# Meet Novartis Management 2020

## Agenda

**November 24, 2020**
All times in CET

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00 – 14:45</td>
<td><strong>Novartis Group</strong> (incl. CEO intro)</td>
</tr>
<tr>
<td>Break / 15 minutes</td>
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<tr>
<td>15:00 – 15:45</td>
<td><strong>Pipeline / R&amp;D</strong></td>
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<tr>
<td>Break / 60 minutes</td>
<td></td>
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<tr>
<td>16:45 – 17:30</td>
<td><strong>Pharmaceuticals</strong></td>
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<tr>
<td>Break / 15 minutes</td>
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<tr>
<td>17:45 – 18:30</td>
<td><strong>Oncology</strong></td>
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<tr>
<td>Break / 15 minutes</td>
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<tr>
<td>18:45 – 19:30</td>
<td><strong>Sandoz</strong></td>
</tr>
</tbody>
</table>
Disclaimer

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Welcome to the Meet Novartis Management 2020 interactive guide, which accompanies our investor day.

Use the navigation tabs above to go to any of the main sections in this document: Group, Key Assets, Sandoz and Appendix. And use the tabs within each of those sections to navigate further to our franchises and products featured here.

The arrows buttons top right allow you move through the section content. The home button will bring you back to this page to see the overview of all content below.

**Contents**

**Group**
- Where we are today
- Looking ahead
- Sandoz
- ESG
- Conclusion

**Key Assets**
- Overview
- IHD
  - Cosentyx®
  - Iscalimab
  - Ligelizumab
- CRM
  - Entresto®
  - Leqvio®
  - Pelacarsen
  -iptacopan
- Neuroscience
  - Kesimpta®
  - Branaplam
- Ophthalmology
  - Beovu®

**Oncology: Solid Tumors**
- Kisqali®
- Piqray®
- Tabrecta™
- Canakinumab
- 177Lu-PSMA-617
- TNO155
- LXH254

**Oncology: Hematology**
- Asciminib
- Sabatolimab

**Sandoz**
- Where we are today
- Strategy
- Biosimilars & Antibiotics
- Conclusion

**Appendix**
- Agenda
- Glossary
- References
In 2018, we set out a clear strategy that we are executing

Strategy set out in 2018...

Our focus
- Focus our company and capital
- Strengthen our core
- Accelerate certain geographies

Our five priorities
- Unleash the power of our people
- Go big on data and digital
- Deliver transformative innovation
- Embrace operational excellence
- Build trust with society

...is delivering...

✓ Consistent top-line growth
✓ Sustained bottom-line expansion

...while positioning Novartis for the long-term

✓ 100% focused as a medicines company
✓ Record-high engagement score
✓ Leading pipeline, with 4 advanced therapy platforms
✓ USD 2bn cost savings achieved over 2017-2020
✓ Building a leading digital and data science platform
✓ Improving ESG scores, industry leader across 3 key indices
## Strong operational performance over the past three years

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>% 2018 growth (cc)</th>
<th>2018</th>
<th>% 2019 growth (cc)</th>
<th>2019</th>
<th>% 9M 2020 growth (cc)</th>
<th>9M 2020</th>
<th>FY guidance³</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net sales</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>USD bn, growth cc²</td>
<td>42.3</td>
<td>+5%</td>
<td>44.8</td>
<td>+9%</td>
<td>47.4</td>
<td>+4%</td>
<td>35.9</td>
<td>To grow mid single digit</td>
</tr>
<tr>
<td><strong>Core² OpInc</strong></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>USD bn, growth cc²</td>
<td>11.7</td>
<td>+7%</td>
<td>12.6</td>
<td>+17%</td>
<td>14.1</td>
<td>+16%</td>
<td>11.9</td>
<td>To grow low double digit to mid teens</td>
</tr>
<tr>
<td><strong>Innovative Medicines</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Core² margin</td>
<td>31.0%</td>
<td>+1.0% pts</td>
<td>32.0%</td>
<td>+1.8% pts</td>
<td>33.5%</td>
<td>+2.7% pts</td>
<td>36.3%</td>
<td>Mid 30s⁴</td>
</tr>
<tr>
<td>%, growth cc²</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

1. Continuing operations excludes Alcon, includes the businesses of Innovative Medicines and Sandoz as well as the continuing corporate functions.  
2. Constant currencies (cc) and core results are non-IFRS measures.  
3. Guidance assumes that we see a continuation of the return to normal global healthcare systems including prescription dynamics, particularly ophthalmology, in Q4 2020. In addition, we assume that no Gilenya and no Sandozatin LAR generics enter in 2020 in the US.  
4. Historically Q4 margin lower due to seasonality.
We have focused the company

Our focus

Today, we present investors a unique profile
Diversified across geographies and TAs, while providing exposure to cutting-edge platforms

<table>
<thead>
<tr>
<th>Company</th>
<th># of TAs¹</th>
<th>Top-selling drug</th>
<th>Blockbusters</th>
<th>Advanced therapy platforms²</th>
<th>Geographical diversification % of total Rx sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandoz</td>
<td>10</td>
<td>8%</td>
<td>15</td>
<td>Cell Gene RLT RNA</td>
<td></td>
</tr>
<tr>
<td>Company 1</td>
<td>10</td>
<td>8%</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 2</td>
<td>10</td>
<td>41%</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 3</td>
<td>9</td>
<td>15%</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 4</td>
<td>9</td>
<td>27%</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 5</td>
<td>9</td>
<td>13%</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 6</td>
<td>8</td>
<td>15%</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 7</td>
<td>6</td>
<td>24%</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 8</td>
<td>6</td>
<td>14%</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 9</td>
<td>6</td>
<td>21%</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 10</td>
<td>4</td>
<td>9%</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 11</td>
<td>4</td>
<td>27%</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 12</td>
<td>3</td>
<td>18%</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 13</td>
<td>3</td>
<td>22%</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company 14</td>
<td>2</td>
<td>39%</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Only TAs (Therapeutic Areas) with annual 3rd party sales > USD 500m in 2019; TA definition as per Evaluate Pharma; manual adjustments to keep classification consistent vs. previous years. 2. Defined as net sales from one of the mentioned therapy platforms by 2025 according to Evaluate Pharma and publicly available pipeline information. Source: Evaluate Pharma 2020

US | Asia, Africa, Australasia | ex-US | EU | Canada & Latin America
Novartis business diversified geographically with modest US pricing exposure

Percentage of 2020 9M net sales
Continuing Operations

- **Canada & Latin America**: 7%
- **US**: 34%
- **Europe**: 38%
- **Rest of World**: 21%

**US**
Limited exposure to US compared to peers

**Canada & Latin America**

**Europe**
#1 pharma company in Europe by net sales
Deep experience navigating difficult pricing and reimbursement environments

**Rest of World**
China double-digit growth driving Emerging Growth Markets +7% cc

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We are making progress on culture, pipeline, and launch execution...

Our 5 priorities

Unleash the power of our people
Deliver transformative innovation
Embrace operational excellence
Go big on data and digital
Build trust with society

Significant progress on our culture journey

**Inspired – Engagement**

75
Pharma benchmark: 70
05/19  08/19  11/19  03/20  05/20  08/20

**Curious – Growth & learning**

74
Pharma benchmark: 70
05/19  08/19  11/19  03/20  05/20  08/20

**Unbossed – Manager effectiveness**

82
Manager recommendation score
+5 vs. benchmark

10 key approvals received over the past 3 years

1. Source: Quarterly Glint Engagement Survey Scores (out of 100).
2. Source: Team Perspectives, March 2020, 63k participants.
3. DLBCL.
4. rrAxSpA.
...as well as productivity, digitalization and ESG

Our 5 priorities

Advancing on NTO and NBS transformations

Novartis Technical Operations
Reducing asset-intensity and enhancing standardization, while investing in innovative technologies

- 14 Sites exited
- 123 Warehouses reduced
- 2 New Operation Centers
- 2 New EU sites for Kymriah
- 1m+ Square feet footprint for GTx
- $2bn Further productivity (mid-term)

Novartis Business Services
Continuing on the journey to become a 4th gen enterprise transformation engine

Building a leading digital and data science platform

Scaling our 12 Lighthouses

- 3k+ Trials ingested in Data42
- 750k+ Patients data ingested in Data42

Bold moves starting to pay off

- Microsoft
- Amazon
- Tencent

Continuous investments in:
- People: DS&AI community with 800+ data scientists
- Foundations and enterprise data management

On our way to become a trusted ESG leader

Integrating ESG across our operations, whilst strengthening KPIs and their measurements

Setting ourselves up to achieve a consistent leadership position

Our progress resulted in upgrades to ESG rankings

Top-tier sector-leading performance

Novartis access programs / management best-in-class

See pages 31-32 for further details
Confident that we will grow top and bottom line every year to 2025 and meet external expectations

Analyst consensus sales
USD billion

Consensus IM margin 33.5%

1 Growth drivers

Strong operational performance from growth drivers provides foundation for future expansion

Key growth driver sales 9M 2020

<table>
<thead>
<tr>
<th>Sales</th>
<th>Growth vs. PY</th>
<th>Growth vs. PY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>USD Million</td>
<td>USD Million</td>
</tr>
<tr>
<td>Entresto</td>
<td>1,781</td>
<td>573</td>
</tr>
<tr>
<td>zolgensma</td>
<td>666</td>
<td>491</td>
</tr>
<tr>
<td>Cosentyx</td>
<td>2,886</td>
<td>300</td>
</tr>
<tr>
<td>PROMACTA</td>
<td>1,267</td>
<td>231</td>
</tr>
<tr>
<td>PIQRAY</td>
<td>236</td>
<td>187</td>
</tr>
<tr>
<td>KISQALI</td>
<td>503</td>
<td>178</td>
</tr>
<tr>
<td>Xeljara</td>
<td>268</td>
<td>166</td>
</tr>
<tr>
<td>Beovu</td>
<td>153</td>
<td>153</td>
</tr>
<tr>
<td>Tafinlar</td>
<td>1,134</td>
<td>152</td>
</tr>
<tr>
<td>Kymriah</td>
<td>333</td>
<td>151</td>
</tr>
<tr>
<td>JAKAVI</td>
<td>963</td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>633</td>
<td>140</td>
</tr>
</tbody>
</table>

nm – not meaningful

Key growth drivers now 48% of Innovative Medicines sales

1. Includes Tasigna®, Xolair®, Aimovig®, Tabrecta™, Luxturna®, Kesimpta®, Enerzair®, Allectra®
**1. Growth drivers**

**Cosentyx® delivering solid performance; strong trajectory for Entresto®, LCM plans in place to sustain growth in the long-run**

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### Cosentyx®

**Maintaining dermatology position, outgrowing rheumatology market**

- **US Q3 2020 TRx YoY Growth**: 11% Dermatology, 20% Rheumatology

- **2025 consensus USD 5.6bn**

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### Entresto®

**Strong momentum across geographies**

- US increased penetration in HFrEF population (+43% cc vs. PY in Q3’20); weekly NBRx reached >4,000 in September
- China driving ex-US growth (+104% cc vs. PY in Q3’20)

**US Weekly NBRx as of September 2020**

- **2025 consensus USD 4.9bn**

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**Future growth driven by new indications and market growth**

- Market growth driven by broadening use of biologics
- Up to six additional new indications and three changes in formulation and administration, with up to 7m addressable patients in development

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**New indications and China / Japan to drive further growth**

- ~3/4 of all HFrEF patients can still benefit from Entresto®
- Geo expansion of current indications, e.g. JP launch in CHF (August)
- LCM: HFpEF review by FDA ongoing, PARADISE-MI results expected in H1 2021

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Source: Novartis Investor Relations in-house consensus as of November 12, 2020. References at page 35.
1. Growth drivers

**Zolgensma® momentum sustained by geographical expansion, Kisqali® performing well on the back of positive data**

**Zolgensma®**

**Strong performance driven by geographic expansion**
- Expect steady sales in the US going forward
- Solid uptake in Europe; Germany ~50% of ex-US sales in Q3
- Patient mix will continue to shift over time post market launch from heavy prevalent/switch to a greater proportion of incident patients

**Expanding access in Europe and Emerging Markets to drive further growth**
- Geographic expansion including Switzerland, Canada, Australia and emerging markets expected Q4 2020 / H1 2021
- Access pathways established in 9 EU countries; rapid uptake with immediate full reimbursement in Japan; approved in Brazil
- AVXS-101 IT: Working with FDA on Ph3 confirmatory trial and to lift partial clinical hold

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**Kisqali®**

**Opportunity to fully realize potential of best-in-class profile**
- 9M 2020 sales at USD 503m (+59%, cc) driven by consistent OS benefit from two pivotal Ph3 trials (MONALEESA-7 and -3) across all geographies, despite market slowdown during COVID-19
- Selective and preferential inhibition of CDK4 over CDK6 continues to drive differentiation within the class
- Highest rating of any CDK4/6 inhibitor on ESMO Magnitude of Clinical Benefit Scale, based on OS and Quality of Life benefits

**Adjuvant indication presents sizeable opportunity**
- Additional OS results to be reported in metastatic setting, including MONALEESA-2 (event based, expected in H2 2021)
- NATALEE adjuvant study: Potential to make Kisqali® the only CDK4/6i with evidence supporting use in intermediate and high-risk populations (70% of adjuvant patients). Read-out expected in 2022

Source: Novartis Investor Relations in-house consensus as of November 12, 2020
Looking ahead

**Kesimpta® trending in the right direction, Leqvio® only waiting for action dates in major markets**

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### Kesimpta®

**HCP engagement translating into adoption**

- 95%+ (>6,000) of MS prescribing targets reached
- 95% of field force territories have adopted Kesimpta®
- 5.2% NBRx share 11 weeks post launch

**Securing rapid and broad access**

- Commercial bridging program
- Approximately 50% first line commercial access including CVS and Aetna commercial formularies, first Medicare win, Blue Cross Blue Shield regional accounts

**Patient initiation seen as simple, easy and fast**

- Favorable feedback from HCPs and patients

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### Leqvio® (inclisiran)*

**2025 consensus USD 1.8bn**

**Significant unmet need**

- >135m ASCVD patients
- >50% of statin-treated patients not at goal
- >80% of patients not adhering to treatment

**>USD 1tn** Expected global cost of CVD by 2030

**2 doses a year to reduce persistently elevated LDL-C**

**Worldwide launch preparation progressing well**

- EU approval expected December ‘20 / January ‘21 for all 27 member states and others including UK; FDA action date expected December ‘20
- Ready for launch in US and Germany; population health agreement with NHS on track

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# Launched

Recent and upcoming launches expected to fuel Oncology growth in the short- to mid-term

<table>
<thead>
<tr>
<th>Launch</th>
<th>Key Assets</th>
<th>2025 consensus</th>
<th>US$ Billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIQRAY</td>
<td>USD 1.3bn</td>
<td>9M 2020 sales at USD 236m, driven by strong demand and PIK3CA testing rate uptake in US</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Global rollout continued, with &gt;50 countries now approved</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&quot;EPIK&quot; development program with potential opportunity to serve additional ~100k patients</td>
<td></td>
</tr>
<tr>
<td>Lutathera</td>
<td>USD 0.9bn</td>
<td>9M 2020 sales at USD 336m, with majority of sales still coming from US</td>
<td></td>
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<td></td>
<td></td>
<td>2-tier FF to enable E2E business model, covering nuclear medicine and community centers</td>
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<tr>
<td></td>
<td></td>
<td>OS data H1 2021, ongoing evidence generation for re-treatment benefit after progression</td>
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<tr>
<td>KYMRIAH</td>
<td>USD 1.2bn</td>
<td>9M 2020 sales at USD 333m, driven by strong uptake across US, EU and Japan</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>&gt;26 countries covering at least one indication and more than 260 qualified treatment centers</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Next indications to be filed in 2021: r/r FL and r/r DLBCL 1st relapse</td>
<td></td>
</tr>
<tr>
<td>ADAKVEO</td>
<td>USD 0.8bn</td>
<td>Strong launch execution with USD 71m net sales in the US for 9M 2020</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Approved for reduction in frequency of VOCs in SCD in 36 countries, incl. US &amp; EU countries</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Estimated 2,500 SCD patients have been treated with Adakveo since approval</td>
<td></td>
</tr>
<tr>
<td>TABRECTA</td>
<td>USD 0.6bn</td>
<td>3-4% of NSCLC patients have METex14 mutations, associated with poor prognosis</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>US launch off to an encouraging start, leveraging robust omni-channel capabilities</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tabrecta™ LCM plan with potential opportunity to serve ~100k additional patients</td>
<td></td>
</tr>
<tr>
<td>Asciminib</td>
<td>USD 0.3bn</td>
<td>Unmet need in later lines of CML remains high, with 75% failure rate in 3L</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Asciminib has the potential to address TKI-resistance and intolerance in CML</td>
<td></td>
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<td></td>
<td></td>
<td>ASCEMBL Ph3 study met its primary endpoint, 1st submission H1 2021</td>
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</tbody>
</table>

Source: Novartis Investor Relations in-house consensus as of November 12, 2020
Leading pipeline by key measures...

### Scale

<table>
<thead>
<tr>
<th># of projects¹</th>
<th>Phase 1/2</th>
<th>116</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Phase 3/Registration</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>NMEs</td>
<td>&gt;65</td>
</tr>
</tbody>
</table>

### Innovation

<table>
<thead>
<tr>
<th>Advanced platform therapies in clinical development</th>
<th>~90% Pipeline² potentially first-in-class / first-in-indication</th>
<th>~80% Target areas of high unmet need³</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td></td>
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</tbody>
</table>

### Value

Estimated 2026 sales from products launched 2020-2026³

#2 Replacement power

Company A

Company B

Company C

Company D

Company E

Company F

Company G

Company H

Company I

1. Including Global Health, excluding Sandoz.  2. Projects in confirmatory development.  3. Innovative Medicines product sales excl. Vaccines and LCM products (e.g. new formulations, combos with off-patent molecules); compound-based analysis (Ph2 and 3) with additional indications allocated to 1st launch.  Source: Novartis peer group analysis based on data from Evaluate Pharma (download from September 24, 2020).
### Pipeline

...including strengthening our advanced therapy platforms along the value chain

<table>
<thead>
<tr>
<th><strong>Research &amp; Development</strong></th>
<th><strong>Pre-clinical</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical programs</strong></td>
<td></td>
</tr>
<tr>
<td>OAV101</td>
<td>SMA IT</td>
</tr>
<tr>
<td>OAV201</td>
<td>Rett syndrome</td>
</tr>
<tr>
<td>ADPT03</td>
<td>Sickle cell anemia</td>
</tr>
<tr>
<td>CPK850</td>
<td>RP</td>
</tr>
<tr>
<td>CTL019</td>
<td>Multiple¹</td>
</tr>
<tr>
<td>JEZ567</td>
<td>AML</td>
</tr>
<tr>
<td>LXF821</td>
<td>Glioblastoma multiforme</td>
</tr>
<tr>
<td>MCM998</td>
<td>Plasma cell myeloma</td>
</tr>
<tr>
<td>YTB323</td>
<td>Hematological malignancy</td>
</tr>
<tr>
<td>¹⁷⁷Lu-NeoB</td>
<td>Multiple solid tumors</td>
</tr>
<tr>
<td>¹⁷⁷Lu-oxodotroside</td>
<td>GEP-NET 1L G3</td>
</tr>
<tr>
<td>¹⁷⁷Lu-PSMA-617</td>
<td>mCRPC</td>
</tr>
<tr>
<td>¹⁷⁷Lu-PSMA-R2</td>
<td>Prostate cancer</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Manufacturing</strong></td>
<td><strong>More info</strong></td>
</tr>
<tr>
<td><strong>Internal sites</strong></td>
<td></td>
</tr>
<tr>
<td>3 Libertyville (US)</td>
<td>1m+</td>
</tr>
<tr>
<td>4 Libertyville (US)</td>
<td>Square foot footprint of the internal network</td>
</tr>
<tr>
<td>3 Longmont (US)</td>
<td></td>
</tr>
<tr>
<td>3 Durham (US)</td>
<td></td>
</tr>
<tr>
<td>3 Morris Plains (US)</td>
<td></td>
</tr>
<tr>
<td>4 Morris Plains (US)</td>
<td>Continents spanned by Novartis' manufacturing network</td>
</tr>
<tr>
<td>3 Stein (CH)</td>
<td></td>
</tr>
<tr>
<td>3 Les Ulis (FR)</td>
<td></td>
</tr>
<tr>
<td>6 Millburn (US)</td>
<td></td>
</tr>
<tr>
<td>6 Ivrea, Saluggia, Forli (IT)</td>
<td>Additional site under construction in Indianapolis (US)</td>
</tr>
<tr>
<td>6 Zaragoza (ES)</td>
<td></td>
</tr>
<tr>
<td>6 IDB (NL)</td>
<td></td>
</tr>
<tr>
<td>6 Lutathera®</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Commercialization</strong></td>
<td><strong>Countries approved</strong></td>
</tr>
<tr>
<td></td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>27</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 4 additional clinical programs relating to RNA (including KJX839 and TQJ230)
- 1. DLBCL 1º relapse, rfr follicular lymphoma, rfr DLBCL in combo with pembrolizumab, 1º line high risk pediatric and young adult ALL
- 2. Both pALL and DLBCL
### 3. Pipeline

**Moving forward promising assets to drive long-term growth (1/3)**

Lifecycle management (further information in our Key Assets section)

#### Selected opportunities

<table>
<thead>
<tr>
<th>Asset</th>
<th>Next indication</th>
<th>FIC</th>
<th>FII</th>
<th>Peak sales (by indication)</th>
<th>Phase</th>
<th>Next milestone</th>
<th>Submission</th>
<th>Additional indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>HfPEF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Registration</td>
<td>Approval US - 2021</td>
<td>✓ Essential hypertension (ex US) Pediatric</td>
</tr>
<tr>
<td>Post-AMI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>III</td>
<td>FIR - H1 2021</td>
<td>2021</td>
</tr>
<tr>
<td>HS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>III</td>
<td>iFIR1 - H2 2021</td>
<td>2022</td>
</tr>
<tr>
<td>Adjuvant BC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>III</td>
<td>MONALEESA-2 OS FIR H2 2021 NATALEE Ph III aBC FIR 2022</td>
<td>2023</td>
</tr>
<tr>
<td>BYL719</td>
<td>PROS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>II</td>
<td>Submission 2021</td>
<td>2021</td>
</tr>
<tr>
<td>Beovu</td>
<td>DME</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>III</td>
<td>Primary FIR - Q4 2020 (2nd pivotal study read-out)</td>
<td>2021</td>
</tr>
</tbody>
</table>

**FIC/FII:** First in class = first compound launching with a specific MoA / First in indication = expected to launch at least 6 months before first competitor with the same target/MoA in the same indication.  
(j) FIR: (interim) First Interpretable Results (study read-outs).  
1. iFIR is the primary readout/analysis for the study.  
Unprobabilized peak sales (USD): ●<500m  ●● 500m-1bn  ●●● 1-2bn  ●●●●>2bn
# Pipeline

## Moving forward promising assets to drive long-term growth (2/3)

Pharmaceuticals (further information in our Key Assets section)

### Selected opportunities

<table>
<thead>
<tr>
<th>Asset</th>
<th>Next indication</th>
<th>FIC</th>
<th>FII</th>
<th>Peak sales (by indication)</th>
<th>Phase</th>
<th>Next milestone</th>
<th>Submission</th>
<th>Additional indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNP023 (iptacopan) Factor B inhibitor</td>
<td>IgAN</td>
<td>⭐️</td>
<td>⭐️</td>
<td>⭐️</td>
<td>II</td>
<td>Ph III FPFV H1 2021</td>
<td>2023</td>
<td>PNH¹ aHUS C3G iMN</td>
</tr>
<tr>
<td>CFZ533 (iscalcimab) Anti-CD40 mAb</td>
<td>Sjögren's</td>
<td>⭐️</td>
<td>⭐️</td>
<td>⭐️</td>
<td>II</td>
<td>iFIR² - 2022</td>
<td>≥ 2024</td>
<td>Kidney Tx Liver Tx</td>
</tr>
<tr>
<td>QGE031 (ligelizumab) Anti-IgE mAb</td>
<td>CSU</td>
<td>⭐️</td>
<td>⭐️</td>
<td>⭐️</td>
<td>III</td>
<td>FIR - H2 2021</td>
<td>2022</td>
<td>Pediatric CSU CINDU, food allergy</td>
</tr>
<tr>
<td>TQJ230 (pelacarsen) Antisense oligonucleotide</td>
<td>CVRR-Lp(a)</td>
<td>⭐️</td>
<td>⭐️</td>
<td>⭐️</td>
<td>III</td>
<td>FIR - 2024</td>
<td>≥ 2024</td>
<td>n/a</td>
</tr>
<tr>
<td>LMI070 (branaplam) RNA splicing modulator</td>
<td>Huntington disease</td>
<td>⭐️</td>
<td>⭐️</td>
<td>⭐️</td>
<td>I</td>
<td>Ph IIb FPFV H1 2021</td>
<td>≥ 2024</td>
<td>SMA</td>
</tr>
</tbody>
</table>

**FIC/FII**: First in class = first compound launching with a specific MoA / First in indication = expected to launch at least 6 months before first competitor with the same target/MoA in the same indication.  
(i) FIR: (interim) First Interpretable Results (study read-outs).  
1. PNH indication planned to be submitted first.  
2. iFIR is the primary readout / analysis for the study.  
Unprobabilized peak sales (USD): ⬤ <500m  ⬤♭ 500m-1bn  ⬤♭♭ 1-2bn  ⬤♭♭♭♭♭ >2bn
### Pipeline

**Moving forward promising assets to drive long-term growth (3/3)**

**Oncology** (further information in our Key Assets section)

#### Selected opportunities

<table>
<thead>
<tr>
<th>Asset</th>
<th>Next indication</th>
<th>FIC</th>
<th>FII</th>
<th>Peak sales (by indication)</th>
<th>Phase</th>
<th>Next milestone</th>
<th>Submission</th>
<th>Additional indications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACZ885</strong> (canakinumab)</td>
<td>NSCLC 1L/2L</td>
<td>⭐️</td>
<td>⭐️</td>
<td>⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️</td>
<td>III</td>
<td>CANOPY-1 FIR H2 2021</td>
<td>2021¹</td>
<td>NSCLC adjuvant</td>
</tr>
<tr>
<td>Anti-IL-1β mAb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CANOPY-2 FIR H1 2021</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>177Lu-PSMA-617</strong></td>
<td>mCRPC 3L</td>
<td>⭐️</td>
<td></td>
<td>⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️</td>
<td>III</td>
<td>VISION FIR H1 2021</td>
<td>2021</td>
<td>mCRPC pre-taxane</td>
</tr>
<tr>
<td>Radioactive lutetium-labelled small molecule</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MBG453</strong> (sabatolimab)</td>
<td>HR-MDS</td>
<td>⭐️</td>
<td>⭐️</td>
<td>⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️</td>
<td>III</td>
<td>FIR² H2 2021</td>
<td>2021 (US)</td>
<td>AML Maintenance MRD+ AML</td>
</tr>
<tr>
<td>Anti-TIM-3 mAb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TNO155</strong></td>
<td>Solid tumors</td>
<td>⭐️</td>
<td>⭐️</td>
<td>⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️</td>
<td>II</td>
<td>Data presentation H1 2021</td>
<td>tbd</td>
<td>Multiple combinations being explored including 1L KRAS NSCLC</td>
</tr>
<tr>
<td>Low molecular weight SHP2 inhibitor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LXH254</strong></td>
<td>BRAF/NRASm</td>
<td>⭐️</td>
<td>⭐️</td>
<td>⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️ ⭐️</td>
<td>II</td>
<td>Expansion phase start H2 2021</td>
<td>tbd</td>
<td>mRAS/RAF NSCLC</td>
</tr>
<tr>
<td>Low molecular weight B/C-RAF inhibitor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FIC/FII:** First in class = first compound launching with a specific MoA / First in indication = expected to launch at least 6 months before first competitor with the same target/MoA in the same indication. (study read-outs).

1. Depending on timing of final read-out submission may move to early 2022.
2. FIR is for the Ph2 study (e.g. STIMULUS MDS-1).

**Unprobabilized peak sales (USD):** ⚫ <500m  ⚫ 500m-1bn  ⚫iments 1-2bn  ⚫ ⚫ ⚫ ⚫ ⚫ >2bn

¹ FIN: (interim) First Interpretable Results
## Pipeline

### Wild cards: High-risk, high-reward programs

<table>
<thead>
<tr>
<th>Description</th>
<th>Unmet need</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CSJ117 Asthma</strong></td>
<td>Potent neutralizing antibody fragment directed against human TSLP, an upstream epithelial-cell-derived cytokine involved in the asthmatic airway inflammation. Delivered via dry powder inhaler directly to the lungs</td>
<td>Recruiting Ph2b study in patients with severe uncontrolled asthma</td>
</tr>
<tr>
<td>Recombinant human lubricin is a mucin-like glycoprotein naturally present on the ocular surface with anti-inflammatory, lubricating and anti-adhesive properties</td>
<td>Unmet need for fast-acting, effective, durable, tolerable pharmacological treatment for DED, particularly in moderate-to-severe cases</td>
<td>Ph2b readout expected H2 2021</td>
</tr>
<tr>
<td><strong>LNA043 Osteoarthritis</strong></td>
<td>Modified human ANGPTL3 with the potential to repair damaged cartilage - the underlying cause of osteoarthritis (OA) - when administered as an intra-articular injection</td>
<td>OA is a degenerative, chronic, progressive joint disease with no current treatment targeting the prevention of degeneration</td>
</tr>
<tr>
<td><strong>QBW251 COPD</strong></td>
<td>Oral CFTR potentiator targeting life-altering improvements in symptoms of COPD, by enhancing mucus clearance and reducing pulmonary infections</td>
<td>Despite optimized inhaled therapies, most COPD patients continue to suffer debilitating symptoms that significantly impact their lives</td>
</tr>
<tr>
<td><strong>NIS793 Solid Tumors</strong></td>
<td>Fully human anti-TGFβ IgG2 monoclonal antibody designed to inhibit TGFβ pathway in tumor cells as well as modulate the tumor microenvironment, reversing both immunosuppression and fibrosis</td>
<td>Large unmet need in several tumor types resistant and/or refractory to current treatments</td>
</tr>
</tbody>
</table>
Margins

Delivering on Innovative Medicines core margin of mid 30s...

**Innovative Medicines**
Core margin (%)

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020 9M</th>
</tr>
</thead>
<tbody>
<tr>
<td>COGS¹</td>
<td>15.7%</td>
<td>14.9%</td>
<td>14.9%</td>
<td>14.2%</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>21.8%</td>
<td>21.0%</td>
<td>20.1%</td>
<td>19.4%</td>
</tr>
<tr>
<td>SG&amp;A/OIE</td>
<td>31.5%</td>
<td>32.1%</td>
<td>31.5%</td>
<td>30.1%</td>
</tr>
<tr>
<td>Core Margin</td>
<td>31.0%</td>
<td>32.0%</td>
<td>33.5%</td>
<td>36.3%</td>
</tr>
</tbody>
</table>

Key drivers of expansion

- Manufacturing Network Transformation
- NBS productivity programs and procurement savings
- Resource allocation in commercial units
- Leverage from sales momentum of key growth drivers

- Generic erosion
- Launch and growth investments

FY 2020 core margin expected below 9M actuals around mid 30s²

¹. Includes other revenues and sales to other segments. ². Historically Q4 margin lower due to seasonality
**Margins**

**...and raising outlook to high 30s mid-term**

### Innovative Medicines

Core margin (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>Core Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>31.0</td>
</tr>
<tr>
<td>2018</td>
<td>32.0</td>
</tr>
<tr>
<td>2019</td>
<td>33.5</td>
</tr>
<tr>
<td>2020e</td>
<td></td>
</tr>
<tr>
<td>Mid 30s</td>
<td></td>
</tr>
<tr>
<td>Mid to high 30s</td>
<td></td>
</tr>
<tr>
<td>High 30s</td>
<td></td>
</tr>
<tr>
<td>Near term</td>
<td></td>
</tr>
<tr>
<td>Mid term</td>
<td></td>
</tr>
</tbody>
</table>

**Key drivers of expansion**

+ Sales momentum of key growth drivers and operational excellence on upcoming launches
+ NTO productivity program starting in 2021 increased to USD 2bn in the mid term
+ Evolution in ways of working

- Generic erosion
- Launch investments
Strong Free Cash Flow development driven by growth, margin expansion and balance sheet discipline

Continuing Operations Free Cash Flow¹
USD billion

1. Sales and core¹ margin improvement (continuing operations)

2. Capex discipline

3. Rigorous receivable and payables management

4. Inventory management key improvement opportunity
Inventory increased from 2017 to 2019 to support NTO network transformation

¹. Free cash flow and core margin are non-IFRS measures.
We remain disciplined and shareholder-focused in our capital allocation

Capital allocation priorities

1. Investments in organic business  
   Continued focus on core medicines business

2. Growing annual dividend in CHF  
   Committed to maintain strong and growing dividend (in CHF), increased by CAGR 8% in CHF and 10% in USD\(^1\) between 1996-2019

3. Value-creating bolt-ons  
   Guide to spend up to ~5% of market cap per year, but only if good strategic fit, right price and value creating

4. Share buybacks  
   Announcing immediate share buyback of up to USD 2.5bn

---

1. Converted at historic exchange rates at the dividend payment dates as per Bloomberg; assumes a USD/CHF exchange rate of 0.9690 as of December 31, 2019 for 2019.
Initiating up to USD 2.5bn share buyback, highlighting confidence in top-line growth and margin expansion

Expect growth on top and bottom line
- Growth drivers and recent / upcoming launches, foundations for future expansion
- Leading pipeline, fueling growth mid- to long-term and hedging against patent cliffs
- Committed to driving consistent margin expansion

Up to USD 2.5bn share buyback will be executed under the existing AGM authority

Novartis’ liquidity and strong balance sheet, in line with our capital structure reflecting AA- (S&P) / A1 (Moody’s) credit rating, supports such a share buyback

The buyback will start immediately and will be executed until H1 2021
Sandoz aims to grow low-to-mid single digit by focusing on biosimilars and selected segments of standard Gx

### Biosimilars

- The biosimilar market offers a significant and growing opportunity (market expected to grow ~80% to 2026)
- Focusing on biosimilar leadership, with 15+ molecules in our pipeline, and adding at least one new project per year

**Biosimilars revenue ambition**

USD billion

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>2bn</td>
</tr>
<tr>
<td>2025</td>
<td>3 - 3.5bn</td>
</tr>
<tr>
<td>2030</td>
<td>5 - 6bn</td>
</tr>
</tbody>
</table>

1. Based on current pipeline.

### Small molecules

- Sandoz is on track to submit ~40 first-to-files in US until 2024
- >80% loss of exclusivity coverage (LoE) in Europe and >50% LoE coverage’ in US
- Increased focus on Oncology and Respiratory
- Ambition to outgrow the global market
Continue margin improvement to reach mid-to-high 20s core ROS

Sandoz financial progress

Core¹ ROS

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>9M 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core ROS</td>
<td>20.4%</td>
<td>20.7%</td>
<td>20.3%</td>
<td>21.5%</td>
<td>25.4%²</td>
</tr>
</tbody>
</table>

Core¹ Gross Margin

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>9M 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Gross Margin</td>
<td>48.2%</td>
<td>49.7%</td>
<td>52.0%</td>
<td>53.2%</td>
<td>55.4%</td>
</tr>
</tbody>
</table>

Key drivers of margin expansion

+ Manufacturing Network Optimization
+ Shift of portfolio to more differentiated therapeutics including Biosimilars, which create a positive mix
+ Digital to transform commercial model and development
+ Core ROS to reach top quartile in industry (mid-to-high 20s in mid to long term)

1. Core figures are non-IFRS measures.  
2. COVID-19 favorability included.
ESG aspirations with clear mid- and long-term goals...

Integrating ESG across our operations, whilst strengthening KPIs and their measurements

<table>
<thead>
<tr>
<th>Ethical Standards</th>
<th>Pricing &amp; Access</th>
<th>Global Health Challenges</th>
<th>Corporate Citizenship</th>
</tr>
</thead>
</table>
| **Achievements to date**| Resolving longstanding legal issues  
Launched new Code of Ethics                                                                 | 100+ EMBs YTD, exceeded target of 20% patient reach in LMICs  
New Sub-Saharan Africa strategy                                                                 | Innovative Sustainability-Linked Bond  
Expanded Africa SCD program                                                                 | YTD vs. 2016: -17% carbon own operations, -3% waste, -29% water  
44% female in management  
Strong COVID-19 response                                                                 |
| **Selected mid-term goals**| Third party risk assessment conducted on 100% suppliers by 2022                                                                 | +200% patient reach in LMICs with SIT¹  
100% SIT launches w/ access strategy  
+500% patient reach in SSA by 2025²                                                                 | +50% patient reach with flagship programs¹                                                                 | Management gender balance by 2023  
Carbon neutral own operations by 2025                                                                 |
| **Long-term aspirations**| Be recognized in the healthcare sector for human rights                                                                 | Full implementation of Novartis access principles, incl. clinical trial diversity                                                                 | Launch novel medicines to eliminate malaria                                                                 | Full carbon, plastic, water neutrality³                                                                 |


1. 2025 vs. 2019 baseline.  
2. 2025 vs. 2020 baseline.  
3. 2030 vs. 2016 baseline.  
EMB – Emerging Market Brands  
SCD – Sickle Cell Disease  
SIT - Strategic Innovative Therapies
...and improving our ESG scores across multiple rating agencies

<table>
<thead>
<tr>
<th>Agency</th>
<th>Score</th>
<th>Score</th>
<th>Sector Ranking¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Current</td>
<td>Previous</td>
</tr>
<tr>
<td>SUSTAINALYTICS</td>
<td>Risk score</td>
<td>▲ 21</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Controversy level</td>
<td>▲ 3</td>
<td>5</td>
</tr>
<tr>
<td>ISS ESG</td>
<td>ESG score</td>
<td>▲ B-</td>
<td>B-</td>
</tr>
<tr>
<td>FTSE4Good</td>
<td>ESG score</td>
<td>▲ 4.7</td>
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Top-tier sector-leading performance
Novartis access programs / management best-in-class

**Concluding thoughts**

Group key messages

1. **We are executing on our strategy**
   - 100% focused as a medicines company
   - Significant progress on each of our five strategic priorities
   - Strong operational performance, with consistent top- and bottom-line expansion

2. **Looking ahead, we believe we can consistently grow both our top and bottom line**
   - Growth drivers and recent / upcoming launches expected to lay the foundation for future expansion
   - Leading pipeline, fueling growth in the mid- to long-term and hedging against patent cliffs
   - Committed to driving consistent margin expansion

3. **We provide investors with a unique profile**
   - TAs breadth and depth
   - Exposure to cutting-edge platforms
   - Diversification of revenues, both in terms of assets and geographies
Meet Novartis Management 2020
Participating members of the Executive Committee

Vas Narasimhan
CEO, Novartis

Harry Kirsch
CFO, Novartis

Marie-France Tschudin
President, Novartis Pharmaceuticals

Susanne Schaffert
President, Novartis Oncology

Richard Saynor
CEO, Sandoz

John Tsai
Global Head, Drug Development and CMO, Novartis

Jay Bradner
President, Novartis Institutes for BioMedical Research (NIBR)

Shannon Thyme Klinger
Chief Legal Officer, Novartis

Steffen Lang
Global Head, Novartis Technical Operations
References

**Slide 12**

1. TRx growth is calculated by comparing product volume across two time periods (YoY refers to Q3 2020 compared with Q3 2019). NBRx share calculated as product NBRx volume divided by market NBRx volume.

2. IQVIA National Prescription Audit for Dermatology through September 2020; PsO market includes Enbrel®, Humira®, Siliq®, Skyrizi™, Stelara®, Taltz®, Tremfya®. NBRx share refers to monthly data for Q3 2020 (Quarter ending September 30). Note the quarter ended mid-week.

3. IQVIA National Prescription Audit for Rheumatology through September 2020; SpA market includes Cimzia®, Enbrel®, Humira®, Simponi®, Stelara®, Taltz®. NBRx share refers to monthly data for Q3 2020 (Quarter ending September 30). Note the quarter ended mid-week.

4. IQVIA National Prescription Audit Data.

**Slide 14**

1. IQVIA reported NBRxs through October 30, 2020.


Key Assets

Overview

Immunology, Hepatology & Dermatology
- Cosentyx®
- Iscalimab
- Ligelizumab

Cardiovascular, Renal & Metabolism
- Entresto®
- Leqvio®
- Pelacarsen
- Iptacopan

Neuroscience
- Kesimpta®
- Branaplam

Ophthalmology
- Beovu®

Oncology: Solid Tumors
- Kisqali®
- Piqray®
- Tabrecta™
- Canakinumab
- 177 Lu-PSMA-617
- TNO155
- LHX254

Oncology: Hematology
- Asciminib
- Sabatolimab

Click to view MNM Agenda
# Building depth across our core therapeutic areas

<table>
<thead>
<tr>
<th>ONCOLOGY</th>
<th>PHARMACEUTICALS</th>
<th>BIOPHARMA</th>
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| Piqray<sup>®</sup>  
New Indications | Entresto<sup>®</sup>  
HFPEF, post-MI | Cosentyx<sup>®</sup>  
HS, GCA, LP | AVXS-101 IT  
SMA IT | Beovu<sup>®</sup>  
DME, RVO | CSJ117  
Asthma | Trastuzumab<sup>1</sup> |
| Kisqali<sup>®</sup>  
Adjuvant HR+HER2- BC | Incilisiran (KJX839)  
Hyperlipidemia, CVRR-LDLG | Iscallimab (CFZ533)  
Sjögren’s / Transplant | Brananplam (LM070)  
SMA, HD | UNR444  
Presbyopia | QBW251  
COPD | Insulins<sup>3</sup> |
| Asciminib (ABL001)  
CML 3L | Iptacopan (LNP023)  
Renal diseases, PNH | Ligilizumab (QGE031)  
CSU/CIU, food allergy, CINDU | AVXS-201  
Rett Syndrome | ECF843  
Dry eye | SAF312  
COSP | Natalizumab<sup>3</sup> |
| Canakinumab (ACZ885)  
NSCLC 1L/2L / Adjuvant | Pelacarsen (TQJ230)  
CVRR | Imanalumab (VAY785)  
Sjogren’s, AIH |  |  |  | Denosumab |
| 17L-PSMA-617  
mCRPC |  | Remibrutinib (LOU064)  
CSU/CID, Sjogrens |  |  |  | 9+ biosimilars in pre-clinical development |
| Sabatolimab (MBG453)  
HR-MDS, until AML |  | Tropifexor (LJN452)  
NASH |  |  |  |  |
| NIS793  
Solid tumors |  | LNA643  
Osteoarthritis |  |  |  |  |
| TNO155  
GI tumors |  |  |  |  |  |  |
| LHX254  
Melanoma |  |  |  |  |  |  |

1. Alliance program (EirGenix).  
2. Alliance program (Gan&Lee).  
3. Alliance program Polpharma.
Immunology, Hepatology & Dermatology

Cosentyx®
Iscalimab
Ligelizumab

Click to view
MNM Agenda
Cosentyx®
(seucukinumab)

Human anti-IL17A monoclonal antibody directly inhibits IL-17A, a multisource cytokine that causes skin and entheal inflammation

Marketed; LCM in Phase 2,3

Key highlights

- Proven sustained efficacy and safety data across psoriasis (PsO), psoriatic arthritis (PsA) and ankylosing spondylitis (AS)
- USD 1bn sales delivered in Q3 2020
- Non-radiographic axial SpA (nr-axSpA) approved as 4th indication by FDA and EMA
- Pediatric psoriasis (EU), AS (China) recently approved
- Submissions for Cosentyx® 300mg AI/PFS and pediatric PsO (US)
- Robust clinical evidence with >100 studies, also in persistent manifestations of PsO, namely scalp, palms, soles, nails and joints involvement
- Recent key publications¹ EXCEED (PsA H2H vs. Humira), PREVENT (nr-axSpA), MEASURE (five-year data in AS)
- Expect to reach USD 5bn+ in sales with PsO, PsA, AS and nr-axSpA, maintaining share in a growing Dermatology market and accelerating growth in Rheumatology
- Reaching up to 7m additional addressable patients by expanding beyond current approved indications over the next 10 years

Cosentyx® poised to maintain strong position in growing dermatology market, set to accelerate in rheumatology

>400k patients reached, >5 years efficacy and safety data, strong 1st-line access

**Steady Cosentyx® sales growth over the years**

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<thead>
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**Strong dermatology position**

- USD 17bn market WW, double-digit growth long-term
- 15% biologic penetration\(^3,4\)
- 8/10 patients achieve clear or almost clear skin\(^5\)
- Dedicated studies in scalp, nails, palmoplantar\(^6\)
- Biologic of choice for 2/3 of patients with multiple manifestations\(^7\)

**Ready to accelerate in rheumatology**

- USD 12bn market WW, double-digit growth long-term
- 14% axSpA, 23% PsA biologic penetration\(^8,9\)
- Efficacy in joints with AS\(^10\) and PsA\(^11\) is increasingly supported by guidelines\(^12-14\)
- Ongoing, first-of-its-kind evidence generation with MAXIMISE\(^15\) and ULTIMATE\(^16\)
- PREVENT reinforces substantial benefits across axSpA spectrum\(^17\)

Developing Cosentyx® across 10 indications/label expansions to address key unmet needs

**Expansion in formulations and administration**

<table>
<thead>
<tr>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
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<td>IV formulation PsA &amp; AS</td>
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<td>PsO flex. dosing</td>
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**New indications**

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<td>▲</td>
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<td>Ph 3</td>
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**Addressable patients per indication (EU5 and US)**

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<th>Patients</th>
<th>Comment</th>
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<tr>
<td>Hidradenitis Suppurativa</td>
<td>&gt;400K</td>
<td>High unmet need and high disease burden</td>
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<tr>
<td>Lichen Planus</td>
<td>&gt;2,500K</td>
<td>Significantly impaired quality of life and lack of approved systemic therapies</td>
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<tr>
<td>Juvenile Idiopathic Arthritis</td>
<td>&gt;10K</td>
<td>Enhancing strong safety profile</td>
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<tr>
<td>IV formulation (PsA/AS)</td>
<td>&gt;3,500K</td>
<td>Additional access for Medicare patients in US</td>
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<tr>
<td>Giant Cell Arteritis</td>
<td>380K</td>
<td>Amongst most common inflammatory disease in elderly</td>
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<tr>
<td>Lupus Nephritis</td>
<td>&gt;140K</td>
<td>Major cause of morbidity and mortality in SLE patients</td>
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Meet Novartis Management | November 2020 | Novartis Investor Relations

---

Cosentyx® Iscalimab Ligelizumab
**Hidradenitis Suppurativa**

Secukinumab as a potential novel therapy to address a debilitating disease

### High unmet need in Hidradenitis Suppurativa

- Chronic, inflammatory disabling skin disease, with recurrent, painful nodules and abscesses, leading to impairing scarring and subdermal tunnels
- Impact on quality of life due to chronic pain/scarring, odor, purulent discharge and loss of function
- The global prevalence rate is estimated to be ~1%\(^1\), ~400K (200k in the US, 200k in EU5) patients suffering from moderate to severe HS.
- Largely underdiagnosed with diagnosis rate ~20%\(^2\)

### Need for new mechanisms to control disease

- Available treatment options do not prevent disease progression nor control symptoms optimally
- A TNF inhibitor is the only biologic treatment approved for HS, with partial response achieved by 50% of the patients\(^4\) that is not always durable
- IL-17 is highly expressed in the lesions. Goal of therapy is to prevent disease progression and reduce inflammation in existing lesions

---

Phase 3 program in Hidradenitis Suppurativa

SUNRISE & SUNSHINE

- Two identical Phase 3, randomized, double-blind, placebo-controlled, multicenter studies to evaluate the efficacy and safety of secukinumab vs. placebo in patients with moderate to severe hidradenitis suppurativa
- The primary endpoint is the achievement of HiSCR at Week 16. HiSCR response is defined as at least a 50% decrease in Abscess and Inflammatory Nodule (AN) count with no increase in the number of draining fistulae.

Study attributes
- Scientific rationale based on reports suggestive of efficacy in HS patients

Lichen Planus
Significantly impaired quality of life with currently no approved systemic therapies

Unmet need in Lichen Planus

- Chronic inflammatory disorder of the skin and mucosa
- Impact on patient’s quality of life comparable to psoriasis
- Prevalence of 0.4% - 2.6% of the general population
- Current standard of care topical and systemic corticosteroids
- No approved systemic treatment options available for corticosteroid refractory patients (60% of topically treated patients)

Clinical and molecular response to secukinumab identifies lichen planus as a Th17-driven disorder

Available treatment options of local and systemic corticosteroid leave many patients refractory and are the only approved therapies

Th17 axis is essential for lichen planus pathophysiology with reported clinical and molecular response to IL-17 inhibition

Phase 2a/b in Lichen Planus

**PRELUDE¹**

- **Mucosal LP**
  - Secukinumab 300 mg Q4W (24 pts)
  - Placebo (12 pts)
- **Cutaneous LP**
  - Secukinumab 300 mg Q4W (24 pts)
  - Placebo (12 pts)
- **L. planopilaris**
  - Secukinumab 300 mg Q4W (24 pts)
  - Placebo (12 pts)

Primary endpoint: w0 to w16

Estimated primary completion: 2022

**Study attributes**

- No clinical proof of concept data
- Rationale for targeting IL17A based on positive case series

- Innovative basket study design evaluating secukinumab in 3 subtypes of lichen planus in a single study
- Randomized, placebo-controlled, double-blind, multi-center Phase 2 trial
- Testing 2 dosing regimens
- New outcome measuring tools developed specifically for lichen planus

¹ ClinicalTrials.gov Identifier: NCT04300296.
Lupus Nephritis
A major cause of morbidity and mortality in systemic lupus erythematosus (SLE) patients

Unmet need in Lupus Nephritis (LN)

- Up to 50% of patients with SLE suffer from LN
- No approved therapies currently available, steroids and off-label B-cell depleting therapy (for refractory patients) used
- ~50% of patients do not achieve remission with standard of care
- Most patients continue to have flares and suffer from toxicity during maintenance regimen; 17%-22% of LN patients progress to end-stage renal disease (ESRD) within 10 to 15 years

Goal to improve therapeutic response, reduce use of steroids and prevent progression to end-stage renal disease (ESRD)

- Need for a steroid sparing regimen with an increase in complete renal response and a proven safety profile (no lab monitoring etc.)
- Secukinumab has the potential to become induction and maintenance therapy in adult patients with active lupus nephritis – assumes treating patients with LN class III/IV +/-V (approx. 72% of LN patients)

Phase 3 SELUNE trial in patients with Lupus Nephritis

**SELUNE**

- 2-year, Phase 3 randomized, double-blind, parallel-group, placebo-controlled trial to evaluate the safety, efficacy, and tolerability of 300mg s.c. secukinumab vs. placebo, in combination with SoC therapy, in patients with active Lupus Nephritis
- Primary end-point: proportion of patients achieving Complete Renal Response (CRR) following 52 weeks of treatment

**Study attributes**

Robust scientific rationale for IL-17 inhibition and clinical evidence with case report indicating secukinumab efficacy in LN refractory to standard of care

Adaptive design trial with planned Futility Analysis when 30% pts (N=138) achieve 52 weeks of treatment (Go/No go decision)

---

1. ClinicalTrials.gov Identifier: NCT04181762.  
   MPA = Mycophenolic acid.  
   CS = Corticosteroids.
Our continued commitment to pediatric patients
Addressing 2 sub-types of Juvenile Idiopathic Arthritis (JIA): Juvenile Psoriatic Arthritis (JPsA) and Enthesitis Related Arthritis (ERA)

### Unmet need in JIA

- JIA is the most common childhood rheumatic disease, covering six subtypes. In the US, patients with JPsA and ERA represent ~20% of the overall JIA population (~5% JPsA, ~15% ERA)¹
- Across the US and EU5, approx¹. 16,000 patients with diagnosed JPsA/ERA
- Due to the progressive nature of these diseases and the age of onset, need to treat patients aggressively, as lasting joint inflammation in children can lead to long-term damage
- 33% of children with ERA lack response to anti-TNF therapy and NSAIDs

### Lack of targeted treatment options

- Current standard of care (SoC) is NSAID and/or conventional synthetic DMARDs
- Limited options for patients inadequately controlled on SoC:
  - Only 1 anti-TNF (golimumab) approved for treatment of JPsA in the US
  - No biologics approved for ERA in the EU
- Although JPsA and ERA affect a relatively small patient population, the high burden of disease and limitation in available treatment options demand for safe and new targeted therapies

Phase 3 trial in patients with Juvenile Idiopathic Arthritis

JIA study

- Double-blind, placebo-controlled, event-driven randomized withdrawal study to investigate the efficacy and safety of secukinumab treatment in the Juvenile Idiopathic Arthritis (JIA) categories of Juvenile Psoriatic Arthritis (JPsA) and Enthesitis-related Arthritis (ERA)
- Primary endpoint: time to flare in Treatment Period 2

Study attributes

Published case reports show efficacy of secukinumab in children and adolescents with ERA and JPsA.

By trial design, ACR30 responders to secukinumab in the open label TP1 period entered in the placebo-controlled TP2.
Giant Cell Arteritis (GCA)
Still unmet need despite an approved biologic therapy; Cosentyx® Ph3 program planned to start in H2 2021

<table>
<thead>
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<th>Unmet need in GCA</th>
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<tbody>
<tr>
<td>▪ Most common form of adult primary systemic vasculitis with features of cranial and/or large-vessel vasculitis; primarily affects elderly patients (mean age, 74 yrs); annual incidence up to 27 (US) - 32 (EU)/100K persons ≥ 50 yrs</td>
</tr>
<tr>
<td>▪ Substantial morbidity due to complications of irreversible vision loss and stroke(^1) and associated toxicity of prolonged glucocorticoid treatment</td>
</tr>
<tr>
<td>▪ A strong unmet medical need remains for safe and effective treatments that bring an earlier and further reduction of glucocorticoids</td>
</tr>
<tr>
<td>▪ Efficacy: failure in achieving sustained remission and significant rates of relapse with existing treatment including glucocorticoids and anti-IL6R mAb</td>
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<table>
<thead>
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<th>Rationale for IL-17 clinical development program</th>
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<tbody>
<tr>
<td>▪ IL17A plays an important role in the pathogenesis of GCA as evidenced by polymorphisms in IL17A locus associated with GCA and ↑IL17A in temporal arteries and ↑ TH17 cells in blood, with rapid decline following GC treatment predictive of sustained remission</td>
</tr>
<tr>
<td>▪ Cosentyx® has the potential to offer GCA patients a first in class anti-IL-17A treatment option, with a proven safety profile</td>
</tr>
<tr>
<td>▪ Phase 2 / PoC(^2) study readout expected in H1 2021</td>
</tr>
<tr>
<td>▪ Phase 3 program design under development with</td>
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</tbody>
</table>
  - Randomized, double-blind, multicenter 52wk study to evaluate the efficacy and safety of secukinumab vs. placebo in patients with newly diagnosed or relapsing GCA |

\(^{1}\) Koster M, et al.(2016) Current Treatment Options in Rheumatology. \(^{2}\) ClinicalTrials.gov Identifier: NCT03765788.
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<th>Group</th>
<th>Key Assets</th>
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<td>Overview</td>
<td>IHD</td>
<td>CRM</td>
<td>Neuroscience</td>
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<td>Cosentyx® Iscalimab Ligelizumab</td>
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### Iscalimab (CFZ533)

Fully human monoclonal antibody blocking the CD154-CD40 pathway

**Phase 2**

### Key highlights

- Iscalimab blocks CD154-CD40 pathway with broad potential in multiple diseases
- Positive Proof of Concept study in Sjögren's syndrome, the second most common rheumatic autoimmune disease after Rheumatoid Arthritis
- Positive Proof of Concept study in kidney transplantation, suggesting better renal function and pristine renal histology compared to current SoC
- Iscalimab has the opportunity to be first-in-class in solid organ transplantation and Sjögren’s.
Iscalimab blocks CD154-CD40 pathway with broad potential in multiple diseases

**CD40 involvement**

- **Humoral immunity** (de novo DSA, autoAbs)
- **Complex CD40-medicated immunity** (cytokines, Mφ function, ectopic germinal centers)

**CD40**
- 48 kDa membrane bound; ~20 kDa soluble form
- Constitutively expressed on B cells and APCs (e.g. monocytes, macrophages, dendritic cells)
- Expressed on platelets, and under certain conditions on eosinophils and parenchymal cells

**CD154 (CD40 ligand)**
- Induced on a variety of cell types including activated T cells, platelets, and B cells

**CD40-CD154 signaling**
- Important for germinal center function, antibody production, and humoral memory
- Regulates macrophage, dendritic cell and parenchymal cell function
- Implicated in various autoimmune diseases

---

**Figure adapted from Mathur RK et al. 2006**

**Sjögren's syndrome and rationale for CD40 as a therapeutic target**

**Prevalence and treatment**
- Autoimmune disease; prevalence in adult population 0.2%
- No cure or disease modifying treatment approved

**Rationale for iscalimab**
- A hallmark diagnostic feature of Sjögren's syndrome is B-cell hyperreactivity
- T-cells and B-cells infiltrate patients' salivary glands and upregulate CD40 and CD154
- Positive Proof of Concept study

---

Fisher et al. Abstr # 1784; Am College of Rheumatology 2017.
Kidney and liver transplantation

Significant unmet need in transplantation to prolong graft survival and reduce side effects

Graft survival probabilities (%)

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<td>98.6%</td>
<td>97.5%</td>
<td>95.3%</td>
<td>93.1%</td>
<td>85.3%</td>
<td>64.8%</td>
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- Deceased Donors
- Living Donors

Challenges with existing standard of care, such as CNI-based therapies

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Description</th>
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<tbody>
<tr>
<td>Renal toxicity</td>
<td>Chronic toxicity → chronic dysfunction → return to dialysis</td>
</tr>
<tr>
<td>Cardio-metabolic complications</td>
<td>Frequent new-onset post-transplant diabetes, hypertension, increased cardio-vascular mortality</td>
</tr>
<tr>
<td>Insufficient graft protection</td>
<td>From recipient immune defense leading to progressive graft damage → return to dialysis</td>
</tr>
<tr>
<td>Cancers and infections</td>
<td>Cancers, bacterial and viral infections; complications due to (over-) immunosuppression</td>
</tr>
</tbody>
</table>

2018 USRDS Annual Data Report Reference Tables, adjusted for age, sex, race, ethnicity, and primary cause of ESRD. Graft survival is determined as the earliest occurrence of either death with graft function or graft failure requiring dialysis or re-transplant.
Potential to reimagine transplant with better graft protection and less toxicity

Superior graft quality with iscalimab

Graft loss increases with CADI; after 3 years, the graft loss is:
- CADI 0-1: 0%
- CADI 2-4: 5%
- CADI >4: 17%

## Advancing icsalimab in a range of indications through 2020-26

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
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<th>2024</th>
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<td>Sjögren’s Syndrome</td>
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<tr>
<td>Lupus Nephritis</td>
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<tr>
<td>Hidradenitis Suppurativa</td>
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</tr>
</tbody>
</table>

Timelines are tentative assuming limited further impact of COVID-19
# Prevalent and incident patient populations

## Market potential in G7 countries

<table>
<thead>
<tr>
<th>Indication</th>
<th>Prevalence</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sjögren's Syndrome¹</td>
<td>950,000+</td>
<td></td>
</tr>
<tr>
<td>Kidney transplantation²</td>
<td>500,000+</td>
<td>40,000+</td>
</tr>
<tr>
<td>Liver transplantation³</td>
<td>300,000+</td>
<td>15,000+</td>
</tr>
<tr>
<td>Systemic Lupus Erythematosus⁴</td>
<td>500,000+</td>
<td></td>
</tr>
<tr>
<td>Lupus Nephritis⁵</td>
<td>180,000+</td>
<td></td>
</tr>
<tr>
<td>Hidradenitis Suppurativa⁶</td>
<td>~3m (150,000+ Hurley stage II and III)</td>
<td></td>
</tr>
</tbody>
</table>

4. DRG Lupus Nephritis Disease report, Novartis internal analysis.  
5. DRG Lupus Nephritis Disease report, Novartis internal analysis.  
6. Phan K et al. Biomedical Dermatology 2020; Primary Market Research.
**Ligelizumab**
(QGE031)

Humanized anti-IgE monoclonal antibody blocking IgE/FcεRI pathway

**Key highlights**

- Ligelizumab with potential to become first-line biologic after antihistamine therapy in Chronic Spontaneous Urticaria (CSU)

- Nature Communications publication demonstrates that ligelizumab shows more profound inhibition of IgE binding to FcεRI (high affinity IgE receptor)\(^1\)
  - Mechanistic and functional profile of ligelizumab rationalizes Ph2b results with more patients achieving symptom control vs. Xolair®

- Currently assessing ligelizumab in other anti-IgE/FcεRI mediated diseases - Chronic Inducible Urticaria (CINDU) and Food Allergy, with combined blockbuster potential

- Ph3 CSU superiority studies vs. Xolair® (PEARL 1, 2) finished recruitment in adults; first results expected H2 2021 with submission in 2022 (COVID impact)

---

Chronic Spontaneous Urticaria
In Ph2b, ligelizumab showed better symptom control compared to Xolair®

1.3m+ CSU patients are still inadequately controlled

- CSU diminishes quality of life with unpredictable onset of itch, hives and/or angioedema
- Approximately 40% do not respond to updosed second generation antihistamines
- Up to 30% of people with moderate to severe CSU suffer from depression or anxiety

Phase 2b study with clear dose-response on complete hives control and USA7³ change from baseline⁴

"Ligelizumab for chronic spontaneous urticaria"
Primary publication of the Phase 2b study (QGE0312201)⁴

Primary objective achieved: Dose response relationship with respect to complete weekly hives response rate (HSS7<0) at week 12

---


5. HSS7 = Hives Severity Score over 7 days.
**Mechanistic differences between ligelizumab and omalizumab (Xolair®) provide scientific rationale for strong Ph2b results**

**Ligelizumab recognizes a different epitope of the IgE molecule than Xolair®**

- Higher affinity to IgE is due to formation of more stable IgE-ligelizumab complexes (slower off-rate)
- More potently inhibits IgE binding to the high affinity IgE receptor (FcεRI) on effector cells than to the low affinity receptor FcεRII (CD23)
- More potently inhibits mast cell and basophil activation and degranulation
- More potently inhibits IgE production

Ligelizumab Phase 3 CSU studies
Aim to demonstrate superiority vs omalizumab

**PEARL 1 and 2 ongoing; first results expected H2 2021**

2 multi-center, randomized, double-blind, active/placebo-controlled studies with 1050 patients each

1. UAS7 = Urticaria Activity Score over 7 days.

**Well powered, bold Head-to-Head comparison vs SoC**
(highest approved Xolair® dose 300mg)

**1º endpoint:**
Absolute change from baseline in UAS7 at week 12

**Key 2º endpoints at week 12:**
- Complete absence of hives and itch, % of subjects with no itch, no hives
- Improvement of itch severity score
- Impact on subject’s quality of life
- Cumulative number of weeks without angioedema
Exploring ligelizumab in other IgE/FcεRI inhibition mediated diseases - Chronic Inducible Urticaria (CINDU)

- Approximately 1/3 of chronic urticaria patients have CINDU
- The current SoC is second generation antihistamines
- While disease triggers in majority of cases are unavoidable, there are no approved therapies for uncontrolled CINDU patients
- The therapeutic goal is to achieve complete symptom control by blocking the effects of mast cell mediators and prevention of mast cell degranulation

IgE/FcεRI inhibition a promising therapeutic target in CINDU

- Pathophysiology includes activation and degranulation of tissue-resident mast cells and release of pro-inflammatory mediators
- The respective trigger may result in de novo synthesized autoantigen/autoallergen, which is detected by IgE bound to skin mast cells

---

Potential best-in-class therapy in Food Allergy
Protecting patients from allergic reactions triggered by accidental exposure

- Prevalence is 3-8% across countries; allergy to multiple foods is common¹
- High unmet need for effective and safe treatments² to improve quality of life of patients and families³
- Current standard of care is avoidance of allergens and injectable epinephrine to treat reactions³.
- However:
  - 42% of children and 51% of adults have experienced at least one severe food-allergic reaction⁴,⁵
  - Reactions can be triggered by tiny exposures (e.g. fraction of a peanut⁶)

Currently exploring ligelizumab potential in other IgE/FcεRI inhibition mediated diseases

<table>
<thead>
<tr>
<th>Market potential</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indication</strong></td>
</tr>
<tr>
<td>CSU</td>
</tr>
<tr>
<td>Food Allergy</td>
</tr>
<tr>
<td>CINDU</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Upcoming milestones for development program</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2020</strong></td>
</tr>
<tr>
<td>CSU</td>
</tr>
<tr>
<td>Food Allergy</td>
</tr>
<tr>
<td>CINDU</td>
</tr>
<tr>
<td>▪ CSU PEARLs readout expected H2 2021; submission 2022</td>
</tr>
<tr>
<td>▪ Food Allergy: Initiation of Ph3 program expected H2 2021</td>
</tr>
<tr>
<td>▪ CINDU: Initiation of Ph3 program expected H2 2021</td>
</tr>
</tbody>
</table>
CRM

Entresto®
Leqvio®
Pelacarsen
Iptacopan
### Entresto®

Angiotensin receptor neprilysin inhibitor (ARNI) providing dual blockage of critical pathways involved in the pathogenesis of heart failure

Marketed; LCM in Phase 3

#### Key highlights

- **Significant growth opportunity through geographic expansion with current and LCM indications**
  - ~3/4 of all HFrEF patients can still benefit from Entresto®
- **Heart failure with reduced ejection fraction (HF-rEF)**
  - Approved in 115 countries
  - Strong growth across all geographies
  - Extensive clinical and real-world evidence supporting use as first-line treatment
- **Heart failure with preserved ejection fraction (HF-pEF)**
  - FDA AdCom on December 15, FDA action date in Q1 2021
- **Post acute myocardial infarction (PAMI)**
  - Ph3 PARADISE-MI study ongoing with readout expected in Q2 2021
- **Pediatric heart failure**
  - Approved in US
  - PANORAMA-HF study ongoing with readout expected 2022
**Entresto® is the essential, first choice therapy in HFrEF**

Increasing use and adoption as 1\textsuperscript{st} line treatment, supported by broad evidence base

**Key characteristics supporting first line use of Entresto®**

- Essential role of both nephrilysin and RAAS inhibition in clinical outcomes
- Improved cardiovascular outcomes vs. conventional RAAS inhibition
- Safe and effective in broad populations including ACEi/ARB naive patients
- Easy and safe initiation in-hospital or immediately after discharge
- Well understood reversal of cardiac remodelling based on unique MoA
- Effectiveness and safety confirmed by large body of RWE in clinical practice
- Guidelines support as SoC

**Entresto® has the most comprehensive evidence of all HF therapies including >20,000 patients in clinical trials and >300,000 patients in RWE**
Entresto® has significant growth opportunity through geographic expansion in HFrEF and LCM indications with high unmet need

**Future growth drivers**

- **Strong Q3 performance across major geographies vs. PY:**
  - US+43%, China+104%, EU+36%
- Strong recovery from COVID impact

**HFrEF**

- Increased penetration – approx. 3/4 of HFrEF patients can still benefit
- Geographic expansion (e.g. China)

- **HF-pEF (US)**
  - Potential approval: 2021
  - Up to ~3.1m patients in US
  - Potential to be first approved treatment

- **Post-MI**
  - Potential approval: 2022
  - 805,000 MI events per year in US
  - Potential to replace ACEi/ARB as 1st line therapy

- **Pediatric HF**
  - Potential approval: 2023
  - Low patient number but fulfilling societal need
  - Potential to be first approved treatment and to replace ACEi as 1st line treatment
Entresto® could be the first approved pharmacological therapy for HF-pEF in US
Review ongoing with action date in Q1 2021

### PARAGON

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Sac/val N=2407</th>
<th>Valsartan N=2389</th>
<th>Rate Ratio (95% CI)</th>
<th>Rate Ratio (95% CI)</th>
<th>2-sided P-value</th>
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</thead>
<tbody>
<tr>
<td>CEC-confirmed</td>
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<tr>
<td>Primary endpoint</td>
<td>894</td>
<td>1009</td>
<td>0.870 (0.753, 1.005)</td>
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<td>0.059</td>
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<tr>
<td>Expanded composite endpoint*</td>
<td>934</td>
<td>1064</td>
<td>0.861 (0.747, 0.993)</td>
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<td>0.040</td>
</tr>
<tr>
<td>Supportive analyses of the primary endpoint</td>
<td>1064</td>
<td>1241</td>
<td>0.843 (0.736, 0.966)</td>
<td></td>
<td>0.014</td>
</tr>
</tbody>
</table>

- FDA Advisory committee December 15, 2020
- Favorable safety profile in line with rEF population
- Totality of evidence including several supportive analyses demonstrates a beneficial treatment effect

PARADISE-MI in patients with post acute MI is ongoing
Results expected in Q2 2021

**Study design Ph3 PARADISE-MI study**

- **Screen**: LCZ696 (titrate to 200 mg bid; dose adjustment permitted)
- **Randomize between 12 hrs up to 7 days after an AMI**: Ramipril (titrate to 5 mg bid; dose adjustment permitted)

**Patients**: 5670 patients following an acute myocardial infarction without prior history of heart failure

**Primary objective**: Demonstrate superior efficacy of Entresto® compared to standard of care (ramipril) in time to first composite event

**Primary composite endpoint**: CV death, HF hospitalizations, outpatient HF visits

**Trial profile**

- Comparison to ACE inhibitor ramipril to show superiority to current SoC
- Potentially extends use to preventing the development of HF in patients post-AMI
- Mitigation strategies were put into place to address potential impact of COVID-19 on trial
**Confidence in future growth based on current and new indications**
Potential to reach up to 9m patients worldwide at peak with Entresto®

### Market potential

<table>
<thead>
<tr>
<th>Indication</th>
<th>USD</th>
</tr>
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<tbody>
<tr>
<td>HF-rEF</td>
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<tr>
<td>HF-pEF (US)</td>
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<tr>
<td>pAMI</td>
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<tr>
<td>Pediatric HF</td>
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- 🟢<100m
- 🟢<100m – 2bn
- 🟢>2bn

### Upcoming milestones for development program

<table>
<thead>
<tr>
<th></th>
<th>H2 2020</th>
<th>H1 2021</th>
<th>H2 2021</th>
<th>H1 2022</th>
<th>H2 2022</th>
<th>H1 2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>HF-pEF</td>
<td></td>
<td>🟢(US)</td>
<td></td>
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<tr>
<td>pAMI</td>
<td>Phase 3</td>
<td></td>
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<tr>
<td>Pediatric HF</td>
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</tbody>
</table>

- 🟢 Expected submission
- 🟢 FDA action date
**Key highlights**

- More than 135m ASCVD patients worldwide\(^1,2,3\)
- Positive CHMP opinion received October 15, 2020:
  - European approval expected December / January in 27 EU members states plus UK, Norway
  - Launch in Germany in H1 2021, launch in UK in H2 2021
- China and Japan additional studies planned in order to pursue approval
- FDA action date December 2020; inspection of production site (Italy) pending
- Effective and sustained LDL-C reduction up to 52% with only two doses a year\(^3\)\(^+\)
- Safety comparable to placebo

\(^*\)Product and brand name are not FDA approved. Currently under FDA review.
\(^+\)Given as an initial dose, again at 3 months, and then every six months thereafter.
Inclisiran delivers an effective and sustained LDL-C reduction of up to 52%\(^1,2\)

- Cardiovascular disease is the number one killer worldwide, responsible for one in every three deaths globally.
- Effective and sustained LDL-C reduction remains a challenge, with 80% of people with ASCVD not achieving guideline-recommended LDL-C targets on statins alone.
- Barriers include difficulties in making lifestyle changes and the inability to access some therapies or adhere to treatment.
- These challenges underscore the significant unmet need for a new type of medicine.

---

1. Two Phase 3 Trials of Inclisiran in Patients with Elevated LDL CholesterolKausik K. Ray, M.D., M.Phil., R. Scott Wright, M.D., David Kallend, M.D., Wolfgang Koenig, M.D., Lawrence A. Leiter, M.D., Frederick J. Raal, Ph.D., Jenna A. Bisch, B.A., Tara Richardson, B.A., Mark Jaros, Ph.D., Peter L.J. Wijngaard, Ph.D., and John J.P. Kastelein, M.D., Ph.D., for the ORION-10 and ORION-11 Investigators*; March 18, 2020, at NEJM.org.DOI: 10.1056/NEJMoa1912387
Inclisiran is well tolerated with a safety profile comparable to placebo

- No significant safety or tolerability concerns have been identified with the long-term administration of inclisiran\(^1,2\)
- Most common adverse events occurred with similar frequency in the inclisiran and placebo groups
- The only adverse reactions associated with inclisiran were at the injection site all of which were mild or moderate in severity, transient and resolved without sequelae
- The most common adverse reactions reported were diabetes mellitus, hypertension, nasopharyngitis, arthralgia, back pain, dyspnea, bronchitis and upper respiratory tract infection

### ORION-9 (n=481)\(^1\)

<table>
<thead>
<tr>
<th>Safety population</th>
<th>Inclisiran n=241</th>
<th>Placebo n=240</th>
<th>Inclisiran n=781</th>
<th>Placebo n=778</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Patients with at least one serious TEAE</td>
<td>18</td>
<td>7.5%</td>
<td>33</td>
<td>13.8%</td>
</tr>
<tr>
<td>Pre-specified exploratory CV endpoint (MedDRA basket)</td>
<td>10</td>
<td>4.2%</td>
<td>10</td>
<td>4.2%</td>
</tr>
</tbody>
</table>

### ORION-10 (n=1,559)\(^2\)

<table>
<thead>
<tr>
<th>Safety population</th>
<th>Inclisiran n=811</th>
<th>Placebo n=804</th>
<th>Inclisiran n=778</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Patients with at least one serious TEAE</td>
<td>181</td>
<td>22.3%</td>
<td>181</td>
</tr>
<tr>
<td>Pre-specified exploratory CV endpoint (MedDRA basket)</td>
<td>63</td>
<td>7.8%</td>
<td>83</td>
</tr>
</tbody>
</table>

2 HCP-administered doses a year\textsuperscript{1\dagger} may remove adherence challenges

Commonly encountered with self-administered treatments; low adherence increases MACE

Statin adherence in a secondary prevention cohort

- Non adherent: 43%
- Partially adherent: 26%
- Fully adherent: 31%

MACE according to adherence categories in a secondary prevention cohort\textsuperscript{2}

- PDC <40%
- PDC 40%-79%
- PDC ≥80%

\textsuperscript{1} Given as an initial dose, again at 3 months, and then every six months thereafter.  

MACE, major adverse cardiovascular events; MI, myocardial infarction; PDC, percent days covered.
Reducing LDL-C improves CV outcomes
ORION-4, 15,000 patients, designed to confirm MACE and CV mortality benefit over 5 years

- Almost 1 million patient-years of clinical trial data, plus genetic and epidemiologic data, support the relationship between LDL-C and MACE
- Each mmol/L reduction in LDL-C reduces the relative risk of ASCVD events by 20% after 3 years and 1.5% in each subsequent year
- This relationship is reflected in international clinical treatment guidelines
- In US, the relation between LDL-C and outcomes is well established
- We continue to pursue unique access models ahead of ORION-4 outcomes data which will help physicians improve patients' outcomes
- Expected read-out in 2025

1. Figure from Ference et al Eur Heart J. 2017.  
3. Major Adverse Cardiovascular Events.
**Inclisiran is supported by a robust clinical program**
12 trials in 20 countries with more than 19,000 patients involved

**Phase 3 pivotal trials**

- ORION-9, -10 and -11 trials are multicenter, double-blind, randomized, placebo-controlled, 18-month studies
- Primary endpoints met in all three trials
- Effective and sustained LDL-C reduction up to 52% with only two doses a year†
- Safety comparable to placebo except for injection site reactions

† Given as an initial dose, again at 3 months, and then every six months thereafter.

Pelacarsen
(TQJ230)

Antisense oligonucleotide for the reduction of lipoprotein(a)

Phase 3

Key highlights

- Pelacarsen is an antisense oligonucleotide expected to be the first disease modifying treatment for elevated Lp(a), which is expected to reduce CV risk
- Pelacarsen addressable target population in G7¹ ~8m
- Ph2b data showed potent and consistent reduction of Lp(a) with a good tolerability and safety profile
- Lp(a) Heritage – prevalence trial (N ~45,000) – recruitment ongoing and readout expected in 2021
- Lp(a) Horizon - Ph3 cardiovascular outcome trial (N ~7,680; pelacarsen 80mg monthly subcutaneous injection; patient self-administered) - recruitment on track for completion in 2021. Trial readout expected 2024

¹. Potential patients defined by the population studied in Lp(a)HORIZON: patients with elevated Lp(a) and MI, stroke or PAD. Potentially eligible population dependent on trial results and label.
Pelacarsen has blockbuster potential and would be the first treatment for high-risk patients with elevated lipoprotein(a)

**High unmet need - no treatments today**
- 1 in 5 people have elevated Lp(a)\(^4\)
- No approved treatment to lower Lp(a) CV risk\(^5\)
- Lp(a) is inherited and cannot be addressed by diet and exercise
- Current lipid lowering therapies have limited impact on Lp(a)

**Potential eligible patients G7\(^1\)**

**First to market with blockbuster potential**
- Pelacarsen is a novel antisense oligo therapy targeting Lp(a)
- It would be the first therapy to treat Lp(a) CV risk
- Novartis is committed to ASCVD and pioneering innovation for patients with Lp(a)

---

1. Potential patients defined by the population studied in Lp(a)\(\text{HORIZON: patients with elevated Lp(a) and MI, stroke or PAD. Potentially eligible population dependent on trial results and label.}\)\(\text{2. US AHA (Heart Disease & Stroke Stats 2018 update), EUS & JP Kantar Health EPI database, DRG Database, REACH Registry. ASCVD: Atherosclerotic cardiovascular disease.}\)
2. Odyssey Outcome Trial. Estimates vary based on regional/ethnic variability.\)
Pelacarsen: An innovative approach to reducing Lipoprotein(a)

- Apolipoprotein(a) is required for the assembly of Lp(a)
- Pelacarsen binds to apolipoprotein(a) mRNA, preventing the synthesis of the apo(a) protein and lowering the levels of circulating Lp(a)
In Phase 2b, pelacarsen significantly reduced Lp(a) in CVD patients\(^1\)

**Ph2b results – pelacarsen vs. placebo**

*NEJM Tsimikas, et al. 2020*

<table>
<thead>
<tr>
<th>% of patients achieving Lp(a) ≤50mg/dL</th>
<th>P-values</th>
<th>Pearson's correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pooled Placebo</td>
<td>6.4</td>
<td></td>
</tr>
<tr>
<td>20 mg/Q4W</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>40 mg/Q4W</td>
<td>62.5</td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td>20 mg/Q2W</td>
<td>64.6</td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td>60 mg/Q4W</td>
<td>80.9</td>
<td>P&lt;0.0001</td>
</tr>
<tr>
<td>20 mg/QW</td>
<td>97.7</td>
<td>P&lt;0.0001</td>
</tr>
</tbody>
</table>

Ph2b data showed\(^1\):
- Lp(a) levels were reduced to ≤50mg/dL in 98% of CVD patients following treatment with pelacarsen 20mg once a week
- Dose-dependent Lp(a) reductions up to 80%
- Good tolerability and safety profile

80mg monthly is being evaluated in Ph3

---

CVD, cardiovascular disease; Lp(a), lipoprotein (a); QW, once a week

Prevalence study and Ph3 outcome study ongoing with expected readouts in 2021 and 2024

**Prevalence study**

- Study to evaluate prevalence of elevated Lp(a) levels in patients with established CVD
- ~45,000 patients,
  > 900 sites in 48 countries
- Study initiated April 2019
- Study results expected 2021

**Phase 3 outcome study**

- CV outcome trial to assess effect of pelacarsen on MACE in patients with established CV disease and elevated Lp(a) on optimal therapy for other risk factors\(^1\)
- Pioneering trial to evaluate impact of Lp(a) lowering on CV outcomes
- Study initiated December 2019
- Primary outcome: 2024

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CV, cardiovascular; MACE, major adverse CV events; Lp(a), lipoprotein (a).  
\(^1\) [https://clinicaltrials.gov/ct2/show/NCT04023552](https://clinicaltrials.gov/ct2/show/NCT04023552)
### Iptacopan (LNP023)

**Low molecular weight Factor B inhibitor targeting the alternative complement pathway**

**Phase 2**

**Key highlights**

- In parallel development for five rare diseases including four in nephrology and one in hematology
- Positive Ph2 results presented at EBMT\(^1\) for paroxysmal nocturnal hemoglobinuria (PNH) and at ASN\(^2\) for C3 glomerulopathy (C3G)
- PRIME designation for C3G and five orphan drug designations granted
- First Ph3 planned to start December 2020 (investigated as monotherapy in PNH) followed by others in H1 2021
- First filings expected 2023 to support outlook with multi-billion potential
- Differentiated profile as potential first effective and safe anti-complement therapy with a convenient oral delivery

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1. EBMT = Annual Meeting of European Society for Blood and Marrow Transplantation.
2. ASN = American Society of Nephrology Annual Meeting.
Iptacopan: First-in-class factor B alternative pathway inhibitor

In parallel targeted development for four complement driven rare renal diseases and PNH

High unmet need - limited treatment options

- Complement driven renal diseases (CDRD) mostly affect young adults
- Current SoC: Non-specific immuno-suppressants with limited clinical evidence and significant side effects
- 20-50% of patients progress to ESRD\(^1\) within 10-20 years
- IgAN: leading cause of ESRD (dialysis/transplant) in young adults
- PNH: Many patients suffer from anemia and remain transfusion dependent despite anti-C5 therapy

Number of patients with Targeted CDRD\(^2\) in the US

First-in-class blockbuster potential

- Iptacopan is a first in class factor B inhibitor of the alternative complement pathway
- Poised to slow progression to ESRD in complement driven renal diseases
- Positive Ph2 results in C3G, PNH
- Targeted approach in high risk IgAN patients with persistent proteinuria ≥1g/day
- Part of Novartis commitment to deliver transformative therapies to patients with renal diseases

1. End-stage Renal Disease (ESRD).
2. IgA Nephropathy (IgAN), C3 Glomerulopathy (C3G), atypical Hemolytic Uremic Syndrome (aHUS), Membranous Nephropathy (MN) and Paroxysmal Nocturnal Hemoglobinuria (PNH).
**Factor B inhibition in complement driven renal diseases**
A targeted approach to reduce injury in inflammatory renal diseases

**Complement Cascade in Renal Diseases**

- **Alternative Pathway**
  - Atypical HUS
  - C3 Glomerulopathy
  - IgA Nephropathy
  - Factor B
  - Factor D, Properdin

- **Lectin Pathway**
  - IgA Nephropathy
  - MBL, MASP-1,2

- **Classical Pathway**
  - Lupus Nephritis
  - MPGN

- **C3 Convertase**
  - C3bBb
  - C3a
  - C3b

- **C5 Convertase**
  - C3bC3bBb
  - C5a
  - C5b-9

- **Terminal Pathway**

- The complement system is a critical part of the innate immune response
- Complement dysregulation can cause kidney injury
- Dysregulation of alternative complement pathway is associated with a range of glomerular diseases including IgAN, C3G and aHUS

Iptacopan in C3 glomerulopathy (C3G)
Promising efficacy and favorable safety and tolerability profile seen in Ph2

**UPCR (24h urine collection) vs. baseline over time**

- Iptacopan reduces complement alternative pathway activity
- 49% reduction in UPCR from baseline as well as stabilization of eGFR at 3 months
- Well tolerated with no unexpected or new safety findings
Iptacopan in IgA Nephropathy (IgAN)
Potential to slow progression to dialysis and renal transplant

Phase 3 design (n=450)

- Blinded IgAN Ph2 interim results passed futility, full primary endpoint results available Q1 2021
- FDA and EMA recognize proteinuria at 9 months as surrogate marker for accelerated/conditional approval
- Initiation of Ph3 planned for Q1 2021

- Adult IgAN patients with UPCR ≥1g/g/day despite optimal RAAS blockade
- Primary Endpoint: Proteinuria reduction from baseline at 9 months (IA); Annualized eGFR slope over 2-year follow-up (EoS)
Iptacopan in Paroxysmal Nocturnal Hemoglobinuria (PNH)
Superior efficacy and oral RoA; alternative treatment choice to current/future SoC

PNH Ph2 Transfusion-free Hb increase

Individual time profiles of hemoglobin (g/L)

- Represents the last dose of eculizumab
- Add-on: improved hematological response (Hb I); maintained on monotherapy
- Monotherapy (in anti-C5 naive patients; not shown): >60% LDH reduction in all patients
- Lab parameter normalization indicates control of intra- and extravascular hemolysis

PNH Ph3 design (LNP023 studied as monotherapy)

- Adult PNH patients with residual anemia (Hgb <10g/dL) despite stable anti-C5 therapy in last six months
- Primary Endpoints:
  - % of patients achieving increase in Hgb ≥2g/dL from baseline in the absence of RBC transfusion
  - % of patients achieving Hgb ≥12g/dL in the absence of RBC transfusion

1. Colored lines represent single individuals; colored asterisks the last dose of eculizumab. The lower panel shows hemoglobin levels during combination – and LNP023 monotherapy after withdrawal of eculizumab. LLN – lower limit of normal.
**Iptacopan (LNP023) development program**
First-in-class potential across a range of complement driven diseases

### Market potential

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<th>Indication</th>
<th>US prevalence thousands</th>
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<td>IgAN</td>
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<td>MN</td>
<td>~80</td>
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<td>C3G</td>
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<td>aHUS</td>
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<td><strong>Hematology</strong></td>
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<td>PNH</td>
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- Ph3 studies in four indications projected to start between December 2020 (PNH) and mid-2021
- IgAN and PNH Ph3 study designs agreed with HAs; C3G and aHUS Ph3 studies under discussion with HAs
- IA in IgAN Ph3 study potentially supports filing for accelerated / conditional approvals based on proteinuria reduction
- Anticipated worldwide filings as of 2023 with projected blockbuster sales potential
- Additional specialty indications under consideration

IgA Nephropathy (IgAN), Membranous Nephropathy (MN), C3 Glomerulopathy (C3G), atypical Hemolytic Uremic Syndrome (aHUS), and Paroxysmal Nocturnal Hemoglobinuria (PNH).
Neuroscience

Kesimpta®

Branaplam
Kesimpta®
(ofatumumab)

Anti CD20 monoclonal antibody targeting B-Cells with a monthly 20mg sc dosing

Marketed in US

Key highlights

- Kesimpta® demonstrated high efficacy in both Ph3 trials ASCLEPIOS I and II:
  - Patients treated with Kesimpta® experienced on average only 1 relapse every 10 patient-years\(^4\)
  - 9/10 patients had no evidence of disease activity (NEDA-3) in year 2 in post hoc analysis\(^5\)
- Kesimpta® is approved in the US for the treatment of relapsing forms of MS, to include clinically isolated syndrome, relapsing-remitting disease, and active secondary progressive disease, in adults
- Over 700k people living with RMS in major markets with over 300k in the US alone\(^1\)
- The US MS market has grown to USD 15bn\(^2\) in 2019
- B-cell therapies expected to account for 34% share in key markets by 2025\(^3\)
- Ongoing regulatory activities in major regions and countries (EU, Japan and China)
- Ongoing long-term safety and efficacy extension study as well as a broad medical affairs and pediatric program to supplement current data for Kesimpta® over the next 5 - 10 years

Kesimpta® early US launch indicators are positive
Potential to become a 1st choice high efficacy DMT for patients, physicians and payers

- HCP engagement translating into adoption
  - 95%+ (~6,000) of MS prescribing targets reached
  - 95% of field force territories have adopted Kesimpta®
  - 5.2%¹ NBRx share just 10 weeks post launch

- Securing rapid and broad access
  - Commercial bridging program
  - Engagement plans ongoing and on-track
  - 44% (~90M) of total US commercial lives coverage
  - CVS Caremark & Aetna, ESI, and Anthem commercial formularies
  - Early Medicare wins in plans such as BCBS of MA

- Patient initiation seen as simple, easy and fast
  - Favorable customer feedback from HCPs and patients

1. IQVIA reported NBRx week ending October 30, 2020.

2020

- Focus on demand and patient initiations
- Free goods enabling rapid initiation and account for majority of initial demand
- NBRx uptake and early payor access key lead indicators
B-cell share of MS market expected to double within the next five years

Over 700k\(^1\) people living with RMS in major markets (2019) with frequent switching among classes and brands

**US** 317k RMS diagnosed

**EU5** 420k RMS diagnosed

WW MS market expected to remain flat; B-cell share expected to double by 2025

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<thead>
<tr>
<th>Class</th>
<th>2019</th>
<th>2025</th>
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<tbody>
<tr>
<td>Orals</td>
<td>15%</td>
<td>34%</td>
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<tr>
<td>B-cell</td>
<td>33%</td>
<td>43%</td>
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<tr>
<td>BRACE</td>
<td>8%</td>
<td>35%</td>
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<tr>
<td>Other mAbs</td>
<td>8%</td>
<td>35%</td>
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\(^1\) Calculated based on actual IQVIA SU data validated through DRG Epi database and secondary research. RMS includes CIS, RRMS, aSPMS. DRG Disease Landscape & Forecast. Analysis includes Key markets: US, Germany, France, Italy, Spain, UK, and Japan. Future launches in DRG forecast: BTK inhibitors (2025), Ibudilast (2029).

2. Class definition: Orals – (S1P, Tecfidera, Vumerity, Mavenclad, BTK inhibitors, Ibudilast); BRACE (Recombinant interferon-betas, Polypeptides); B-cell (Anti-CD20 monoclonal antibodies), Other mAbs (Tysabri, Lemtrada).
BRACE and first-line orals commonly used in early stages
Despite data showing high-efficacy treatments started early result in better outcomes

Use of disease-modifying treatments in MS\(^1\)

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<th>US</th>
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<tr>
<td>1st line</td>
<td>10%</td>
<td>7%</td>
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<td>2nd line</td>
<td>16%</td>
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<td>3rd line</td>
<td>29%</td>
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13% 16%
77% 78%
74% 42%
60% 26%
55% 55%
33% 31%
12% 14%

% patients

BRACE & First-line orals
High-efficacy orals
mAbs

Cumulative hazard of CDP in patients with RRMS treated from disease onset versus late with high-efficacy treatment\(^2\)

![Graph showing cumulative hazard of CDP](image)

\(^{1}\) MAb: Ocergusit, Lemtrada; Tysabri; High-efficacy orals: Gilenya, Mayzent, Mavenclad. BRACE & First-line orals: Interferons, Copaxone, GA Gc, Tecfidera, Aubagio. *High efficacy DMTs may include orals and MAbs

2. He A et al. Lancet Neurol. 2020;19(4):307–316. Retrospective analysis, measured from disease onset. Bold lines are cumulative hazard estimates and shaded areas are 95% CIs. CDP, confirmed disability progression; CI, confidence interval; HR, hazard ratio; RMS, relapsing multiple sclerosis.
Patients value high efficacy treatments that balance safety, convenience and have easier access

44% of people with MS aren’t satisfied with today’s treatments 1,2,3

Due to:
- Lack of efficacy
- Side-effects/ tolerability issues
- Treatment burden
- Direct costs of treatments and testing
- Indirect costs of time commitments

Resulting in frequent switching (2019) 1,4

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<tr>
<td>Dynamic (includes naive &amp; switch patients)</td>
<td>28%</td>
<td>44%</td>
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<td>Stable / continuing</td>
<td>72%</td>
<td>56%</td>
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1. EU5 IPSOS Monitor Q4 2019 (Patients dissatisfied with current Oral, Injectables, and IV medications).
3. MS Patient Journey research 2019.
**Kesimpta®** was designed to address the needs of treating physicians and people living with MS

**Unique mode of binding and s.c. dosing delivering high efficacy**

**Precise B-cell depletion in the lymph nodes, sparing the spleen, helps maintain immune function**

**Flexibility of once-monthly, at-home self-administration delivered through a Sensoready® pen**

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2. Hauser S.L. et al. Ofatumumab vs Teriflunomide in Relapsing Multiple Sclerosis Analysis of No Evidence of Disease Activity (NEDA-3) from ASCLEPIOS I and II
Kesimpta® demonstrated up to nearly 60% reduction in relapses (ARR) vs. teriflunomide

Patients treated with Kesimpta® (ofatumumab) experienced on average only 1 relapse every 10 patient-years¹

9/10 patients on Kesimpta® had no evidence of disease activity (NEDA-3) in year 2 in post hoc analysis²

**Kesimpta® showed 37% and 46% reductions in 12 and 24-week CDW1 vs. teriflunomide**

12-week CDW2

- Risk reduction: 36.6% (p=0.002)
- Hazard ratio (95% CI): 0.634 (0.472; 0.851)

24-week CDW2

- Risk reduction: 45.9% (p<0.001)
- Hazard ratio (95% CI): 0.541 (0.381; 0.768)

---

1. CDW = Confirmed Disability Worsening.
2. Post-hoc analysis with revised definition, adapted from the OPERA trials, Hauser et al. 2017. A disability "progression" was defined as an increase from the baseline EDSS score of at least 1.0 point (or 0.5 points if the baseline EDSS score was >5.5) that was sustained for at least 12 (24) weeks.
The Axios program\(^1\) can further establish Kesimpta\(^\circledast\) as a first-choice high efficacy DMT for patients, physicians and payers

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Kesimpta® has the potential to become a 1st choice, high efficacy DMT for patients, physicians and payers

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<th>For patients who want …</th>
<th>For physicians who want…</th>
<th>For payers who want…</th>
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<tr>
<td><strong>High efficacy</strong></td>
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<td>without treatment burden</td>
<td>that balances safety</td>
<td>that is competitively priced to reflect its unique value and ensure broad access</td>
</tr>
<tr>
<td>impacting their lives</td>
<td></td>
<td>An easily administered, subcutaneous solution requiring no premedication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To avoid reliance on infusion infrastructure</td>
</tr>
<tr>
<td>Flexibility of at-home self-administration</td>
<td>An at-home treatment with no added medical costs</td>
<td></td>
</tr>
</tbody>
</table>

Kesimpta® Branaplam
Branaplam
(LMI070)

Orally administered, small molecule RNA splicing modulator

Phase 1

Key highlights

- In development for Huntington’s disease (HD) and Spinal Muscular Atrophy (SMA), two devastating rare neurodegenerative diseases

- Multiple data readouts and next steps in H1 2021:
  1. Readout of ongoing Ph1 single-ascending dose study in adult healthy volunteers to inform Huntington’s disease program
  2. Start of Ph2b dose range finding study in Huntington’s disease
     - Goal: Identify dose which reduces mHTT sufficiently to provide clinical benefit while maintaining adequate levels of HTT for normal function
  3. Publication of results from ongoing Ph1/2 study in SMA
Huntington’s disease is a devastating neurodegenerative disease
Our goal is to transform care with the first oral disease-modifying therapy

**Huntington’s disease**
- Inherited disease affecting multiple generations of families, those with a mutated gene develop disease
- Patients typically diagnosed between age 30-50, disability leads to death within 15-20 years
- Characterized by progressive worsening in motor, cognitive and psychiatric symptoms
- Rare disease, ~70,000 diagnosed patients in US and EU
- No approved disease modifying therapies to delay disease onset or slow progression
- Earlier diagnosis by genetic testing expected as disease-modifying therapies become available

**Branaplam**
- Oral branaplam lowers Huntingtin protein, an opportunity for disease modification
- Non-invasive oral splice modulator for at-home administration
- Once weekly dosing in SMA, potential for same regimen in HD
- May provide uniform HTT lowering throughout brain based on mouse models
- Broad exposure in peripheral tissues
Ph2b in Huntington's Disease to begin in 2021
Ongoing Ph1 will readout in H1 2021 and inform development program

Branaplam lowering of HTT mRNA in SMA patients led to development in HD

Early stage program of novel MoA
Preclinical and clinical data provide proof of concept in HD
Branaplam lowers:
- HTT transcript and protein in vitro
- HTT transcript and mutant HTT protein levels in BacHD mice\(^1\)
- HTT mRNA in SMA patients

Market potential

<table>
<thead>
<tr>
<th>Indication</th>
<th>Market size (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huntington’s Disease</td>
<td></td>
</tr>
</tbody>
</table>

1. Branaplam does not affect endogenous mouse HTT, the effect is specific to human HTT.
# Readout of Ph1/2 study in Spinal Muscular Atrophy in H1 2021

Preliminary data from ongoing study support continued development

## Ongoing Ph1/2 LMI070X2201 study in T1 SMA

<table>
<thead>
<tr>
<th>Part 1</th>
<th>Part 2</th>
<th>Part 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dose finding and safety</strong></td>
<td><strong>Safety and efficacy</strong></td>
<td><strong>Long-term follow-up</strong></td>
</tr>
<tr>
<td>COMPLETE</td>
<td>COMPLETE</td>
<td>ONGOING</td>
</tr>
</tbody>
</table>

### Objectives

<table>
<thead>
<tr>
<th>Part 1</th>
<th>Part 2</th>
<th>Part 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety, tolerability, PK, PD after 13 weeks of multiple oral doses of branaplam</td>
<td>Safety, tolerability, growth and efficacy of two doses of branaplam over 52 weeks</td>
<td>Long-term safety and efficacy follow-up in patients from Parts 1 and 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patients</th>
<th>13 infants</th>
<th>25 infants</th>
<th>29 patients rolled over 27 currently treated</th>
</tr>
</thead>
</table>

Preliminary data from Parts 1 and 2 suggest positive benefit:risk in SMA

Maximum exposure > 60 months

Effects on safety, tolerability, growth, motor function support continued study

Weekly oral doses are well-tolerated

Adverse events are mild to moderate, reversible and manageable and consistent with underlying disease

Development options being considered to improve outcomes in SMA
Ophthalmology

Beovu®
Beovu®
(brolucizumab, RTH258)

Humanized single-chain Fv antibody fragment inhibitor of VEGF

Marketeted; LCM in Phase 3

Key highlights

Launch progressing in wAMD
- Approved in >50 countries incl. top 10 markets and 10 Emerging Markets
- Label updates received in 45 countries
- Reimbursement in US, DE, JP; these markets are ~65% of total global aVEGF market today
- US demand recovered vs. Q2, stabilized ~1,2k vials/week
- Good launch uptake in DE-JP: ~6-8% wAMD market share achieved in the first 6 months from launch

Strengthening both our efficacy and safety narrative
- Correlation between fluid and vision in wAMD demonstrated in 3 brand agnostic post-hoc analyses
  - In two H2H studies Beovu® outperformed aflibercept in achieving superior fluid resolution (IRF and/or SRF)
  - Good progress on short-term insights and potential measures that could help reduce overall risk of AEs (patient characteristics, treatment)

Progressing clinical development in new indications
- KITE pivotal DME study reported positive top line results
- Progressing clinical development in DME, RVO and PDR

In two H2H studies in wAMD, Beovu® outperformed aflibercept in achieving superior fluid resolution (IRF and/or SRF)

AMD is a leading cause of severe and irreversible vision loss worldwide\(^1,2\).

Affects 10–13% of adults aged >65 years with estimated 196M cases by 2020\(^2\).

A large unmet need still exists:
- >50% of patients have unresolved fluid\(^3\)
- >50% are on less than every 8 weeks (q8w) injection intervals\(^4\)

In H&H Beovu\(^5,6\):
- Achieved robust vision gains
- Outperformed aflibercept in achieving superior fluid resolution (IRF and/or SRF)
- Maintained majority of patients on 12-week intervals immediately after loading through year 1

TALON and MERLIN to address new dosing regimens

---

Beovu® performance recovering after safety signal and COVID-19

Sales per quarter
USD million

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Q4 2019</th>
<th>Q1 2020</th>
<th>Q2 2020</th>
<th>Q3 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>30</td>
<td>65</td>
<td>40</td>
<td>70</td>
</tr>
<tr>
<td>EU</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>JP</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>US</td>
<td>0</td>
<td>15</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Approvals and label updates and reimbursement
- >50 MAs received in 2020
- Safety label updates in all major geographies (45+)
- Reimbursement discussions mostly in line with expectations with some COVID delays (UK, FR)

Markets that launched after US see good uptake
- ~6-8% wAMD market share achieved in DE-JP in the first 6 months from launch
- 20-40% share of business from naive patients

Further growth expected through
- Increased market penetration and geographic expansions in wAMD
- Subject to approval of additional indications (DME submission planned for Q2 2021)

New data presented at AAO (2020) for brolucizumab

- Ongoing investigations from real world data showed that patients with prior IOI and/or prior RO had highest observed risk rate for an event of IOI (including RV) and/or RO. Similar results were seen in the RV and/or RO subgroup.

- Treatment emergent ADAs (boosted and induced), but not pre-existing, may be associated with an increased incidence of RV/RO by using the conservative definition of the association.

- Additional analysis from ongoing studies are warranted to further assess findings.

- In post-hoc analysis, brolucizumab 6mg is associated with greater and sustained reduction in Pigment Epithelial Detachments and Subretinal Hyper-reflective Material compared with aflibercept.

- Novartis and the Coalition are fully committed to transparently communicating all facts and findings to ensure that ECPs have the latest data.

- Beovu® continues to represent an important treatment option for patients with wet AMD, with an overall favorable benefit-risk profile.

---

Strong LCM plan to expand in additional indications
Addressable population expected to double with indications beyond wAMD

- Approved in >50 countries, label updates received in >45 countries
- ~1.5m treated wAMD patients in G7; significant unmet need exists
- Post marketing safety events (RV/RVO) addressed in worldwide label updates
- Beovu® US demand recovered vs. Q2 and stabilized at ~1200 vials/week²
- Strong ex-US uptake despite context; wAMD share in DE and JP ~6-8% today³
- Market is recognizing superior drying of Beovu® and usage is expected to grow⁴

**wet AMD**
(Already approved indication)

### DME
- Affects 5.5m¹ people in G8 countries alone
- High unmet need for a new treatment option that improves patient outcomes & reduce treatment burden⁵,⁶
- Low diagnosis rate 54%⁸, treatment rate ~40%⁸
- Growing at 6% CAGR⁸

### RVO
- Affects 2.3m¹ people in G8 countries alone
- High unmet need for a new treatment option that improves patients outcomes, reduce treatment burden and resolves Ischemia⁶
- Low diagnosis rate ~63%⁸, treatment rate ~58%⁸

### PDR
- Affects 2.3m¹ people in G8 countries alone
- High unmet need for a new treatment option that reverse underlying severity and limit progression⁶
- Growing at 5% CAGR⁸

---

KITE pivotal DME study reported positive topline results\(^1\)

Progressing clinical development in DME: KITE & KESTREL

**KITE\(^1\) and KESTREL\(^2\)**

<table>
<thead>
<tr>
<th>Week 48</th>
<th>Week 96</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brolocizumab 6mg q12w/q8w</td>
<td>Brolocizumab 3mg q12w/q8w</td>
</tr>
<tr>
<td>Aflibercept 2mg q8w</td>
<td>Brolocizumab 6mg q12w/q8w</td>
</tr>
<tr>
<td>Brolocizumab 6mg q12w/q8w</td>
<td>Aflibercept 2mg q8w</td>
</tr>
</tbody>
</table>

**Comments**

**KITE pivotal DME study reported positive topline results\(^1\)**
- Non inferiority to aflibercept on BCVA at year 1
- Superior CST improvement versus aflibercept in a secondary endpoint over week 40-52
- >50% of Beovu\(^\circledR\) patients maintained on 3-month dosing interval through year 1, following the loading phase

**KESTREL**

Expected primary readout: December 2020

---

Phase 3 programs in BRVO/CRVO and PDR with expected readouts in 2023 (RAPTOR, RAVEN) and 2024 (CONDOR)

**RAPTOR** and **RAVEN**

<table>
<thead>
<tr>
<th>Week 24</th>
<th>Week 52</th>
<th>Week 76</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brolucizumab 6mg</td>
<td>Aflibercept 2mg</td>
<td></td>
</tr>
</tbody>
</table>

- Two eighteen-month, two-arm, randomized, double-masked, multi-center, Ph3 studies assessing the efficacy and safety of brolucizumab vs aflibercept in adult patients with visual impairment due to macular edema secondary to BRVO (RAPTOR) to CRVO (RAVEN)
- Primary objective: Non-inferiority of brolucizumab to aflibercept with respect to the change in BCVA from baseline up to Week 52

**CONDOR**

- A 96-week, two-arm, randomized, single-masked, multi-center, Ph3 study assessing the efficacy and safety of brolucizumab 6mg compared to panretinal photocoagulation laser in patients with proliferative diabetic retinopathy
- Primary objective: Non-inferiority of brolucizumab to PRP with respect to the change in BCVA from baseline up to Week 54

**Comments**

- Anti-VEGF therapy has demonstrated efficacy in RVO and PDR patients with ranibizumab and aflibercept
- Phase 3 trials have matched dosing and observation periods vs aflibercept
- Single Phase 3 study in PDR will be used in combination with KITE and KESTREL for seeking approval

---

BCVA, best corrected visual acuity; PDR, proliferative diabetic retinopathy; PRP, panretinal photocoagulation.  
1. [ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/NCT03802630?term=raptor&draw=2&rank=4)
2. [ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/NCT03810313?term=raven&draw=2&rank=4)
3. [ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/NCT04278417?term=brolucizumab&draw=2&rank=4)
**Beovu® market potential and upcoming new indication milestones**

Overall value driven by 4 indications

---

**Market potential¹**

<table>
<thead>
<tr>
<th>Indication</th>
<th>Market size (USD)</th>
</tr>
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<tbody>
<tr>
<td>AMD</td>
<td>●●●</td>
</tr>
<tr>
<td>DME</td>
<td>●●●●</td>
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<tr>
<td>RVO</td>
<td>●●●●●</td>
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<tr>
<td>PDR</td>
<td>●●●</td>
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- ●●●<500m
- ●●●<500m – 1bn
- ●●●>1bn

<table>
<thead>
<tr>
<th></th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
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</tr>
</thead>
<tbody>
<tr>
<td>wAMD</td>
<td></td>
<td></td>
<td></td>
<td>Phase 3b ★</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DME</td>
<td>★ Phase 3</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>RVO</td>
<td>Phase 3</td>
<td></td>
<td></td>
<td>★</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDR</td>
<td>Phase 3</td>
<td></td>
<td></td>
<td></td>
<td>★</td>
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</tbody>
</table>

- Interim analyses (1-year data: ★) may enable registration in DME and RVO indications
- Single pivotal study approach for PDR (based on regulatory precedence in Anti VEGF drug class)
- Additional specialty indications under consideration

---

AMD – Age-related Macular Degeneration.  
DME – Diabetic Macular Edema.  
RVO – Retinal Vein Occlusion.  
PDR – Proliferative Diabetic Retinopathy.  
1. DRG Dry and wet AMD Disease landscape and forecast report May 2020, DRG DME/DR Disease Landscape and forecast report Sep 2020.
Oncology: Solid Tumors

Kisqali®
Piqray®
Tabrecta™
Canakinumab

177Lu-PSMA-617
TNO155
LXH254
Kisqali®

Cyclin-Dependent Kinase 4/6 Inhibitor

Marketed; LCM in Phase 3

Key highlights

- Kisqali® is the only CDK4/6 inhibitor to demonstrate consistently superior Overall Survival (OS) in two large Ph3 trials, regardless of metastatic sites, endocrine treatment (ET) resistance, ET partner, treatment line or menopausal status, while maintaining Quality of Life (QoL)

- Kisqali® received the highest rating of any CDK4/6i on the ESMO Magnitude of Clinical Benefit Scale, based on OS and QoL benefits

- OS data and emerging evidence suggests that preferential and selective inhibition of CDK4 (such as that demonstrated by Kisqali®) may be relevant in both the advanced and early breast cancer settings

- Additional OS results to be reported in metastatic setting, including MONALEESA-2 data, expected in H2 2021 (event-driven)

- Kisqali® is being investigated in early breast cancer in the Ph3 NATALEE study, if successful, Kisqali® will be the only CDK4/6i with evidence supporting use in the large intermediate and high-risk populations; expected readout in 2022
High unmet need remains in HR+/HER2- BC

**Estimated percentages of total breast cancer population**

- 17% of breast cancer cases are HR+/HER2-
- 70% of breast cancer cases are TNBC
- 10% of breast cancer cases are HER2+

**Metastatic Breast Cancer**
- Improving OS while maintaining QoL is the #1 treatment goal
- Kisqali® stands apart as the only CDK 4/6 inhibitor that significantly improves Overall Survival in two Ph3 trials, across patient subgroups, with the QoL benefits

**Early Breast Cancer (EBC)**
- 83% of breast cancers are diagnosed as EBC
- The objective of EBC treatment is to cure the patient by preventing disease recurrence while maintaining QoL
- Kisqali® is being investigated in EBC in the Ph3 NATALEE study with the expected readout in 2022
- If successful, Kisqali® will be the only CDK 4/6 inhibitor with evidence supporting use in the large intermediate and high-risk populations

Kisqali®: Only CDK4/6i proven to extend the lives of patients in two Ph3 trials

- 9M 2020 sales up +59% cc, as only CDK4/6 with consistent OS benefit from two pivotal Ph3 trials (MONALEESA-7 and -3)
- Current and future growth in the metastatic setting driven by increasing number of top medical experts preferring Kisqali® as drug of choice over other CDK4/6 inhibitors based on the strength of OS benefit
- Kisqali® is the only CDK4/6i with the opportunity to demonstrate benefit in a broad patient population with high unmet need
- Future Kisqali® growth expected to be fueled by the expansion to the adjuvant BC setting with the NATALEE study
**Kisqali® received the highest rating of any CDK4/6 inhibitor on the ESMO Magnitude of Clinical Benefit Scale**

- Kisqali® has achieved the highest rating of any CDK4/6 inhibitor on the ESMO Magnitude of Clinical Benefit Scale
  - 5 out of 5 in 1L pre-menopausal patients based on significant OS benefit and improved QoL in MONALEESA-7\(^1\)
  - 4 out of 5 in 1L post-menopausal patients based on significant OS benefit and maintained QoL in MONALEESA-3\(^1\)
- Additional data supporting clinical differences of Kisqali®, as well as consistent OS benefit submitted to SABCS

1. ESMO-MCBS v1.1; Scorecard version:1.
Evidence suggests differences among CDK4/6 inhibitors

Selected differences among CDK4/6 inhibitors

- CDK4 is a critical driver of HR+/HER2-advanced breast cancer, while CDK6 drives hematological toxicities.
- Kisqali® inhibits CDK4 8x more than CDK6 in vitro.
- Higher unbound \( C_{avg} \) (average free drug concentration at steady state) means more drug is available to act on tumor cells.
- At clinically relevant doses and adjusting for differences in potency against CDK4/6 and protein binding, Kisqali® should provide greater CDK4 inhibition in vivo than competitors.

NATALEE: Pivotal Ph3 study in adjuvant setting on track for readout in 2022

**What makes NATALEE unique?**

- Includes patients with high and intermediate risk of recurrence based on AJCC prognostic staging
- Longer treatment duration: 3 vs. 2 years
- Lower dose compared to metastatic setting (400 vs. 600mg) may improve overall tolerability

**Study status**

- Sample size increased from initially planned 4,000 to 5,000 patients to allow more robust assessment of the treatment effect
- Enrollment remains strong and is expected to complete by Q2 2021
- Targeting global submission in 2023 based on the final analysis
- Discontinuation rate remains below expected rate based on current aggregate data
Piqray®

Alpha-specific PI3K Inhibitor

Marketed; LCM in Phase 3

Key highlights

- Piqray® is the first and only targeted therapy for HR+/HER2- advanced breast cancer patients with a PIK3CA mutation following progression on or after an endocrine-based regimen
- Approximately 40% of patients living with HR+/HER2- advanced breast cancer have a PIK3CA mutation and face a worse prognosis
- Piqray® + fulvestrant nearly doubled mPFS in patients with a PIK3CA mutation in the pivotal SOLAR-1 study
- Piqray® listed as Category 1 preferred option for patients with a PIK3CA mutation in the NCCN guidelines
- Growing geographical footprint with regulatory approvals in >50 markets, including US and Europe; submissions under review in 48 additional markets
- Piqray® is being investigated across multiple indications in the EPIK program
Strong uptake addressing an unmet need in HR+/HER2-advanced BC with PIK3CA mutations

<table>
<thead>
<tr>
<th>Key Assets</th>
<th>Group</th>
<th>Overview</th>
<th>IHD</th>
<th>CRM</th>
<th>Sandoz</th>
<th>Appendix</th>
<th>Oncology: Hematology</th>
<th>Oncology: Solid Tumors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kisqali®</td>
<td>Piqray®</td>
<td>Canakinumab</td>
<td>^177^Lu-PSMA-617</td>
<td>TNO155</td>
<td>LXH254</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Net sales

USD million  
Growth in % cc vs. PY period

- Q3 2020 vs. PY sales up +95%, driven by strong uptake and clear unmet need in this population
- Continued growth in testing rates for PIK3CA mutation, changing the paradigm of treatment
- Approved testing modalities encompass liquid and tissue biopsies via NGS and PCR platforms, offering a wide clinical choice
- Expanding commercial footprint with European Commission approval in Q3 2020
- Robust EPIK lifecycle development programs: study initiations occurred for TNBC and HER2+ BC; ovarian & HNSCC to start in 2021\(^1\)

\(^1\) RWE study for PROS also underway, submission expected 2021.
PI3K signalling is frequently dysregulated; PI3K inhibition augments ER function and dependence in HR+ BC

Novel therapeutic targets

- PI3K signalling is involved in tumor growth, proliferation, and survival, and is frequently active in solid tumors\(^1\)
- The PI3K pathway may be activated by gain of function mutations and/or amplification of the PIK3CA gene\(^2-5\)
- Mutations in PIK3CA are detected in ~40% of HR+/HER2- breast cancer\(^6\)
- Tumor biology of HR+/HER2- aBC with ET and/or CDK 4/6i use, combined with the MoA of alpelisib, shows no evidence of cross-resistance with prior CDK 4/6i use that would modify the clinical effect of alpelisib\(^1-3\)

---

Piqray®: Improving outcomes for patients with PIK3CA mutations

Locally assessed PFS in patients with a PIK3CA mutation (SOLAR-1)¹

- Patients with a PIK3CA mutation face a poor prognosis
- Piqray® + fulvestrant nearly doubled mPFS in patients with a PIK3CA mutation in pivotal SOLAR-1 study
- 52% of patients in the SOLAR-1 trial received Piqray® as their first line of treatment and most of these patients were endocrine resistant¹
- Piqray® demonstrated OS improvement of >1 yr (14 months) in patients with lung or liver metastases, which were observed in 41% of patients²
- BYLieve study reinforces efficacy of Piqray® use in post CDK4/6 setting, with manageable side effects

PI3K pathway is commonly dysregulated in cancer; addressing medical need across multiple tumor types

EPIK Development Program\(^1\)

- PI3K pathway dysregulation is common in cancer
- EPIK program initiated with patients enrolling into TNBC and HER2+ BC trials; ovarian & HNSCC to start in 2021; filings planned in 2023+
- PIK3CA mutations are present in ~25% in HER2+ aBC and ~15% in advanced TNBC, and ~30% of TNBC have PTEN loss
- In ovarian cancer high unmet need in 2L/3L settings, particularly for BRCAwt\(^6\) patients, whose tumors are platinum resistant or refractory
- PI3K pathway is a promising therapeutic target in HNSCC based on pre-clinical data

\(^1\) RWE study for PROS also underway, submission expected 2021  
\(^2\) Annual incidence in the U.S. Source: Kantar Health  
\(^3\) TNBC – Triple Negative Breast Cancer  
\(^4\) aBC – advanced breast cancer  
\(^5\) HNSCC (2/3L)  
\(^6\) BReaSt CANcer gene wild-type
**Tabrecta™**

**MET inhibitor**

**Key highlights**

- Lung cancer affects 2m patients a year; 3-4% of NSCLC patients have METex14 mutations, associated with a poor prognosis.
- Tabrecta™ is the first and only therapy approved by the FDA to specifically target METex14 mutated metastatic NSCLC; Tabrecta™ was approved in Japan in June 2020, and additional regulatory filings continue around the world.
- Omni-channel launch underway, leveraging robust digital capabilities to accelerate patient access amid pandemic conditions.
- Tabrecta™ has potential to expand into multiple indications in NSCLC and beyond-as a monotherapy and in combinations.
- Tabrecta™ is approved with FoundationOne™, the first and only FDA approved diagnostic for METex14; **liquid biopsy diagnostic approval anticipated Q1 2021**.
Patients with METEx14 mutation face poor prognosis

**Unique patient population**

Patients with METEx14 mutation are older, with a median age of 71 years and are predominately female; approximately 40% have never smoked

**Aggressive disease**

Patients with METEx14 mutation have a high incidence of multi-focal disease and often have brain, bone, and liver metastases

**Limited survival benefit**

METEx14 mutation was found to be an independent prognostic factor that predicted worse survival compared with patients without MET alteration

Strong launch as first and only approved METex14 inhibitor in the US

- HCPs have expressed high excitement for Tabrecta™ for METex14 mNSCLC patients
- Rapid uptake driven by significant unmet need, expanded coverage and strong Rx momentum
- Continued focus on improving the use of comprehensive genomic testing before 1L therapeutic choice, currently the case for only 30-35% of patients in US
- Anticipating addition of liquid biopsy CDx in early 2021
- Expanding to other geographies
  - Japan approval on June 29, 2020
  - Confirmatory Ph3 study started in EU
  - Regulatory filings continue in other geographies
Strong response rates in 1L METex14 NSCLC; intracranial responses in patients with brain metastases

- Tabrecta™ is highly active in previously treated and treatment-naïve METex14 NSCLC patients
- As a monotherapy in the 1L setting, ORR was 67.9%, DCR - 96.4%, and mPFS - 12.4 mos
- Intracranial responses were achieved in 54% of patients, including 31% with CR; intracranial disease control achieved in 92% of patients
Expanding Tabrecta™ beyond METex14 NSCLC
Exploring combination with anti-PD-1 in NSCLC, irrespective of MET status

- MET also plays a role in immuno-modulation in the following populations of the tumor microenvironment:
  - Neutrophils
  - Dendritic cells
  - T cells
- Combination of capmatinib with anti-PD-1 enhances antitumor immunity irrespective of MET status

**Opportunity**
Chemo-free alternative for ~30% of NSCLC patients with high PD-L1 expression

**Population**
1L locally advanced or metastatic NSCLC with PD-L1≥ 50% (est. population ~90K; G7)

**Study design**
A randomized, Ph2 proof-of-concept study evaluating the efficacy and safety of Tabrecta™ plus pembrolizumab vs. pembrolizumab alone

**Primary Objective**
To assess efficacy of Tabrecta™ and pembrolizumab combination vs. pembrolizumab monotherapy

**Estimated completion**: H2 2021
Expanding Tabrecta™ beyond METex14 NSCLC
Tabrecta™ to be studied in acquired resistance to EGFR inhibitors

MET amplification is a common mechanism of resistance in 1L and 2L osimertinib failures

MET amplification¹ after EGFR TKI progression enriches for response to Tabrecta™ and gefitinib

EGFR activating mutations are common in NSCLC, identified in ~10-20% of patients in US/EU and ~25-45% of patients in Asia

MET amplification is a driver of resistance; can be detected in ~5-20% of patients who have progressed after EGFR TKIs such as gefitinib, erlotinib, osimertinib (est. population ~20K; G7)

Tabrecta™ can be safety combined with EGFR TKIs; studies of Tabrecta™ with gefitinib and EGFR816 in patients who progressed on 1st/2nd generation TKIs showed that responses were enhanced in patients with MET alterations

Initiating a Ph3 study of Tabrecta™ in combination with an EGFRi in patients with EGFRmut+ NSCLC who have progressed on EGFR therapy and have MET amplification

Canakinumab  
(ACZ885)

Anti-IL-1β monoclonal antibody

Key highlights

- **High unmet need for new treatments**: Lung cancer affects over 2m patients a year and is a leading cause of cancer related deaths worldwide; despite treatment advances in the last five years, long-term outcomes in advanced disease remain poor

- **Pro-Tumor Inflammation and IL-1β**: Pre-clinical data support the role of IL-1β as a facilitator of Pro-Tumor Inflammation (PTI), promoting tumor processes such as angiogenesis and invasion and inhibiting anti-tumor immune responses

- **Canakinumab in lung cancer**: Canakinumab is a monoclonal antibody that targets IL-1β; several lines of evidence suggest potential benefit of canakinumab in addition to current standard of care medicines in lung cancer

- **CANOPY program**: Three Ph3 registrational studies in (NSCLC) are ongoing; >1500 patients enrolled to date; extensive safety data in combination with standard chemotherapies across treatment lines; pathway inhibition confirmed in safety run-in

- **Ph3 data expected in 2021**: CANOPY-1 & 2 anticipated to readout in 2021
Lung cancer is the leading cause of cancer-related deaths worldwide with remaining high unmet need

#1 killer among cancers

Deaths per incident case

84% Lung

48% Colorectal

30% Breast

~1.8 million deaths from Lung Cancer in 2018

Even with recent treatment advances

Median OS by treatment

Long-term outcomes remain poor

5-year OS by stage, %

Most patients are diagnosed with advanced disease; outcomes worse in patients with high levels of CRP

---

Canakinumab is a monoclonal antibody that targets IL-1β, one of key drivers of PTI

- Canakinumab is a human IgGκ monoclonal antibody with high affinity and specificity for IL-1β
- Canakinumab binds to human IL-1β and neutralizes its activity by blocking its interaction with IL-1 receptors
- CANTOS study demonstrated statistically significant dose-dependent effect risk reduction in lung cancer incidence and mortality
- Pre-clinical data support the role of IL-1β as a facilitator of Pro-Tumor Inflammation (PTI)
- PTI enables tumor development in two key ways:
  - Drives oncogenic processes such as proliferation and survival, angiogenesis and invasion
  - Suppress anti-tumor immune response, in part, by increasing influx of immunosuppressive cells into the tumor microenvironment (TME)

Scientific rationale for canakinumab combination with pembrolizumab + chemotherapy

- High levels of IL-6 and C-reactive protein (CRP) – downstream effectors of IL-1β – correlate with poor outcomes in NSCLC patients treated with PD-(L)1 inhibitors
  - Decreasing IL-6 and CRP with canakinumab may enhance the response to PD-(L)1 inhibitors

In a humanized lung cancer mouse model, canakinumab + pembrolizumab delayed tumor growth more than monotherapies

- Chemotherapy triggers immunogenic cell death, stimulating anti-tumor immune responses, which may improve response to PD-(L)1 inhibitors

![Diagram](attachment:image.png)

IL, interleukin. MDSC, myeloid-derived suppressor cell. NK, natural killer. PD-(L)1, programmed death ligand 1. TIL, tumor-infiltrating T cell. TME, tumor microenvironment. Treg, regulatory T cell.

CANOPY registrational program evaluates canakinumab across a large proportion of NSCLC

Incident + newly recurrent NSCLC

<table>
<thead>
<tr>
<th>Indication</th>
<th>Patient population</th>
<th>Trial design</th>
<th>Exp. completion</th>
<th>Market size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st line NSCLC (CANOPY-1)</td>
<td>Non-mutated, no prior treatment for metastatic disease or Stage III unresectable</td>
<td>Platinum doublet chemotherapy and pembrolizumab with or without canakinumab (n=600 with 1:1 randomization)</td>
<td>H2 2021</td>
<td>⚫⚫⚫</td>
</tr>
<tr>
<td>2nd line NSCLC (CANOPY-2)</td>
<td>Non-mutated with no more than 2 prior lines of metastatic treatment (PD-1 ± chemo)</td>
<td>Docetaxel with or without canakinumab (n=226 with 1:1 randomization)</td>
<td>H1 2021</td>
<td>⚫⚫⚫</td>
</tr>
<tr>
<td>Adjuvant NSCLC (CANOPY-A)</td>
<td>High-risk Stage II-III</td>
<td>Canakinumab vs. placebo (n=1500 with 1:1 randomization) after post-resection chemotherapy</td>
<td>2023</td>
<td>⚫⚫</td>
</tr>
<tr>
<td>Neoadjuvant NSCLC (CANOPY-N)</td>
<td>Stage IB - IIIA</td>
<td>Canakinumab, canakinumab + pembrolizumab or pembrolizumab (n=110 with 2:2:1 randomization)</td>
<td>Not registrational study, Ph2</td>
<td>⚫</td>
</tr>
</tbody>
</table>

Market size: ⚫○○ <USD 500m  ⚫⚫⚫ USD 500m – 1bn  ⚫⚫⚫ >USD 1bn
**177Lu-PSMA-617**

Radioactive lutetium-labelled small molecule targeting the prostate specific membrane antigen (PSMA)

**Key highlights**

- Targeted delivery of radiation to cancer cells has already demonstrated favorable efficacy (HR for PFS = 0.21; 95% CI, 0.13 to 0.33; \(P<0.001\)) and safety in neuroendocrine tumors (Lutathera NETTER-1 trial\(^1\))

- **177Lu-PSMA-617** is expected to be the first to market targeted radioligand therapy (RLT) addressing >80% patients with prostate cancer who express PSMA

- First independent randomized Ph2 trial TheraP\(^2\) with **177Lu-PSMA-617** (initiated and sponsored by ANZUP\(^1\) Cancer Trials Group) suggests a promising clinical profile in metastatic castration resistant prostate cancer (mCRPC)

- VISION Ph3 trial in mCRPC ongoing, with radiographic progression-free survival (rPFS) readout expected H1 2021

- Plans to expand **177Lu-PSMA-617** in earlier lines of advanced prostate cancer (APC) treatment are underway

---

\(^1\)Strosberg et al. NEJM. 2017; 376: 125-35. Australian and New Zealand Urogenital and Prostate Cancer Trials Group; ANZUP study ANZUP 1603.
Despite advances in treatments, prognosis remains poor for patients with mCRPC

2nd
most diagnosed cancer in men

>80%
patients metastatic at the time of CRPC$^1$ diagnosis

>30%
5-year survival prognosis for mCRPC$^2$ patients

~10
months median OS$^3$

Treatments with new mechanisms of action are needed to improve outcomes beyond second line

**Patients with mCRPC**
US, EU5, Japan

<table>
<thead>
<tr>
<th></th>
<th>Second line</th>
<th>Third line</th>
<th>Fourth line</th>
</tr>
</thead>
<tbody>
<tr>
<td>In long-term response from prior line</td>
<td>72k&lt;sup&gt;5&lt;/sup&gt;</td>
<td>37k&lt;sup&gt;5&lt;/sup&gt;</td>
<td>14k&lt;sup&gt;5&lt;/sup&gt;</td>
</tr>
<tr>
<td>Die before receive therapy</td>
<td>14%</td>
<td>15%</td>
<td>13%</td>
</tr>
<tr>
<td>Progress but do not receive therapy</td>
<td>16%</td>
<td>26%</td>
<td>38%</td>
</tr>
<tr>
<td>Receive therapy</td>
<td>18%</td>
<td>23%</td>
<td>32%</td>
</tr>
<tr>
<td>Note: percentages do not add to 100% due to rounding</td>
<td>51%</td>
<td>37%</td>
<td>18%</td>
</tr>
</tbody>
</table>

- Very limited set of treatment mechanisms available across lines in mCRPC: ARDTs<sup>2</sup>, ADT<sup>3</sup> and taxane
- Fewer patients receive each subsequent line of therapy, with no clear standard of care in late lines
- High unmet need for new MoAs<sup>4</sup>, offering a new and potentially better option for patients in second line and beyond

---

1. Metastatic castration resistant prostate cancer.
2. Androgen receptor-directed therapy.
3. Androgen deprivation therapy.
**177Lu-PSMA-617 RLT** enables targeted delivery of radiation to tumor while minimizing damage to surrounding normal tissues

What makes PSMA² RLT unique?

- Binds to PSMA, expressed on >80% advanced prostate cancer cells³,⁴
- Once bound, the ¹⁷⁷Lu⁵ atom releases an energetic beta particle resulting in lethal radiation, which
- Kills the cancer cell³, through single- and/or double-stranded DNA breaks
- Potentially minimizes damage to surrounding normal tissues³,⁴
- ¹⁷⁷Lu half-life is approximately 7 days

---

177Lu-PSMA-617 has shown early promising signals of efficacy and safety in TheraP, an independent randomized Ph2 trial

Primary endpoint: **PSA¹ ≥ 50% response (PSA50-RR²)**

- **Best PSA Response**
  - **PSA50-RR**
    - **(95%CI)**
    - **37%** (27-46%)
  - **Lu-PSMA (N=98)**
    - **66%** (56-75%)
  - Cabazitaxel (N=101)

177Lu-PSMA-617 had **29% absolute** (95% CI 16%-42%; p<0.0001) greater PSA ≥ 50% response rate compared to cabazitaxel.

- Relatively fewer Grade 3-4 AEs³ for 177Lu-PSMA-617 vs. cabazitaxel

- **200 mCRPC men post docetaxel with high PSMA expression and PSA>20 ng/mL, suitable for cabazitaxel, randomized 1:1 177Lu-PSMA-617 or cabazitaxel**

- Promising PSA response rate, awaiting radiographic endpoint

- Results highlight potential clinical activity of 177Lu-PSMA-617

---

TheraP is an independent investigator-initiated trial (IIT) sponsored by ANZUP; Australian & New Zealand Urogenital and Prostate (ANZUP) Cancer Trials Group. [https://clinicaltrials.gov/ct2/show/NCT03392478](https://clinicaltrials.gov/ct2/show/NCT03392478). All data are taken from the ANZUP presentation at the 2020 ASCO Annual Meeting by Michael Hofman, MBBS. TheraP is different from VISION; Novartis awaits the VISION study readout in H1 2021.

1. Prostate-Specific Antigen
2. Response rate
3. Adverse events
VISION is the first Ph3 RLT trial in prostate cancer, with rPFS readout expected in H1 2021

VISION study design

- Ambition to be SoC for mCRPC patients progressing after first taxane/ARDTs
- Event-driven endpoint makes it difficult to predict data cut-off
  - Primary analysis with final rPFS\textsuperscript{3} endpoint and interim OS\textsuperscript{4} analysis - expected in H1 2021
  - Final analysis with OS data expected in H2 2021
- US / EU submissions expected in Q4 2021

1. Best standard of care / best supportive care: broad range of active treatment options, excluding investigational agents and chemotherapy.  
2. ARDT = Androgen receptor-directed therapy.  
3. Radiographic progression-free survival.  
4. Overall survival.
Plans to take $^{177}$Lu-PSMA-617 into earlier lines, creating robust asset value

Patients with metastatic PC
US, EU5, JP¹ (’000)

>80% of patients express PSMA⁵

<table>
<thead>
<tr>
<th>Patients</th>
<th>1L mCRPC³</th>
<th>2L mCRPC</th>
<th>3L / 4L mCRPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>mHSPC²</td>
<td>160</td>
<td>80</td>
<td>72</td>
</tr>
</tbody>
</table>

Aim to expand into earlier lines of advanced PC treatment

<table>
<thead>
<tr>
<th>mCRPC post-taxane</th>
<th>mCRPC pre-taxane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing studies</td>
<td>Ph3 VISION; Expected submission 2021</td>
</tr>
<tr>
<td>Planned studies</td>
<td>Ph3, expected FPFV⁴ 2021</td>
</tr>
</tbody>
</table>

Opportunity⁶

Market size:
- ⬤⬤⬤ $\leq$ USD 500m
- ⬤⬤ USD 500m – 1bn
- ⬤⬤⬤ $>$ USD 1bn

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1. Based on Kantar Health CancerMPact Treatment Architecture US, EU5, JP (Dec. 2019). Patient numbers incl. patients in long-term response from prior line, who die before receiving therapy, progress but do not receive therapy, and receive systemic therapy (per slide 3). 2. Metastatic hormonal sensitive prostate cancer. 3. Metastatic castration resistant prostate cancer. 4. First patient first visit. 5. Prostate specific membrane antigen. 6. NVS estimation based on current treatment rates with 15% of 2L patients assumed to have progressed on both a first ARDT and taxane treatment.
### TNO155

**Low molecular weight SHP2 inhibitor**

**Key highlights**

- SHP2 is a protein tyrosine phosphatase that drives cancer growth signaling in collaboration with receptor tyrosine kinases (RTKs) and KRAS; it is also a transducer of PD-1 signaling
- TNO155 is a first-in-class inhibitor of SHP2 that acts as an intramolecular glue to effect allosteric inhibition
- Pre-clinical data support combination of TNO155 with a range of tyrosine kinase inhibitors as well KRAS\(^{G12C}\) inhibitors, and we have adopted a broad clinical combination strategy to blanket the MAPK pathway with 5 ongoing or planned combination trials in solid tumors
- TNO155 is the first SHP2 inhibitor to enter the clinic, and has shown promising, yet very preliminary, early clinical data in MRTX849 combination trial for KRAS\(^{G12C}\) mutant NSCLC
**TNO155: A first-in-class inhibitor of SHP2**

**First SHP2i to enter the clinic**
- Ideal drug-like properties (e.g., high permeability, solubility, no CYP450 inhibition, ideal preclinical PK profile)

**Required for RTK signaling**
- RTK-SHP2-RAS-MAPK pathway activation has been implicated across the majority of human cancers

**Downstream transducer of PD-1**
- SHP2 is a downstream transducer of PD-1 signaling, a critical immune checkpoint in human malignancies
Almost all patients develop resistance to targeted therapies
Role of SHP2 phosphatase

Multiple resistance mechanisms arise during targeted therapy treatment

1L Tagrisso® in EGFR¹

2L+ Lorbrerna® in ALK²

Multiple and diverse resistance mechanisms can develop in patients treated with targeted therapies, leading to clinical relapse

For highly selective, next-generation targeted agents, resistance is often mediated by off-target mechanisms that lead to MAPK re-activation

Combination strategies that target both the oncogenic driver and downstream signaling pathways are urgently needed

SHP2 inhibition overcomes resistance mechanisms in pre-clinical models

EGFR mutant NSCLC

ALK+ NSCLC³

**Strong pre-clinical synergy between SHP2i and KRAS<sup>G12C</sup>i informs TKI combination approach**

KRAS<sup>G12C</sup> still cycles between GTP- and GDP-bound states and SHP2i enriches the GDP-bound KRAS<sup>G12C</sup>, which G12Ci binds (enhances target engagement)

SHP2i suppresses feedback activation of wildtype KRAS, NRAS, HRAS post ERK inhibition by G12Ci (prevents pathway re-activation)

---

*TNO155 + KRAS<sup>G12C</sup>i shrink tumors in KRAS<sup>G12C</sup> NSCLC PDX pre-clinical models*

# Early clinical activity with MRTX849 + TNO155 in KRAS$^{G12C}$ mutant cancers

**Patient is a 53 year-old male current smoker who was diagnosed with metastatic NSCLC in April of 2017**

Patient had received several prior treatments:
- Chemotherapy
- Immunotherapy
- Chemotherapy + immunotherapy
- AMG510 x 3 mos
- RMC4630+cobimetinib x 1 cycle
- Experimental CDK4/6i

Patient enrolled in combination trial **MRTX849+TNO155**

Patient showed rapid resolution of cancer symptoms, PR on first scans (shown on right panel)

Mild grade 1 toxicities

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**CT scan of NSCLC patient before treatment and one month after treatment with MRTX849 and TNO155**

Pretreatment

1mo after treatment

[CT scan images]

Courtesy of Dr. Zhu (UCI)
Multiple TNO155 combinations are being explored clinically

<table>
<thead>
<tr>
<th>Combination</th>
<th>Description</th>
<th>Est. frequency</th>
<th>FPFV</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNO155 + EGF816</td>
<td>EGFR mutant NSCLC, post osimertinib</td>
<td>10-40% of NSCLC</td>
<td>September 2020</td>
</tr>
<tr>
<td>TNO155 + lorlatinib</td>
<td>ALK+ NSCLC, post lorlatinib</td>
<td>3-5% of NSCLC</td>
<td>Q1 2021</td>
</tr>
<tr>
<td>TNO155 + PDR001</td>
<td>KRAS&lt;sup&gt;G12C&lt;/sup&gt; NSCLC, ≥1% PD-L1 post-chemo and aPD-(L)1</td>
<td>~13% of NSCLC</td>
<td>August 2019</td>
</tr>
<tr>
<td>TNO155 + ribociclib</td>
<td>KRAS-mut CRC post-SOC, per local standard</td>
<td>30-40% of CRC</td>
<td>August 2019</td>
</tr>
<tr>
<td>TNO155 + MRTX849</td>
<td>KRAS&lt;sup&gt;G12C&lt;/sup&gt; NSCLC and CRC</td>
<td>~13% of NSCLC, ~4% of CRC</td>
<td>April 2020</td>
</tr>
</tbody>
</table>
**LXH254**

Low molecular weight B/C-RAF inhibitor

---

**Key highlights**

- 40% of cutaneous melanomas harbor BRAF mutations, 20% harbor NRAS mutations
  - Current standard of care in BRAF\textsuperscript{V600E} melanoma includes BRAFi + MEKi, but resistance to pathway activation occurs in most patients
  - No effective treatments in NRAS mutant melanoma following first line IO therapies
- LXH254 is a potent and selective B/C RAF inhibitor which can block both dimeric and monomeric B/C RAF kinases
- Pre-clinical studies have shown robust LXH254 activity in NRAS mutant models when combined with MEK, ERK, and CDK4/6 inhibitors
- Combination studies ongoing in BRAF-mutant and NRAS-mutant melanomas with FPFV achieved in the Ph2 trial in October 2020
- Combinations also being tested in NSCLC harboring KRAS mutations or atypical (non-V600) BRAF mutations
LXH254: Potentially best-in-class B/C-RAF inhibitor in RAS/RAF mutant melanomas and lung cancers

Highly potent and selective
- LXH254 inhibits both dimeric and monomeric B- and C-RAF kinases
- B/C-RAF inhibition targets RAS-mutant tumors and BRAF mutants both V600E and non-V600E

Tumor growth inhibition as single agent or in combination
- Antitumor activity of LXH254 single agent was observed in patients with KRAS-mut and BRAF-mut cancers
- Preclinical data show robust activity in vertical combinations with MEK, ERK, and CDK4/6 inhibitors
- Favorable tolerability profile of LXH254 enables combinations
- Clinical studies evaluating LXH254 in combination with LTT462 (ERKi), trametinib (MEKi), ribociclib (CDK4/6) and spartalizumab (anti-PD-1) in RAS/RAF mutant NSCLC and melanoma ongoing
Design of ongoing LXH254 combination study in melanoma

Study assesses multiple combinations
LXH254 doublets with LTT462, trametinib (TMT212), ribociclib (LEE011) in previously treated unresectable or metastatic BRAF V600 or NRAS mutant melanoma (FPFV October 2020)

**Selection Phase (BRAFV600 mut melanoma)**
- LXH254 + LTT462: 30 Patients
- LXH254 + TMT212: 30 Patients
- LXH254 + LEE011: 30 Patients

**Expansion Phase (BRAFV600 mut melanoma)**
- 70 Patients in each arm that meets criteria for expansion

**Selection Phase (NRAS mut melanoma)**
- LXH254 + LTT462: 30 Patients
- LXH254 + TMT212: 30 Patients
- LXH254 + LEE011: 30 Patients

**Expansion Phase (NRAS mut melanoma)**
- 70 Patients in each arm that meets criteria for expansion
Oncology: Hematology

Asciminib

Sabatolimab
# Asciminib

(ABL001)

First-in-class STAMP (Specifically Targeting the ABL Myristoyl Pocket) inhibitor

**Phase 3**

## Key highlights

- Despite advances in Chronic Myeloid Leukemia (CML) care, many patients are at risk of disease progression, and sequential TKI therapy may be associated with increased resistance and intolerance.

- Asciminib, a first-in-class STAMP inhibitor, has the potential to address these unmet needs.

- The Ph3 ASCEMBL study met its primary endpoint of major molecular response (MMR) rate at 24 weeks; the study evaluated asciminib (ABL001) vs. bosutinib in patients with Philadelphia chromosome positive (Ph+) CML in Chronic Phase (CP) previously treated with two or more TKIs.

- X2101/FIH study demonstrated clinical activity and favorable tolerability of asciminib in CML patients harboring T315I mutation (Oral at ASH, December 2020).

- **Global regulatory submissions planned in H1 2021**
Asciminib in Chronic Myeloid Leukemia (CML)
Transform CML treatment standards to enable more patients to live disease-free

High unmet need in 3L+ CML-CP
Many patients with CML are at risk of disease progression, and sequential TKI therapy can be associated with increased resistance and treatment intolerance

Significant unmet need in CML patients harboring T315I mutation
Many patients develop mutations that cause resistance to TKI therapy; the T315I mutation confers resistance to all approved TKIs except for ponatinib

Prevalence
Although the incidence of CML is low (1-2/100,000 people), the prevalence is increasing (currently 55,500 US patients), because TKI treatment significantly reduces mortality

Addressable market potential
Currently 10% - 15% of patients progress to 3L, but a significant number remain in 2L due to lack of appropriate options; failure rate in 3L is as high as 75% on current therapies

Asciminib is a fist-in-class STAMP (Specifically Targeting the ABL Myristoyl Pocket) inhibitor and is different from ATP-competitive TKIs

The specificity of asciminib for BCR-ABL1 minimizes off-target activity, which may reduce toxicity

Asciminib maintains activity against BCR-ABL1 with resistance mutations (including T315I) in the ATP-binding site

Asciminib is designed to:
- Bind to the myristoyl pocket in the kinase domain
- Bind in a non-ATP-competitive manner
- Bind to BCR-ABL1 in the presence of ATP-competitive TKIs
- Maintain activity against BCR-ABL1 with resistance mutations (including T315I)

TKIs:
- Bind to the ATP-binding site of the kinase domain
- Bind in an ATP-competitive manner
- Are resistant to many ATP site mutations
Asciminib Ph3 study (ASCEMBL) in 3L+ CML-CP
Primary endpoint met; ~two-fold improvement in MMR rate at 24 weeks

Major Molecular Response (MMR) rate at 24 weeks

Asciminib demonstrated statistically significant superiority in efficacy compared to bosutinib and a favorable safety profile

- The MMR rate at 24 weeks was 25.5% with asciminib and 13.2% with bosutinib, meeting the study's primary endpoint

Pre-planned analysis showed that the MMR rate at 24 weeks was superior in the asciminib arm vs. the bosutinib arm across most major demographic and prognostic subgroups

Most frequent grade ≥3 AEs with asciminib vs. bosutinib were thrombocytopenia (17.3%, 6.6%), neutropenia (14.7%, 11.8%), diarrhea (0%, 10.5%), and increased alanine aminotransferase (0.6%, 14.5%)

Assessment of asciminib line extension plans is ongoing

1. Difference:12.2% (95% CI, 2.19-22.3: two-sided p = 0.029) per the Cochran–Mantel–Haenszel test which is stratified by baseline major cytogenetic response status
Asciminib first launch in 3L+ CML with expansion to earlier lines
Asciminib has the potential to transform standard of care in CML

**Patient Journey in CML, treatment options and preferences**

1L
- Imatinib / 2G TKIs (nilotinib, dasatinib, bosutinib)
  - In 1L, majority of patients are treated with imatinib, and the remaining patients with 2G TKIs (nilotinib or dasatinib)

2L
- 2G TKIs (nilotinib, dasatinib, bosutinib) / ponatinib
  - In 2L, nearly all patients receive 2G TKIs (nilotinib or dasatinib)

3L+
- 2G TKIs (nilotinib, dasatinib, bosutinib) / ponatinib
  - In 3L and beyond, any remaining TKIs is a potential treatment option, however, is mostly limited to bosutinib and ponatinib

T315I
- ponatinib
  - Only ponatinib is indicated for patients with T315I mutation

**Market potential**

<table>
<thead>
<tr>
<th>Indication</th>
<th>Market size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1L CML-CP</td>
<td>●●●</td>
</tr>
<tr>
<td>3L+ CML-CP</td>
<td>●●●</td>
</tr>
<tr>
<td>T315I CML-CP</td>
<td>●●●&lt;USD 500m</td>
</tr>
<tr>
<td></td>
<td>●●● USD 500m – 1bn</td>
</tr>
<tr>
<td></td>
<td>●●●● &gt;USD 1bn</td>
</tr>
</tbody>
</table>

2G TKIs = 2nd Generation Tyrosine Kinase Inhibitors, CML-CP = Chronic Myeloid Leukemia in Chronic Phase. Ipsos, February 2020, EU5 countries. 1. Applicable globally where therapies are approved.
Sabatolimab (MBG453)

First in class anti-TIM-3 monoclonal antibody, a unique opportunity in MDS/AML to target both immune and myeloid cells

Phase 3

---

**Key highlights**

- Myelodysplastic Syndrome (MDS) and Acute Myeloid Leukemia (AML) are related myeloid disorders with very high unmet medical need
  - 5-years survival is 20% in Higher-Risk (HR) MDS and 28% in AML
  - Significant toxicity impacts the benefit of current therapies

- High annual incidence rate (MDS: ~10,000/year; AML: ~ 20,000/year in US) makes it particularly important to develop novel therapies

- Sabatolimab may have both immunomodulatory and direct anti-leukemic effects which synergize with hypomethylating agents to enhance efficacy in MDS/AML

- Pivotal Ph2 study in HR-MDS is ongoing with read-out and first submission expected H2 2021

- Ph2 study in Unfit AML started in 2020 with Ph3 read-out projected for 2025

---

TIM-3, T cell immunoglobulin mucin domain 3.
Myelodysplastic syndrome and acute myeloid leukemia are related myeloid disorders with high unmet medical need

**Overall survival**

- 5-year survival is poor:
  - 20% for HR-MDS
  - 28% for AML

**Tolerability**

- Significant toxicity impacts the benefit of current therapies (intensive chemotherapy, hypomethylating agents, HSCT)

**Lack of innovation**

- No regulatory approvals in over 10 years in HR-MDS

- Emerging data pointing to a strong role of immune dysfunction in MDS
- Higher Risk-MDS (HR-MDS) is a more aggressive type of MDS where patients have a worse prognosis and a higher chance of progressing to AML
- Unfit AML patients are often older and have general health status that precludes intensive chemotherapy
- Age at diagnosis is ~75 years for MDS and ~68 years for AML
- G7 annual incidence is ~15,300/year for HR-MDS and ~13,300/year for unfit AML

---

MDS = Myelodysplastic Syndromes; AML = Acute Myeloid Leukemia  
IPPS (International Prognostic Scoring System) risk categorization in MDS. "Higher Risk" ~34% (11% High Risk, 23% Intermediate-2 risk).  
### Sabatolimab inhibits TIM-3, a dual target on immune cells and leukemic stem cells in AML and MDS

**Sabatolimab MoA**

TIM-3 is expressed on myeloid immune cells and leukemic stem cells (LSC) but not on normal hematopoietic stem cells, making it a promising target in MDS/AML

Sabatolimab is a potential first-in-class IgG4 anti-TIM-3 monoclonal antibody (mAb), which is hypothesized to:

- Restore effector T-cell activity and promote antitumor activity
- Disrupt the LSC galectin-9/TIM-3 autocrine loop and trigger ACDP

Hypomethylating agents (HMA) upregulate TIM-3 on LSC

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Sabatolimab + HMA lead to promising and durable response rates in an ongoing Ph1 trial

High CR/mCR rate with a favorable safety profile and emerging durability in high- and very-high IPSS-R risk MDS

<table>
<thead>
<tr>
<th>Sabatolimab + decitabine</th>
<th>Sabatolimab + azacitidine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median exposure 8.3 months</td>
<td>Median exposure 2.8 months</td>
</tr>
<tr>
<td>ORR 61% (11/18)</td>
<td>ORR 57% (8/14)*</td>
</tr>
<tr>
<td>SD w/ HI 11.1</td>
<td>SD w/ HI 14.3</td>
</tr>
<tr>
<td>mCR 16.7</td>
<td>mCR 35.7</td>
</tr>
<tr>
<td>CR 33.3</td>
<td>CR 7.1</td>
</tr>
</tbody>
</table>

HR-MDS (n = 18) | HR-MDS (n = 16)


EHA25 VIRTUAL

SABATOLIMAB - A Novel Antigliomalectic Therapy for Essential Thrombocythemia
**STIMULUS program fully deployed in a competitive landscape**

Pivotal studies initiated and first read-out expected in H2 2021

---

### Market potential

<table>
<thead>
<tr>
<th>Indication</th>
<th>Market size</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDS</td>
<td>🟢🟢</td>
</tr>
<tr>
<td>AML</td>
<td>🟢🟢 &lt;USD 500m</td>
</tr>
<tr>
<td></td>
<td>🟢🟢🟢 USD 500m – 1bn</td>
</tr>
<tr>
<td></td>
<td>🟢🟢🟢🟢 &gt;USD 1bn</td>
</tr>
</tbody>
</table>

---

### Novel combinations

**MDS/AML**

Phase 1, HDM201a combination

---

### Myelofibrosis

Phase 1b/2, ruxolitinib combination

Phase 1, combination, post-JAK inhibitor patients

---


* HDM201: MDM2 inhibitor. JAK, Janus kinase.

---

**Asciminib**  

**Sabatolimab**
Sandoz

Where we are today

Strategy

Biosimilars & Antibiotics

Conclusion
Sandoz aspires to drive growth, in order to deliver on pioneering access for patients

Purpose
Pioneering access for patients

Growth
Our ultimate measure of purpose

Ambition
To be the world’s leading and most valued generics company
Sandoz is a top two Gx player, with an unmatched presence across all three major regions...

The only global Gx company ranking top 3 across Europe, US and RoW

### H1 2020 market performance summary

<table>
<thead>
<tr>
<th></th>
<th>Mylan</th>
<th>Sandoz</th>
<th>teva</th>
<th>Dr. Reddy's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gx Net Sales (USD million)</td>
<td>5,350</td>
<td>4,687</td>
<td>4,519</td>
<td>2,164</td>
</tr>
</tbody>
</table>

Based on IQVIA MIDAS MAT 06 2019-20 data. Gx (Rx+ OTC + Bio) based on Gross IQVIA sales. IQVIA RoW data excludes key markets, incl. India. Source: Company qtrly reports, press releases; Sdz financials.

### Sandoz rankings

<table>
<thead>
<tr>
<th></th>
<th>Biosimilars only</th>
<th>Gx Antibiotics</th>
<th>Gx Oncology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Gx EU</th>
<th>Gx US</th>
<th>Gx RoW¹</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regional</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Source: IQVIA MIDAS data (MAT 06 2020). Gross sales in USD. QTR database updated till Jun 2020, currency impact included in RoW. ¹ #5 across Latam/APAC.
...number 1 Generics company in Europe...

Monthly Gx market share development for Sandoz and key competitors

Source: IQVIA PADDs July 2020 Value: @TGT 2020. Total Gx (OTC, Bio, Rx) excluding Kazakhstan, Baltics & Ireland.
...number 3 in US but committed to succeed with a goal to return to share growth

Sandoz is on track to submit ~40 first-to-files in US by 2024

### Segments

**Oral Solids & Derm**
- Aurobindo termination maintains volume / scale

**Status**
- Market size\(^1\)
  - USD ~53bn
- Termination of Aurobindo deal makes us #3 in US

**Strategy**
- Stabilize business to enable growth

---

**Biosimilars**
- Biosimilars continue to drive growth with 3 biosimilars in-market

**Market size\(^1\)**
- USD ~3bn

**Market growth**
- 2020-23 CAGR, %
  - ~55%+

---

**Specialty**
- Injectables, respiratory and ophthalmology in focus

**Market size\(^1\)**
- USD ~42bn

**Strategy**
- Drive growth in specialty through innovation (e.g. KitCheck)
- High-margin segments
- Growing market
- #1 in Ophthalmology

---

\(^1\) MAT June 2020, USD
Sandoz is driving value and delivering on its strategic goals...

Financial progress

<table>
<thead>
<tr>
<th>Year</th>
<th>Core ROS</th>
<th>Gross Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>20.4%</td>
<td>48.2%</td>
</tr>
<tr>
<td>2017</td>
<td>20.7%</td>
<td>49.7%</td>
</tr>
<tr>
<td>2018</td>
<td>20.3%</td>
<td>52.0%</td>
</tr>
<tr>
<td>2019</td>
<td>21.5%</td>
<td>53.2%</td>
</tr>
<tr>
<td>Sep'20</td>
<td>25.4%</td>
<td>55.4%</td>
</tr>
</tbody>
</table>

1. COVID favorability included

Strategic successes in key markets

- Biosimilars in Europe are outgrowing the competition in a rapidly growing market
- Two key strategic deals (KitCheck, Civica), with first products already launched
- Successful Aspen Japan acquisition and integration
...and aiming to grow top line low-to-mid single digit, core margin to mid-to-high 20s with its portfolio and strategy

**Portfolio**

<table>
<thead>
<tr>
<th>Biosimilars</th>
<th>Small Molecules</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oral solids</td>
</tr>
<tr>
<td></td>
<td>Anti-infectives</td>
</tr>
<tr>
<td></td>
<td>Steriles</td>
</tr>
<tr>
<td></td>
<td>Respiratory</td>
</tr>
</tbody>
</table>

**First in, last out**

- First-to-market launches
- Cost competitiveness
- Reliable & flexible supply
- Bolt-on M&A

**Growth**

- **Biosimilars**: Main growth driver from strong pipeline of 15+ assets leading to sales of up to USD 3.5bn by 2025, maintaining strong position in growing market
- **Small molecules**: High LoE coverage (EU: >80%, US: >50%) with ~40 first-to-files in US until 2024

**Competitiveness**

- **Gross margin**: Gx TechOps network optimization
- **TFC**: Digital to transform commercial model and development
- **ROS**: Top quartile in industry (mid-to-high 20s in mid-to-long term)

**Enablers**

- People & Culture
- Pragmatic autonomy
- Gx setup & mindset
- Complexity reduction
- Data & Digital
### Pipeline focus on promising segments

#### Sandoz priority market segments

<table>
<thead>
<tr>
<th>Segment</th>
<th>2030 Gx Market(^1) USDbn</th>
<th>2019-30 CAGR(^2) %</th>
<th># of relevant Gx players</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Orals(^3)</td>
<td>100</td>
<td>+1</td>
<td>100+</td>
</tr>
<tr>
<td>Injectables(^4)</td>
<td>70</td>
<td>+4</td>
<td>20+</td>
</tr>
<tr>
<td>Biosimilars(^5)</td>
<td>30</td>
<td>+9</td>
<td>~5</td>
</tr>
<tr>
<td>Respiratory</td>
<td>19</td>
<td>+8</td>
<td>~5</td>
</tr>
<tr>
<td>Antibiotics(^6)</td>
<td>9</td>
<td>+1</td>
<td>10+</td>
</tr>
</tbody>
</table>

#### De-prioritized market segments

<table>
<thead>
<tr>
<th>Segment</th>
<th>2030 Gx Market(^1) USDbn</th>
<th>2019-30 CAGR(^2) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTC</td>
<td>20</td>
<td>+2</td>
</tr>
<tr>
<td>Gynecology</td>
<td>11</td>
<td>+2</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>7</td>
<td>+4</td>
</tr>
<tr>
<td>Dermatology</td>
<td>6</td>
<td>+/-0</td>
</tr>
<tr>
<td>HIV/HCV</td>
<td>4</td>
<td>+5</td>
</tr>
</tbody>
</table>

---

1. Based on IQVIA sales. 2. Based on past sales, IQVIA market prognosis and other industry reports. 3. CVM, CNS, Gastro, Pain etc. 4. Including Oncology and Antibiotics. 5. Incl. Insulins. 6. Non-injectable.
Growth driven by biosimilar expansion, while strengthening key segments of standard generics

**Sandoz business segments**

**Net Sales 2019**
- Small molecules: 60%
- Biosimilars: 40%

**Net Sales 2030**
- Small molecules: 50%
- Biosimilars: 50%

Low-to-mid single digit growth
**Strong biosimilars market position, with 8 marketed molecules...**

Biosimilars have grown at CAGR of 23% per year since 2006 to USD 1.6bn in 2019

---

The global leader in biosimilars market share

<table>
<thead>
<tr>
<th>Global view</th>
<th>Regional view</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>Sandoz</td>
</tr>
<tr>
<td>Celltrion</td>
<td>Sandoz #1</td>
</tr>
<tr>
<td>Pfizer</td>
<td>Sandoz #1</td>
</tr>
<tr>
<td>Samsung</td>
<td>Sandoz #3</td>
</tr>
<tr>
<td>Amgen</td>
<td>South Korea</td>
</tr>
</tbody>
</table>

---

1. Without insulins, IQVIA August 2020

---

Meet Novartis Management | November 2020 | Novartis Investor Relations

---

Reimagining Medicine
...the (biosimilar) opportunity continues to be significant and growing...

Biosimilar market outlook
USD billion

Originator biologic Rx market growth
- Conventional/Unclassified
- Biotechnology

Originator LoE - 1\(^1\) year gross sales
USD billion

...and have a leading (biosimilar) pipeline with 15+ molecules, adding at least 1 new project per year

**Potential timeframe (IP dependent)**

<table>
<thead>
<tr>
<th></th>
<th>2021-2023</th>
<th>2024-2026</th>
<th>2027-2029</th>
<th>2030 and beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandoz planned launches¹ (#)</td>
<td>2+</td>
<td>7+</td>
<td>4+</td>
<td>2+</td>
</tr>
<tr>
<td>Est. originator revenue² (USD billion)</td>
<td>25</td>
<td>40</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>Therapy area (Immuno / Onco/ Other)</td>
<td>Immuno / Other</td>
<td>Onco / Other</td>
<td>Onco</td>
<td>Immuno / Other</td>
</tr>
<tr>
<td><strong>Major growth catalysts (USD)</strong></td>
<td>~1bn Adalimumab Can/Aus</td>
<td>~6.5bn Denosumab</td>
<td>~43bn Onco³</td>
<td>~9bn Other</td>
</tr>
<tr>
<td>Originator LOE annual sales @ Sandoz Entry</td>
<td>~18bn US</td>
<td>~8bn Other</td>
<td>~17bn Immuno⁴</td>
<td></td>
</tr>
<tr>
<td></td>
<td>~2bn Natalizumab</td>
<td>~6bn Onco</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Revenue ambition**

- 2020: 2 bn
- 2025: 3 - 3.5 bn
- 2030: 5 - 6 bn

**Source of business**

- Europe
- US
- RoW

---

1. Externally partnered biosimilars disclosed in Phase 3: trastuzumab, insulins aspart, lispro, glargine, natalizumab. Other partnered assets not yet in phase 3 and undisclosed by partner.
2. In year of Sandoz biosimilar launch.
3. Refers to 3 of the biosimilars onco major growth catalysts.
4. Refers to 2 of the biosimilars immunology major growth catalysts.
Sandoz #1 in Gx antibiotics – a USD 1bn business, with a unique integrated European supply chain

Leading position in antibiotics

Global #1 in Gx antibiotics
Strong antibiotic portfolio with over 150 different product and technology combinations
Flagship product, AmoxiClav, has steady market share of >20%, 15 formulations, 60+ strengths

The only manufacturing network based outside Asia

Main antibiotic manufacturing site in Kundl, Austria, is only remaining integrated antibiotics production plant outside Asia, producing >170 million packs every year
Joint investment with AT government in Kundl (EUR 150m over 5 years for penicillin API/FDF)
Dedicated development center in Kundl, focused on antibiotics

Strong commitment to access and sustainability

Working jointly on framework to incentivize robust supply chains for critical products
Signed ‘Davos Declaration’ for collective and dedicated response to AMR
Driving balanced approach (access, responsible use, responsible manufacturing and R&D)

Source: IQVIA MIDAS  1. Antimicrobial Resistance
Conclusion

Sandoz remains focused on sustainable growth

1. Sandoz is focused on driving sustainable growth, in order to realize its business ambition and deliver on its Purpose: Pioneering access for patients

2. Sandoz aspires to maintain a strong position in the rapidly-growing biosimilars industry and to outgrow the global generics industry

3. Sandoz is committed to drive overall value by balancing sales growth with continued innovation and an unwavering commitment to social responsibility
Appendix

MNM Agenda

Portfolio overview

Glossary
Meet Novartis Management

November 24, 2020
All times in CET

14:00 – 14:45  **Novartis Group** (incl. CEO intro)
Break / 15 minutes

15:00 – 15:45  **Pipeline / R&D**
Break / 60 minutes

16:45 – 17:30  **Pharmaceuticals**
Break / 15 minutes

17:45 – 18:30  **Oncology**
Break / 15 minutes

18:45 – 19:30  **Sandoz**

Click to return to Contents page
## Pipeline projects at a glance

As presented at Q3 2020 financial results

<table>
<thead>
<tr>
<th>Category</th>
<th>Phase 1/2</th>
<th>Phase 3</th>
<th>Registration</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ONCOLOGY</strong></td>
<td>52</td>
<td>21</td>
<td>1</td>
<td>74</td>
</tr>
<tr>
<td>Kisqali®, Piqray®, Tabrecta™, Canakinumab, Lu-PSMA-617, TNO155, LHX254</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asciminib, Sabatolimab</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PHARMACEUTICALS</strong></td>
<td>64</td>
<td>20</td>
<td>6</td>
<td>90</td>
</tr>
<tr>
<td>Cardiovascular, Renal, Metabolism (CRM)</td>
<td>12</td>
<td>4</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Entresto®, Leqvio, Pelacarsen, Iptacopan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immunology, Hepatology, Dermatology (IHD)</td>
<td>27</td>
<td>6</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td>Cosentyx®, Iscalimab, Ligilizumab</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neuroscience</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Kesimpta®, Branaplam</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Beovu®</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td>8</td>
<td>3</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Global Health</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>BIOSIMILARS</td>
<td>Not disclosed</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>116</td>
<td>42</td>
<td>7</td>
<td>165</td>
</tr>
</tbody>
</table>
# Novartis pipeline in Phase 1 (1 of 2)

As presented at Q3 2020 financial results

## Oncology

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Mechanism</th>
<th>Indication(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>^177Lu-NeoB</td>
<td>^177Lu-NeoB</td>
<td>Radioligand therapy target GRPR</td>
<td>Multiple solid tumors</td>
</tr>
<tr>
<td>^177Lu-PSMA-R2</td>
<td>^177Lu-PSMA-R2</td>
<td>Radioligand therapy target PSMA</td>
<td>Prostate cancer</td>
</tr>
<tr>
<td>ADPT01</td>
<td>ADPT01</td>
<td>-</td>
<td>TNBC (combos)</td>
</tr>
<tr>
<td>ADPT03</td>
<td>ADPT03</td>
<td>-</td>
<td>Colorectal Cancer (combos)</td>
</tr>
<tr>
<td>CSJ137</td>
<td>CSJ137</td>
<td>Growth Factor Inhibitor</td>
<td>Anaemia</td>
</tr>
<tr>
<td>CTL019</td>
<td>Kymriah®</td>
<td>CD19 CART</td>
<td>Lymphoma</td>
</tr>
<tr>
<td>DAK0004</td>
<td>DAK0004</td>
<td>-</td>
<td>r/r DLBCL (+ pembrolizum)</td>
</tr>
<tr>
<td>DKY709</td>
<td>DKY709 + spartaluzumab</td>
<td>-</td>
<td>Cancers</td>
</tr>
<tr>
<td>EGF816</td>
<td>nazarinitin + LHX1254, ribociclib, capmatinib, Opdivo, Mekinist</td>
<td>EGFR Inhibitor</td>
<td>NSCLC (combo)</td>
</tr>
<tr>
<td>HDM001</td>
<td>HDM001 + MB2453, venetoclax</td>
<td>MDM2 Inhibitor</td>
<td>Haematological malignancy</td>
</tr>
<tr>
<td>INCA424</td>
<td>Jakavi</td>
<td>JAK1 / 2 Inhibitor</td>
<td>Myelofibrosis (combination)</td>
</tr>
<tr>
<td>JBIH492</td>
<td>JBIH492</td>
<td>-</td>
<td>Haematological Malignancy</td>
</tr>
<tr>
<td>JCI567</td>
<td>JCI567</td>
<td>CD123 CART</td>
<td>AML</td>
</tr>
<tr>
<td>LHC165</td>
<td>LHC165 + spartaluzumab</td>
<td>TLR7 Agonist</td>
<td>Solid tumors</td>
</tr>
<tr>
<td>LXF821</td>
<td>LXF821</td>
<td>EGFR CART</td>
<td>Glioblastoma multiforme</td>
</tr>
<tr>
<td>LXH254</td>
<td>LXH254 (combos)</td>
<td>crAF Inhibitor</td>
<td>Solid tumors</td>
</tr>
<tr>
<td>MAX883</td>
<td>MAX883</td>
<td>EED Inhibitor</td>
<td>Cancers</td>
</tr>
<tr>
<td>MCM888</td>
<td>MCM888, LXG250</td>
<td>BCMA CART, CD19 CART</td>
<td>Multiple myeloma</td>
</tr>
<tr>
<td>MK665</td>
<td>MK665</td>
<td>MCL1 Inhibitor</td>
<td>AML (combo)</td>
</tr>
<tr>
<td>NIS793</td>
<td>NIS793, spartaluzumab</td>
<td>TGF81 Inhibitor</td>
<td>Solid tumors</td>
</tr>
<tr>
<td>NIZ895</td>
<td>NIZ895, spartaluzumab</td>
<td>IL-15 Agonist</td>
<td>Solid tumors</td>
</tr>
<tr>
<td>NJH385</td>
<td>NJH385</td>
<td>-</td>
<td>Solid tumors</td>
</tr>
<tr>
<td>NZV330</td>
<td>NZV330, spartaluzumab, NIR178</td>
<td>CD73 Antagonist</td>
<td>Solid tumors (combo)</td>
</tr>
<tr>
<td>PDR001</td>
<td>spartaluzumab (combos)</td>
<td>PD1 Inhibitor</td>
<td>AML</td>
</tr>
<tr>
<td>PHE885</td>
<td>PHE885</td>
<td>BCMA Cell therapy</td>
<td>Multiple Myeloma</td>
</tr>
<tr>
<td>SQD932</td>
<td>SQD932</td>
<td>CD123xCD3 Modulator</td>
<td>AML</td>
</tr>
<tr>
<td>TNO155</td>
<td>TNO155</td>
<td>SHP2 Inhibitor</td>
<td>Solid tumors (single-agent)</td>
</tr>
<tr>
<td>VAY736</td>
<td>ianaumab + ibritinib</td>
<td>BAFF-R Inhibitor</td>
<td>Haematological malignancy</td>
</tr>
<tr>
<td>VOB560</td>
<td>VOB560</td>
<td>-</td>
<td>Cancers</td>
</tr>
<tr>
<td>VPM087</td>
<td>gevokizumab</td>
<td>IL1B Antagonist</td>
<td>CRC 1st line</td>
</tr>
<tr>
<td>WNT794</td>
<td>WNT794 + spartaluzumab</td>
<td>Porcupine Inhibitor</td>
<td>Solid tumors</td>
</tr>
<tr>
<td>WVT078</td>
<td>WVT078</td>
<td>-</td>
<td>Multiple myeloma</td>
</tr>
<tr>
<td>YTB323</td>
<td>YTB323 ± ibritinib</td>
<td>CD19 CART</td>
<td>Haematological malignancy</td>
</tr>
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Novartis pipeline in Phase 1 (2 of 2)
As presented at Q3 2020 financial results

<table>
<thead>
<tr>
<th><strong>Immunology, Hepatology, Dermatology</strong></th>
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<tr>
<td><strong>Code</strong></td>
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<tr>
<td>CEE321</td>
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<td>DFV890</td>
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<td>FA588</td>
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<td>MAB25</td>
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<td>MHSV52</td>
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<th><strong>Neuroscience</strong></th>
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<tr>
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<td>OAV201</td>
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<td>LM070</td>
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<tr>
<th><strong>Respiratory Disease</strong></th>
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<tbody>
<tr>
<td><strong>Code</strong></td>
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<td>LTP001</td>
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<table>
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<th><strong>Cardiovascular, Renal, Metabolism</strong></th>
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<tbody>
<tr>
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<td>HSY244</td>
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<td>MBL949</td>
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### Novartis pipeline in Phase 2

**As presented at Q3 2020 financial results**

#### Oncology

<table>
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<th>Code</th>
<th>Name</th>
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<th>Indication(s)</th>
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<tbody>
<tr>
<td>BYL719</td>
<td>dupilumab</td>
<td>PD-1 inhibitor</td>
<td>PROS</td>
</tr>
<tr>
<td>BLZ945</td>
<td>BLZ945</td>
<td>CSF-1 Inhibitor</td>
<td>Solid tumors</td>
</tr>
<tr>
<td>INC280</td>
<td>camdomab</td>
<td>MET inhibitor</td>
<td>NSCLC, Solid tumors</td>
</tr>
<tr>
<td>INC424</td>
<td>Jakavi</td>
<td>JAK1 Inhibitor</td>
<td>Myelofibrosis (combination)</td>
</tr>
<tr>
<td>MBG143</td>
<td>sabotinlimab</td>
<td>TIM3 Antagonist</td>
<td>Unit AML</td>
</tr>
<tr>
<td>NMR178</td>
<td>M8581</td>
<td>spartalizumab</td>
<td>PD1 Inhibitor, PD1 Inhibitor</td>
</tr>
<tr>
<td>POR001</td>
<td>spartalizumab</td>
<td>PD1 Inhibitor</td>
<td>Cancers</td>
</tr>
<tr>
<td>SEG010</td>
<td>ezlorninib</td>
<td>P-selectin Inhibitor</td>
<td>Ped sickle cell anaemia with crisis</td>
</tr>
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#### Immunology, Hepatology, Dermatology

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Mechanism</th>
<th>Indication(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADQ722</td>
<td>Cosmetex™50</td>
<td>IL17A Inhibitor</td>
<td>GCA, Lichen Planus</td>
</tr>
<tr>
<td>CFZ353</td>
<td>iscalimab</td>
<td>CD40 Inhibitor</td>
<td>Renal TX, SJogren’s, HS, Liver TX</td>
</tr>
<tr>
<td>LCQ242</td>
<td>trexiplexor</td>
<td>FXR agonist, CCR2 Inhibitor</td>
<td>NASH (combos)</td>
</tr>
<tr>
<td>LNQ452</td>
<td>trexiplexor</td>
<td>FXR agonist</td>
<td>NASH</td>
</tr>
<tr>
<td>LN2043</td>
<td>ANGPTL3 Agonist</td>
<td>Osteoarthropathy</td>
<td></td>
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<tr>
<td>LOU006</td>
<td>remidulinib</td>
<td>BTK Inhibitor</td>
<td>CSU / CIU, SJogren’s</td>
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<tr>
<td>LRX121</td>
<td>LRX121</td>
<td>-</td>
<td>Osteoarthropathy</td>
</tr>
<tr>
<td>LYS005</td>
<td>LYS006</td>
<td>Anti-inflammatory</td>
<td>Acne, Colitis ulcerative HS</td>
</tr>
<tr>
<td>VAY736</td>
<td>latalumab</td>
<td>BAFF-R Inhibitor</td>
<td>SJogren’s, AHI, SLE</td>
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</table>

#### Ophthalmology

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Mechanism</th>
<th>Indication(s)</th>
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<tbody>
<tr>
<td>CPE850</td>
<td>CPE850</td>
<td>RLB1P AAV</td>
<td>RP</td>
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<tr>
<td>ECP343</td>
<td>ECP343</td>
<td>pH-Ludinone</td>
<td>Dry eye</td>
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<tr>
<td>LRA61</td>
<td>LRA61</td>
<td>EPO Inhibitor</td>
<td>DME</td>
</tr>
<tr>
<td>SAF312</td>
<td>SAF312</td>
<td>TRPV1 Antagonist</td>
<td>CISP</td>
</tr>
<tr>
<td>UNR644</td>
<td>UNR644</td>
<td>disulfide bonds Modulator</td>
<td>Presbyopia</td>
</tr>
</tbody>
</table>

1. Approved in US & JP
Novartis pipeline in Phase 3
As presented at Q3 2020 financial results

**Oncology**

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Mechanism</th>
<th>Indication(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>177Lu-PSMA-617</td>
<td>Targeted Radioligand Therapy</td>
<td>mCRPC</td>
<td>McRan prostate</td>
</tr>
</tbody>
</table>
| 177Lu-
  chelated (15) | 177Lu-PSMA-617 | Targeted Radioligand Therapy | GEP-NET 1 & G3                    |
| A60601  | asacitabine       | BCR-ABL Inhibitor | CML 3L                           |
| ACZ885  | canakinumab       | IL-1b Inhibitor  | NSCLC 1L                         |
| BLY719  | Pegylated          | P3Kα inhibitor   | HER2+ adv BC                      |
| CTL019  | Kymriah®          | CD19 CART       | rFollicular lymphoma             |
| ETB115  | Promacta®         | Thrombopoietin receptor (TPO-R) | Radiation sickness syndrome          |
| INC424  | Jakavi® Ileucine  | JAK1 Inhibitor   | Acute GVHD                        |
| LEE011  | Kira15™           | CDK4 Inhibitor   | Chronic GVHD                      |
| MBI453  | sertolitinib      | TIM3 Antagonist  | HR+HER2- BC (adj)                |
| SEG101  | ortuzantuzumab    | P-selectin Inhibitor | Sickle cell anemia new formulation |

**Neuroscience**

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Mechanism</th>
<th>Indication(s)</th>
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<tbody>
<tr>
<td>AMG307A</td>
<td>Aimovig®</td>
<td>CGRP antagonist</td>
<td>Ped Migraine</td>
</tr>
<tr>
<td>BAF312</td>
<td>Mayzent®</td>
<td>S1P1 Modulator</td>
<td>Ped MS</td>
</tr>
<tr>
<td>OAV101</td>
<td>AVXS-101 Gene Therapy</td>
<td>Survival motor neuron (SMN1) gene</td>
<td>SMA IT &lt;sup&gt;3&lt;/sup&gt;</td>
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**Respiratory Disease**

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Mechanism</th>
<th>Indication(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGEO25</td>
<td>Xolair®</td>
<td>IgE Inhibitor</td>
<td>Food allergy Auto-injector</td>
</tr>
<tr>
<td>INC424</td>
<td>Jakavi®</td>
<td>JAK1 Inhibitor</td>
<td>COVID-19 related pneumonia &lt;sup&gt;2&lt;/sup&gt;</td>
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</tbody>
</table>

**Cardiovascular, Renal, Metabolism**

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Mechanism</th>
<th>Indication(s)</th>
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</thead>
<tbody>
<tr>
<td>KDX339</td>
<td>Inclisiran</td>
<td>siRNA (regulation of LDL-C)</td>
<td>CVRR-LDL-C</td>
</tr>
<tr>
<td>LCZ696</td>
<td>Entresto®</td>
<td>Angiotensin II Receptor Neprilysin Inhibitor (ARNI)</td>
<td>Post-AMI, Pediatric HF &lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>TQJ230</td>
<td>pelacansen</td>
<td>ASO targeting Lp(a)</td>
<td>CVRR-Lp(a)</td>
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**Global Health**

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Mechanism</th>
<th>Indication(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COA366</td>
<td>Coartem® isolated</td>
<td>-</td>
<td>Malari uncomplicated, new formulation &lt;sup&gt;3&lt;/sup&gt;</td>
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**Immunology, Hepatology, Dermatology**

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Mechanism</th>
<th>Indication(s)</th>
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</thead>
<tbody>
<tr>
<td>AIN057</td>
<td>Cosentyse®</td>
<td>IL17A Inhibitor</td>
<td>Lupus Nephritis</td>
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<tr>
<td>ACZ885</td>
<td>canakinumab</td>
<td>IL-1b Inhibitor</td>
<td>COVID-19 induced respiratory disease</td>
</tr>
<tr>
<td>QGE031</td>
<td>Igelizumab</td>
<td>IgE Inhibitor</td>
<td>CSU / CIU</td>
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**Ophtalmology**

<table>
<thead>
<tr>
<th>Code</th>
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<th>Mechanism</th>
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<tbody>
<tr>
<td>RTH258</td>
<td>Beovu®</td>
<td>VEGF Inhibitor</td>
<td>Diabetic retinopathy RVO DME</td>
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**Biosimilars**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>GP3411</td>
<td>denosumab</td>
<td>anti RANKL mAb</td>
<td>Denosumab BioS</td>
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1. 177Lu-dotate in US.  2. FDA placed a partial hold on AVXS-101 intrathecal clinical trials for SMA patients based on findings in a small pre-clinical animal study.  3. Not aimed at label change.  4. Approved in US.
# Novartis pipeline in registration

As presented at Q3 2020 financial results

## Oncology

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
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<tbody>
<tr>
<td>SEG101</td>
<td>Adalveo®</td>
<td>P-selectin Inhibitor</td>
<td>Sickle cell disease&lt;sup&gt;1&lt;/sup&gt;</td>
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## Respiratory Disease

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Mechanism</th>
<th>Indication(s)</th>
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</thead>
<tbody>
<tr>
<td>IGE025</td>
<td>Xolair®</td>
<td>IgE Inhibitor</td>
<td>Nasal polyps&lt;sup&gt;2&lt;/sup&gt;</td>
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## Immunology, Hepatology, Dermatology

<table>
<thead>
<tr>
<th>Code</th>
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<th>Indication(s)</th>
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<tbody>
<tr>
<td>AIN407</td>
<td>Cosentyx®</td>
<td>IL-17A Inhibitor</td>
<td>300 mg Al</td>
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## Cardiovascular, Renal, Metabolism

<table>
<thead>
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<th>Name</th>
<th>Mechanism</th>
<th>Indication(s)</th>
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<tr>
<td>KUX339</td>
<td>IndraSAN</td>
<td>siRNA (regulation of LDL-C)</td>
<td>Hyperlipidemia</td>
</tr>
<tr>
<td>LCZ696</td>
<td>Entresto®</td>
<td>Angiotensin II Receptor Neprilysin Inhibitor (ARNI)</td>
<td>HFpEF</td>
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## Neuroscience

<table>
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<td>CMB517</td>
<td>ofatumumab</td>
<td>CD20 Antagonist</td>
<td>r MS&lt;sup&gt;3&lt;/sup&gt;</td>
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## Global Health

<table>
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<th>Mechanism</th>
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<tr>
<td>LAM020</td>
<td>Lamprene®</td>
<td>SMPD1 Inhibitor</td>
<td>Tuberculosis&lt;sup&gt;4&lt;/sup&gt;</td>
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1. Approved in US, CHMP pos. opinion received.  
2. Approved in EU.  
3. Approved in US as Kesimpta®.  
4. WHO Pre-Qualification.
# Glossary (1/2)

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<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>aBC</td>
<td>Advanced breast cancer</td>
</tr>
<tr>
<td>ACT</td>
<td>Actual</td>
</tr>
<tr>
<td>AD</td>
<td>Atopic Dermatitis</td>
</tr>
<tr>
<td>aHUS</td>
<td>Atypical Hemolytic Uremic Syndrome</td>
</tr>
<tr>
<td>AIH</td>
<td>Autoimmune hepatitis</td>
</tr>
<tr>
<td>ALL</td>
<td>Acute lymphoblastic leukemia</td>
</tr>
<tr>
<td>ALS</td>
<td>Amyotrophic lateral sclerosis</td>
</tr>
<tr>
<td>AMI</td>
<td>Acute myocardial infarction</td>
</tr>
<tr>
<td>AML</td>
<td>Acute myeloid leukemia</td>
</tr>
<tr>
<td>AS H2H</td>
<td>Ankylosing spondylitis head-to-head study versus adalimumab</td>
</tr>
<tr>
<td>ASCVD</td>
<td>Atherosclerotic cardiovascular disease</td>
</tr>
<tr>
<td>BC</td>
<td>Breast cancer</td>
</tr>
<tr>
<td>C3G</td>
<td>C3 glomerulopathy</td>
</tr>
<tr>
<td>CCF</td>
<td>Congestive cardiac failure</td>
</tr>
<tr>
<td>CHF</td>
<td>Chronic heart failure</td>
</tr>
<tr>
<td>CINDU</td>
<td>Chronic inducible urticaria</td>
</tr>
<tr>
<td>CLL</td>
<td>Chronic lymphocytic leukemia</td>
</tr>
<tr>
<td>CML</td>
<td>Chronic myeloid leukemia</td>
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<tr>
<td>CONS</td>
<td>Consensus</td>
</tr>
<tr>
<td>COPD</td>
<td>Chronic obstructive pulmonary disease</td>
</tr>
<tr>
<td>COSP</td>
<td>Chronic ocular surface pain</td>
</tr>
<tr>
<td>CRC</td>
<td>Colorectal cancer</td>
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<td>CRSwNP</td>
<td>Severe chronic rhinosinusitis with nasal polyps</td>
</tr>
<tr>
<td>CSU</td>
<td>Chronic spontaneous urticaria</td>
</tr>
<tr>
<td>CVD</td>
<td>Cardiovascular disease</td>
</tr>
<tr>
<td>CVRR</td>
<td>Cardiovascular Risk Reduction</td>
</tr>
<tr>
<td>CVRR-LDLC</td>
<td>Secondary prevention of cardiovascular events in patients with elevated levels of LDL-C</td>
</tr>
<tr>
<td>CVRR-Lp(a)</td>
<td>Secondary prevention of cardiovascular events in patients with elevated levels of lipoprotein (a)</td>
</tr>
<tr>
<td>D&amp;I</td>
<td>Diversity &amp; Inclusion</td>
</tr>
<tr>
<td>DLBCL</td>
<td>Diffuse large B-cell lymphoma</td>
</tr>
<tr>
<td>DLBCL</td>
<td>Diffuse large B-cell lymphoma refractory</td>
</tr>
<tr>
<td>DME</td>
<td>Diabetic macular edema</td>
</tr>
<tr>
<td>DS&amp;AI</td>
<td>Data Science &amp; Artificial Intelligence</td>
</tr>
<tr>
<td>E2E</td>
<td>End to end</td>
</tr>
<tr>
<td>ESG</td>
<td>Environmental, social and governance</td>
</tr>
<tr>
<td>ESMO</td>
<td>European Society for Medical Oncology</td>
</tr>
<tr>
<td>FF</td>
<td>Field force</td>
</tr>
<tr>
<td>FL</td>
<td>Follicular lymphoma</td>
</tr>
<tr>
<td>FPFV</td>
<td>First patient first visit</td>
</tr>
<tr>
<td>GCA</td>
<td>Giant cell arteritis</td>
</tr>
<tr>
<td>GHCR</td>
<td>Global Health &amp; Corporate Responsibility</td>
</tr>
<tr>
<td>GTx</td>
<td>Gene Therapies</td>
</tr>
<tr>
<td>GVHD</td>
<td>Graft-versus-host disease</td>
</tr>
<tr>
<td>HCC</td>
<td>Hepatocellular carcinoma</td>
</tr>
<tr>
<td>HCP</td>
<td>Healthcare provider</td>
</tr>
<tr>
<td>HD</td>
<td>Huntington’s disease</td>
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</tbody>
</table>
## Glossary (2/2)

<table>
<thead>
<tr>
<th>HER2+ aBC</th>
<th>Human epidermal growth factor receptor-2 positive advanced breast cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFrEF</td>
<td>Heart failure with preserved ejection fraction</td>
</tr>
<tr>
<td>HFrEF</td>
<td>Heart failure with reduced ejection fraction</td>
</tr>
<tr>
<td>HNSCC</td>
<td>Head and neck squamous cell carcinoma</td>
</tr>
<tr>
<td>HR-MDS</td>
<td>Myelodysplastic syndrome</td>
</tr>
<tr>
<td>HS</td>
<td>Hidradenitis suppurativa</td>
</tr>
<tr>
<td>IA</td>
<td>Interim analysis</td>
</tr>
<tr>
<td>IgAN</td>
<td>IgA nephropathy</td>
</tr>
<tr>
<td>IM</td>
<td>Innovative Medicines</td>
</tr>
<tr>
<td>iMN</td>
<td>Membranous nephropathy</td>
</tr>
<tr>
<td>IPF</td>
<td>Idiopathic pulmonary fibrosis</td>
</tr>
<tr>
<td>jPsA/ ERA</td>
<td>Juvenile psoriatic arthritis / enthesitis-related arthritis</td>
</tr>
<tr>
<td>LCM</td>
<td>Lifecycle Management</td>
</tr>
<tr>
<td>Lp(a)</td>
<td>Lipoprotein(a)</td>
</tr>
<tr>
<td>mCRPC</td>
<td>Metastatic castration-resistant prostate cancer</td>
</tr>
<tr>
<td>MDR</td>
<td>Multi-drug resistant</td>
</tr>
<tr>
<td>MDS</td>
<td>Myelodysplastic syndrome</td>
</tr>
<tr>
<td>MRD</td>
<td>Measurable residual disease</td>
</tr>
<tr>
<td>NASH</td>
<td>Non-alcoholic steatohepatitis</td>
</tr>
<tr>
<td>NSCLC</td>
<td>Non-small cell lung cancer</td>
</tr>
<tr>
<td>NTO</td>
<td>Novartis Technical Operations</td>
</tr>
<tr>
<td>PDR</td>
<td>Proliferative diabetic retinopathy</td>
</tr>
<tr>
<td>PedPsO</td>
<td>Pediatric psoriasis</td>
</tr>
<tr>
<td>PEF</td>
<td>Preserved ejection fraction</td>
</tr>
<tr>
<td>PNH</td>
<td>Paroxysmal nocturnal haemoglobinuria</td>
</tr>
<tr>
<td>Pros</td>
<td>PIK3CA related overgrowth spectrum</td>
</tr>
<tr>
<td>PsA H2H</td>
<td>Psoriatic arthritis head-to-head study versus adalimumab</td>
</tr>
<tr>
<td>RA</td>
<td>Rheumatoid arthritis</td>
</tr>
<tr>
<td>RCC</td>
<td>Renal cell carcinoma</td>
</tr>
<tr>
<td>rMS</td>
<td>Relapsing multiple sclerosis</td>
</tr>
<tr>
<td>ROP</td>
<td>Retinopathy of prematurity</td>
</tr>
<tr>
<td>RP</td>
<td>Retinitis pigmentosa</td>
</tr>
<tr>
<td>RVO</td>
<td>Retinal vein occlusion</td>
</tr>
<tr>
<td>SAA</td>
<td>Severe aplastic anemia</td>
</tr>
<tr>
<td>SLE</td>
<td>Systemic lupus erythematosus</td>
</tr>
<tr>
<td>SMA Type 1</td>
<td>Spinal muscular atrophy (IV formulation)</td>
</tr>
<tr>
<td>SMA Type 2/3</td>
<td>Spinal muscular atrophy (IT formulation)</td>
</tr>
<tr>
<td>SpA</td>
<td>Spondyloarthritis</td>
</tr>
<tr>
<td>SPMS</td>
<td>Secondary progressive multiple sclerosis</td>
</tr>
<tr>
<td>T1DM</td>
<td>Type 1 Diabetes mellitus</td>
</tr>
<tr>
<td>TNBC</td>
<td>Triple negative breast cancer</td>
</tr>
<tr>
<td>wAMD</td>
<td>Wet (neovascular) age-related macular degeneration</td>
</tr>
</tbody>
</table>

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