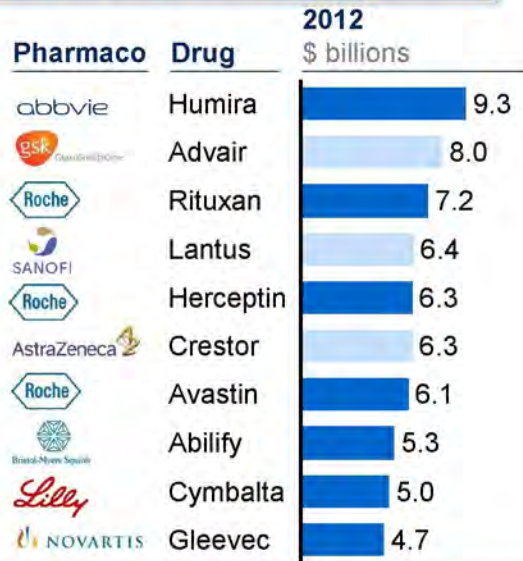
**2 In the past 7 years, the top performing drugs have shifted away from primary care to more specialized offerings**

■ Specialty  
■ Primary care

**Top 10 drugs worldwide revenue**



**Top 10 drugs worldwide revenue**



- 7 of top 10 drugs are primary care in '05
- 78% of top 10 revenue is primary care

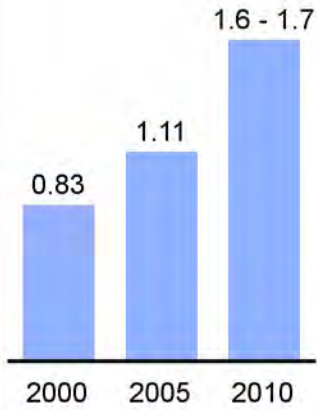
- 7 of top 10 drugs are specialty by '12
- 68% of top 10 revenue is specialty<sup>1</sup>

1. Several large primary care products in 2005 have gone generic by 2012.  
SOURCE: Evaluate Pharma

## 2 Cost of R&D has doubled so to cost effectively fuel pipeline expansion, pharma are increasingly accessing external sources of innovation

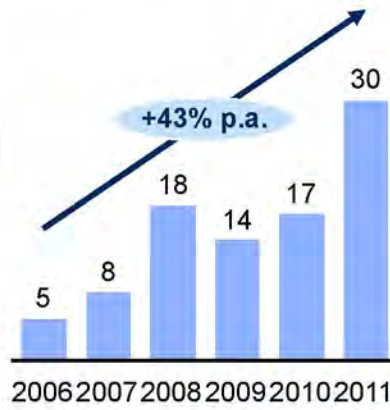
### Average cost per NME

Average cost<sup>1</sup> USD, bn



### Pharma-academic partnerships

Number of new partnerships (n=92)<sup>1</sup>



**Estimated >30% of scientifically novel compounds originated in academics**

Examples

Partners

KOL grants to address specific questions



Share data/resources with consortium



Collaborate on a targeted therapeutic area



Multi-disciplinary collaborative relationship



<sup>1</sup> Top 500 pharmaceutical and biotech

SOURCE: Nat Rev Drug Discovery, IN VIVO, Elsevier's strategic transactions, press search, McKinsey analysis

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## 2 ... and expanding use of personalized medicine and genomics

### Increased use of personalized medicine, particularly in oncology and orphan

- >70 approved drugs utilized some form of personalized medicine as part of approval by 2011
  - Over 30 include pharmacogenomic biomarkers in their drug labels (mostly in oncology and orphan indications)
- Overall increase in pipeline compounds that rely on biomarker data
  - 30% of all treatments in late clinical development rely on biomarker data
  - 50% of treatments in early clinical development rely on biomarker data
  - 60% of all compounds in preclinical development rely on biomarker data
- 10% of marketed drugs inform or recommend genetic testing for optimal treatment



SOURCE: Evaluate, press search

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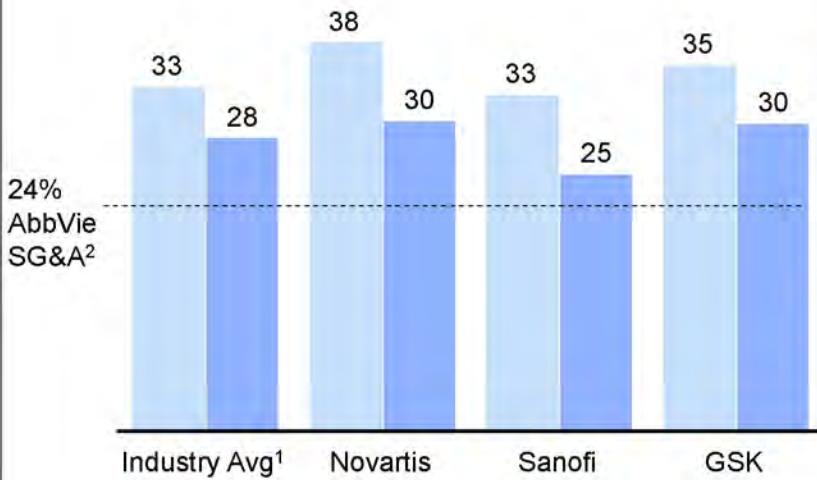


**3 At the same time, pharma as a whole has been steadily decreasing SG&A expenses**

2002  
2012

**Improvement in SG&A expense**

Percent of total revenue



- 5% improvement in SG&A represents an industry wide savings of ~\$1.8B in 2012 vs. 2002
- AbbVie appears well positioned vs peers

<sup>1</sup> Weighted by market cap  
<sup>2</sup> Based on 2012 LRP  
SOURCE: Capital IQ

**As a result of pharmaceutical companies' adaptation and turnaround, the industry as a whole is rebounding**

- A** Pharma index has once again begun to outperform the market
- B** Pharma P/E ratios are rebounding, suggesting investors have renewed belief in longer-term growth
- C** Increase in the number of product approvals
- D** Underlying pharmaceutical sector profit pool remains large and attractive compared to other industries



## A Pharma index has begun to rebound

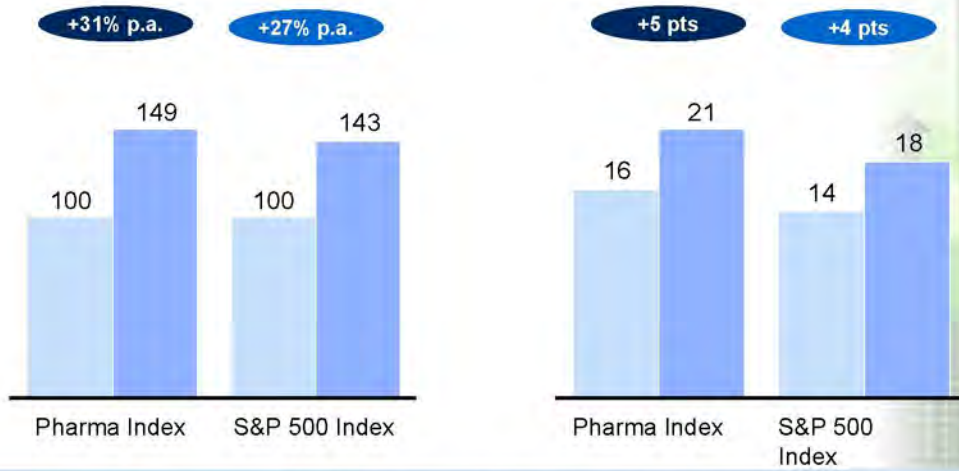
Oct. 2011

Apr. 2013

### Comparison between Pharma Index and S&P 500, October 2011 to present

TRS, indexed to Oct 2011 =100

Trailing P/E ratio



- Pharma index increase points to renewed enthusiasm in the sector
- "The global pharmaceutical industry is likely to experience a return to earnings growth in 2013 as fewer top-selling drugs lose their patent protection compared with last year" – Moody's

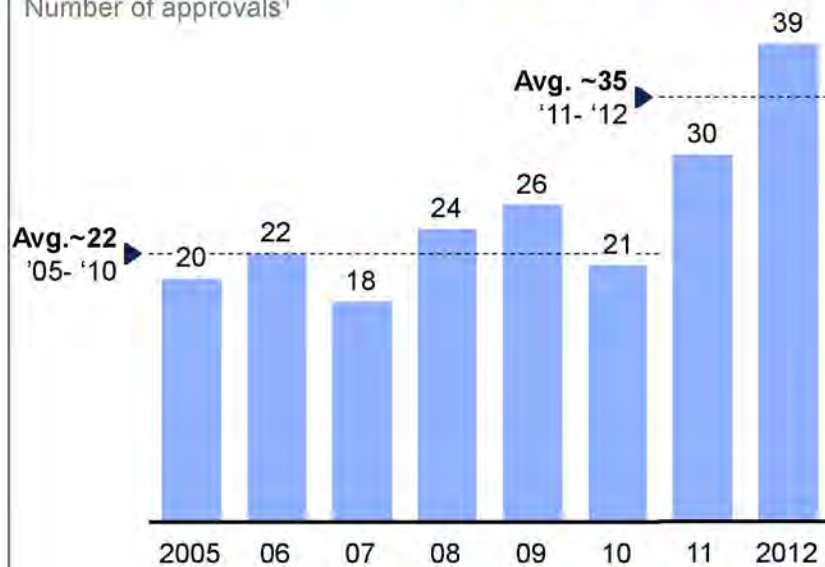
SOURCE: Capital IQ, analyst reports

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## C FDA approvals have trended upward after several years of stagnation

### FDA New molecular entities approvals by year

Number of approvals<sup>1</sup>



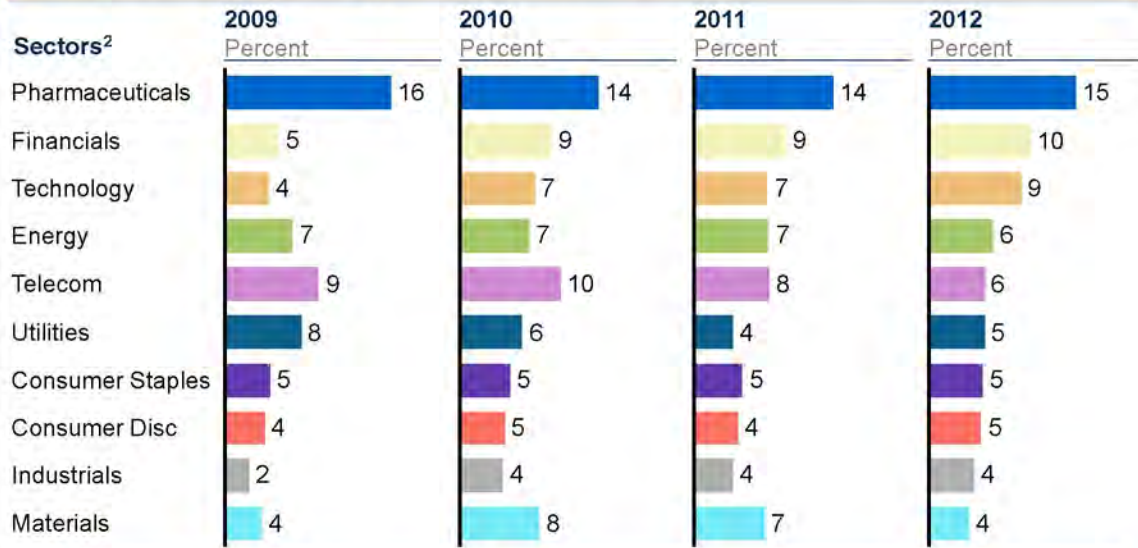
- Increasing number of priority approvals for first in class compounds or areas of high unmet need
  - ~30% in 2008 vs ~50% in 2012
- 2012 highlights:
  - 20 of 39 approvals were first-in-class
  - 13 of 39 approvals for orphan drugs
- 2013 expected to be similar highlighting sustained uptick

SOURCE: FDA data, McKinsey analysis

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**D** The underlying pharmaceutical sector profit pool remains very attractive compared to other sectors

**Comparison of profit margin across economic sectors**



**Overall profitability indicates ongoing growth opportunities for winners in pharma space**

1 Industry average, weighted by revenues in US\$

2 Sample includes global companies with US\$500 Million in revenue and above from 2008 onwards

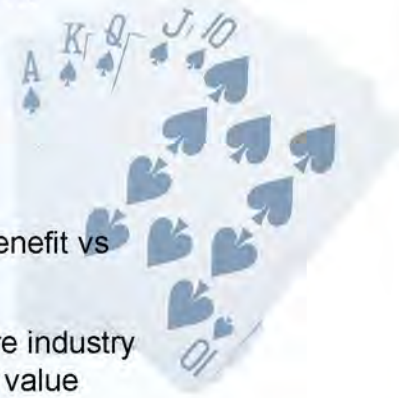
SOURCE: Corporate Performance Analysis Tool

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**Given existing landscape and trends, we believe the next 10 years will be considerably different than the last**

### Several “sure bets”

- Increased role of consumer (both in decision making financially)
- Further M&A activity (both to gain access to innovative new therapies and cost synergies)
- Shift towards more integrated care (e.g. ACOs and IDNs)
- Further limited access to physicians creating demand for a new commercial model
- Rise of pharmaco-genomics and biomarkers to treat increasingly specific sub-populations
- Requirements for health economic and clear clinical benefit vs standard of care for premium reimbursement
- Ongoing pricing (and utilization) pressure on healthcare industry putting a premium on unique TPPs with demonstrated value



However there are also several “wild cards” that are less certain but have opportunity to greatly influence the market

### Wild cards

- Will the industry crash through the next wave of innovation and return to historic productivity?
- Will the day of the \$100K+ therapy be over?
- Will the “bubble burst” on valuations?
- When will Emerging Markets reach enough scale to drive significant portion of industry profits?
- Will increasing pricing and data transparency dramatically change fortunes?
- Will some markets place draconian measures on pricing and intellectual property?



## We believe winners in the market can capture disproportionate share and growth

### Keys to success in this new environment

- Focus on specialty products with clear differentiation vs standard of care in areas where the company can add unique value (rather than following the herd)
- Build cutting edge capabilities that will be required to win in the new world (e.g., Market Access / Pricing, Health Economics / Outcomes, Medical Affairs)
- Increasingly externalize R&D (in particular R) to cost effectively access new sources of innovation while leveraging advances in personalized medicine to more efficiently target therapies and development
- Focus on value creating M&A for required assets, talent and technology
- Drive a “lean / mean” low-cost organization and operational model to maintain cash flow while still being able to invest in growth
- Foster a culture of innovation, accountability, rapid decision-making, cross-functional cooperation and strong external orientation



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