Pharmaceuticals Division

David Epstein – Division Head, Pharmaceuticals
Meet Novartis Management
June 17-18, 2015
Disclaimer

This presentation contains forward-looking statements that can be identified by words such as “momentum,” “progress,” “building,” “focused,” “pipeline,” “focusing,” “focus,” “expect,” “target,” “on track,” “strategy,” “accelerating,” “well positioned,” “ongoing,” “planned,” “aim,” “being investigated,” “continuing,” “potential,” “preparing,” “launch,” “underway,” “working,” “committed,” “potentially,” “developing,” “initiated,” “continued,” “development,” “plans,” “evolving,” “will,” “expects,” “continue,” “expected,” “progressing,” “priorities,” or similar terms, or by express or implied discussions regarding potential new products, potential new indications for existing products, or regarding potential future revenues from any such products; potential shareholder returns or credit ratings; or regarding the potential completion of the announced transaction with CSL, or regarding the potential financial or other impact on Novartis of the transactions with GSK, Lilly or CSL, or regarding any potential strategic benefits, synergies or opportunities as a result of these transactions; or regarding potential future sales or earnings of the Novartis Group or its divisions and associated companies; or by discussions of strategy, plans, expectations or intentions. You should not place undue reliance on these statements. Such forward-looking statements are based on the current beliefs and expectations of management regarding future events, and are subject to significant known and unknown risks and uncertainties. Should one or more of these risks or uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those set forth in the forward-looking statements. There can be no guarantee that any new products will be approved for sale in any market, or that any new indications will be approved for any existing products in any market, or that any approvals which are obtained will be obtained at any particular time, or that any such products will achieve any particular revenue levels. Nor can there be any guarantee that the announced transaction with CSL will be completed in the expected form or within the expected timeframe or at all. Neither can there be any guarantee that Novartis will be able to realize any of the potential strategic benefits, synergies or opportunities as a result of the transactions with GSK, Lilly or CSL. Neither can there be any guarantee that the Novartis Group or any of its divisions or associated companies will achieve any particular financial results in the future. Nor can there be any guarantee that shareholders will achieve any particular level of shareholder returns. Neither can there be any guarantee that the Novartis Group, or any of its divisions, will be commercially successful in the future, or achieve any particular credit rating. In particular, management’s expectations could be affected by, among other things, unexpected regulatory actions or delays and government regulation generally, including an unexpected failure to obtain necessary government approvals for the announced transaction with CSL, or unexpected delays in obtaining such approvals; the potential that the strategic benefits, synergies or opportunities expected from the transactions with GSK, Lilly or CSL may not be realized or may take longer to realize than expected; the inherent uncertainties involved in predicting shareholder returns or credit ratings; the uncertainties inherent in research and development, including unexpected clinical trial results and additional analysis of existing clinical data; the Company’s ability to obtain or maintain proprietary intellectual property protection; unexpected manufacturing or quality issues; global trends toward health care cost containment, including ongoing pricing pressures; uncertainties regarding actual or potential legal proceedings, including, among others, actual or potential product liability litigation, litigation and investigations regarding sales and marketing practices, government investigations and intellectual property disputes; general economic and industry conditions, including uncertainties regarding the effects of the persistently weak economic and financial environment in many countries; uncertainties regarding future global exchange rates; uncertainties regarding future demand for our products; uncertainties involved in the development of new healthcare products; uncertainties regarding potential significant breaches of data security or disruptions of the Company’s information technology systems; and other risks and factors referred to in Novartis AG’s current Form 20-F on file with the US Securities and Exchange Commission. Novartis is providing the information in this press release as of this date and does not undertake any obligation to update any forward-looking statements as a result of new information, future events or otherwise.
Pharmaceuticals Division: A snapshot of our strategy

Aspire to:
- Record # of approvals
- Top tier in sales and profit growth
- Strong reputation

Disease area focused portfolio (from development to commercialization) with truly global footprint

Innovative processes & structures, incl. Digital Medicines and Real World Evidence capabilities

Great people and culture based on shared values

1. RIGHT drug
2. RIGHT patient
3. RIGHT time
4. RIGHT dose
Seven franchises to address unmet needs and compete through innovative solutions

Franchises led jointly by Franchise and Development Head
Franchises led by members of the Pharmaceuticals Division Executive Leadership team

1. Cell & Gene Therapies includes Development and TechOps
2. Oncology includes Development
Our portfolio offers breadth and depth over time\(^1\)

Near-term
- Cosentyx\(^\circledR\)
- Entresto\(^\text{TM}^2\)
- New Oncology assets

Mid-term
- RLX030
- ACZ885
- LEE011
- BKM120
- BYL719

Longer-term
- Immuno-Oncology
- Cell & Gene
- Muscle/Joint
- Respiratory

Compounds / disease areas mentioned represent a selection of the portfolio

\(^2\) Entresto\(^\text{TM}\) is a trade name conditionally approved by the FDA for LCZ696
Cosentyx®: Further data confirms strong efficacy profile and blockbuster potential

**Ankylosing Spondylitis (AS):** Rapid and sustained improvement in symptoms

**Psoriatic Arthritis (PsA):** Inhibition of structural damage to joints

---

**Mean change from baseline**

- Secukinumab pooled (N=404)
- Placebo (N=202)

- Modified Total Sharp Score (mTSS)

- Statistically significant improvement in mTSS ($P<0.05$) at week 24. mTSS includes both erosion and joint space narrowing. Pooled data from 75 and 150mg. Van der Heijde et al, poster at EULAR 2015

---

**Regulatory developments**

Submitted in Q2 in US as well as EU for both PsA and AS

---

Missing data were imputed as non-responses through Week 16. Observed data shown from Week 20 through Week 52 (grey box). Novartis Data on File 2014 (from the MEASURE2 trial).

---

0.57

0.08
Entresto™: Impressive outcomes data across study endpoints

PARADIGM-HF cause of death and hospitalization data vs. current standard of care ACEi enalapril

- **Death from CV causes**
  - 20% (vs. 19%)

- **Sudden death**
  - 19% (vs. 16%)

- **Death from any cause**
  - 16% (vs. 19%)

- **First hospitalization for HF**
  - 21% (vs. 30%)

- **Total number of ER visits for HF**
  - 30% (vs. 23%)

- **Total number of hospitalization for HF**
  - 23% (vs. 30%)

Regulatory and access developments

- Accelerated review granted in US, Canada and CH
- Brand name conditionally approved in US
- Early / temporary access programs granted in UK, France

---

2. Individual components of primary endpoint  
   - Note: Entresto™ is a trade name conditionally approved by the FDA for LCZ696  
3. Secondary endpoint  
4. Exploratory endpoint
Strong mid-term pipeline in cardiovascular diseases

**LCZ696 Heart Failure pEF**
PARAGON trial recruitment on track (target 4,300 patients)
Planned submission 2019 upon trial completion

**RLX030 Acute Heart Failure**
RELAX-AHF-2 trial recruitment on track (target 6,800 patients)
Interim analysis planned H2 2015
Submission planned 2016

**ACZ885 Coronary Artery Disease**
CANTOS trial fully recruited (10,220 patients)
Interim analyses planned: mid 2015 and H2 2016
Planned submission 2017 upon trial completion
New Oncology assets strengthen our portfolio

### New Growth Products

<table>
<thead>
<tr>
<th>Opportunities in Melanoma and beyond</th>
<th>Expansion in Hematology</th>
<th>Expansion in Renal Cell Carcinoma</th>
<th>Other²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tafinlar®, Mekinist®, Promacta®/Revolade®, Votrient®, Arzerra®</td>
<td>Mekinist® (trametinib)</td>
<td>Tafinlar® (dabrafenib)</td>
<td>PROMACTA® (eltrombopag)</td>
</tr>
</tbody>
</table>

2014 net sales: USD 2 bn

New indications
Market expansion

Potential for 3 blockbusters

---

1 Tafinlar®, Mekinist®, Promacta®/Revolade®, Votrient®, Arzerra® are included in the Novartis rolling definition of Growth Products, which comprise products launched in a key market (EU, US, Japan) in 2010 or later, or products with exclusivity until at least 2019 in key markets.

2 This includes Arzerra® (hematology) and Tyverb®/Tykerb® (breast cancer)
Tafinlar® + Mekinist®: Established survival benefit in metastatic melanoma, 2 more submissions completed

- 29% reduction in risk of death vs. single agent
- 1-year and 2-year overall survival of 74% and 51%, respectively

**COMBI-d: Overall Survival**

- Median OS 18.7 mos
- Median OS 25.1 mos
- P-value: 0.011
- HR (95% CI): 0.71 (0.55, 0.92)

**COMBI-v: Overall Survival**

- Median OS 17.2 mos
- P value: 0.005
- HR (95% CI): 0.69 (0.53, 0.89)

- 31% reduction in risk of death vs. single agent
- 1-year overall survival of 73%

**Regulatory developments**

US: Accelerated approval obtained Jan ‘14
EU + JP: Submissions completed in Q2

---

1. Long et al., ASCO 2015. Ph III study with 423 patients
2. Robert et al. NEJM 2014. Ph III study with 704 patients. Note: 2-year OS data not yet available
3. Submission and approval of 1st line combination therapy (Tafinlar® + Mekinist®) in unresectable or metastatic melanoma with BRAF V600E or V600K mutations
**Tafinlar® + Mekinist®: Development programs in NSCLC and colorectal cancer are on track**

**Patient population:**
BRAF V600E-mutant advanced NSCLC patients prior progression and after receiving systemic chemotherapy, i.e. ~2% of total NSCLC population
Note: Filing expected in 2016

**Patient population:**
BRAF V600E mutated metastatic colorectal cancer, i.e. ~8% of CRC population
Note: filing expected ≥2019

---

1 D. Planchar et al., ASCO 2015. Note: Cohort B: 24 patients enrolled, 23 evaluable for response.
2 Atreya, ASCO 2015. Note: 35 patients enrolled. Note: panitumumab, a monoclonal antibody, is commercialized by Amgen as Vectibix® in colorectal cancer
Breast cancer portfolio is well positioned to explore benefits of doublet and triplet combinations

<table>
<thead>
<tr>
<th>Standard therapy</th>
<th>Combination therapies (with standard and targeted therapy/ies)</th>
<th>Trials¹ (selected examples)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endocrine therapy (e.g. fulvestrant, Femara®)</td>
<td>▪ mTOR (Afinitor®) &lt;br&gt;▪ pan-PI3K inhibitor (BKM120) &lt;br&gt;▪ α-specific PI3K inhibitor (BYL719) &lt;br&gt;▪ CDK4/6 inhibitor (LEE011) &lt;br&gt;▪ Anti-CSF1 antibody (MCS110) &lt;br&gt;▪ CDK4/6 inhibitor + PI3K inhibitor &lt;br&gt;▪ CDK4/6 inhibitor + mTOR inhibitor</td>
<td>BELLE-2 (results Q3, filing 2015) &lt;br&gt;BELLE-3 (results in H1 2016, filing in 2016) &lt;br&gt;MONALEESA-2 (results in H1 2016) &lt;br&gt;MONALEESA-7 (enrollment ongoing, results in 2018) &lt;br&gt;¹st data presented at SABCS 2014 (PI3K combo) and at ASCO 2014 (mTOR combo); Ph I / II enrolment ongoing</td>
</tr>
</tbody>
</table>

¹ Selected examples, with expected results and filing dates
BYL719 shows promising activity in PIK3CA\textsuperscript{mut} patients in combination with letrozole

**BYL719 + letrozole: Best treatment response**

- Patient population: 3\textsuperscript{rd}/4\textsuperscript{th} line postmenopausal HR+/HER2− metastatic BC patients (Phase I)
- Preferential activity seen with BYL719 + letrozole in tumors with PIK3CA mutation
- Response Rate (RR) of 25% in patients with PIK3CA mutation (vs. 10% in PIK3CA wild-type)
- Median time on treatment is ~11 months in patients with PIK3CA mutation (vs. ~4 months in PIK3CA wild-type)
- Phase III planned for H2 2015

---

1. Letrozole + BYL719 in patients previously treated with hormonal therapy and up to 1-line of chemotherapy
2. Best Response Evaluation Criteria in Solid Tumors (RECIST) version 1.1
3. Duration on treatment for each patient before unacceptable toxicity or disease progression observed

Source: Mayer et al. AACR 2015
Four exciting areas of focus in our early development portfolio

1. Immuno-Oncology
   - Checkpoint inhibitors (CoStim)
   - Clinical collaborations (e.g. PD-1)
   - Other mechanisms (STING & GITR)
   - On track for 3 checkpoint inhibitors¹ in clinic in ‘15
   - Extensive program across in- and external assets

2. Cell & Gene Therapies
   - Focus on immuno-oncology
   - R&D targeting T-cells and hematopoietic stem cells
   - Robust C&GT pipeline with growth and combination potential

3. Muscle / Joint
   - Sarcopenia
   - Tendon and cartilage repair
   - Polymyositis
   - Spinal muscular atrophy
   - Cancer cachexia
   - BYM338 is also in full development for sIBM²
   - 4 compounds in exploratory stages

4. Respiratory
   - Development progressing for QGE031, QAW039, QVM149
   - Earlier stage compounds for asthma, COPD, cystic fibrosis, PAH, pulmonary fibrosis

¹ Novartis assets ² Filing for Sporadic Inclusion Body Myositis (sIBM) planned in 2016; sarcopenia and hip-fracture filings ≥2019
Immunotherapy is the next chapter in cancer treatment and it goes beyond checkpoint inhibitors.

Stimulatory and inhibitory factors in the cancer-immunity cycle

1. **Release of cancer cell antigens (cancer cell death)**
   - INF-γ
   - T cell granule content
   - CD28/B7.1
   - CTLA4/B7.1
   - PD-L1/PD-1
   - PD-L1/B7.1

2. **Cancer antigen presentation (dendritic cells/ APCs)**
   - TNF-α
   - IL-1
   - IFN-α
   - CD40L/CD40
   - CDN
   - ATP

3. **Immunogenic cell death**
   - HMGB1
   - TLR
   - STING

4. ** Trafficking of T cells to tumors (CTLs)**
   - HEM
   - GITR
   - LFA1/ICAM1

5. **Infiltration of T cells into tumors (CTLs, endothelial cells)**
   - CX3CL1
   - CXCL9
   - CXCL10
   - CCL5

6. **Recognition of cancer cells by T cells (CTLs, cancer cells)**
   - IDO
   - TGF-β
   - BTLA
   - VISTA
   - LAG-3
   - INF-γ
   - T cell granule content

7. **Killing of cancer cells (Immune and cancer cells)**
   - CD28/B7.1
   - CTLA4/B7.1
   - PD-L1/PD-1
   - PD-L1/B7.1

**Stimulatory factors**
- CD28/B7.1
- CD137/CD137L
- OX40/OX40L
- CD27/CD70
- HVEM
- GITR
- CTLA4/B7.1
- PD-L1/PD-1
- PD-L1/B7.1
- prostaglandins
- INF-γ
- T cell granule content
- CD28/B7.1
- CTLA4/B7.1
- PD-L1/PD-1
- PD-L1/B7.1

**Inhibitory factors**
- LFA1/ICAM1
- Selectins
- VEGF
- Endothelin B receptor
- INF-γ
- T cell receptor
- CART
- Reduced pMHC on cancer cells

**Targeted therapy**
- TNF-α
- IL-1
- IFN-α
- CD40L/CD40
- CDN
- ATP
- HMGB1
- TLR
- STING
- INF-γ
- T cell granule content
- CD28/B7.1
- CTLA4/B7.1
- PD-L1/PD-1
- PD-L1/B7.1
- Arginase
- MICA/MICB
- B7-H4
- TIM-3/phospholipids
- CSF1
- Targeted therapy

Reprinted from Chen DS, Mellman I. Immunity. 2013;39(1):1-10, Copyright 2013, with permission from Elsevier
We aim for leadership across targeted and immuno-therapies including multiple combinations...

**Targeted therapy**

- MEK inhibitor (Mekinist®)
- CDK4/6 inhibitor (LEE011)
- PI3K inhibitor (BKM120, BYL719)
- BRAF inhibitor (Tafinlar®)
- cMET inhibitor (INC280)
- EGFRmut inhibitor (EGF816)

**Immuno-therapy**

- Checkpoint inhibitors (1st and 2nd generation¹)
- External clinical collaborations (checkpoint inhibitors and monoclonal antibody)
- STING² CDN agonist (MIW815)
- GITR agonist (LKZ145)
- Anti-CSF1³ antibody (MCS110)

**Industry leading pipeline**

Examples of pipeline assets:
- MEK inhibitor (Mekinist®)
- CDK4/6 inhibitor (LEE011)
- PI3K inhibitor (BKM120, BYL719)
- BRAF inhibitor (Tafinlar®)
- cMET inhibitor (INC280)
- EGFRmut inhibitor (EGF816)

**Internal pipeline and collaborations / alliances**

2. Aduro Biotech collaboration. MIW815 formerly known as ADU-S100
3. Also known as M-CSF (Macrophage Colony Stimulating Factor)
...through our internal pipeline and external collaborations

<table>
<thead>
<tr>
<th>Checkpoint inhibitors  (Novartis assets)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PDR001</strong> (Anti-PD1) – solid tumors</td>
</tr>
<tr>
<td>FIH achieved</td>
</tr>
<tr>
<td><strong>LAG525</strong> (Anti-LAG3) – solid tumors</td>
</tr>
<tr>
<td>Dosing is imminent</td>
</tr>
<tr>
<td><strong>MBG453</strong> (Anti-TIM3) – solid tumors</td>
</tr>
<tr>
<td>FIH expected in 2015</td>
</tr>
<tr>
<td><strong>On track for 3 checkpoint inhibitors in clinic in 2015</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>External clinical collaboration  (combinations)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amgen</strong>: Colorectal cancer triplet of Vectibix® with Tafinlar® + Mekinist® (Ph II)</td>
</tr>
<tr>
<td><strong>BMS</strong>: NSCLC doublet combinations of Opdivo® with Zykadia™, with EGF816, and with INC280; FIH for each doublet in H1 2015</td>
</tr>
<tr>
<td><strong>MedImmune / AstraZeneca</strong>: Melanoma triple combination of MEDI4736 with Tafinlar® + Mekinist® (Ph I)</td>
</tr>
<tr>
<td><strong>Merck</strong>: RCC doublet of Keytruda® with Votrient® (Ph I) and melanoma triplet of Keytruda® with Tafinlar® + Mekinist® (Ph I)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Mechanisms  (Novartis assets and alliances)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MIW815</strong> (STING CDN Agonist)</td>
</tr>
<tr>
<td>Collaboration with Aduro Biotech</td>
</tr>
<tr>
<td>Potential 1st in class therapy. FIH expected in 2016</td>
</tr>
<tr>
<td><strong>MCS110</strong> (Anti-CSF1) – solid tumors</td>
</tr>
<tr>
<td>Dosing is imminent</td>
</tr>
<tr>
<td><strong>LKZ145</strong> (GITR agonist)</td>
</tr>
<tr>
<td>FIH expected in 2016</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other combinations  (Novartis assets)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PDR001</strong>(Anti-PD1) + LAG525 (Anti-LAG3):</td>
</tr>
<tr>
<td>Clinical entry expected in 2015 – solid tumors</td>
</tr>
<tr>
<td><strong>PDR001</strong>(Anti-PD1) + MBG453 (Anti-TIM3):</td>
</tr>
<tr>
<td>Clinical entry expected in 2016 – solid tumors</td>
</tr>
<tr>
<td><strong>PDR001</strong>(Anti-PD1) + MCS110 (Anti-CSF1):</td>
</tr>
<tr>
<td>Clinical entry expected in 2016 – solid tumors</td>
</tr>
</tbody>
</table>

*Opdivo®, Keytruda®, Vectibix® are registered trademarks of Bristol-Myers Squibb Company, Merck & Co, Inc. and Amgen Inc. respectively*
**CTL019: Potential first-in-class CART Therapy**

**Recent achievements**
- Novartis global study in pediatric r/r ALL patients initiated in the US (March)
- Cells of first patients processed at our manufacturing facility (April)
- Latest clinical results (May)
  - >160 patients treated with CTL019
  - Pediatric r/r ALL: 94% CR\(^1\) (45/48 pts)
  - r/r FL: 100% ORR\(^2\) (7/7 pts)
  - r/r DLBCL: 50% CR\(^2\) (6/12 pts)

**Outlook**
- First clinical sites planned to be opened ex-US in H2 2015
- Filing of pediatric r/r ALL in the US targeted for 2016 (2017 in EU)
- Pivotal trials in r/r DLBCL expected to start in H2 2015 with filing in the US targeted for 2017 (2018 in EU)

---

1. Patient's T-cells are harvested
2. T-cells are activated and genetically transduced ex vivo
3. CTL019 cells undergo ex vivo expansion
4. Patient receives a lymphodepleting regimen before the infusion
5. CTL019 cells are reinfused into the patient, where they undergo in vivo expansion and destroy cancer cells

---

1. Penn Phase I study
2. Penn Phase II ongoing study
Novartis is committed to pursue research in personalized cellular immunotherapies

### CTL019 additional indications
- Work on chronic lymphocytic leukemia (CLL) and mantle cell lymphoma ongoing (Ph I / II)
- Early work on multiple myeloma (Ph I) presented at ASCO

### New CART targets
- CART targeting EGFRvIII to treat glioma has entered into the clinics with early data presented at ASCGT (May – pilot study)
- Additional CARTs targeting multiple myeloma and acute myeloid leukemia about to enter clinical trials

### Next CART generation
- Multiple strategies pursued to regulate CARTs
- CARTs using gene editing technology (CRISPR) being assessed (allogeneic CARTs, increase benefit/risk ratio)
- Combinations with CARTs being evaluated (e.g. PD-1)

### Non-CART platforms
- FCR001, facilitating cell therapy to induce tolerance, being developed in mismatch living donor kidney transplant
- HSC835, expanded umbilical cord blood stem cells being developed in hematologic malignancies
BYM338 is spearheading our efforts to treat muscle & joint diseases with high unmet need

**Supportive initial data**

- Quadriceps wasting
- Forearm, finger, & wrist flexor wasting
- Activities for sIBM on track for 2016 filing
  - Pivotal trial fully recruited
  - Expected trial completion H1 2016
- Dose ranging study in sarcopenia and hip fracture recovery initiated
- Ongoing PoC trials for further indications and compounds
- Data suggests 18% of persons aged ≥60 have weak or intermediate muscle strength

1. Statistically significant difference
2. NCHS Data Brief No. 179, January 2015 (U.S. National Center for Health Statistics) – Based on 2011-12 data

Note: All data are preliminary / investigational, i.e. efficacy and safety data have not been established

Sources: BYM338B2205 Proof of Concept study in sIBM patients; Engel & Askanas, 2005
Asthma portfolio: Developing options for patients with moderate to severe asthma

Steps to gain asthma control

1. For illustration purposes only, i.e. to be validated by appropriate trial data. Note also that other potential steps and future add-on therapies are not shown
2. LABA = indacaterol; LAMA = glycopyrronium (in-licensed from Vectura / Sosei); ICS = mometasone (in-licensed from Merck & Co, Inc.)
3. Filing expected in 2018
4. Currently in Phase II; filing expected ≥2019
Phase II QAW039 data demonstrates significant reduction of sputum eosinophilia

12-week study in patients with eosinophilic, persistent asthma (≥2% sputum eos)

**Primary** endpoint met: QAW039 (225 mg BID) induced significant suppression of sputum eosinophilia at week 12

**Secondary** endpoint met: significant improvement in ACQ7 at week 12 in patients uncontrolled at baseline

**Exploratory** endpoint met: significantly improved QoL vs. placebo at week 12

---

**Fold reduction from baseline in eosinophil count**

*(Geometric mean (95% CI); LOCF)*

<table>
<thead>
<tr>
<th>Time (weeks)</th>
<th>QAW039</th>
<th>Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.0x</td>
<td>1.0x</td>
</tr>
<tr>
<td>6</td>
<td>2.6x</td>
<td>1.0x</td>
</tr>
<tr>
<td>12</td>
<td>3.5x</td>
<td>1.0x</td>
</tr>
<tr>
<td>18</td>
<td>1.0x</td>
<td>1.0x</td>
</tr>
</tbody>
</table>

**Source:** S Gonem et al., Phase 2a randomized placebo-controlled trial of the oral prostaglandin D2 receptor (PD2/CRTh2) antagonist QAW039 in eosinophilic asthma (Abstract ERS 2014)
### Selected development programs in Retina and Neuroscience franchises

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
</tr>
</thead>
</table>
| **CJM112** Anti-IL17A | - High affinity for the target and *in-vitro* potency  
- Focus on new indications, e.g. multiple sclerosis |
| **BAF312** S1P Modulator | - Potent S1P1/S1P5-selective agonist  
- Ongoing study in secondary progressive MS  
- Potential new indications in evaluation, e.g. polymyositis |
| **E10030** Anti-PDGF | - Phase III studies for wet AMD on track  
- Planned submissions 2016 |
|           | - Includes two therapeutic approaches to reduce amyloid beta  
- Phase III with Banner Alzheimer’s Institute planned to start in 2015 |

---

† Also known as OAP030. E10030 (Fovista®) is being developed by Ophthotech Corp. Ophthotech has licensed ex-US commercialization rights to Novartis under a Licensing and Commercialization Agreement.
And finally... We aspire to revolutionize the treatment of CML and go from ‘caring to curing’

Transform CML treatment with Glivec® and Tasigna®
Redefine therapy with Tasigna® TFR
Revolutionize SoC with ABL001

CML mortality rate in the US (1975-2011)

Tasigna® TFR data expected in 2016

ABL001 induced reduction in BCR ABL transcripts in refractory CML (Pre-clinical)

LoE in US and Europe in 2016
Data expected in mid-2016
ABL001+ nilotinib Ph I ongoing

1 Treatment Free Remission (TFR)
2 Standard of Care (SoC)
3 Primary endpoint: % of patients without confirmed loss of MR4.0 or loss of MMR (Major Molecular Response) at 1 year (and no reinitiation of nilotinib therapy) after stopping Tasigna®
The Pharma journey: Trend to increase margin, while investing to transform portfolio and absorbing Gx impact

Selected drivers of sales evolution

Illustrative timing

- **Gx: Diovan®, Exforge®, E. Patch¹, Glivec®**
- **Gx: Afinitor®, Gilenya®**

1. Productivity improvements and effective resource allocation / prioritization
2. Current Growth Products and new Oncology assets²
3. New launches (incl. Entresto™ / Cosentyx® / Onco)³

---|---|---|---|---|---|---
Margin expansion | Growth from New Onco & fueling new launches | Transformed portfolio benefitting from launches

1. Exelon® Patch
2. Growth Products comprise products launched in a key market (EU, US, Japan) in 2010 or later, or products with exclusivity until at least 2019 in key markets. Growth Products include newly acquired Oncology assets as of March 2015
3. Entresto™ is a trade name conditionally approved by the FDA for LCZ696. Onco launches include Jadenu™ and Farydak® and assets as per filing chart
Pharmaceuticals Division Executive Leadership Team

** Functions **

- Robert Karsunky: Chief Financial Officer
- Vas Narasimhan: Global GenMeds Development
- Sean Reilly: Legal
- Laura McKeaveney: Human Resources
- Pierre-Alain Ruffieux: Quality Assurance
- Juan Andres: TechOps
- Catherine Steele: Communications & Patient Relations

** Business Operations **

- David Epstein: Pharmaceuticals Division Head
- Dirk Kosche: Japan
- Usman Azam: Cell & Gene Therapies Unit
- Rainer Boehm: Chief Commercial Officer
- Bruno Strigini: Oncology
- Guido Guidi: Europe
- Carlos D. Garcia: AMAC (Asia-Pacific, Middle East and African Countries)
- Christi Shaw: USA
- Fabrice Chouraqui: LACan (Latin America and Canada)
- Xudong Yin: China

---

1 Includes Cell & Gene Development and TechOps
2 Includes Oncology Development
### Overview of approvals

#### New chemical/molecular entity (NCE/NME) approvals for selected companies (2009 – Q1 2015)

<table>
<thead>
<tr>
<th>Company</th>
<th>EU EMA</th>
<th>US FDA</th>
<th>Japan PMDA</th>
<th>China SFDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novartis</td>
<td>14</td>
<td>8</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Merck/SGP</td>
<td>5</td>
<td>4</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Pfizer/Wyeth</td>
<td>8</td>
<td>6</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>GSK</td>
<td>10</td>
<td>7</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>J&amp;J</td>
<td>11</td>
<td>7</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>BMS</td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>AstraZeneca</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Roche/Genentech</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Sanofi</td>
<td>9</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Eli Lilly</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Bayer</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

**Note:** Does not include vaccines. Includes compounds acquired through mergers and acquisitions. EU approvals for all companies are inclusive of fixed-dose combinations.

**Source:** FDA, EMA, PMDA, CFDA websites (snapshot as of April 2, 2015)
<table>
<thead>
<tr>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>BKM120</td>
<td>BYM338</td>
<td>KAE609</td>
<td>EGF816</td>
<td>ABL001</td>
</tr>
<tr>
<td>mBC ER+ AI resistant/mTOR</td>
<td>sIBM®</td>
<td>Malaria</td>
<td>Solid tumors</td>
<td>CML®</td>
</tr>
<tr>
<td>naive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PKC412</td>
<td>CTRL019</td>
<td>LCI699</td>
<td>INC280</td>
<td>ASB183</td>
</tr>
<tr>
<td>AML®</td>
<td>Acute lymphoblastic</td>
<td>Cushing’s disease</td>
<td>NSCLC®</td>
<td>Hematological tumors</td>
</tr>
<tr>
<td>leukemia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afinitor®</td>
<td>LEE011</td>
<td>AC2885</td>
<td>Afinitor®</td>
<td>BAF312</td>
</tr>
<tr>
<td>Non-functioning GI and lung</td>
<td>HR+ HER2+ advanced breast</td>
<td>Sec. prev. CV events</td>
<td>DLBCL®</td>
<td>Multiple sclerosis</td>
</tr>
<tr>
<td>NET®</td>
<td>cancer (postmenopausal</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>women)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arzerra®</td>
<td>E10030**</td>
<td>Arzerra®</td>
<td>Arzerra®</td>
<td>QAW039</td>
</tr>
<tr>
<td>CLL® (maintenance)</td>
<td>Wet AMD</td>
<td>NHL® (refractory)</td>
<td>NHL® (elapse)</td>
<td>Asthma</td>
</tr>
<tr>
<td>Arzerra®</td>
<td>RLX030</td>
<td>CTL019</td>
<td>LEE011</td>
<td>QAX576</td>
</tr>
<tr>
<td>CLL® (relapse)</td>
<td>Acute heart failure</td>
<td>DLBCL®</td>
<td>Solid tumors</td>
<td>Allergic diseases</td>
</tr>
<tr>
<td>Cosentyx®</td>
<td>Afinitor®</td>
<td>Gileny®</td>
<td>LEEO11</td>
<td>BGJ398</td>
</tr>
<tr>
<td>Ankylosing spondylitis®</td>
<td>TSC seizures</td>
<td>CIDP®</td>
<td>Solid tumors</td>
<td>Solid tumors</td>
</tr>
<tr>
<td>Cosentyx®</td>
<td>BKM120</td>
<td>Mekinist®+Tafinlar®</td>
<td>Lucentis®</td>
<td>BGS649</td>
</tr>
<tr>
<td>Psoriatic arthritis®</td>
<td>mBC ER+ post AI and mTOR</td>
<td>Melanoma (adjacent)</td>
<td>ROP®</td>
<td>OHH®</td>
</tr>
<tr>
<td>inhibitor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PKC412</td>
<td>Ilaris®</td>
<td>Promacta®/Revolade®</td>
<td>QMF149</td>
<td>BYL719</td>
</tr>
<tr>
<td>ASM®</td>
<td>Hereditary periodic fevers</td>
<td>MDS®</td>
<td>Asthma</td>
<td>Solid tumors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lucentis®</td>
<td>Votrient®</td>
<td>QVM149</td>
<td>CAD106</td>
</tr>
<tr>
<td></td>
<td>CNV and ME®</td>
<td>Renal cell carcinoma</td>
<td>Asthma</td>
<td>Alzheimer’s disease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(adjunct)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mekinist®+Tafinlar®</td>
<td>Zykadia®™ (first line,</td>
<td></td>
<td>CJM112</td>
</tr>
<tr>
<td></td>
<td>NSCLC®</td>
<td>treatment-naive)</td>
<td></td>
<td>Immune disorders</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Promacta®/Revolade®</td>
<td>Zykadia®™</td>
<td>FCR001</td>
<td>LCZ696</td>
</tr>
<tr>
<td></td>
<td>MDS/AML (associated</td>
<td>Alk+ NSCLC®</td>
<td>Renal transplantation</td>
<td>Heart failure (PEF)®</td>
</tr>
<tr>
<td></td>
<td>thrombocytopenia</td>
<td>(brain metastasis)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tasigna®</td>
<td>KAF156</td>
<td>Stem cell transplantation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CML® treatment-free</td>
<td>Malaria</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>remission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tekturna®</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heart failure®</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Signor®</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LAR®12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cushing’s disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Filed in EU and US in Q2 2015
** Also known as OAP030. E10030 (Fovista®) is being developed by Ophthotech Corp. Ophthotech has licensed ex-US commercialization rights to Novartis under a Licensing and Commercialization Agreement

7 Acute myeloid leukemia
2 Neuroendocrine tumors
3 Chronic lymphocytic leukemia
4 Aggressive systemic mastocytosis
5 Sporadic inclusion body myositis
6 Tuberculous sclerosis complex
7 Choroidal neovascularization (CNV) and macular edema (ME) secondary to conditions other than macular degeneration, diabetic macular edema, retinal vein occlusion and pathologic myopia
8 Non-small cell lung cancer
9 Myelodysplastic syndrome
10 Chronic myeloid leukemia
11 Reduction of CV death/hospitalization in chronic heart failure patients
12 Long-acting release
13 Secondary prevention of cardiovascular events
14 Non-Hodgkins lymphoma
15 Diffuse large B-cell lymphoma
16 Chronic inflammatory demyelinating polyradiculoneuropathy
17 Retinopathy of prematurity
18 Chronic obstructive pulmonary disease
19 Obese hypogonadal hypogonadism
20 Preserved ejection fraction
Key definitions

This presentation contains several important words or phrases that we define as below:

- **ACQ**: Asthma Control Questionnaire
- **AI**: Aromatase Inhibitor
- **ALK+ NSCLC**: Anaplastic Lymphoma Kinase positive (ALK+) Non-Small Cell Lung Cancer (NSCLC)
- **Approval**: In Pharmaceuticals, Alcon and Vaccines in US and EU; each indication and regulator combination counts as approval; excludes label updates, CHMP opinions alone, and minor approvals
- **ASAS40**: 40% improvement in the Assessment of Spondyloarthritis International Society criterion
- **ASCO**: American Society of Clinical Oncology
- **COPD**: Chronic Obstructive Pulmonary Disease
- **CR**: Complete Response
- **DLBCL**: Diffuse Large B Cell Lymphoma
- **ER+**: Estrogen Receptor positive
- **FDA**: US Food and Drug Administration
- **FIH**: First In Human trial
- **FL**: Follicular Lymphoma
- **FFPV**: First Patient First Visit
- **GITR**: Glucocorticoid-Induced Tumor necrosis factor Receptor
- **Growth Products**: Growth products comprise products launched in a key market (EU, US, Japan) in 2010 or later, or products with exclusivity until at least 2019 in key markets
- **HFrEF / HRpEF**: Heart failure with reduced ejection fraction and preserved ejection fraction, respectively
- **HR+/HER2-**: Hormone Receptor positive, Human Epidermal growth factor Receptor 2 negative
- **ICS**: Inhaled Corticosteroid
- **LABA**: Long-Acting Beta2 Agonist
- **LAMA**: Long-Acting Muscarinic Antagonist
- **LOCF**: Last Observation Carried Forward
- **mBC**: metastatic Breast Cancer
- **MF**: Myelofibrosis
- **MMR**: Major Molecular Response
- **mtOR**: mammalian Target Of Rapamycin
- **mTSS**: modified Total Sharp Score for PsA including both erosions and joint space narrowing
- **NSCLC**: Non-Small Cell Lung Cancer
- **ORR**: Overall Response Rate
- **OS**: Overall Survival
- **PD**: Progressive Disease
- **PR**: Partial Response
- **QoL**: Quality of Life
- **r/r ALL**: Relapsed / refractory Acute Lymphoblastic Leukemia (ALL)
- **sIBM**: Sporadic Inclusion Body Myositis
- **SD**: Stable Disease
- **SoC**: Standard of Care
- **STING**: Stimulator of Interferon Genes
- **TFR**: Treatment Free Remission