

BENTAIEB Fathi **FETRO Christine** LINDNER Lucie MAAMAR Suina **RAME** Blandine

Jan. 29th, 2014 M2 AREIPS





THALOMID

THALOMID

THALOMIC

THALOMI



Summary

- 1. History
- 2. Celgene ID
- 3. Celgene's strategy
- 4. Perspectives
- 5. Conclusion SWOT

1 - HIISTORY





History

Gelanese

Fine and specialty chemicals man made fibers





1986

Separate enterprise Celgene Corporation

- Biological work
- •Isomeric drug (Ritaline, Thalidomide)



Thalidomide

- First patent in 1954 by Grünenthal
- Placed on the market on October 1957 (Germany)
- -effective tranquilizer and pain killer
- -effective antiemetic

a synthetic glutamic acid derivative

R-(+)-Thalidomide

S-(-)-Thalidomide



Thalidomide's teratogenic effects

Congenital abnormalities caused by use of thalidomide in pregnancy: On Nov 21, 1961, the company withdrew thalidomide from sale in Germany

only one particular optical isomer of thalidomide caused the teratogenicity

⇒Conversion in the human body

Withdrawn from the market in 1962 except in

South America





At the beginning, Celgene and Thalidomide ...

• 1991: Gilla Kaplan has a better project for the company ... (other than tuberculosis)

new research showed thalidomide could treat the painful skin lesions caused by leprosy (and AIDS+

cancer)

Celgene's 1992 acquisition of exclusive US rights for thalidomide

- A very worthwhile project
- A tremendous challenge working with the FDA



Leprosy-ENL

- a *Mycobacterium leprae* infection
- a diffuse, generalized pattern with **clusters of tender**, swollen subcutaneous **nodules** over the face, trunk, thighs, and arms
- ⇒Immune-mediated complication
- ⇒July 1998: approval from the FDA to market for the acute treatment of the cutaneous manifestations of moderate to severe ENL









Antitumor Activity of Thalidomide in Refractory Multiple Myeloma

Seema Singhal, M.D., Jayesh Mehta, M.D., Raman Desikan, M.D., Dan Ayers, M.S., Paula Roberson, Ph.D., Paul Eddlemon, B.S., Nikhil Munshi, M.D., Elias Anaissie, M.D., Carla Wilson, M.D., Ph.D., Madhav Dhodapkar, M.D., Jerome Zeldis, M.D., David Siegel, M.D., Ph.D., John Crowley, Ph.D., and Bart Barlogie, M.D., Ph.D.

N Engl J Med 1999; 341:1565-1571

•May 2006: approval in combination with dexamethasone for the treatment of patients with newly diagnosed multiple myeloma

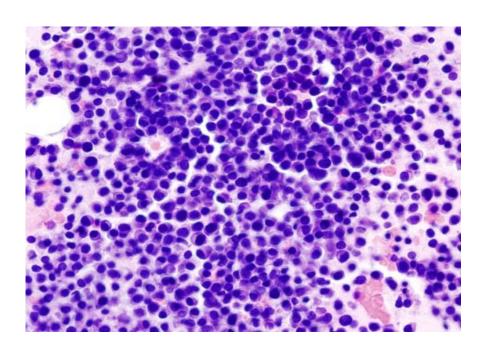


Multiple myeloma

A cancer formed by malignant plasma cells

CRAB

- •1.22/10000 in the UE
- •About 20 000 cases occur every year in the USA







Thalidomide Celgene ® an incredible story ...

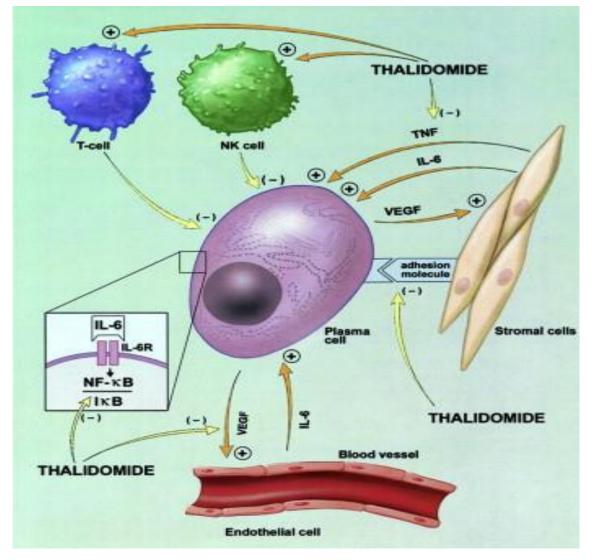


"There has never been a drug that has so profoundly affected drug development around the world as has Thalidomide" Sol Barer, Chief executive officer, manufacturer Celgene Corporation. JAMA 1997: 8-10

- Designated as an orphan medicinal product by the European Commission in 2001
- Sales:
 - In 1998 : 3,3 millions \$
 - In 2001: 82 millions \$ = 93 % of Celgene's total revenue
- Using as a springboard to build a pipeline of drugs whose chemical structures were derived from thalidomide = IMiDs



Why we can use Thalidomide?

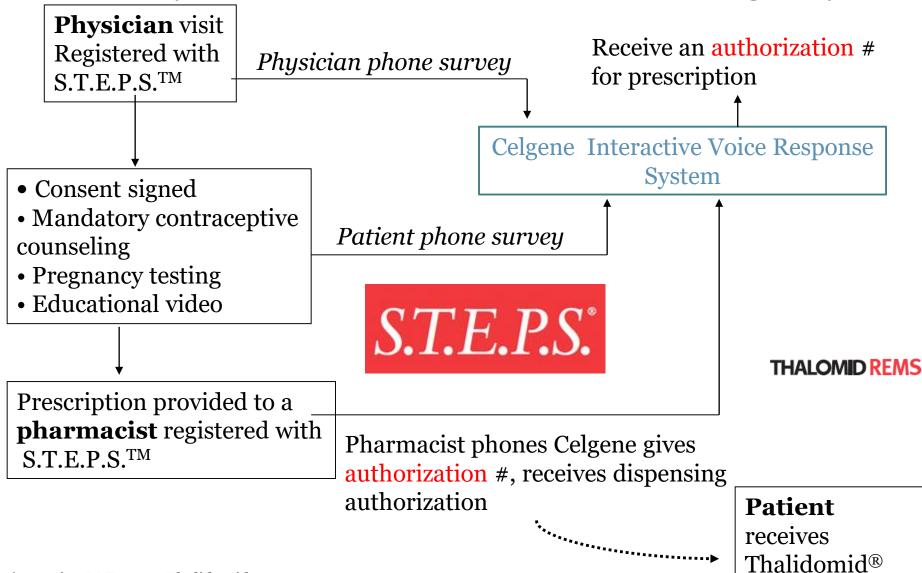


<u>The International Journal of Biochemistry & Cell Biology Volume 39, Issues 7–8, July–August 2007, Pages 1489–1499, the Thalidomide saga Magda Melchert</u>



Présentation M, Tartar « Thalidomide 2010 »

The System for Thalidomide Education and Prescribing Safety



2 - IID CELGENE





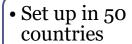
2-1 Origin of Celgene

- Biopharmaceutical laboratory specializing in innovation
- Since 1986

Celgene Corporation



• New Jersey



• Patients in 70 countries

Headquarters



In the World



- Hematology
- Oncology
- Inflammation
- Immunology

Areas of activities



- R&D: 30% turnover
- 25 Phase III trials in progress

R&D



• Robert J.Hugin

Chief Executive Officer





2-1 Origin of Celgene

Biopharmaceutical laboratory specializing in innovation

• Since 1986

Celgene Corporation



• New Jersey

- Set up in 50 countries
- Patients in 70 countries

Headquarters





- Hematology
- Oncology
- Inflammation
- Immunology



- R&D: 30% turnover
- 25 Phase III trials in progress



• Robert J. Hugin





Celgene Corporation

- ✓ 1986: Celanese → Celgene
- ✓ Biotech
- ✓ Specializing in innovation
- ✓ Thalidomide and deracemisation



Headquarters: New Jersey



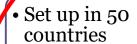
2-2 Celgene around the world

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R&D



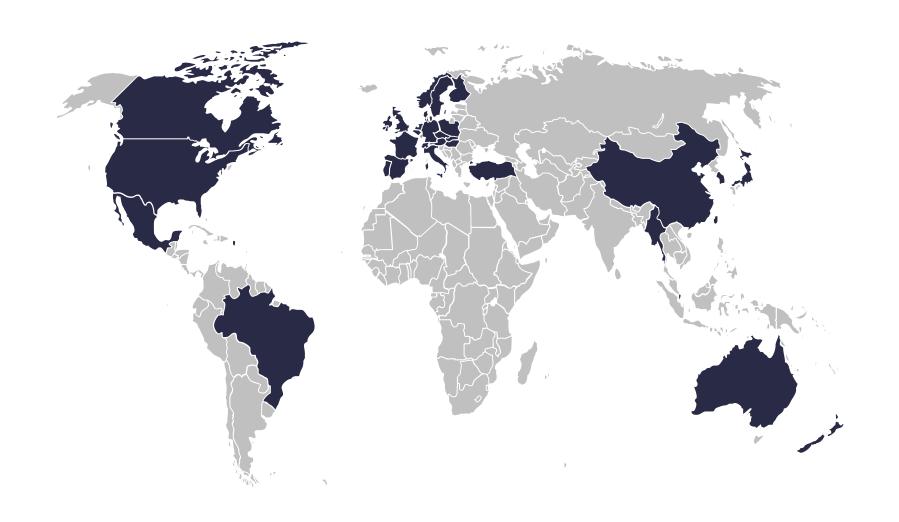
• Robert J.Hugin

Chief Executive Officer





Celgene around the world





2-3 Areas of activities

- Biopharmaceutical laboratory specializing in innovation
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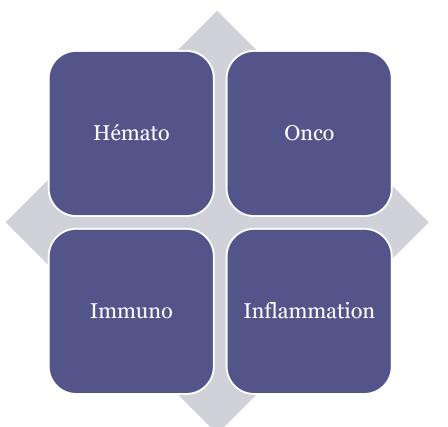
Chief Executive Officer





Areas of activities

Very selective in the choice and development of its molecules In search of a real added medical value



Company that integrates all processes by which passes a pharmaceutical product: discovery / development / production / clinical-trials / marketing and sales



2-4 R&D - Revenue

- Biopharmaceutical laboratory specializing in innovation
- Since 1986

Celgene Corporation



• New Jersey



• Patients in 70 countries

Headquarters



In the World



- Hematology
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R&D

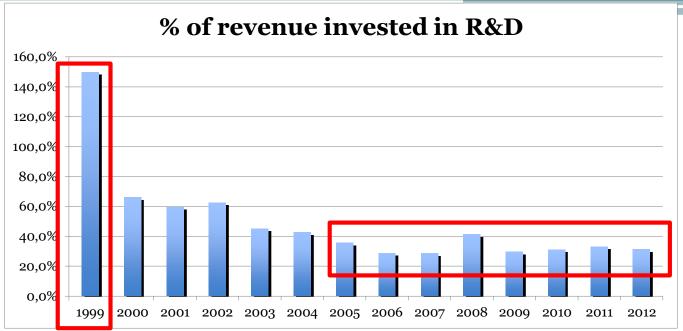


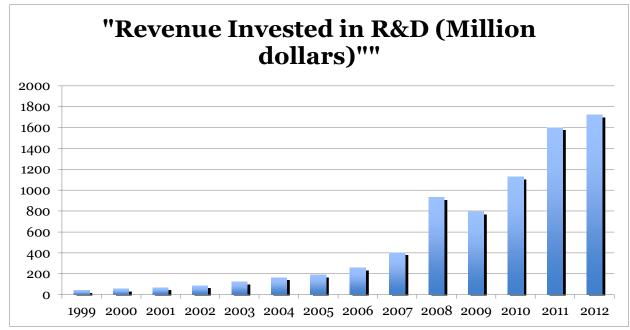
• Robert J.Hugin

Chief Executive Officer











2-5 CEO and Employees

- Biopharmaceutical laboratory specializing in innovation
- Since 1986



• New Jersey



• Patients in 70 countries

countries





- Hematology
- Oncology
- Inflammation
- Immunology



- R&D: 30% turnover
- 25 Phase III trials in progress



Robert J.Hugin

Chief Executive Officer





Bob Hugin - Celgene

Name: Bob Hugin

Title: Chairman and CEO

2012 pay: \$10.57 million

2011 pay: \$8.92 million

Former Marine officer Manager at J.P. Morgan & Co. Joined Celgene as CFO in 1999 Took over as CEO in June 2010



We always are looking at the landscape for partnership opportunities and products that have a good value proposition.

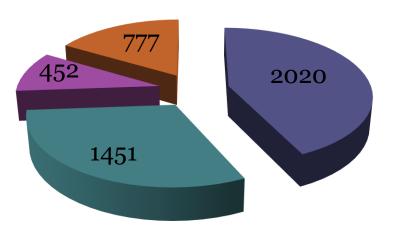
Rhoffsheyin

Robert J. Hugin

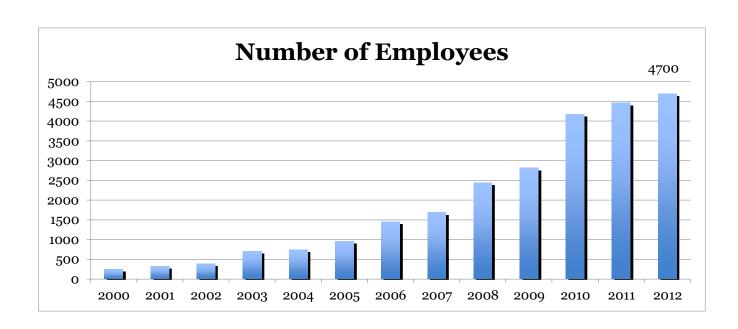
Chairman and Chief Executive Officer



Employees (2012)



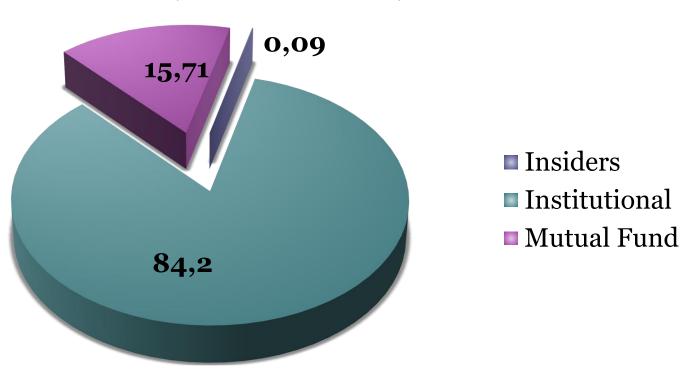
- R and D
- Marketing and sales
- Manufacturing
- Direction and Administration



Share Holders Distribution

Share Holders

(Jan. 2014 - source Macroaxis.com)





Detfinitions de Chelgene (1986)

OCDE: Association between Life Sciences and a set of modern techniques

✓Innovation

■Revenue invested in R&D

™Origin and spirit of a small pharma

Losing money

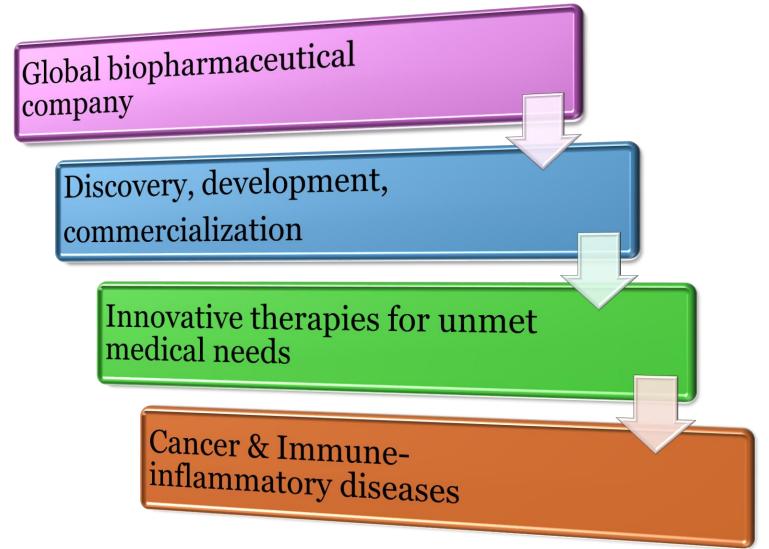
→ Biotech

3 - CIEILGIENIE'S STIRATIEGY





Celgene's vision and missions

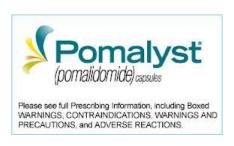


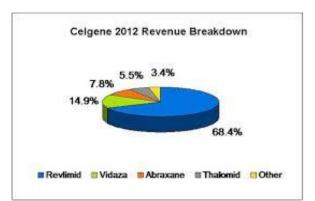


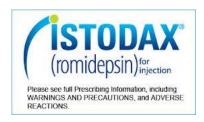
Registered products











Abraxane' for Injectable Suspension

(paclitaxel protein-bound particles for injectable suspension)
(albumin-bound)

Please see full Prescribing Information, including Boxed WARNING, CONTRAINDICATIONS, WARNINGS AND PRECAUTIONS, and ADVERSE REACTIONS.





Celgene's strategy



Financial results for 2012 were outstanding.

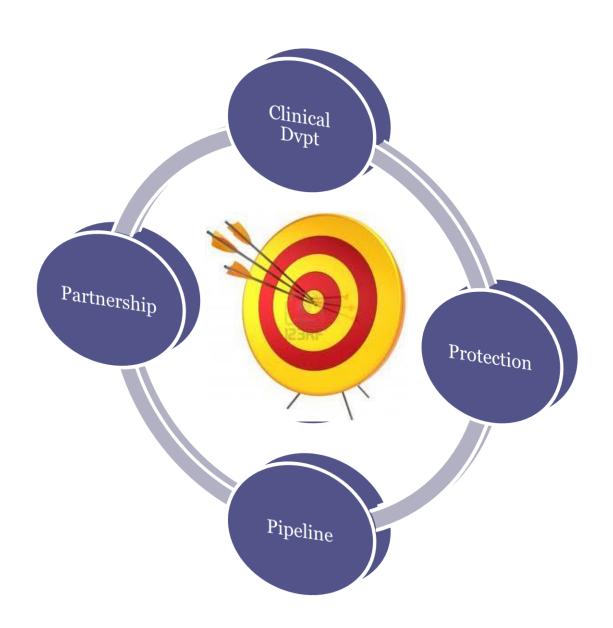
These results underscore the strength and leverage of our business model

I have never been more optimistic about where our company is heading. Celgene is on the move.

Robert J. Hugin

Chairman and Chief Executive Officer











Clinical development – Key points

Expertise

- Capitalizing on Hematology
- Building new franchises in Oncology and I&I

Maximising

- New indications of existing product
- Treatment of a disease at ALL stages

Innovation

- Pipeline of new drug candidates
- Strategic collaboration



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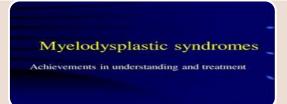
Hematology Franchise





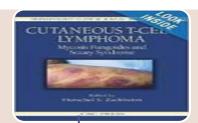




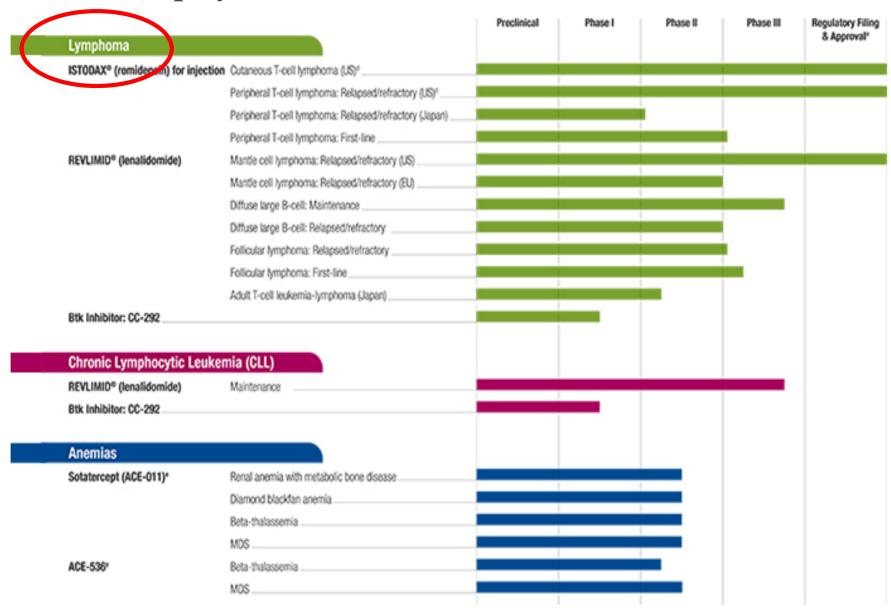








Established player in the blood cancer market





Established player in the blood cancer market





Expertise

- 160 abstracts submitted to ASH 2013 on Celgene therapies
- 100 abstracts on Revlimid® alone













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Hematology Franchise IMiDs in Multiple Myeloma



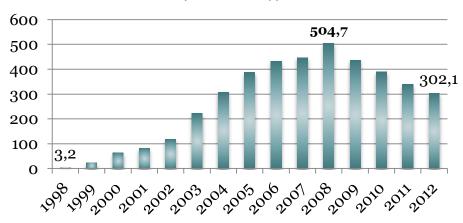
Thalidomide **THALOMID**®

Lenalidomide **REVLIMID** ®

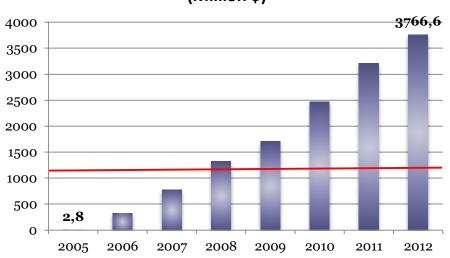
Pomalidomide **POMALYST®/ IMNOVID®**

Revenues – Thalidomide® / Revlimid®

(Million \$)



(Million \$)



Source: Celgene



Clinical development – Key points

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Treatment of MM at ALL stages



May 2006 (US) April 2008 (EU)

June 2006 (US) June 2007 (EU) Feb 2013 (US) August 2013 (EU)

Pomalyst/ Revlimid® **Thalomid**® **Immovid®**



First line

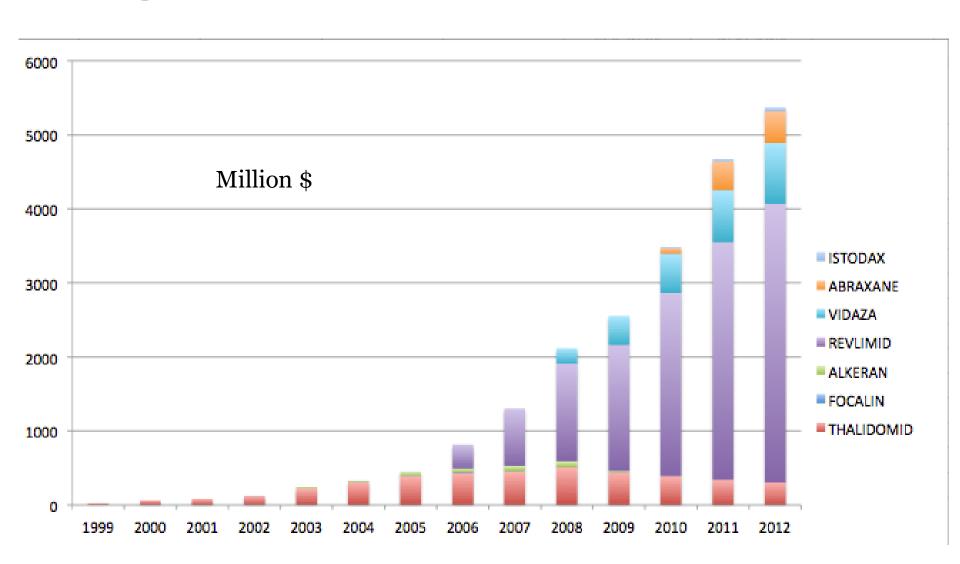
After at least one prior therapy

First line

Off label use

Resistant and refractory MM (at least two prior therapies)

Celgene's revenues





Clinical development – Key points

Expertise

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Maximising

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- Treatment of a disease at ALL stages

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- Pipeline of new drug candidates
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PROTECTION



« We consider intellectual property protection to be critical to our operations »

- Total of
 - 400 patents (US)
 - 500 pending patent applications (US)
 - + foreign patent rights corresponding to most of the US patents
 - Regulatory exclusivities
 - Brand names, logos



PROTECTION 1: CC

No big patent cliffs approaching

	U.S.		Europe	
REVLIMID® brand drug (U.S. and European Patent Office, or EPO, drug	2027 substance	patents	2024)	
THALOMID® brand drug (Use and/or drug product patents)	2023		2019	_
VIDAZA® brand drug (U.S. and EMA regulatory exclusivities only)	2011		2018	
ABRAXANE® brand drug (U.S. use and EPO use/drug product patents)	2026		2022	
ISTODAX® brand drug (U.S. drug substance patents) (EMA regulatory exclusivity upon approval)	2021	\ •	ears regul y upon a	
POMALYST® brand drug (U.S. use patent) (EMA regulatory exclusivity upon approval)	2024	` .	ears regul y upon a	



PROTECTION of Revlimid



- **Patent** protected until 2024 (EU) until 2027 (US)
 - last-to-expire patent 2027 (US) polymorphic forms of active ingredient
 - 2024 (EU) + SPC in Spain, France, Italy, Germay and the UK.
 - Orphan drug status
 - PIP: Treatment of diffuse large B-cell lymphoma /Myelodysplastic Syndrome

VELCADE® (Takeda) loses patent protection in early 2014







Pipeline (1/2)

Strong late-stage pipeline

Data on over 10 phase 3 trials in 2013 including data on trials for Revlimid ® for newly diagnosed MM.



Phase III trials of commercial stage products

Trial Beginning Date
August 2008
December 2004
February 2010
April 2009
July 2010
May 2009
December 2011
November 2009
February 2009
October 2010
April 2009
•
April 2009 September 2010
•
September 2010
•
September 2010 April 2011
September 2010
•

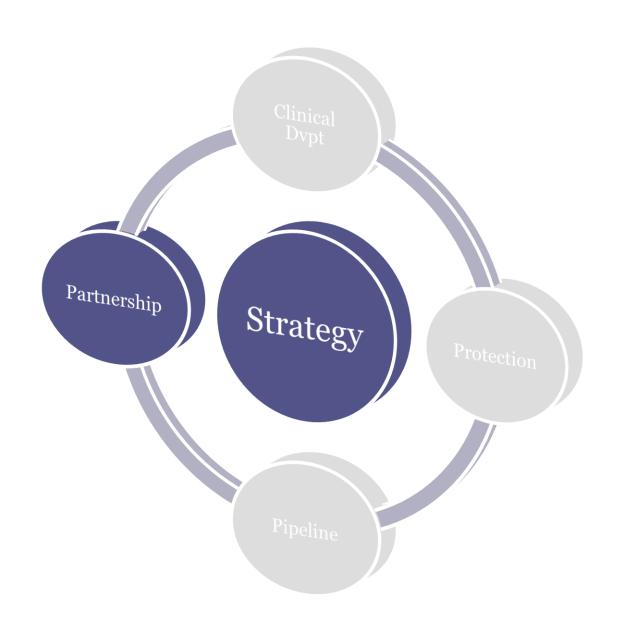


Pipeline (2/2)

RESEARCH & EARLY DEVELOPMENT







Partnership

1.Acquisitions

- Strengthen research & manufacturing capabilities
- Enhance commercial product portfolio

2. Alliances

- With small development companies (promising candidates in pre-clinical /early stages)
- Shape future pipeline

Partnership

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1.Acquisitions

- Strengthen research & manufacturing capabilities
- Enhance commercial product portfolio



Signal Pharmaceuticals (2000)

- Biopharmaceutical company
- Focused on the discovery & development of drugs that **regulate genes associated with disease**

ANTHROGENESIS

Anthrogenesis (2002)

- Biotherapeutics company
- Engaged in the research, recovery culture-expansion, preservation, development & distribution of **placental stem cells as therapeutic agents**.



Avila Therapeutics (2012)

- Biotechnology company
- Platform for developing targeted covalent drugs that treat diseases through **protein silencing**

1.Acquisitions

- Strengthen research & manufacturing capabilities
- Enhance commercial product portfolio



Pharmion (2008)

- $\rightarrow VIDAZA^{\otimes}$
- Biopharmaceutical company
- 2,9 billions \$



Gloucester Pharmaceuticals (2010)

- → ISTODAX®
- Biopharmaceutical company
- 340 millions \$



Abraxis BioScience (2010)

- → ABRAXANE®
- Biotechnology company
- BioScience 2.9 Billions \$



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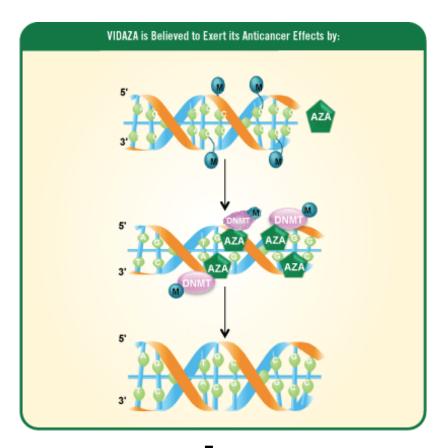


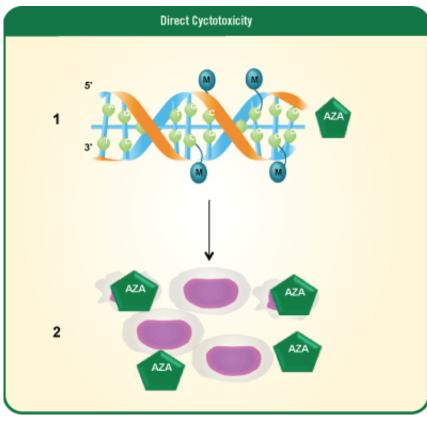
Vidaza® Azacitidine

- is a pyrimidine nucleoside analog of cytidine
- Vidaza® is approved in the US and Europe for myelodysplastic syndromes (2008)
- Mechanism of actions:

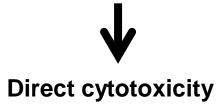


VIDAZA® is believed to have the following two Mechanisms of Actions:











VIDAZA® (azacitidine)

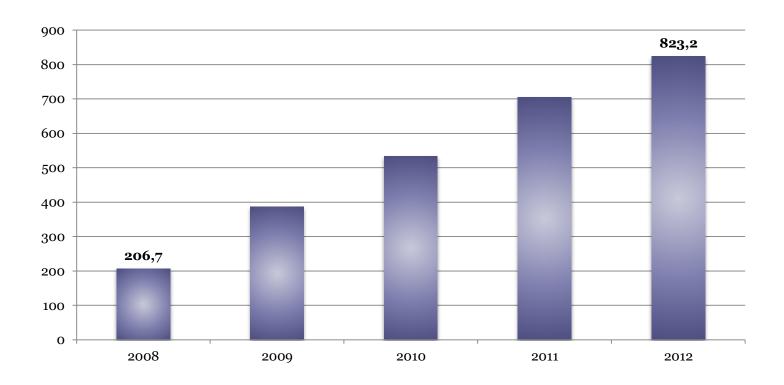
- generic in the US (may 2011 market 2013)
- full potential:
- in **Europe** (orphan drug exclusivity through the end of **2018**)
- others internationals markets (until January 2021 in Japan)
- Results from Phase 3 study in elderly newly diagnosed expected by 2014



VIDAZA® (azacitidine)

Vidaza (Revenues)

(Million \$)





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Istodax® Romidepsin

- The first and only drug approved in both peripheral and cutaneous T-cell lymphoma (PTCL-CTCL) in US
- a histone deacetylase (HDAC) inhibitor
- obtained from the bacteria <u>Chromobacterium</u> violaceum

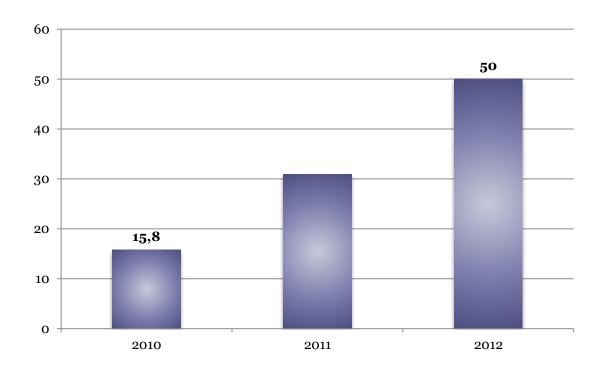




Istodax® Romidepsin

Istodax (Revenues)

(Million \$)





Pharmion (2008)

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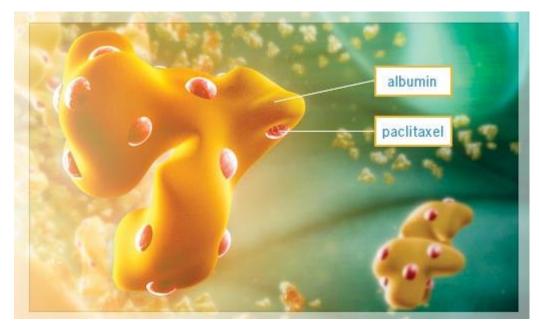
Abraxis BioScience (2010)

- → ABRAXANE®
- Biotechnology company
- BioScience 2.9 Billions \$



ABRAXANE® (Nab-paclitaxel)

- Cornerstone therapy for the treatment of multiple **solid tumor cancers**
- Injectable suspension



Abraxane's expanded therapeutic indications:

Non Small Cell Lung Cancer

Oct 2012 (US)

→ First line

2

1

Metastatic Breast Cancer

Jan 2005 (US)

Jan 2008 (EU)

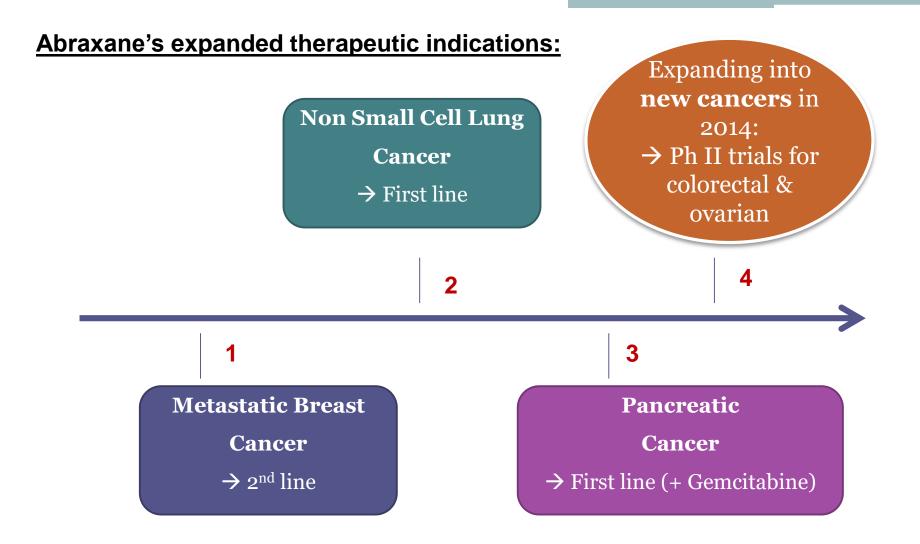
 \rightarrow 2nd line

Pancreatic Cancer

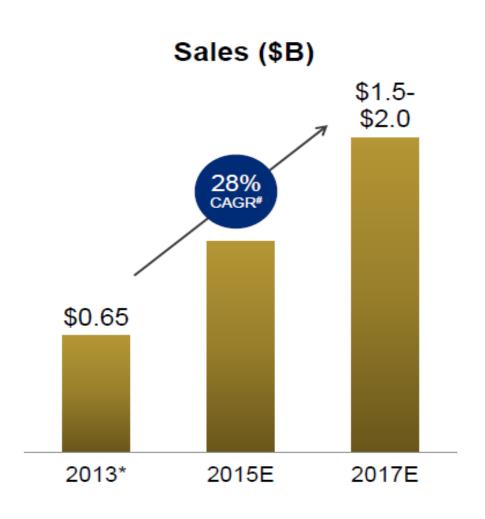
Sept 2013 (US)

Nov 2013 (EU)

→ First line (+ Gemcitabine)



ABRAXANE® (Nab-paclitaxel)



BLOCKBUSTER!!!

32nd Annual J.P. Morgan Healthcare Conference - January 13, 2014

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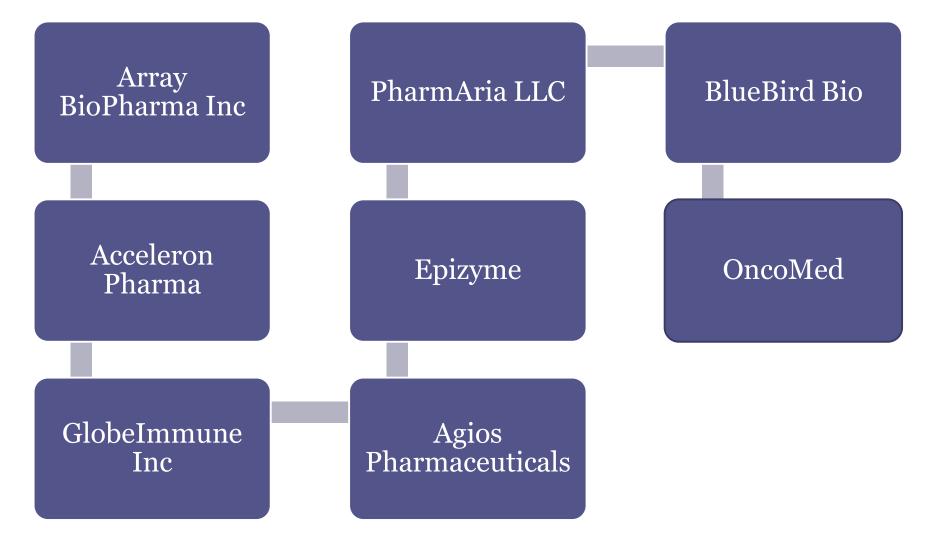
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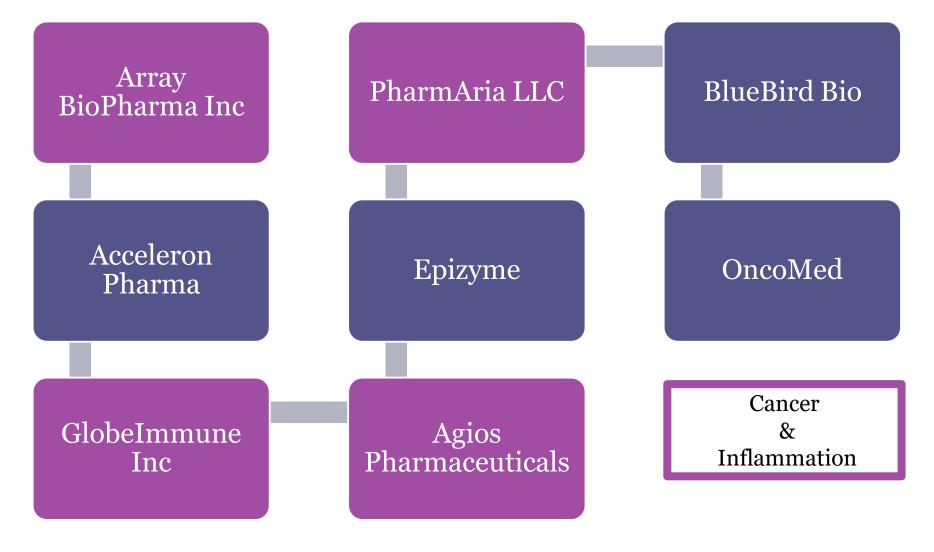
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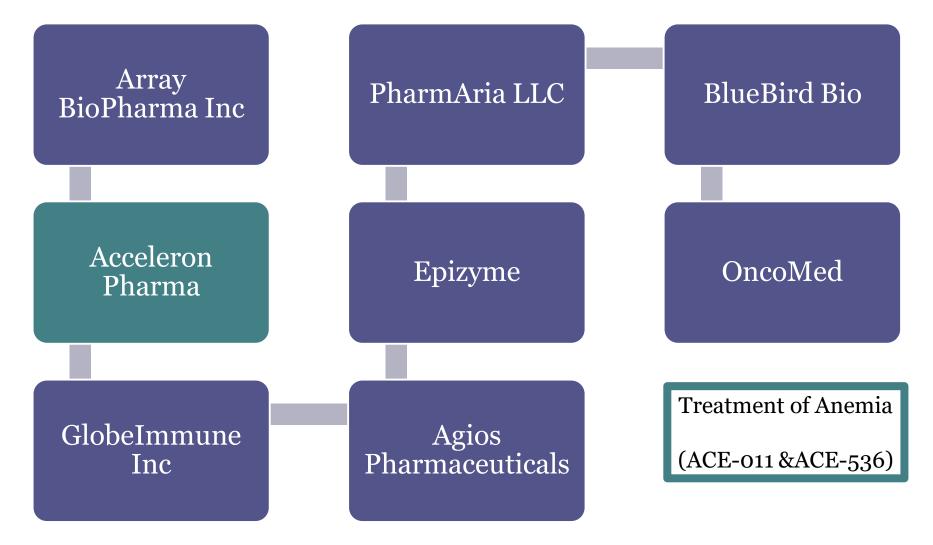














Array BioPharma Inc PharmAria LLC BlueBird Bio Acceleron Epizyme OncoMed Pharma Agios Pharmaceuticals GlobeImmune Epigenetic target class Inc



Array PharmAria LLC BlueBird Bio BioPharma Inc Acceleron Epizyme OncoMed Pharma Agios GlobeImmune Gene therapy Pharmaceuticals Inc products in oncology



Array PharmAria LLC BlueBird Bio BioPharma Inc Acceleron Epizyme OncoMed Pharma Multiple Anti-Cancer GlobeImmune Agios Stem Cell Pharmaceuticals Therapeutics Inc (DEMCIZUMAB Ph II 2014)



Summary

Celanese Chemical Group spin-off

Biotech specialized in deracemization

The Thalidomide gamble

A simple but very efficient strategy

- Great clinical developments OncoHematology & Inflammatory
- A controlled industrial protection, at all levels
- An abundant pipeline (early & late stages)
- Acquisitions allowing ready products
- Alliances allowing upcoming developments to be followed

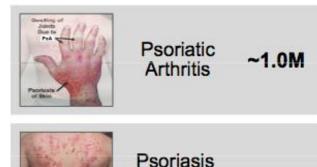
4 - IPIEIRSIPIECTIMES





Short term Perspectives – 2014/2015

- Approvals : Psoriatic
 Arthritis (1M patients) &
 Psoriasis (2.5M patients)
- → Otezla® (apremilast)







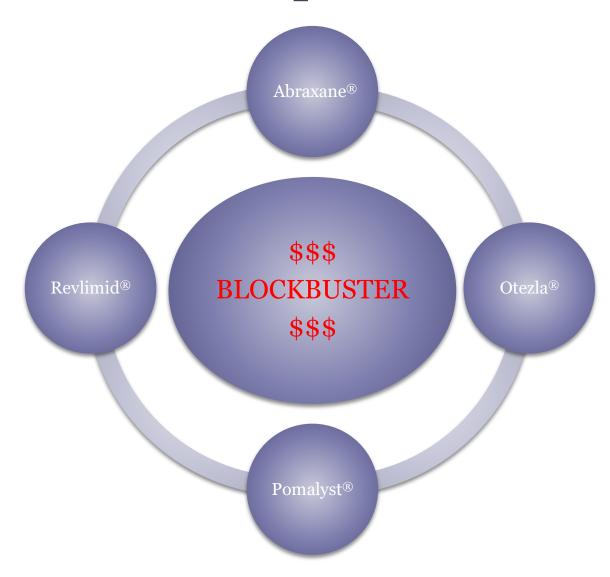
Mid-term Perspectives – 2017



+21% products sales
 between 2013 and 2017



Mid-term Perspectives – 2017





Availabilities

Thousands \$	2006	2007	2008	2009	2010	2011	2012
Total revenue	898,873	1,405,820	2,254,781	2,689,893	3,625,745	4,842,070	5,506,713
Retained earnings	(101,773)	124,660	(1,408,993	(632,246)	248,266	1,566,416	3,022,596

Source : Celgene

No dividend distributed

Investors dislike to many available and unused cash – They would prefer investments in future projects

Available cash allows:

- Immediate investments in clinical trials (otherwise the produts goes back to partner company)
- Acquisitions of partner companies



What are the next steps?



Continue on same line : acquisitions ?



Kyprolis (Onyx)



- Onyx: « the top biotechnology takeover target in 2012 »
- Kyprolis® acquired by Amgen in Aug. 2013 (\$10.4 B)
- Multiple Myeloma (3rd line) => Pomalyst[®] competitor
- Did Celgene think to buy Kyprolis® before Amgen?







What are the next steps?



- Continue on same line: acquisitions?
- Move towards a strategy of rupture ?



Stem Cells

- Acquisition of Anthrogenesis in 2002 for \$45M
- Collaboration with Oncomed in 2013 for \$155M
 + \$22.25M investment + \$790M milestones
- Human placental tissue stem cells → bone marrow transplants (hematological cancers)
- Also: LifeBankUSA® (cord blood bank issued from Anthrogenenis acquisition)



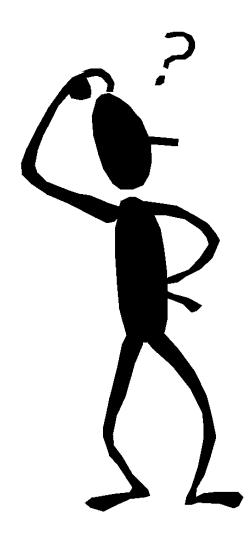
Gene Therapy



- Epigenetics
- Collaboration: \$90M upfront + \$160M milestones (2012)
- Current products: Vidaza[®] / Istodax[®]
- Pipeline: CC-486 (solid tumors ph II / AML ph III)
- Collaborators: DOT1L (Leukemia ph I)
- Diagnostic tools to identify genetic abnormalities



Is Celgene still a biotech?





Today Celgene

Association between Life Sciences and a set of modern techniques

✓Innovation

✓ revenue invested in R&D ✓ ✓

Xspirit of a small pharma

Xlosing money

→ BioPharmaceutical

5-CONCILUSION





SWOT Investors

STRENGTHS

- -Market performance Revlimid®(blockbuster)
 - Strategic acquisiton
 - Intellectual property
 - STEP program

WEAKNESSES

-To be dependent on one product - Internal R&D

OPPORTUNITIES

- Extension indication
 - -Strategic alliance
 - Availabilities

THREATS

- Generic competition
 - Safety issues
- Competitors (Kyprolis)



Working at Celgene?



Operational experience

Innovative therapies

Job opportunities



Risk taking

One product dependence

Associate Director, Regulatory Affairs Job	Berkeley Heights, New Jersey, United States	Jan 15, 2014
Manager, Regulatory Affairs Job	Mississauga Ontario Canada	Jan 13, 2014
Director, Regulatory Affairs, Brazil Job		Jan 13, 2014
Associate Director, Regulatory Affairs Job	Mississauga Ontario Canada	Jan 11, 2014
Drug Safety Specialist - 12 Month Contract Job	Mississauga Ontario Canada	Jan 7, 2014
Associate Director, Regulatory Affairs Job	Berkeley Heights, New Jersey, United States	Dec 20, 2013



THANK YOU FOR YOUR ATTENTION

