Meet Novartis Management Pharmaceuticals Business Unit

May 31, 2017
Disclaimer

This presentation contains forward-looking statements that can be identified by terminology such as "potential," "expected," "will," "planned," or similar expressions, 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 outcome of the announced review of options being undertaken to maximize shareholder value of the Alcon Division; or regarding the potential financial or other impact on Novartis or any of our divisions of the significant reorganizations of recent years, including the creation of the Pharmaceuticals and Oncology business units to form the Innovative Medicines Division, the creation of the Global Drug Development organization and Novartis Operations (including Novartis Technical Operations and Novartis Business Services), the transfer of the Ophthalmic Pharmaceuticals products of our Alcon Division to the Innovative Medicines Division, the transfer of selected mature, non-promoted pharmaceutical products from the Innovative Medicines Division to the Sandoz Division, and the transactions with GSK, Lilly and CSL; or regarding the potential impact of the share buyback plan; or regarding potential future sales or earnings of the Novartis Group or any of its divisions; 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 review of options being undertaken to maximize shareholder value of the Alcon Division will reach any particular results, or at any particular time. 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 significant reorganizations of recent years, including the creation of the Pharmaceuticals and Oncology business units to form the Innovative Medicines Division, the creation of the Global Drug Development organization and Novartis Operations (including Novartis Technical Operations and Novartis Business Services), the transfer of the Ophthalmic Pharmaceuticals products of our Alcon Division to the Innovative Medicines Division, the transfer of selected mature, non-promoted pharmaceutical products from the Innovative Medicines Division to the Sandoz Division, and the transactions with GSK, Lilly and CSL. Neither can there be any guarantee that shareholders will achieve any particular level of shareholder returns. Nor can there be any guarantee that the Group, or any of its divisions, will be commercially successful in the future, or achieve any particular credit rating or financial results. In particular, management's expectations could be affected by, among other things: regulatory actions or delays or government regulation generally; the potential that the strategic benefits, synergies or opportunities expected from the significant reorganizations of recent years, including the creation of the Pharmaceuticals and Oncology business units to form the Innovative Medicines Division, the creation of the Global Drug Development organization and Novartis Operations (including Novartis Technical Operations and Novartis Business Services), the transfer of the Ophthalmic Pharmaceuticals products of our Alcon Division to the Innovative Medicines Division, the transfer of selected mature, non-promoted pharmaceutical products from the Innovative Medicines Division to the Sandoz Division, and the transactions with GSK, Lilly and 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 the research and development of new healthcare products, including clinical trial results and additional analysis of existing clinical data; our ability to obtain or maintain proprietary intellectual property protection, including the ultimate extent of the impact on Novartis of the loss of patent protection and exclusivity on key products which commenced in prior years and will continue this year; safety, quality or manufacturing issues; global trends toward healthcare cost containment, including ongoing pricing and reimbursement pressures, such as from increased publicity on pharmaceuticals pricing, including in certain large markets; uncertainties regarding actual or potential legal proceedings, including, among others, actual or potential product liability litigation, litigation and investigations regarding sales and marketing practices, intellectual property disputes and government investigations generally; 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; and uncertainties regarding potential significant breaches of data security or data privacy, or disruptions of our 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 presentation 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.
Key Messages

1. Continued momentum for Entresto® by expanding prescriber breadth and depth, improving access and affordability, and increasing ex-US contribution

2. Strong uptake of Cosentyx® across indications and geographies, reflecting best-in-class profile, with a competitive window in SpA, a market opportunity that could rival that of RA

3. Five strong franchises with expanding therapeutic depth, poised for future growth, fueled by a strong pipeline and recent external deals (e.g. atopic dermatitis, NASH, presbyopia and dry eye)
Novartis Pharmaceuticals: Our priorities

1. Ensure Entresto® and Cosentyx® success
2. Focus on commercial execution
3. Prepare for data read-outs and new launches
4. Culture
Five strong franchises with expanding therapeutic depth

### Key assets

**2016 net sales (USD m) and growth vs. PY (in cc)**

<table>
<thead>
<tr>
<th>Franchise</th>
<th>2016 Net Sales</th>
<th>Growth vs. PY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardio-Metabolic (CM)</td>
<td>170 (n.m.)</td>
<td></td>
</tr>
<tr>
<td>Immunology Dermatology (I&amp;D)</td>
<td>1,128 (334%)</td>
<td></td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>1,835 (-8%)</td>
<td></td>
</tr>
<tr>
<td>Neuroscience (NS)</td>
<td>3,109 (14%)</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td>835 (+15%)</td>
<td>363 (+38%)</td>
</tr>
</tbody>
</table>

### Pipeline assets and opportunities

<table>
<thead>
<tr>
<th>Franchise</th>
<th>Assets and Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardio-Metabolic (CM)</td>
<td>Entresto® (pEF, post-acute MI)</td>
</tr>
<tr>
<td>Immunology Dermatology (I&amp;D)</td>
<td>Cosentyx® (NrAxSpA)</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>RTH258 (brolucizumab)</td>
</tr>
<tr>
<td>Neuroscience (NS)</td>
<td>BAF312 (siponimod)</td>
</tr>
<tr>
<td>Respiratory</td>
<td>QAW039 (fevipiprant)</td>
</tr>
</tbody>
</table>

### Recent deals

**Examples incl. both BD&L and M&A**

<table>
<thead>
<tr>
<th>Franchise</th>
<th>Recent Deals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardio-Metabolic (CM)</td>
<td>IONIS / AKCEA (AKCEA-APO(a)-LRx and AKCEA-APOIII-LRx)¹</td>
</tr>
<tr>
<td>Immunology Dermatology (I&amp;D)</td>
<td>Ziarco (Atopic Dermatitis)</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>Encore Vision, Inc (Presbyopia, topical Rx medicine)</td>
</tr>
<tr>
<td>Neuroscience (NS)</td>
<td>Amgen (Migraine, territory expansion for AMG 334)</td>
</tr>
<tr>
<td>Respiratory</td>
<td>Utibron® Breezhaler® (Out-licensing in US territory only)</td>
</tr>
</tbody>
</table>

---

1. Option to in-license subject to customary closing conditions and regulatory approval
2. Option exercise is pending antitrust review
Building industry leading presence in heart failure and CV specialty

<table>
<thead>
<tr>
<th>Now</th>
<th>2018/19</th>
<th>2020-21</th>
<th>&gt;2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entresto® HFrEF</td>
<td>Late stage pipeline ACZ885, CVRR</td>
<td>Extending Entresto® footprint across HF (HFpEF, HFpost-MI PARAGON and PARADISE)</td>
<td>Early pipeline LIK066, weight loss CVRR Apo(a)-LRx, ApoCII-LRx lipid CVRR Neprilysin inhibition in rHTN</td>
</tr>
</tbody>
</table>

- Entresto® launch in HFrEF laying foundation for CM infrastructure
- Attractive pipeline based on differentiated biology addressing new pathways
- Driving growth in US, full geographic ownership of all pipeline assets
Entresto® progressing steadily

- Q1 sales of USD 84m, with US contributing 2/3
- NBRx growth accelerating, now >2,300 per week
- US field force expansion complete as of Feb 2017

Weekly NBRx

Weekly TRx

1. US data, NBRx and TRx across specialties from week ending July 10, 2015 to May 5, 2017 (Source: IMS)
Investments in place to support further uptake among both cardiologists and PCPs

Share of HFrEF potential addressed\(^1\)

Coverage of Rx potential increasing

- **Launch**: Jul 2015
- **1st wave**: Apr 2016
- **2nd wave**: Sep 2016 – Feb 2017

Weekly new prescribers\(^2\)

- > 640 per week

1. US data, HFrEF potential defined as TRx volume specific to HFrEF indication across a predefined group of physicians across both cardiology and PCPs (Source: IMS). 1\(^{st}\) wave and 2\(^{nd}\) wave refer to field force expansion.
2. US data, weekly new prescribers across both cardiology and PCPs (Source: IMS); data from week ending Jul 10, 2015 to week ending May 5, 2017.
Continued momentum expected in 2017 given strong breadth and depth trends

**Breadth**
Cardiologist breadth has doubled and nearly two-thirds have prescribed

**Depth**
Number of Cardiologist with >15 TRx has quadrupled

---

US: More than half of Medicare patients with no PA requirement anymore

Share of insured patients¹

<table>
<thead>
<tr>
<th></th>
<th>Medicare</th>
<th>Commercial insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>YE 16</td>
<td>70%</td>
<td>45%</td>
</tr>
<tr>
<td>Q1 17</td>
<td>62%</td>
<td>45%</td>
</tr>
<tr>
<td>Q2 17</td>
<td>36%</td>
<td>43%</td>
</tr>
</tbody>
</table>

Prior Authorization criteria²

- No PA
- Simple PA
- Complex PA

For the majority of potentially eligible patients⁴
- Preferred formulary listing
- Improved affordability

¹ Insured patients in either the Medicare or commercial insurance segment; across national and regional plans
² "Simple" defined as “1 page Entresto® specific form with few check boxes based on label criteria. “Complex” defined as “generic form (fill in info) and complex criteria” (Source: Formulary Data on file, Novartis March 2017)
³ Based on latest available data in Q2’17, week ending April 28
⁴ Applicable to both Medicare and Commercial Insurance
Continued progress with pricing and reimbursement globally

Access across the world
80 countries approved

Highlights and expectations 2017
- Reimbursed launches in Italy, Canada, Australia
- Value ofEntresto® reflected in final price secured in Germany
- Reimbursed launches in France expected in Q3

1. National reimbursement granted in Italy; regional implementation ongoing. Canada national price approval (January), provincial listing in Quebec (March) and Ontario (April), Australia listing granted as of June
2. In Germany, price secured and ‘Praxisbesonderheit’ granted in March
ACZ885 could address the need for anti-inflammatory therapies to lower CV risk post MI

Post-MI Prevalence¹

Million

- 10+
- ~40%
- Patients with MI history in G7
- With high inflammation burden²

Unmet need: Moving beyond LDL

- No treatment currently available for patients with high inflammation burden post-MI
- New approach to address inflammation’s role in plaque formation and disruption
- CANTOS designed to show reduction of CV risk post MI (> 10,000 patients randomized)
- CANTOS on track for mid-2017 read out

¹. US AHA (Heart Disease & Stroke Stats 2016 update – e255), EU5 & JP Kantar Health EPI database
². CANTOS trial baseline
Strengthening our leadership by targeting new frontiers in key specialty areas

<table>
<thead>
<tr>
<th>Specialty Area</th>
<th>Now</th>
<th>2019-22</th>
<th>2022-23</th>
<th>&gt;2024</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dermatology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rheumatology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatology &amp; Transplant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psoriasis</td>
<td>Xolair omalizumab</td>
<td>Next generation Bx in CSU QGE031 (ligelizumab)</td>
<td>Atopic dermatitis (ZPL389) Hidradenitis suppurativa</td>
<td>Early pipeline vitiligo etc</td>
</tr>
<tr>
<td>PsA, AS</td>
<td>PsA, AS Orphan</td>
<td>nrAxSpA, superiority H2H vs. adalimumab</td>
<td>primary Sjoegren's syndrome (VAY736 etc)</td>
<td>Early pipeline</td>
</tr>
<tr>
<td>CSU</td>
<td>Cosentyx (secukinumab)</td>
<td>Cosentyx (secukinumab)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ilaris (canakinumab)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neoral, Simulect, Zortress, Myfortic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto-immune hepatitis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NASH (LJN452) (VAY785)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combo NASH treatments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cosentyx® momentum continued, reflecting best-in-class profile

Quarterly net sales evolution
USDm

Key differentiators
- Only anti-IL17A approved in PsO, PsA & AS
- Only fully human anti-IL17A, with almost zero immunogenicity\(^1,2\) and high regain of response\(^3\)
- Unique long-term efficacy (4 years in PsO\(^4\), 3 years in PsA\(^5\), 2 years in AS\(^6\))
- New data suggesting potential for disease modification in psoriasis\(^7\)

---

3. Based on PASI 75 (Blauvelt et al. Late Breaker Poster presentation, AAD 2016)  
4. Bissonette R. et. al Late Breaker Oral Presentation EADV 2016  
5. Mease et al. ACR Annual Meeting Oral presentation Abstract 916 2016 Washington DC  
Strong uptake across indications and geographies

US PsA/AS: Weekly share of NBRx

DE PsO: Monthly value share

Note: all trademarks are the property of their respective owners

1. IMS NPA data week ending 1 Jan 2016 to 05 May 2017. NBRx from Rheumatology specialty and allocated for PsA and AS indications only based on anonymized patient data. Simponi®, Cimzia® not shown. Remicade® excluded from analysis

2. IMS (Office based dermatologists, value share in biologics market, plus Otezla, not represented in the graph)
Cosentyx® is rapidly penetrating ex-US across indications

**Leading new patient capture in EU in psoriasis**
Share and rank: DE, FR, ES, UK, IT

<table>
<thead>
<tr>
<th>Segment share %</th>
<th>Segment rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany (40%)</td>
<td>#1</td>
</tr>
<tr>
<td>France (30%)</td>
<td>#2</td>
</tr>
<tr>
<td>Spain (35%)</td>
<td>#1</td>
</tr>
<tr>
<td>United Kingdom (34%)</td>
<td>#1</td>
</tr>
<tr>
<td>Italy (32%)</td>
<td>#1</td>
</tr>
</tbody>
</table>

**Rapidly growing patient capture in SpA**
Share and rank: DE, FR, ES, UK, IT

<table>
<thead>
<tr>
<th>Segment share %</th>
<th>Segment rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany (20%)</td>
<td>#2</td>
</tr>
<tr>
<td>France (35%)</td>
<td>#1</td>
</tr>
<tr>
<td>Spain (28%)</td>
<td>#1</td>
</tr>
<tr>
<td>United Kingdom (22%)</td>
<td>#2</td>
</tr>
<tr>
<td>Italy (N/A)</td>
<td></td>
</tr>
</tbody>
</table>

---

1. Source: IMS LRx (DE, FR), Market Research Amber (ES), HSML (UK). Data update: Feb17 rolling quarter (DE, FR), Mar17 rolling quarter (UK), Q1 17 (ES), Q4 16 (IT). Segment defined as: Humira, Enbrel, Remicade, other TNF, Stelara, Cosentyx and Biosimilars
2. Source: IMS LRx (DE, FR), Market Research Amber (ES), HSML (UK). Data update: Feb17 rolling quarter (DE, FR), Mar17 rolling quarter (UK), Q1 17 (ES), IT just launched (data not yet robust). Segment defined as: Humira, Enbrel, Remicade, other TNF, Stelara, Cosentyx and Biosimilars

Note: All trademarks are the property of their respective owners. Patient share calculated across naive and switch segment as weighted average (ES based on mathematical average)
**Cosentyx® has best-in-class profile with strong and sustained efficacy across indications**

<table>
<thead>
<tr>
<th>Efficacy</th>
<th>Psoriasis</th>
<th>Psoriatic Arthritis</th>
<th>Ankylosing Spondylitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>✓ vs. Enbrel® and Stelara®</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2 year</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3 year</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4 year</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Safety**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse events</td>
<td>Favorable safety profile similar to etanercept and ustekinumab¹,²,⁶</td>
</tr>
<tr>
<td>Injection site reactions</td>
<td>Almost zero injection site reactions¹</td>
</tr>
<tr>
<td>Immunogenicity</td>
<td>Very low immunogenicity¹²,¹³</td>
</tr>
<tr>
<td>Re-treatment</td>
<td>95% recapture of response¹⁴</td>
</tr>
</tbody>
</table>

3. Thaci D, et al. JAAD, 2015; 73, 3, 400–409
5. Bistonette et al. Late Breaker Poster presentation, EADV 2016
14. Blauvelt et al. Late-Breaker Poster presentation, AAD 2015
20. Novartis Data on File 2016. FUTURE 1 Data Tables; 14.2-1.9a, 14.2-7.9a, 14/2-12.8a
22. Novartis Data on File. 2015. MEASURE 2 Clinical Study Report;
24. Novartis Data on File 2015. Week 104 Data Tables 14.2-1.5 and 14.2-2.5; All trademarks are the property of their respective owners
SpA market has potential to rival RA with a 2017 competitive window¹ for Cosentyx®

<table>
<thead>
<tr>
<th>Number of patients²</th>
<th>Sales 2016³</th>
<th>CAGR³</th>
</tr>
</thead>
<tbody>
<tr>
<td>US &amp; EU5, in millions</td>
<td>US &amp; EU5, in USD bn</td>
<td>2011-16</td>
</tr>
<tr>
<td>RA⁴ synovitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.8</td>
<td>19.3</td>
<td>14%</td>
</tr>
<tr>
<td>PsA⁵</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>4.1</td>
<td>19%</td>
</tr>
<tr>
<td>AS⁶</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>3.5</td>
<td>17%</td>
</tr>
</tbody>
</table>

¹. mAb entrants only; ixekizumab expected to be approved for PsA at the end of 2017 / early 2018 and for AS in H2 2018; no other IL-17 or p19 expected to be approved in PsA or AS in 2017-2019
². Source: Decision Resources Epidemiology Database 2016
³. Source: PsA, AS & RA market size from IMS PADDS Monthly & IMS Medical Data, Dec 2016
⁴. Rheumatoid Arthritis (RA) segment includes anti-TNFs (Remicade®, Humira®, Enbrel®, Cimzia® and Simponi®), Selective costimulation modulators (Ocrevus®), IL-1 (Kineret®), JAK inhibitors (Xeljanz®), IL-6 (Actemra®) and CD20 (MabThera®)
⁵. PsA segment includes anti-TNFs (Remicade®, Humira®, Enbrel®, Cimzia® and Simponi®), IL-12/23 (Stelara®) and IL-17 (Cosentyx®)
⁶. AS segment includes anti-TNFs (Simponi®, Cimzia®, Remicade®, Humira®, Enbrel®) and IL-17 (Cosentyx®)

Note: All trademarks are the property of their respective owners.
Cosentyx® selectively targets IL-17A, a key cytokine involved in enthesitis driven PsA & AS

Early Rheumatoid Arthritis (RA)  
Early psoriatic Arthritis (PsA)  
Early Ankylosing Spondylitis (AS)

Synovitis  
Enthesitis  
Enthesitis

1. Harrison Principles of Internal Medicine 18th ed Ch 321 & 325  
IL-17A plays a key role in enthesitis and structural damage in AS and PsA

**Healthy**

**PsA**

Enthesitis

Mechanical stress & genetics

Bone erosion

& new bone formation

**Bone disease**

Erosion

**AS**

Enthesitis

New bone formation

& erosion

**Structural damage**

**Signs & symptoms**

a) IL-17 along with other relevant cytokines are produced from Th17 T cells, γδ T cells ILC3, iNKTT cells, CD4/CD8 T cells, mast cells and neutrophil cells.  
b) Bone erosion precedes new bone formation in AS and PsA. IL-17, IL-22, TNFα, IL12-23 involved in erosion.  
c) IL-17 and IL-22 cytokines involved in new bone formation based on animals models.  

References:

1. Cosentyx Summary of Product Characteristics. 2017  
Signs & symptoms: Fully-human Cosentyx® delivers strong and sustained relief

PsA: ACR20/50/70 responder rates
3-year data from FUTURE 1 Phase III trial in anti–TNF-naive patients

ASAS 20/40 responder rates
2-year data from MEASURE 1 Phase III trial in anti-TNF-naive population

2. As observed analysis; PASI: Psoriasis Area and Severity Index score
4. Novartis Data on File 2016; FUTURE 1 Data Tables; 14.2-1.9a, 14.2-7.9a, 14.2-12.8a
6. NCT02745080
8. Novartis Data on File 2015. Week 104 Data Tables
13. 1. 'Best-in-class' refers to best in the IL17 class based on demonstrated long-term efficacy (4 years in PsO, 3 years in PsA, 2 years in AS), 2 year inhibition of disease progression data (PsA and AS), 95% recapture of response (PsO) and a favorable safety profile with very low injection site reactions and almost zero immunogenicity
14. The only published PhIII data of any IL17 relate to Cosentyx® (Source: Seminars in Cutaneous Medicine and Surgery (Supplement 7) 15 Blauvelt et al. Late Breaker Poster presentation, AAD 2015
Structural damage: Cosentyx® inhibits disease progression over two years in PsA & AS

Cosentyx® inhibits structural progression in over 84% of PsA patients over 2 years

Cosentyx® inhibits structural progression in over 80% of AS patients over 2 years

a) Non-progression defined as a change in mSASS from baseline ≤0; overall population, data from the MEASURE 1 study, in which patients received intravenous loading doses of secukinumab

b) Non-progression defined as a change in mTSS from baseline ≤0.5; overall population (observed data), data from the FUTURE1 study, in which patients received intravenous loading doses of secukinumab

Extending ophthalmology leadership into new diseases and differentiated medicines

2017 | 2018-2020 | 2021 | 2022 | 2023 | 2024+
--- | --- | --- | --- | --- | ---
RTH258 (Brolucizumab) (nAMD) | UKG489 (AOM) | RTH258 (Brolucizumab) (DME) | ECF843 (Dry Eye Rx) | UNR844 (Presbyopia) | Early Pipeline Sensory Hearing Loss, Geographic Atrophy, Dry Eye

Current commercial Leadership¹
Lucentis #1 in Retina ex-US, Systane #1 in Artificial Tears (OTC Dry Eye), #2 in overall glaucoma portfolio globally

Diversified pipeline
high-risk, high-reward as well as programs with known molecules & pathways

Diversified indication mix
multiple potential major indications such as nAMD, DME, Dry Eye, Presbyopia, and Acute Otitis Media (AOM)

First mover, new indications
Presbyopia & AOM with little or no competition

¹. Based on 2016 Full Year market data
nAMD: Important unmet needs remain for next generation of differentiated anti-VEGFs

Neovascular AMD Epidemiology

- AMD is a leading cause of vision loss in people aged over 50\(^1\)
- Nearly 1 million potential neovascular AMD patients in US, EU5 and Japan alone\(^2\)

<table>
<thead>
<tr>
<th>Region</th>
<th>Potential Patient Population(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>~394k</td>
</tr>
<tr>
<td>EU5</td>
<td>~407k</td>
</tr>
<tr>
<td>Japan</td>
<td>~56k</td>
</tr>
<tr>
<td>Total US + EU5 + Japan</td>
<td>~0.9 mn</td>
</tr>
</tbody>
</table>

Unmet needs in nAMD

- Strong unmet need for treatments that have a higher duration of action, to allow for longer time intervals between injections\(^3,4\)
- Physicians seek retinal fluid resolution as a majority consider fluid recurrence a major indicator of recurrent neovascular AMD\(^4\)
- nAMD patients experience long term visual decline

3. Novartis analyses
4. Age-related Macular Degeneration, FirstWord Therapy Trends, June 2016

Image source: [https://commons.wikimedia.org/wiki/File:Eye_disease_simulation,_age-related_macular_degeneration.jpg](https://commons.wikimedia.org/wiki/File:Eye_disease_simulation,_age-related_macular_degeneration.jpg)
Our NS franchise strategy is to continue our specialty focus across four pillars

<table>
<thead>
<tr>
<th>Now</th>
<th>2018</th>
<th>2019-22</th>
<th>&gt;2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustain leadership in</td>
<td>Expand in Specialty Neurology &amp; Psychiatry</td>
<td>Lead innovative (neuro) muscular therapies</td>
<td>Advancing in Alzheimer’s Disease</td>
</tr>
<tr>
<td>Multiple Sclerosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMG 334 (Erenumab) (migraine</td>
<td>EMA401 (Neuropathic Pain)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTY720 (Fingolimod) (Pediatric MS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAF312 (Siponimod) (MS*)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BYM338 (Hip fracture recovery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BYM338 (Hip fracture recovery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMA401 (Neuropathic Pain)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LMI070 (Spinal Muscular Atrophy)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*RMS in US; EU – discussions ongoing

Early Pipeline
Alzheimer’s, neuropathic Pain depression
AMG 334 (Erenumab)¹ on track with potential to be a game changer in migraine prevention

- High unmet medical need. Current SoC efficacy and tolerability profiles result in a low treatment persistency²
- Fully human, potent, selective CGRP antagonist targeting receptor. Unlike current SoC, erenumab was specifically designed for migraine prevention
- Consistent data in four Phase II/III clinical studies. Efficacy and safety profile well received at recent AAN congress
- On track to be first-in-class: Submitted in US and EU in Q2 2017

Electron microscopy and density map of erenumab and the CGRP receptor
Blue structure is erenumab molecule, the other colored structures represent the different components of the complex structure of the receptor

1. Development in collaboration with Amgen; Novartis has AMG 334 commercialization rights outside of US, and Japan and co-commercialization rights in US
2. Hepp et al. Cephalalgia 2016; 0 (0): 1 - 16
AMG 334 (Erenumab) has blockbuster potential for Novartis

2018 migraine patients in US, Canada & EU5

<table>
<thead>
<tr>
<th>Million</th>
<th>EU5/CA</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total prevalence</td>
<td>74</td>
<td>37</td>
</tr>
<tr>
<td>Diagnosed</td>
<td>41</td>
<td>18</td>
</tr>
<tr>
<td>Diagnosed ≥ 4 MMD</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td>Prophylactically treated</td>
<td>9</td>
<td>7</td>
</tr>
</tbody>
</table>

Recent agreement with Amgen (announced on April 24, 2017)
- Erenumab to be co-commercialized by Amgen and Novartis in the US, leveraging and expanding the existing Novartis neurology field force
- Novartis has exclusive rights to commercialize erenumab in RoW (except Japan), including Canada

Targeting unmet medical need
Ongoing dedicated Ph IIIb clinical trial focusing on patients who failed current standard of care

Opportunity to expand treated patient pool by tapping into “latent” patients, who disengaged from current SoC due to unsuccessful treatment

1. Development in collaboration with Amgen; Novartis has AMG 334 commercialization rights outside of US, and Japan and co-commercialization rights in US (for the US Amgen will book sales and Novartis will book royalties in “other revenues”)
2. Source: internal estimates based on Decision Resources Report, 2014 and 2011 data from Statistics Canada and Primary Market Research; EU5: France, Germany, UK, Italy and Spain
Novartis continues to be a leader in innovation across the MS disease spectrum

1. Based on US label (relapsing MS)  2. Fingolimod is also being developed for Pediatric MS; 3. Atlas of MS, Decision Resources epidemiology data, Novartis analysis; remaining portion of market: ~10% PPMS
### Leading Respiratory science with diverse pipeline to address highest unmet needs

<table>
<thead>
<tr>
<th></th>
<th>Now</th>
<th>2019-22</th>
<th>&gt;2023</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COPD</strong></td>
<td>Lead in Severe Asthma and drive the shift from ICS/LABA in COPD</td>
<td>Lead connected offering, expand in asthma &amp; drive CF innovation</td>
<td>Lead Respiratory science with novel targets and disease-modifying treatments</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="ultibro™ Breezhaler®" /></td>
<td><img src="image" alt="Lead innovations offering connected devices &amp; services" /></td>
<td>Early pipeline Potential disease-modifying therapies</td>
</tr>
<tr>
<td><strong>Asthma</strong></td>
<td></td>
<td></td>
<td>Early pipeline Potential disease-modifying therapies</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Xolair omalizumab" /></td>
<td><img src="image" alt="QAW039 (Fevipiprant)" /></td>
<td>Expand leadership in asthma</td>
</tr>
<tr>
<td><strong>Cystic Fibrosis</strong></td>
<td></td>
<td><img src="image" alt="TOBI" /></td>
<td>Early pipeline Potential combos and mutation agnostic programs</td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="image" alt="QBW251" /></td>
<td></td>
</tr>
</tbody>
</table>

*Image placeholders for products and therapies.*
Summary

• Continued momentum for Entresto®

• Strong uptake of Cosentyx® across indications and geographies

• Five strong franchises with expanding therapeutic depth, poised for future growth