R&D Investor Event

Lead with innovation

June 23, 2020
Forward looking statements

This presentation contains forward-looking statements as defined in the Private Securities Litigation Reform Act of 1995, as amended. Forward-looking statements are statements that are not historical facts. These statements include projections and estimates and their underlying assumptions, statements regarding plans, objectives, intentions and expectations with respect to future financial results, events, operations, services, product development and potential, and statements regarding future performance. Forward-looking statements are generally identified by the words “expects”, “anticipates”, “believes”, “intends”, “estimates”, “plans” and similar expressions. Although Sanofi’s management believes that the expectations reflected in such forward-looking statements are reasonable, investors are cautioned that forward-looking information and statements are subject to various risks and uncertainties, many of which are difficult to predict and generally beyond the control of Sanofi, that could cause actual results and developments to differ materially from those expressed in, or implied or projected by, the forward-looking information and statements. These risks and uncertainties include among other things, the uncertainties inherent in research and development, future clinical data and analysis, including post marketing, decisions by regulatory authorities, such as the FDA or the EMA, regarding whether and when to approve any drug, device or biological application that may be filed for any such product candidates as well as their decisions regarding labelling and other matters that could affect the availability or commercial potential of such product candidates, the fact that product candidates if approved may not be commercially successful, the future approval and commercial success of therapeutic alternatives, Sanofi’s ability to benefit from external growth opportunities, to complete related transactions and/or obtain regulatory clearances, risks associated with intellectual property and any related pending or future litigation and the ultimate outcome of such litigation, trends in exchange rates and prevailing interest rates, volatile economic and market conditions, cost containment initiatives and subsequent changes thereto, and the impact that COVID-19 will have on us, our customers, suppliers, vendors, and other business partners, and the financial condition of any one of them, as well as on our employees and on the global economy as a whole. Any material effect of COVID-19 on any of the foregoing could also adversely impact us. This situation is changing rapidly and additional impacts may arise of which we are not currently aware and may exacerbate other previously identified risks. The risks and uncertainties also include the uncertainties discussed or identified in the public filings with the SEC and the AMF made by Sanofi, including those listed under “Risk Factors” and “Cautionary Statement Regarding Forward-Looking Statements” in Sanofi’s annual report on Form 20-F for the year ended December 31, 2019. Other than as required by applicable law, Sanofi does not undertake any obligation to update or revise any forward-looking information or statements.
| Introduction | Paul Hudson, Chief Executive Officer  
John Reed, Global Head of Research & Development |
| Platforms Synthorx | Yong Jun Liu, Global Head of Research  
Marcos Milla, Chief Scientific Officer, Synthorx |
| Pathways Venglustat | John Reed, Global Head of Research & Development  
Karin Knobe, TA Head, Rare Diseases and Rare Blood Disorders Development  
Pablo Sardi, TA Head, Rare and Neurologic Diseases Research |
| Patients Fitusiran & BIVV001 | Vanessa Wolfeler, Global Franchise Head, Rare Blood Disorders  
Dietmar Berger, Global Head of Development, Chief Medical Officer |
| Capabilities COVID-19 | Dietmar Berger, Global Head of Development, Chief Medical Officer  
John Shiver, Global Head of Research & Development, Sanofi Pasteur |
| Conclusion | John Reed, Global Head of Research & Development |

**Q&A session 1** 20'
Introduction

Paul Hudson
Chief Executive Officer
Our approach to R&D Days

- **Dec. 10, 2019**
  - Capital Markets Day
    - Next chapter for Sanofi R&D
    - Priority assets

- **April 23, 2020**
  - BTKi '168

- **June 2, 2020**
  - Oncology
    - SERD '859
    - Sarclisa®
    - Anti-CEACAM5 '701
    - Libtayo®

- **June 11, 2020**
  - Dupixent®

- **June 23, 2020**
  - R&D Investor Event
    - Synthorx
    - Venglustat
    - Fitusiran & BIVV001
    - COVID-19

- **Coming soon**
  - Nirsevimab

- **Today**
### Key progress in H1 2020

<table>
<thead>
<tr>
<th>Asset</th>
<th>Planned initial submission</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dupixent²(2)</strong></td>
<td>Launched</td>
</tr>
<tr>
<td>Fitusiran &amp; BIVV001³</td>
<td>2021e/2022e</td>
</tr>
<tr>
<td><strong>SERD '859</strong></td>
<td>2021e</td>
</tr>
<tr>
<td><strong>Venglustat</strong></td>
<td>2022e</td>
</tr>
<tr>
<td><strong>Nirsevimab⁴(4)</strong></td>
<td>2023e</td>
</tr>
<tr>
<td><strong>BTKi '168⁵(5)</strong></td>
<td>2024e</td>
</tr>
</tbody>
</table>

**Key progress in H1 2020**

- **Dupixent²(2)**: AD U.S. 6-11 years & China Adults approval; EoE pivotal results
- **Fitusiran & BIVV001³**: Fitusiran & BIVV001 Phase 3 enrollment ongoing
- **SERD '859**: ASCO 3 posters; 2/3L mBC Phase 3 enrollment ongoing
- **Venglustat**: ADPKD Part A of Phase 3 fully enrolled (TKV endpoint)
- **Nirsevimab⁴(4)**: Phase 3 ongoing; investor event planned
- **BTKi '168⁵(5)**: PoC in RMS; pivotal studies started

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**PoC: Proof of concept, clinical and commercial evidence to initiate pivotal study; AD: Atopic dermatitis; EoE: Eosinophilic esophagitis; mBC: metastatic Breast cancer; ADPKD: Autosomal dominant polycystic kidney disease; TKV: Total kidney volume; RMS: Relapsing multiple sclerosis**

(1) First submission for assets with multiple potential indications (2) Breakthrough designation for AD 6-11 years. Dupixent® in collaboration with Regeneron (3) In collaboration with Sobi (4) In collaboration with AstraZeneca (5) In collaboration with Principia
... and our other late-stage molecules

<table>
<thead>
<tr>
<th>Asset</th>
<th>Key progress in H1 2020</th>
<th>Planned initial submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarclisa®</td>
<td>2L RRMM positive pivotal results; 3L RRMM approval U.S. &amp; EU</td>
<td>Launched</td>
</tr>
<tr>
<td>Libtayo®(2)</td>
<td>1L NSCLC and 2L BCC positive pivotal results</td>
<td>Launched</td>
</tr>
<tr>
<td>MenQuadfi™</td>
<td>U.S. approval for ≥2 year-old age group</td>
<td>Approved</td>
</tr>
<tr>
<td>Avalgluco-sidase alfa</td>
<td>LOPD positive pivotal trial results</td>
<td>2020e</td>
</tr>
<tr>
<td>Sutimlimab</td>
<td>Cold Agglutinin Disease Phase 3 priority review</td>
<td>2020e</td>
</tr>
<tr>
<td>Olipudase alfa</td>
<td>ASMD positive pivotal trial results</td>
<td>2021e</td>
</tr>
<tr>
<td>Anti-CEACAM5 '701</td>
<td>Phase 3 lung and Phase 2 in additional settings initiated</td>
<td>2022e</td>
</tr>
</tbody>
</table>

RRMM: Relapsed refractory multiple myeloma; NSCLC: Non-small-cell lung carcinoma; BCC: Basal cell carcinoma; LOPD: Late-onset Pompe disease; ASMD: Acid sphingomyelinase deficiency. (1) First submission for products with multiple potential indications. (2) Breakthrough designation for Cutaneous squamous cell carcinoma. Libtayo® in collaboration with Regeneron. (3) Sarclisa® approved for patients with ≥2 prior therapies, including lenalidomide and a proteasome inhibitor. Approved in the U.S., EU, Canada, Australia and Switzerland, indication in certain non-U.S. countries also includes disease progression on last therapy.
Sanofi's approach to R&D

Platforms
Expanded tools for drug discovery

Pathways
Deep understanding of disease pathways

Patients
Relentless patient focus

Expanding capabilities
Introduction
John Reed
Global Head of Research & Development
Sanofi R&D is transforming

**Focus on priorities**
- Diabetes & Cardiovascular exit
- Focus on priority assets, within 5 therapeutic areas\(^{(1)}\)

**Lead with innovation**
- Building industry leading platforms to deliver practice-changing medicines

**Accelerate efficiency**
- Achieving top-tier performance
- Digital R&D operations

**Reinvent how we work**
- Faster and more rigorous decision making
- Urgency of execution

(1) Immunology and Inflammation, Oncology, Neurosciences, Rare Diseases and Vaccines
Maximizing the potential of our priority assets

**Dupixent®** (1)

- Leveraging Type 2 biology to maximize patient benefit across multiple indications
- Fast roll-out of several new indications supported by Real World Evidence

**Fitusiran & BIVV001** (2)

- Comprehensive program across 4 hemophilia segments for fitusiran (5)
- Selected endpoints for BIVV001 to capture impact on daily activities

**SERD ’859**

- Aiming to become backbone of choice across lines of therapies
- Accelerating pivotal studies in early BC supported by cooperative groups

**Venglustat**

- Leveraging conserved disease biology to expand to broader populations
- Accelerated development in GBA-PD and ADPKD informed by genetics

**Nirsevimab** (3)

- Paradigm shift aiming for universal passive immunization for all infants
- Supported by large RSV development program

**BTKi ‘168** (4)

- Covering the full MS spectrum supported by centrally acting mechanism
- Smart investment allowed fastest possible Phase 3 start

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BC: Breast cancer; PD: Parkinson disease; ADPKD: Autosomal dominant polycystic kidney disease; RSV: Respiratory syncytial virus; MS: Multiple sclerosis

(1) In collaboration with Regeneron  (2) In collaboration with Sobi  (3) In collaboration with AstraZeneca  (4) In collaboration with Principia  (5) Hemophilia A, B, with and without inhibitors
Progressing on our long-term promises

- **>75%**
  Potential first- or best-in-class molecules within development pipeline (objective: >80%)

- **~65%**
  Biologics in research pipeline (objective: ~70%)

- **~65%**
  Internal\(^{(1)}\) assets with no revenue sharing (objective: ~70%)

\(^{(1)}\) This includes assets discovered internally or wholly owned through acquisition and assets in-licensed at an early stage and for which Sanofi retains the majority share of the economics.
## Concrete illustrations of Sanofi's approach to R&D

<table>
<thead>
<tr>
<th>Platforms</th>
<th>Expanded tools for drug discovery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synthorx</strong></td>
<td>Boosting the impact of cancer immunotherapies by expanding the genetic alphabet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pathways</th>
<th>Deep understanding of disease pathways</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Venglustat</strong></td>
<td>Leveraging our knowledge of disease pathways to invent new medicines applicable to multiple disorders</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patients</th>
<th>Relentless patient focus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fitusiran &amp; BIVV001 (1)</strong></td>
<td>Turning cutting-edge protein engineering and new modalities into innovative patient offerings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>Leveraging expanding capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COVID-19</strong></td>
<td>Applying our scale and broad platforms to battle a global health crisis</td>
</tr>
</tbody>
</table>

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(1) In collaboration with Sobi
Platforms
Synthorx

Yong-Jun Liu
Global Head of Research

Marcos Milla
Chief Scientific Officer, Synthorx

SANOFI
Sanofi platforms to expand the druggable universe

85% of the proteome remains undruggable

Multiple platforms required to address difficult targets

Opportunity to create new (“synthetic”) biology for tackling disease

(1) In collaboration with Sangamo  (2) In collaboration with BioNtech
Tri-specific T-cell activation: A novel platform for cancer immunotherapy

Optimized T-cell activation by stimulating T-cells through both TCR (CD3) and co-stimulatory receptor (CD28):

- Conventional CD3-based T-cell engagers provide only "signal 1": TCR
- In the absence of "signal 2" from co-stimulatory receptors, this promotes activation-induced T-cell death, limiting anti-tumor response
- CD28 provides "signal 2" to promote survival of activated T-cells and generation of "T-cell memory"

Improved targeting: Tri-specific antibody also has the potential to bind 2 targets on tumor cells: the established target CD38 as well as CD28, which is expressed on myeloma and other hematologic cancers
SAR442257: First-in-class next-gen T-cell immunotherapy, now in the clinic

Trispecific CD38 antibody
- T-cell engager aiming for enhanced therapeutic efficacy vs conventional T-cell engagers
- Expect CAR-T cell-like efficacy with an antibody

Dual function of targeting CD28
- Co-stimulation of T-cells by delivering "signal 2" to promote T-cell survival
- Targeting CD28 (expressed on >95% of MM cells) directs T-cells more efficiently to myeloma cells (even at low levels of CD38 expression)

Trispecific CD38 antibody showed a 3- to 4-log higher killing potency against human myeloma cell lines vs. daratumumab (1)

<table>
<thead>
<tr>
<th>CD38/cell</th>
<th>RPM I8226</th>
<th>U266</th>
<th>KMS-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPM I8226</td>
<td>129,000</td>
<td>14,000</td>
<td>2,500</td>
</tr>
<tr>
<td>U266</td>
<td>84,000</td>
<td>170,000</td>
<td>35,000</td>
</tr>
<tr>
<td>KMS-11</td>
<td>2,500</td>
<td>35,000</td>
<td></td>
</tr>
</tbody>
</table>

First-in-human study in RRMM and RR-NHL initiated

MM: Multiple myeloma; RRMM: Relapsed refractory multiple myeloma; RR-NHL: Relapsed refractory non-Hodgkin lymphoma
(1) Wu, L. et al Nature Cancer, 2019: mix peripheral blood mononuclear cells with myeloma cell lines and applied antibodies
SAR442257 is an asset under investigation and is not approved by any regulators
Next-gen T-cell engagers based on Nanobody® platform

Advantages inherent to Nanobody® platform

Ability to tune PK profile through clinically validated half-life extension technology reduces dosing frequency

Formatting flexibility
- Multiple options for optimizing
- Multi-valent and multi-specific formats to increase efficacy, selectivity and/or avoid escape
- Engineer high affinity on low-density tumor antigens

Faster production cycle time at lower cost (expressed in yeast)

Excellent CMC characteristics, robust manufacturing

A leading IP position in the industry

Multiple Nanobody® candidates entering the clinic next year
Synthorin platform: Expanding the genetic alphabet to generate more diverse protein drugs

<table>
<thead>
<tr>
<th>Nature DNA</th>
<th>mRNA</th>
<th>Amino Acids</th>
<th>Proteins</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 nucleotides</td>
<td>64 codons code for 20 amino acids</td>
<td>Amino acids determine the shape and function of proteins</td>
<td></td>
</tr>
<tr>
<td>6 nucleotides</td>
<td>216 codons code for up to 172 amino acids</td>
<td>A greater variety of amino acids results in more diverse proteins</td>
<td></td>
</tr>
</tbody>
</table>

Expanded alphabet eDNA eRNA Amino Acids More diverse proteins

Amino Acids

- Methionine (Met)
- Arginine (Arg)
- Tyrosine (Tyr)

Amino acids determine the shape and function of proteins.
Application of the X-Y genetic code for recombinant production of therapeutic proteins: Synthorins

Engineered *E. coli* to install a novel amino acid (nAA) utilizing X-Y to produce optimized biologics

**Production system for Synthorins in *E. coli***

- X and YTPs enter cell via transporter
- nAA diffuses into cells; used by aminoacyl tRNA synthetase to charge X-Y tRNAs

**First application is multi-functional, site-specific pegylation**

mRNA with X-Y codon matches with tRNA displaying anticodon

Translation Machinery decodes X-Y codons introduce nAA into "Synthorin" proteins

Engineered *E. coli* to install a novel amino acid (nAA) utilizing X-Y to produce optimized biologics
IL-2 has dual pharmacology explained by differential engagement of IL-2 receptor subtypes

**Receptor type**
- αβγ
  - High affinity (K_d ~ 10^{-11}M)
- βγ
  - Intermediate affinity (K_d ~ 10^{-9}M)

**Immune cells activated**
- Primarily Treg
- Broadly expressed

**Immune response**
- **Suppression**
  - Treg proliferation → suppression of CD8 Teff and NK Cells
- **Side effects**
  - ILC2 expansion → eosinophils (vascular leak syndrome)
- **Stimulation**
  - Proliferation of CD8 Teff and NK Cells

Site-specific pegylation allows fine-tuning receptor interactions

**Treg**: regulatory T cells; **Teff**: effector T cells; **NK**: Natural Killer; **ILC2**: Group 2 Innate Lymphoid Cells
Site-specific pegylation to turn interleukins into precision drugs for oncology and autoimmune disease indications

THOR-707 IL-2
Synthorin for immuno-oncology

Unique properties
- PEG blocks engagement of IL-2R α chain
- Selectively expands anti-tumor CD8+ T and NK cells
- No expansion of immune-suppressive CD4+ regulatory T cells
- No activation of type 2 innate lymphoid cells and eosinophils responsible for vascular leak syndrome

THOR-809 IL-2
Synthorin for autoimmune diseases

Unique properties
- PEG blunts engagement of IL-2R β chain, making potency at IL-2R αβγ contingent on α chain binding
- Selectively expands CD4+ regulatory T cells
- No expansion of CD8+ T and NK Cells
- Preclinical therapeutic efficacy in delayed type hypersensitivity

Shared pharmacological properties: pegylation increasing IL-2 half-life and reduced immunogenicity risk

“Not-alpha”

“Reduced beta”
Single THOR-707 dose induces lymphocyte expansion in non-human primates without increasing eosinophils

Aldesleukin induced both lymphocyte and eosinophil expansion in humans\(^{(1)}\)

Compared to aldesleukin, THOR-707 shows a strong preference for expanding tumor-fighting lymphocytes vs. eosinophils which are responsible for VLS

---

NHP: Non-human primates; VLS: Vascular leak syndrome


THOR-707 is an asset under investigation, not approved by any regulators
HAMMER FIH study: Promising early biomarker data

Pharmacodynamics markers of surrogate anti-tumor activity
*Peak peripheral expansion post initial THOR-707 dose*(1)

<table>
<thead>
<tr>
<th>Cell Type</th>
<th>Fold Change (Normalized to pre-treatment count)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD8+ Effector T-Cell</td>
<td>2.8</td>
</tr>
<tr>
<td>NK Cell</td>
<td>7.0</td>
</tr>
</tbody>
</table>

**THOR-707**  
At 16 µg/kg, further dose escalation ongoing

Pharmacodynamics markers of selectivity and surrogate safety
*Peak peripheral expansion post initial THOR-707 dose*(1)

<table>
<thead>
<tr>
<th>Cell Type</th>
<th>Fold Change (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4+ Regulatory T-Cell</td>
<td>1.9</td>
</tr>
<tr>
<td>Eosinophil</td>
<td>1.9</td>
</tr>
</tbody>
</table>

**RG7461**  
At RP2D (26 µg/kg)(5)

**NKTR-214**  
At RP2D (6 µg/kg)(6)

---

(1) Mean across dose cohort of 4 patients, maximum fold expansion following one dose of THOR-707  
(2) Normalized to pre-treatment count  
(3) Surrogate Marker of Potential Tumor-Promoting Immunosuppression  
(4) Surrogate Marker of Potential Vascular Leak Syndrome  
(5) Estimated from Melero et al, ESMO 2018, 2-week expansion  
(6) Estimated from Bentebibel et al, Cancer discovery, 2019, mean expansion between day 1 (before treatment) and day 8 (after treatment)  
THOR-707 is an asset under investigation, not approved by any regulators.
# Landscape of IL-2 compounds in development – THOR707 has best-in-class profile

<table>
<thead>
<tr>
<th>Description</th>
<th>aldesleukin(1)</th>
<th>ALKS 4320(2)</th>
<th>NKTR-214(3)</th>
<th>RG7461(4)</th>
<th>THOR-707(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dose</strong> (IL-2 equivalent)</td>
<td>Native IL2</td>
<td>Fusion protein IL-2 fused to IL-2Ra</td>
<td>Random Lys pegylation with (on avg.) 6 cleavable PEGs</td>
<td>Fusion protein IL-2v fused to FAP-mAb</td>
<td>Site-specific pegylation</td>
</tr>
<tr>
<td>37 µg/kg TID x 5 days</td>
<td>6 µg/kg/day</td>
<td>6 µg/kg Q3W</td>
<td>~26 µg/kg QW equivalent</td>
<td>16 µg/kg, dose escalation ongoing</td>
<td></td>
</tr>
<tr>
<td><strong>Not Alpha</strong></td>
<td>×</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Exposure</strong>(6)</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Q3W dosing</strong></td>
<td>×</td>
<td>×</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Expansion of CD8+T-cells</strong></td>
<td>n.a.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Significant fold increase above baseline(7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Expansion of NK cells</strong></td>
<td>n.a.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Significant fold increase above baseline(8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No expansion of CD4-Tregs</strong></td>
<td>n.a.</td>
<td>✔</td>
<td>×</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>No significant fold increase above baseline(9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No Vascular Leak Syndrome</strong></td>
<td>×</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Tolerability</strong></td>
<td>×</td>
<td>✔</td>
<td>×</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><strong>No anti-drug antibodies</strong></td>
<td>×</td>
<td>✔</td>
<td>×</td>
<td>✔</td>
<td>×</td>
</tr>
</tbody>
</table>

TID: three times a day; QD: every day; QW: every week; Q3W: every three weeks; NK: Natural killer; n.a.: non available (1) Lotze M T et al, J Immunol 1985; Meyers FJ, et al Clin Pharmacol Ther. 1991; Foureau et al Cancer Immunol Immunother 2014; Schantz et al, Arch Otolaryngol Head Neck Surg 1990 (2) Lopes et al, Journal for ImmunoTherapy of Cancer 2020; medication package insert (3) Bentebibel et al, Cancer discovery, 2019; Charych et al, PLOS One 2017 (4) Melero et al, ESMO 2018. IL-2 equivalent dose assessed based on recommended dose (20 mg), avg. weight (70 kg) and relative size (RG7461 11x larger than IL-2 as the cytokine is fused to 150,000 daltons IgG) (5) Synthorx data (6) Only THOR-707 has shown sustained exposure: RG7461 exposure is reduced with repeat dosing, all other compounds have low exposure (7) Yes: >2x; Yes, limited: 1.5-2x; No: <1.5x (8) Yes: >2x; Yes, limited: 1.5-2x; No: <1.5x (9) Yes: <2x; No: >2x. For illustrative purposes. Not based on head to head data. Limited conclusions should be derived from this indirect comparison given the variability of study designs. Clinical relevance of these differences is still under investigation.
Beyond interleukins, the X-Y genetic code technology enables diverse applications using nAA chemistry.
Conclusions

**Expanded Genetic Alphabet** has the potential to turn interleukins into **precision drugs for oncology and autoimmune diseases**

THOR-707 and THOR-809 harness dual IL-2 biology:
- **“Not-alpha” THOR-707 selectively upregulates CD8+ T and NK cells** to eliminate tumors without increasing CD4+ regulatory T cells (Tregs) and eosinophils
- **“Decreased beta” THOR-809 selectively upregulates Tregs** to suppress autoimmunity without upregulating CD8+ T and NK cells

Initial biomarker data from human studies increases our confidence in **THOR-707** potential to become partner of choice for checkpoint inhibitors (no ADA issues; well tolerated; target pathway engagement)

**THOR-707** dose-finding Phase 1b combinations with anti-PD-1 (T-cell) and anti-CD38 (NK cell), final Phase 1 results and RP2D expected in 2021

**Wide applicability of Synthorx platform** expected to yield **multiple clinical candidates** in coming years, with **further precision interleukins to enter the clinic in 2021-2023**

NK : Natural Killer; IL: Interleukin; ADA: Anti-drug antibody; RP2D: Recommended Phase 2 dose
Pathways
Introduction
John Reed
Global Head of Research & Development
## Two areas where Sanofi science stands out specifically

<table>
<thead>
<tr>
<th>Human immunology</th>
<th>Monogenic disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO</td>
<td>Gaucher</td>
</tr>
<tr>
<td>Vx</td>
<td>Pompe</td>
</tr>
<tr>
<td>I&amp;I</td>
<td>Fabry</td>
</tr>
<tr>
<td>Neurology</td>
<td>Hemophilia</td>
</tr>
<tr>
<td>Hematology</td>
<td>Others (2)</td>
</tr>
</tbody>
</table>

### Marketed (1)

<table>
<thead>
<tr>
<th>Human immunology</th>
<th>Monogenic disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO</td>
<td>Gaucher</td>
</tr>
<tr>
<td>Vx</td>
<td>Pompe</td>
</tr>
<tr>
<td>I&amp;I</td>
<td>Fabry</td>
</tr>
<tr>
<td>Neurology</td>
<td>Hemophilia</td>
</tr>
<tr>
<td>Hematology</td>
<td>Others (2)</td>
</tr>
</tbody>
</table>

### Clinical development (1)

<table>
<thead>
<tr>
<th>Human immunology</th>
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<tr>
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<td>Hemophilia</td>
</tr>
<tr>
<td>Hematology</td>
<td>Others (2)</td>
</tr>
</tbody>
</table>

---

IO: Immuno-oncology; Vx: Vaccines; I&I: Immunology and Inflammation

(1) Selection of assets  (2) Including Hunter disease, Hurler disease, Niemann-Pick

Note: Includes Sanofi wholly-owned and assets developed in collaboration

SANOFI
Human immunology: A view into our immunomodulatory pipeline and products

Mf: Macrophages; PC: Plasma cells; TH: T helper cells; TCTL: Cytotoxic T lymphocytes; NK: Natural killer cells; TReg: Regulatory T cells
Human immunology: A view into our immunomodulatory pipeline and products

Mf: Macrophages; PC: Plasma cells; TH: T helper cells; TCTL: Cytotoxic T lymphocytes; NK: Natural killer cells; TReg: Regulatory T cells; EOS: Eosinophils; SM: Small molecule; NAb: Nanobody; IO: Immuno-oncology; I&I: Immunology and Inflammation. (1) In collaboration with Regeneron (2) In collaboration with Revolution Medicines (3) In collaboration with BioNTech (4) In collaboration with Principia (5) In collaboration with Denali Therapeutics (6) In collaboration with ImmuNext
Sanofi’s pioneering history in Monogenic disorders

<table>
<thead>
<tr>
<th>Year</th>
<th>Product</th>
<th>Disorder</th>
<th>Launch date</th>
<th>U.S. diagnosed patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>Cerezyme® Gaucher</td>
<td>Gaucher</td>
<td></td>
<td>3.6k</td>
</tr>
<tr>
<td>2003</td>
<td>Aldurazyme® Hurler</td>
<td>Hurler</td>
<td></td>
<td>0.4k</td>
</tr>
<tr>
<td>2006</td>
<td>Myozyme® Pompe</td>
<td>Pompe</td>
<td></td>
<td>2k</td>
</tr>
<tr>
<td>2014</td>
<td>Cerdelga® Gaucher</td>
<td>Gaucher</td>
<td></td>
<td>3.6k</td>
</tr>
<tr>
<td></td>
<td>Olipudase alfa Niemann-Pick</td>
<td></td>
<td></td>
<td>1k</td>
</tr>
<tr>
<td></td>
<td>Avalglucosidase alfa Pompe</td>
<td></td>
<td></td>
<td>2k</td>
</tr>
<tr>
<td></td>
<td>Venglustat GD3, Fabry, GM2</td>
<td></td>
<td></td>
<td>3.2k</td>
</tr>
</tbody>
</table>

Life-threatening and life-altering indications, still highly under-diagnosed

(1) DRG, 2018, number of patients diagnosed in the U.S., thousands  
(2) Press release on Phase 2 results published of June 16, 2020
Pathways
Venglustat

Karin Knobe
TA Head, Rare Diseases & Rare Blood Disorders Development

Pablo Sardi
TA Head, Rare and Neurologic Diseases Research
Leveraging Sanofi’s heritage in LSD and GSL metabolism

Making a difference in patients with LSDs

Sanofi Genzyme
LSD heritage

Expanding the reach in more common disorders with large unmet need

LSD: Lysosomal storage disease; GSL: Glycosphingolipid
Broad role of glycosphingolipids in cellular functions

- GSLs are components of many cellular membranes
- GSLs can interact with adjacent proteins within the membrane to modulate protein function
- Plasma membrane GSLs provide surface features that provide cell recognition signals
- GSLs modulate many cellular processes required for normal function

Source: Natoli et al.; Cellular Signalling 69, 2020
GCS-inhibition as central regulator of GSL metabolism

**Gaucher disease**
- GBA mutation and lysosomal GL1 accumulation in the spleen, liver, bone marrow, lungs and brain

**GBA-Parkinson’s disease**
- Mutant GBA highest risk factor for Parkinson’s disease
- Inhibition of GCS in PD models arrests disease progression

**GM2 gangliosidosis**
- β-hexosaminidase mutations and lysosomal GM2 accumulation

**ADPKD**
- Inhibition of GCS in genetic models reduces kidney cyst growth and preserves kidney function

**Fabry disease**
- α-galactosidase mutations and lysosomal GM2 accumulation

GSL: Glycosphingolipid; GCS: Glucosylceramide synthase, coded by gene UGTG; Gcase: Glucocerebrosidase, coded by gene GBA; GlcCer (GL1): Glucosylceramide; LacCer: Lactosylceramide; GCase, GBA; GCS, UGTG; Venglustat (SRT); GM2 gangliosidoses: rare autosomal recessive genetic disorders including Tay-Sachs and Sandhoff disease; SRT: Substrate-reduction therapy; Venglustat is an asset under investigation and is not approved by any regulators.
Treatment dimensions give venglustat potential to be best-in-class oral GCS-inhibitor

<table>
<thead>
<tr>
<th>Treatment dimensions</th>
<th>1st gen GCS-inhibitors(^{(1)})</th>
<th>Venglustat target profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment burden</td>
<td>Oral; twice-daily</td>
<td>Oral; once-daily</td>
</tr>
<tr>
<td>Potency/selectivity</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Brain penetrance</td>
<td>Very limited</td>
<td>Yes</td>
</tr>
<tr>
<td>Applicability</td>
<td>Multiple LSDs</td>
<td>Multiple LSDs &amp; other GSL pathologies</td>
</tr>
</tbody>
</table>

GCS: Glucosylceramide synthase; LSD: Lysosomal storage disease; GSL: Glycosphingolipid

\(^{(1)}\) Examples include miglustat, eliglustat, lucerastat

No head-to-head studies comparing above products have been conducted. Venglustat target profile is aspirational and comparisons with other therapies cannot be made at this time. Venglustat is an asset under investigation and is not approved by any regulators.
**Venglustat: Leveraging GCS biology in CNS & key organs**

### LSDs

- **Central Manifestations of LSDs:**
  - GD3 & GM2

- **Potential new treatment option for Fabry patients with lower disease burden (~40% of diagnosed):**
  - U.S. diagnosed Fabry patients: ~3,000

### Beyond LSD

- **PD with GBA mutations and potentially idiopathic PD with GSL pathologies:**
  - U.S. GBA-PD population: ~78,000

- **ADPKD with PKD1 or PKD2 mutations affecting GSL signaling in cilia:**
  - U.S. ADPKD population: ~140,000

---

**GCS:** Glucosylceramide synthase; **CNS:** Central nervous system; **LSD:** Lysosomal storage disease; **GSL:** Glycosphingolipid; **GD3:** Type 3 Gaucher Disease; **GM2 gangliosidoses:** rare autosomal recessive genetic disorders including Tay-Sachs and Sandhoff disease; **PD:** Parkinson's disease; **ADPKD:** Autosomal dominant polycystic kidney disease. Venglustat is an asset under investigation and is not approved by any regulators.
Venglustat's activity validated in GD3 and in Fabry

**Gaucher Type 3**

*Phase 2 data at 1 year*

Enhanced occipito-parietal connectivity is the most prominent feature

**Fabry**

*Phase 2 data at 3 years*

Reduction in lysosomal GL3 storage

Paired $t$-test between seed-based connectivity maps
Venglustat: Transformative potential in ADPKD

GCS inhibition restores differentiation signaling in ADPKD

Robust preclinical data in validated animal model\(^1\)

Phase 3 STAGED-PKD: Stage 2 initiated at high dose based on tolerability profile

GCS: Glucosylceramide synthase; ADPKD: Autosomal dominant polycystic kidney disease; GSL: Glycosphingolipid; GlCer: Glucosylceramide; MRI: Magnetic resonance imaging. (1) Natoli et al, Nat Med. 2010

Venglustat is an asset under investigation and is not approved by any regulators
Venglustat: Potentially first DMT in GBA-PD

**GBA mutations associated with higher PD incidence and greater disease severity**

- Venglustat: potential to be the first disease modifying therapy in PD via GBA-PD

**MOVES-PD: first industry sponsored clinical trial in a genetic form of PD**

- Mean % change in CSF GL-1 at week 4 across doses (1)

---

DMT: Disease-modifying therapy; PD: Parkinson’s disease; HR: Hazard ratio; GSL: Glycosphingolipid; GCase: Glucocerebrosidase; GCS: Glucosylceramide synthase; CSF: Cerebrospinal fluid; GlcCer (GL1): Glucosylceramide

(1) MOVES-PD part 1 data presented at WORLD 2019 for 32 weeks of treatment, pool Japan + Rest of World

Venglustat is an asset under investigation, not approved by regulators
Preclinical evidence for therapeutic benefit of venglustat in sporadic PD population

Loss of GCase activity in sporadic PD and Lewy bodies dementia (1)

GCS inhibition reduces toxic α-Synuclein conversion (2)

GCS inhibition improves cognitive function in mouse model (3,4)

FDA recommendation to include idiopathic PD patients in Phase 3

* p-value vs. Control <0.05; ** p-value vs. Control <0.01
GCase: Glucocerebrosidase; GCS: Glucosylceramide synthase; PD: Parkinson’s disease; LD: Low dose; HD: High dose; WT: Wild type
(1) Chiasserini et al, Mol. NDD 2015 (2) Zunke et al, Neuron 2018 (3) Sardi et al, PNAS 2017 (4) In A53T-α-synuclein mice carrying wild-type Gba allele
Venglustat is an asset under investigation and is not approved by any regulators.

Venglustat analogue

A 53T-SNCA

GCase activity (pmol/min/mg)

Substantia nigra

Recall (%)
Lysosome pathway defects are central to most PD

Gene mutations associated to PD affect lysosomal function, GCase activity and GSL flux

- Synuclein overexpression and aggregation reduce GCase activity\(^{(1)}\)
- \textit{SNCA} and \textit{LRRK2} mutations reduce vesicular trafficking and lysosomal activity\(^{(1,2)}\)
- \textit{LRRK2} and \textit{GBA} mutations reduce GCase activity and affect GSLs levels\(^{(2,3)}\)
- Excessive burden of LSD gene variants in PD\(^{(4)}\)

Modulation of GSLs levels by GCS inhibition improves lysosomal and neuronal function, and reduces alpha-synuclein toxicity

\textbf{GSLs regulate cellular processes driving Parkinson’s disease progression\(^{(5)}\)}

GCase: Glucocerebrosidase; GCS: Glucosylceramide synthase; PD: Parkinson’s disease; GSL: Glycosphingolipid; LSD: Lysosomal storage disease

**PD-FIDI: Potentially first validated digital endpoint in PD**

<table>
<thead>
<tr>
<th>Part I</th>
<th>Part II</th>
<th>Part III</th>
<th>Part IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motor impacts</strong></td>
<td><strong>Dyskinesia impacts</strong>&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td><strong>Functional motor impacts</strong></td>
<td><strong>Continuously monitored functional impacts</strong></td>
</tr>
<tr>
<td>• 13 items adapted from MDS-UPDRS Part II</td>
<td>• 2 items adapted from MDS-UDyRS Part Ib</td>
<td>• Gait and balance including stride length&lt;br&gt;• Postural tremor of hands&lt;br&gt;• Pronation/supination of hands&lt;br&gt;• Finger tapping</td>
<td>• Gait and balance&lt;br&gt;• Physical activity and general mobility&lt;br&gt;&lt;br&gt;&lt;i&gt;Measured passively and continuously&lt;/i&gt;</td>
</tr>
</tbody>
</table>

**Exploratory Sleep Assessments**

- 4 original ePRO items assessing sleep duration and quality
- Sleep duration and quality actigraphy measures (measured passively and continuously)

---

Additional data could mean lower variability, so fewer subjects needed to achieve statistical power

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PD: Parkinson's disease; FIDI: Functional impacts digital instrument; MDS-UPDRS: Movement Disorder Society Unified Parkinson's Disease Rating Scale; MDS-UDyRS: Movement Disorder Society Unified Dyskinesia Rating Scale; PRO: Patient reported outcomes

<sup>(1)</sup> Only included for patients taking PD medications
Venglustat: Leveraging GCS biology in CNS & key organs

LSDs

Brain

GD3: LEAP Phase 2/3 ongoing(1)
  • Submission expected by H1 2023

GM2: Phase 3 started
  • Submission expected by H2 2023

Kidney/heart

Fabry: Phase 3 in preparation
  • Submission expected by H2 2023

Beyond LSD

Parkinson (MOVES-PD)
  • Phase 2 PoC expected by H1 2021
  • Submission expected by 2025

ADPKD (STAGED-PKD)
  • Part A fully enrolled (TKV)
  • Part A (TKV) pivotal results expected by Q4 2021
  • Submission expected by 2022

GCS: Glucosylceramide synthase; CNS: Central nervous system; LSD: Lysosomal storage disease; PoC: Proof of concept, clinical and commercial evidence to initiate pivotal study; ADPKD: Autosomal dominant polycystic kidney disease; GD3: Type 3 Gaucher Disease; GM2 gangliosidoses: rare autosomal recessive genetic disorders including Tay-Sachs and Sandhoff disease; TKV: Total Kidney Volume; GFR: Glomerular Filtration Rate. Venglustat is an asset under investigation and is not approved by any regulators

(1) Current LEAP Phase 2 study to be expanded to Phase 3 by end of year
Patients
Fitusiran & BIVV001 (1)

Vanessa Wolfeler
Global Franchise Head,
Rare Blood Disorders

Dietmar Berger
Global Head of Development,
Chief Medical Officer

SANOFI

(1) In collaboration with Sobi
Limitations of current Hemophilia treatments

Treatment burden

Factors
- Monotherapy
- IV infusion
- Frequent dosing

Non-factor (emicizumab)
- SQ injection
- Weekly / every other week dosing usually
- On-demand IV Factor needed (dual therapy)

Activity restrictions
- Active control on protection
- Proven safe and effective
- “Peak and trough” dependent protection
- Steady state efficacy
- “Normal” levels of protection out of reach
- Difficult to measure protection level

Future treatments aim to minimize treatment burden and remove activity restrictions

IV: intravenous; SQ: subcutaneous
(1) 7% of emicizumab patients on monthly dosing – 2019 Specialty Pharmacy data obtained through Specialty Pharmacy Distributors, Hemophilia Alliance HTCs & Direct HTCs
(2) <40% Factor VIII level considered as normal level; equivalent FVIII level of ~9% for emicizumab based on Lenting P et al, ISTH 2019, Lenting P et al, Blood Adv. 2020
Patients’ daily activities are defined by protection levels

<table>
<thead>
<tr>
<th>Factor VIII level (%, Log scale)</th>
<th>Daily activities</th>
<th>Risk with surgery/trauma</th>
<th>Need for supplemental Factor</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>High impact activity possible with no pain (sports, physical jobs, active days)</td>
<td>Major surgery/trauma possible without Factor requirement</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>40</td>
<td>Intense activity possible with no pain (most sports, play with friends, travel, physical jobs) – low bleed risk</td>
<td>Minor invasive procedures possible without Factor requirement</td>
<td>Rare</td>
<td>Minor adjustments</td>
</tr>
<tr>
<td>15</td>
<td>Limited activity with some pain (desk job, careful with active kids) – risk of spontaneous or micro bleeds</td>
<td>Invasive procedures require supplemental Factor</td>
<td>Regular</td>
<td>Significant adjustments</td>
</tr>
<tr>
<td>5</td>
<td>High risk of spontaneous bleeds with low activity and pain with target joints</td>
<td>Invasive procedures require supplemental Factor</td>
<td>Frequent</td>
<td>Vulnerable</td>
</tr>
</tbody>
</table>

Source: Iorio et al, Hemophilia. 2017
Current treatments require trade-off between treatment burden and protection levels

Factors

High protection, high dose frequency
- Short-period: 2-3 infusions per week required
- Patients at risk when at trough
- Patients at risk when missing infusion

Non-Factor (emicizumab)
Reduced dose frequency, lower protection
- ~9% FVIII equivalent level
- 90% patients experiencing acute bleeds require additional Factor
- 7% patients on monthly regimen

Patients achieve protection permitting strenuous activity <50% of their time

(1) Illustration of Factor VIII levels of Hemophilia A patients, or equivalent for non-Factor (2) Advate 50 IU/Kg (Phase 3) (3) Eloctate® 50 IU/Kg (Phase 3). Source: Mahlangu, J., et al, Blood (4) Equivalent FVIII level, based on Lenting P. et al, ISTH 2019, Lenting P. et al, Blood Adv. 2020 (5) Consumer Awareness, Trial, and Usage study among patients conducted over 359 Adult patients and caregivers surveyed online in April 2019, of which 131 were Adult Hemophilia A patients and 78 were Hemophilia A caregivers. Patients who switched to emicizumab answered questions specific to their treatment experience. (6) 2019 Specialty Pharmacy data obtained through Specialty Pharmacy Distributors, Hemophilia Alliance HTCs and Direct HTCs. No head-to-head studies comparing the above products have been conducted.
Our ambition: Pushing patients protection beyond current limitations

BIVV001 target profile

*Higher for longer*

- One week of protection, including ~3.5 days at normal activity level and ~6 days at strenuous activity level
- Increased joint protection

Fitusiran target profile

*High-efficacy monthly therapy*

- Aiming for 15-20% FVIII equivalent level\(^{(4)}\), allowing strenuous activity level
- First real once-monthly Hemophilia treatment

Aiming to get more patients above strenuous level for >80% of their time\(^{(6)}\)

(1) Illustration of Factor VIII levels of Hemophilia A patients, or equivalent for non-Factor (2) Advate 50 IU/Kg (Phase 3) (3) Eloctate® 50 IU/Kg (Phase 3). Source: Mahlangu, J., *et al*, Blood (4) Equivalent FVIII level, based on Lenting P *et al*, ISTH 2019, Lenting P *et al*, Blood Adv. 2020 (5) BIVV001 50 IU/Kg (Phase 1) – Day 22 (6) Assuming FVIII level >15% all the time for fitusiran and 6 days a week for BIVV001. Fitusiran and BIVV001 are assets under investigation and are not approved by any regulators – BIVV001 in collaboration with Sobi. No head-to-head studies comparing the above products have been conducted
BIVV001: New class of factor therapy engineered to achieve higher factor levels, for longer

**Effects of activated thrombin**

- rFVIII_Fc
- VWF
- XTEN®

**XTEN® insertions**
- Hydrophilic sequences comprising natural amino acids
- Decrease degradation, increase half-life

**Thrombin-cleavable linker**
- Enables release of D’D3 upon FVIII activation

**Covalent linkage to the D’D3 domain of VWF**
- Prevents binding to endogenous VWF, decoupling from VWF-mediated clearance
- Partial protection from degradation normally afforded by VWF

No bleed events in BIVV001 Phase 1 repeat dose study

Analysis of bleeding events (n=24)

<table>
<thead>
<tr>
<th>Bleed events in 12-month pre-study (median)(1)</th>
<th>Bleed events in 4-week prophylactic BIVV001 treatment period(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>0</td>
</tr>
</tbody>
</table>

4 weekly doses well tolerated

- No inhibitor development to Factor VIII detected
- No treatment-related adverse events reported
- No adverse events of allergic reaction or anaphylaxis reported

No bleeds reported during treatment period and for at least 10 days after last dose of BIVV001

(1) Pre-study treatment regimen: 21 patients treated with on-demand regimen and 3 with prophylactic regimen. (2) Once-weekly BIVV001 dose of 50 IU/kg (n=10) or 65 IU/kg (n=14). Source: World Federation of Hemophilia Virtual Summit (June 2020). Exploratory results, BIVV001 is an asset under investigation and is not approved by any regulators – in collaboration with Sobi
Fitusiran: Aiming to be the only therapy designed to bring high protection in a subcutaneous monthly therapy

Unique approach to rebalance the deficient coagulation cascade by reducing antithrombin

Hemophilia A and B are caused by an imbalance in hemostasis due to Factor deficiency, resulting in insufficient thrombin generation.

Fitusiran is designed to improve thrombin generation by lowering antithrombin.

250+ patients enrolled in clinical trials, with 4+ years of clinical data.
Fitusiran target profile confirmed in Phase 2 OLE trial

**Efficacy: median ABR**

<table>
<thead>
<tr>
<th>Subjects without inhibitors</th>
<th>Subjects with inhibitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prophylaxis (n=7)</td>
<td>Pre-study (n=14)</td>
</tr>
<tr>
<td>On demand (n=12)</td>
<td>Observation period (n=19)</td>
</tr>
<tr>
<td>Observation period</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>42.0</td>
</tr>
</tbody>
</table>

- **Median duration in observation period:**
  - Subjects without inhibitors: 36 months (range: 5-45 months)
  - Subjects with inhibitors: 28 months (range: 7-36 months)

**Safety and tolerability (n=34)**

- **No thrombotic events** in any subjects who remained compliant with the bleed management guidelines since their implementation in December 2017
- **No cases of anti-drug antibody formation**

**0.84 overall median ABR during observation period & median 2.6 yrs of fitusiran dosing (max. 4.7 yrs)**

OLE: Open-label extension; ABR: Annualized bleed rate
Data cutoff: March 10, 2020. ABR and duration represent pooled data from Phase 1 and Phase 2 OLE studies. Phase 1 data are included if gap between studies was ≤56 days. Only subjects with 28 days of follow-up during the observation period are included in this analysis. Clinical hold period (last dose before hold + 29 days, first dose after hold + 28 days) is excluded. Source: Fitusiran Phase 2 OLE Interim Results, WFH (June 2020). Fitusiran is an asset under investigation and is not approved by any regulators.
# Fitusiran: Potential best-in-class non-Factor therapy for all Hemophilia patients

<table>
<thead>
<tr>
<th>Fitusiran (target profile)</th>
<th>Emicizumab&lt;sup&gt;(2)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABR &lt;1 for Hem A &amp; B (monthly dose)</td>
<td>✔️</td>
</tr>
<tr>
<td>First SQ for all Hem B</td>
<td>✔️</td>
</tr>
<tr>
<td>1 prefilled syringe&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>✔️</td>
</tr>
<tr>
<td>Low-volume fixed dose</td>
<td>✔️</td>
</tr>
<tr>
<td>Room temperature stable</td>
<td>✔️</td>
</tr>
<tr>
<td>Reversal agent available</td>
<td>✔️</td>
</tr>
</tbody>
</table>

ABR: annual bleed rate; Hem: Hemophilia; Q4W: once every four weeks; SQ: subcutaneous

1. Fitusiran prefilled syringe, room temperature stable: planned for launch
2. Hemlibra® U.S. Prescribing Information
3. Hemlibra® U.S. Prescribing Information, assuming some patients may be over 75kg. Fitusiran is an asset under investigation and is not approved by any regulators
Wrap-up: Sanofi portfolio addresses white space of current patients needs

**Treatment burden**
(frequency & number of needles)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>emicizumab</th>
<th>Q4W</th>
<th>Q2W</th>
<th>Q1W</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/month</td>
<td>1/month</td>
<td>1/week</td>
<td>1/day</td>
<td>1/day</td>
</tr>
<tr>
<td>1/week</td>
<td>1/month</td>
<td>1/week</td>
<td>1/day</td>
<td>1/day</td>
</tr>
<tr>
<td>1/day</td>
<td>1/month</td>
<td>1/week</td>
<td>1/day</td>
<td>1/day</td>
</tr>
</tbody>
</table>

**Activity restrictions**
(ABR, All bleeds)

- **High**
  - On-demand factor required to manage bleed
  - FVIII (~75% patients)
  - High Q4W: once every four weeks; Q2W: once every two weeks; Q1W: once per week; ABR: annualized bleed rate
- **Limited**
  - BIVV001 target profile
  - Fitusiran target profile

**Expected submissions**

**H2 2021**
- Three ATLAS studies (>12 years old)
- Two of three Phase 3 studies fully enrolled; near completion of 3rd
- Pediatric Phase 3 study enrolling

**H1 2022**
- Phase 3 study in previously treated patients initiated (>12 years), n=150
- Study initiated in Q4 2019
- Endpoints to capture impact on restrictions in daily activities

---

1. emicizumab: 2.1 ABR with Q4W; 1.6 ABR with Q2W; 0.6 ABR with Q1W (U.S. prescribing information; median ABR (HAVEN-3 for Q1W & Q2W, HAVEN-4 for Q4W)
2. Based on Evaluate Pharma 2020, U.S. patients
3. 7% of emicizumab patients on monthly dosing
4. On-label use: 0.84 ABR with Q4W (Phase 2 OLE Interim Results)
5. BIVV001: Target Product Profile aiming for weekly dose, no bleed reported in Phase 1 repeat dose study
6. Individualized prophylaxis varies from daily to every 4 days and between <1 and >1 ABR
7. No head-to-head studies comparing the efficacy of emicizumab and fitusiran or BIVV001 have been conducted
8. Expected submission in the U.S. Fitusiran and BIVV001 are assets under investigation and are not approved by any regulators

---

BIVV001 in collaboration with Sobi
Aiming for first “true” cure in Hemophilia with LVV GT

AAV limitations for Hemophilia patients

- **DNA insert size limitations**: challenging to package BDD Factor VIII cDNA into AAV
- **Limitations on target population**
  - 21-74% of patients have pre-existing antibodies to AAV\(^1\)
  - Episomal AAV cargo gets diluted when liver grows – expression lost if treated too early, cannot treat pediatric patients
- **FVIII levels continuously declining over time**
  (long-term Hemophilia A data)

LVV target profile for Hemophilia patients

- **Larger DNA insert** size permits BDD Factor VIII cDNA and additional control elements
- **Aiming to address all patients**
  - No pre-existing antibodies to VSVG pseudotyped LVV
  - Treat in pediatrics: LVV cargo integrates into the host genome, growing with the patient
- **Expected to be durable** (integrative nature), as demonstrated in preclinical models

Sanofi/SR-TIGET to develop first-ever in vivo lenti application – expected to enter clinic by 2022
Expanding capabilities
COVID-19

Dietmar Berger
Global Head of Development,
Chief Medical Officer

John Shiver
Global Head of R&D,
Sanofi Pasteur

SANOFI
### Expanding R&D capabilities, focusing on Specialty Care and Vaccines

#### Enhanced patient centricity
- Patient-related insights (PROs, tolerability, health value, etc.)
- Patient-centric trial conduct (leverage telehealth, home delivery, digital tools when possible)
- E-consent and patient portal improving patient experience

#### Digital R&D & Real World Evidence
- DARWIN platform for Real World Evidence
- Digital transformation of Clinical Operations
- Optimization of development candidates through artificial intelligence, indication selection, trial optimization, etc.
- Digital in CMC and Regulatory Affairs

#### Focused, simplified footprint
- Simplifying R&D footprint, focusing clinical operations where it matters
- Global hubs for priority Therapeutic Areas
- Investments in leading-edge capabilities: biomanufacturing, Gene Therapy CMC, evolutive vaccines facility

#### News ways of working & engagement models
- Integrated Development organization
- Fast, rigorous decision-making – taking 'smart' risks
- Early engagement of investigators to optimize study design (#1 Sponsor of Global Clinical Trials)\(^{(1)}\)
- Multiple collaborations (e.g. BARDA, GSK)

---

PRO: Patient reported outcomes; CMC: Chemistry, manufacturing and control; BARDA: Biomedical Advanced Research and Development Authority

(1) Center Watch survey 2019
Ambitious digital transformation across Sanofi R&D

Key digital programs

Real World Evidence
- Commercial value increase of marketed products
- Clinical trial hypotheses support, virtual control arms
- Disease models, biomarker-driven population enrichment
- Search of new indications for development compounds
- Pharmacovigilance

Digital Research
- In-silico screening
- AI-driven compound optimization
- De-novo antibody design
- ML-driven developability assessment

Digital in CMC
- Paperless CMC labs
- One data platform
- Digitized workflows across all CMC, including external partners
- Process modeling simulation

Digital Clinical Operations
- Innovative, evidence-based design
- Digital biomarkers, sensors & tools
- Patient engagement platform
- Investigator & site platform
- Real-time data management
- Digital control room

Digital in Regulatory Affairs
- Automated document generation
- Language translation
- Cloud-based AI to support document management

AI: Artificial intelligence; ML: Machine learning; CMC: Chemistry, manufacturing and control
Improved capabilities and fast execution

**Illustration with BTKi ('168)(1)**

Phase 1 and 2 conducted 1 year faster than benchmarks

- Data exchange platform (Patient – Site – Sponsor) enabling continuous data exchange
- Home delivery of study drug; leverage of telehealth when possible (visits, performance outcomes, etc.)
- Remote site visits enabling business continuity

Phase 3 studies being launched across the full MS spectrum(2)

- Planning Phase 3 studies at risk to start as fast as possible (sites pre-identified and on-boarded)
- Control arm size in PPMS reduced to accelerate study completion while maintaining acceptable statistical power
- Optimized study design through early patient and investigator engagement

Trials maintained during COVID-19 97% of patients are on long-term extension study

First patient enrolled in RMS trial on June 11, despite pandemic

---

BTKi: Bruton's tyrosine kinase inhibitor; RMS: Relapsing multiple sclerosis; PPMS: Primary progressive multiple sclerosis; NR-SPMS: Non relapsing secondary progressive multiple sclerosis. (1) Not yet approved by regulators – in collaboration with Principia (2) RMS, PPMS and NR-SPMS
160+ COVID-19 vaccine candidates in development based on multiple technologies

As of June 19, 2020

Half of clinical candidates are based on exploratory vaccine platforms

(1) Includes replicating and non replicating  (2) Includes viral proteins, subunits, virus-like particles

Source: Milken Institutes
## Vaccine platforms: Different safety and efficacy profiles

<table>
<thead>
<tr>
<th>Technology</th>
<th>Clinical candidates</th>
<th>Efficacy / immune response</th>
<th>Duration of protection</th>
<th>Safety</th>
<th>Established large manufacturing capacity &amp; process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recombinant protein-based</td>
<td>2</td>
<td>✔️ Requires adjuvant and potentially booster dose</td>
<td>✔️ Long-lasting immunity (if adjuvanted)</td>
<td>✔️ Limited concerns</td>
<td>✔️ Yes</td>
</tr>
<tr>
<td>mRNA vaccines</td>
<td>3</td>
<td>? Unknown, may require several doses</td>
<td>? Unknown</td>
<td>? Unknown (limited database)</td>
<td>? Limited (exception: Translate Bio)</td>
</tr>
<tr>
<td>DNA vaccines</td>
<td>1</td>
<td>? Unknown, may require several doses</td>
<td>? Unknown</td>
<td>? Unknown (limited database)</td>
<td>? No existing product</td>
</tr>
<tr>
<td>Vector vaccines</td>
<td>2</td>
<td>✔️ 10-50% of population have pre-existing antibodies to vector</td>
<td>? Unknown, booster not possible (due to immunity against vector after first vaccination)</td>
<td>? History of enhanced infections rates with selected adenovaccines</td>
<td>? No existing product</td>
</tr>
<tr>
<td>Whole inactivated virus</td>
<td>4</td>
<td>✔️ Requires adjuvant, and potentially several doses</td>
<td>✔️ Long-lasting immunity (if adjuvanted)</td>
<td>✗ Risk of VAERD</td>
<td>✔️ Yes</td>
</tr>
<tr>
<td>Live attenuated virus</td>
<td>0</td>
<td>✔️ Induces strong response with single dose</td>
<td>✔️ Long-lasting immunity</td>
<td>✗ Complex biosafety measures (3); immuno-depressed patients ineligible</td>
<td>✔️ Yes</td>
</tr>
</tbody>
</table>

VAERD: Vaccine-associated enhanced respiratory disease

(1) Includes viral proteins, subunits, virus-like particles
(2) Includes replicating and non replicating
(3) Risks: contamination, reversion to virulence, stability
(4) In collaboration with GSK and Translate Bio
Sanofi is developing two complementary vaccines – each with differentiated profile

### Platform

1. **Recombinant protein-based vaccine (Baculovirus)**
   - Protein antigen
   - Adjuvant

2. **mRNA vaccine (natural)**
   - mRNA
   - Lipid nanoparticle

### Description

- **Recombinant protein-based vaccine (Baculovirus)**
  - Licensed recombinant platform\(^1\)
  - Existing large-scale capacity
  - BARDA collaboration
  - Collaboration with gsk for proven AS03 adjuvant

- **mRNA vaccine (natural)**
  - Innovative approach\(^2\) – natural mRNA
  - Potential for accelerated development
  - Significant existing investment in mRNA capacity to be applied towards vaccine

### Unknowns

- May require booster dose(s)

- **Unknown safety risks** (potentially differentiated safety profile vs. modified mRNA)

### Strengths

- Most de-risked technology
- Existing capacities to leverage

- **Promising technology**
- Only established large scale mRNA manufacturing capacity (Translate Bio)

---

\(^1\) Flublok® is manufactured with this platform and licensed in the U.S.  
\(^2\) In collaboration with Translate Bio
Baculovirus: Accelerated timeline – earliest approval in June 2021

Acceleration levers

Simplification of clinical studies
- Phase 1/2: studying fewer dosages
- Phase 3: selection of adjuvant with highest probability of success

Uncoupling of R&D and industrial timelines
- 'At risk' production of drug substance and drug product

Potential for emergency use authorization (up to 100 million doses in January 2021)

(1) In U.S. and EU; development plans and registration pathway being consolidated with rest of the world
Baculovirus: Aiming for 1 billion doses in 2021

Variables determining number of vaccine doses

**Drug substance**
- Established capacity within Sanofi and contract manufacturing network
- Production yield and number of batches
- Antigen dose per vaccination

**Adjuvant**
- Adjuvant manufactured with established GSK pandemic capacity

**Drug product**
- Aiming for 1 billion doses in 2021

Final capacity depending on yield and dosing, multiple levers to maximize it
Sanofi: Differentiated mRNA candidate

Proprietary delivery vehicle achieving desired pharmacokinetics

Proprietary LNP
- Suitable LNP candidate for intramuscular delivery identified and selected from extensive screening
- Formulation optimization completed with large scale LNP process development underway

Natural mRNA
- Multiple SARS-CoV-2 antigen mRNA constructs identified
- Codon optimized version of naturally occurring mRNA, with no chemically modified nucleotides

Established manufacturing capabilities

- Expertise in mRNA manufacturing developed over 10+ years: scale designed and built for chronic disease products, transferable to vaccine production
- Existing large-scale cGMP manufacturing capacity
  - Ongoing 100-gram single-batch mRNA production; demonstrated 250-gram scale
  - Expected annual capacity of 90-360 million doses

First in Human expected in Q4 2020 and earliest approval in H2 2021

LNP: Lipid nanoparticles; cGMP: current Good manufacturing practice
Conclusion: The world needs multiple vaccines – Sanofi is committed to play a key role in fight against COVID-19

- Unprecedented global race to develop vaccines to combat COVID-19 epidemic: >160 vaccine candidates based on established and novel vaccine platforms
- Sanofi develops two complementary vaccines, each with differentiated profile
- Acceleration of Baculovirus vaccine timelines: Phase 1/2 starting in September with >400 patients – potential launch by H1 2021 with up to 1 billion doses capacity
- Potential emergency use authorization by January 2021 with up to 100 million doses of Baculovirus vaccine
- Differentiated mRNA candidate to provide additional capacity (90-360 million doses expected annually), increase overall probability of success and strengthen our capabilities to prepare for future pandemics
Conclusion

John Reed
Global Head of Research & Development
Building our presence in Gene Therapy

**Internal pipeline of clinical candidates**
- Initial focus on AAV platform
  - Experience in Ophthalmology in the clinic
  - Investigating rare and neurological indications
- Pilot projects on innovative platforms: 3rd-generation lentivirus in Hemophilia, non-viral DNA delivery, mRNA

**Standalone Genomic Medicine Unit**
- Gene Therapy drug discovery unit in Cambridge (Boston)
  - Vector design
  - Capsid engineering
  - Dedicated capabilities (CMC, Regulatory, Translational Medicine)
- Expanding with new talents

**In-house bioproduction capabilities**
- Leveraging established capacities at Sanofi
- Fully dedicated CMC unit in Boston area
- GMP-grade manufacturing for clinical supply in Lyon Gerland

AAV: Adeno-associated virus; CMC: Chemistry, manufacturing and control; GMP: Good manufacturing practice
## Concrete illustrations of Sanofi's approach to R&D

<table>
<thead>
<tr>
<th>Platforms</th>
<th>Synthorx</th>
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<tbody>
<tr>
<td>Expanded tools for</td>
<td>Boosting the impact of cancer immunotherapies</td>
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<tr>
<td>drug discovery</td>
<td>by expanding the genetic alphabet</td>
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</table>

<table>
<thead>
<tr>
<th>Pathways</th>
<th>Venglustat</th>
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</thead>
<tbody>
<tr>
<td>Deep understanding of</td>
<td>Leveraging our knowledge of disease pathways to invent new medicines applicable to multiple disorders</td>
</tr>
<tr>
<td>disease pathways</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Patients</th>
<th>Fitusiran &amp; BIVV001&lt;sup&gt;(1)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relentless patient focus</td>
<td>Turning cutting-edge protein engineering and new modalities into innovative patient offerings</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>COVID-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leveraging expanding capabilities</td>
<td>Applying our scale and broad platforms to battle a global health crisis</td>
</tr>
</tbody>
</table>

<sup>(1)</sup> In collaboration with Sobi
Key milestones for priority molecules

**Dupixent®**(1)
- Pivotal results in Asthma 6-11 years old
  - H2 2020
- Pivotal results in PN and CSU
  - H2 2021

**Fitusiran & BIVV001**(2)
- Fitusiran & BIVV001 pivotal results in Hem A/B & Hem A
  - H1/H2 2021

**SERD '859**
- Proof of Concept in combination with CDK4/6i and adjuvant BC
  - H2 2020

**Venglustat**
- Proof of Concept in GBA-PD
  - H1 2021

**Nirsevimab**(3)
- Phase 2b data to be presented at dedicated Sanofi event
  - H2 2020

**BTKi '168**(4)
- First patient in for all Phase 3 studies
  - H2 2020

**Notes:**
- PN: Prurigo nodularis; CSU: Chronic spontaneous urticaria; CDK: Cyclin-dependent kinase; BC: Breast cancer; PD: Parkinson disease; Hem: Hemophilia; PoC: Proof of concept, clinical and commercial evidence to initiate pivotal study
- (1) In collaboration with Regeneron  (2) In collaboration with Sobi  (3) In collaboration with AstraZeneca  (4) In collaboration with Principia
### Upcoming milestones

**Priority assets**

<table>
<thead>
<tr>
<th>Regulatory decision</th>
<th>H2 2020</th>
<th>H1 2021</th>
<th>H2 2021</th>
<th>FY 2022</th>
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<tr>
<td>Sutlimimab</td>
<td>Cold agglutinin disease</td>
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<tr>
<td>Flublok®</td>
<td>EU approval</td>
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<tr>
<td>Sarclisa®</td>
<td>Refractory MM</td>
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<td>Pancuronium</td>
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<td>Baculovirus Recomb. Vx</td>
<td>COVID-19</td>
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<td>Libtayo®</td>
<td>2L BCC</td>
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<td>1L NSCLC monotherapy</td>
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<tr>
<td>MenQuadili™</td>
<td>≥12 months EU approval</td>
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<td>Avelgamotid asa</td>
<td>Pompe disease</td>
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<td>Shan 6</td>
<td>DCGL license</td>
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<tr>
<td><strong>Submission</strong></td>
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<tr>
<td>Sarclisa®</td>
<td>Refractory MM (IKEMA)</td>
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<td>Libitayo®</td>
<td>1L NSCLC monotherapy</td>
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<td>Pompe disease</td>
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<td>Shan 6</td>
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<td><strong>Pivotal results</strong></td>
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<td>Dupixent®</td>
<td>Asthma 6-11yo</td>
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<td>Fitusiran</td>
<td>Hemophilia A/B</td>
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<td>Libitayo®</td>
<td>1L NSCLC in combo with CT</td>
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<tr>
<td>Dupixent®</td>
<td>Prurigo nodularis</td>
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<td>BIVV001®</td>
<td>Hemophilia A</td>
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<tr>
<td><strong>Proof of Concept</strong></td>
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<tr>
<td>SERD '859</td>
<td>1L mBC in combo with CDK4/6i</td>
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<td>SERD '859</td>
<td>Adjuvant BC</td>
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<tr>
<td>SHP2 '720</td>
<td>Solid tumors</td>
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<td>ST400</td>
<td>Beta thalassemia</td>
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<td>BIVV003®</td>
<td>Sickle cell disease</td>
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<td>Vengustat</td>
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<td>Vengustat</td>
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<tr>
<td><strong>Ongoing milestones</strong></td>
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<td>Sutlimimab</td>
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<td>Shan 6</td>
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</tbody>
</table>

### Key Milestones

- **Upcoming milestones**
  - Concept
  - Proof of Concept
  - Pivotal results
  - Submission
  - Regulatory decision

### Key Data

- **SERD '859**
  - 1L mBC in combo with CDK4/6i
  - Adjuvant BC

- **SHP2 '720**
  - Solid tumors

- **T-cell eng. CD3/CD123 '234**
  - Acute myeloid leukemia

- **SERD '859**
  - 2L mBC in combo with PI3Ki

- **Anti-CEACAM5 '701**
  - 2/3L NSCLC monotherapy (LC03)

- **Vengustat**
  - ADPKD

- **BIVV001**
  - Hemophilia A

- **Sarclisa®**
  - 1L ND-MM Ti (IMROZ)

- **Nirsevimab**
  - AD 6mo-5yo

- **Fluzone**
  - RSV active immunization

AD: Atopic dermatitis; BC: Breast cancer; PD: Parkinson disease; m: metastatic; ADPKD: Autosomal dominant polycystic kidney disease; BCC: Basal cell carcinoma; NSCLC: Non-small-cell lung carcinoma; MM: Multiple myeloma; MDX: Multiple myeloma; DCGL: Drug Controller General of India; WHO: World Health Organization

(1) In collaboration with Regeneron  (2) In collaboration with Sobi  (3) In collaboration with Revolution Medicines  (4) In collaboration with AstraZeneca  (5) In collaboration with SK  (6) In collaboration with Sangamo

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Sanofi positioned to deliver the next-generation of medicines and vaccines

Platforms
- Unique blend of cutting-edge technologies
- Demonstrated platforms: Nano-bodies®, Multispecifics, Antibody Drug Conjugates, Vaccines…
- Exploratory platforms: Synthorins, mRNA, Gene Therapy…

Pathways
- Advancing human immunology across multiple areas of high unmet need
- Pioneering history in monogenic disorders
- Bringing Sanofi’s heritage in LSD beyond rare diseases

Patients
- Connecting with patients through digital technologies
- Breaking the barriers of today’s standard of care
- Leveraging real world evidence to make a real difference in patient day-to-day lives

Expanding capabilities
- Digital R&D
- Faster Clinical Operations
Everything begins and ends with the patient

Michael | Kidney Transplant | U.S.
Shannae | MPS I | Australia
Tucker | Hemophilia B | U.S.
James | Prostate Cancer | U.S.
Nancy | AD | U.S.
Sami | Pompe | Palestine
Hajib | Gaucher Disease | Pakistan
Heather | aTTP | U.S.
Gary | CAD | U.S.
Laurie | RA | Canada
Grethe | Multiple Sclerosis | Denmark

MPS: Mucopolysaccharidosis; AD: Atopic Dermatitis; aTTP: Acquired thrombotic thrombocytopenic purpura; CAD: Cold agglutinin disease; RA: Rheumatoid arthritis
R&D Investor Event

Appendices

June 23, 2020
## R&D Pipeline – New Molecular Entities(*)

### Phase 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Compound</th>
<th>Indication</th>
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<tbody>
<tr>
<td>SAR441344</td>
<td>Anti-CD40L mAb</td>
<td>Multiple Sarcoidosis</td>
</tr>
<tr>
<td>SAR439459</td>
<td>mono &amp; with complements, anti-TGFβ mAb</td>
<td>Advanced Solid Tumors</td>
</tr>
<tr>
<td>REGN5458</td>
<td>Anti-BMCAxCD3 bispecific mAb</td>
<td>Relapsed Refractory MM</td>
</tr>
<tr>
<td>REGN4018</td>
<td>Anti-MUC16xCD3 bispecific mAb</td>
<td>Ovarian Lymphoma</td>
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<td>SAR442720</td>
<td>SHP2 inhibitor</td>
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<td>SAR440234</td>
<td>T cell engaging multi specific mAb</td>
<td>Leukemia</td>
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<tr>
<td>SAR441000</td>
<td>mono &amp; with PD1, Cytokine mRNA</td>
<td>Solid tumors</td>
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<tr>
<td>SAR442085</td>
<td>Anti CD38 mAb Fc engineered Myeloma</td>
<td>Multiple Myeloma</td>
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<tr>
<td>REGN5459</td>
<td>Anti-BMCAxCD3 bispecific mAb</td>
<td>Relapsed Refractory MM</td>
</tr>
<tr>
<td>SAR442425 (THOR-707)</td>
<td>mono &amp; combo, Non-alpha IL-2</td>
<td>Solid tumors</td>
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<tr>
<td>SAR44257</td>
<td>Anti-CD3xCD20xCD3 trispecific mAb</td>
<td>MM / NHL Lymphoma</td>
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</table>

### Phase 2

<table>
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<tbody>
<tr>
<td>ST400</td>
<td>Ex Vivo ZFN Gene-Edited Cell Therapy, Beta thalassemia</td>
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<tr>
<td>SAR440340</td>
<td>Anti-IL-33 mAb</td>
<td>COPD</td>
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<td>SAR440600</td>
<td>RIPK1 inhibitor</td>
<td>Amyotrophic Lateral Sclerosis</td>
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<td>SAR43122</td>
<td>RIPK1 inhibitor</td>
<td>Inflammatory indications</td>
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<tr>
<td>SAR41169</td>
<td>RORC (ROR gamma T) antagonist, Psoisoria</td>
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<tr>
<td>SAR441236</td>
<td>Tri-specific neutralizing mAb</td>
<td>HIV</td>
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<td>SAR444465</td>
<td>Neo GAA</td>
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<td>SAR442020</td>
<td>Complement C1 inhibitor</td>
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<tr>
<td>SAR442257</td>
<td>Respiratory syncytial virus</td>
<td>Infants 4-month and older Vaccines</td>
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</table>

### Phase 3

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<th>Indication</th>
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<tbody>
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<td>SAR439859</td>
<td>SERD</td>
<td>Metastatic Breast Cancer 2/3L</td>
</tr>
<tr>
<td>SAR399375</td>
<td>mRNA-21</td>
<td>Aipor Syndrome</td>
</tr>
<tr>
<td>SAR442168</td>
<td>BTK inhibitor</td>
<td>Multiple Sclerosis</td>
</tr>
<tr>
<td>SAR341402 (insulin aspart)</td>
<td>Rapid acting insulin Type 1/2 Diabetes (EU)</td>
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</table>

### Registration

<table>
<thead>
<tr>
<th>Code</th>
<th>Compound</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAR406701</td>
<td>Maytansin-loaded anti-CEACAM5 mAb, NSCLC 2/3L</td>
<td></td>
</tr>
</tbody>
</table>

### Opt-in rights products for which rights have not been exercised yet

- Immuno-inflammation: MS & Neuro
- Oncology: Diabetes
- Rare Diseases: Cardiovascular & metabolism
- Rare Blood Disorders: Vaccines

### Notes

- Developed in collaboration with ImmuneX
- Regeneron product for which Sanofi has opt in rights
- Developed in collaboration with Revolution Medicine
- Developed in collaboration with BioNTech
- Developed in collaboration with Sangamo
- Developed in collaboration with Denali
- Receptor-interacting serine/threonine-protein kinase 1
- Developed in collaboration with Lead Pharma
- Developed in collaboration with SK
- Developed in collaboration with Immune Design/Merck
- Developed in collaboration with Regeneron
- Acid Sphingomyelolase Deficiency also known as Niemann Pick type B
- Developed in collaboration with Principia

* (*): Phase of projects determined by clinicaltrials.gov disclosure timing when relevant
** (**) Partnered and/or in collaboration – Sanofi may have limited or shared rights on some of these products
## Additional Indications(*)

<table>
<thead>
<tr>
<th>Phase 1 (Total : 6)</th>
<th>Phase 2 (Total : 18)</th>
<th>Phase 3 (Total : 25)</th>
<th>Registration (Total : 3)</th>
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<tbody>
<tr>
<td><strong>cemiplimab</strong>(1) + <strong>REGN0418</strong>(2)</td>
<td><strong>dupilumab</strong>(3)</td>
<td><strong>isatuximab</strong> + <strong>cemiplimab</strong>(4)</td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td>Ovarian Cancer</td>
<td><strong>Grass pollen allergy</strong></td>
<td><strong>Relapsed Refractory MM</strong></td>
<td>U.S. 2y+, EU 1y+</td>
</tr>
<tr>
<td>SAR439589 + palbociclib(2)</td>
<td><strong>sarilumab</strong>(2)</td>
<td><strong>isatuximab</strong> + <strong>cemiplimab</strong>(2)</td>
<td><strong>Dupixent</strong>(6)</td>
</tr>
<tr>
<td>Metastatic Breast Cancer</td>
<td><strong>Juvenile Idiopathic Arthritis</strong></td>
<td><strong>Lymphoma</strong></td>
<td>AD 6 – 11 years old (U.S., EU)</td>
</tr>
<tr>
<td><strong>sutimlimab</strong></td>
<td><strong>sarilumab</strong>(2)</td>
<td><strong>isatuximab</strong> + <strong>atezolizumab</strong>(6)</td>
<td><strong>Aubagio</strong>(6)</td>
</tr>
<tr>
<td>Immune Thrombocytopenic Purpura</td>
<td><strong>Systemic Juvenile Arthritis</strong></td>
<td><strong>nCRC</strong></td>
<td>Relapsing MS – Pediatric</td>
</tr>
<tr>
<td>SAR432720(6) + cimotumlimab</td>
<td><strong>Isatuximab</strong> + <strong>cemiplimab</strong>(5)</td>
<td><strong>isatuximab</strong></td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td>Relapsed Refractory solid tumors</td>
<td><strong>Solid Tumors</strong></td>
<td><strong>Smoldering multiple myeloma</strong></td>
<td>U.S. 2y+, EU 1y+</td>
</tr>
<tr>
<td>SAR443060(5)</td>
<td><strong>dupilumab</strong>(2)</td>
<td><strong>dupilumab</strong>(2)</td>
<td><strong>Dupixent</strong>(6)</td>
</tr>
<tr>
<td>Multiple sclerosis</td>
<td><strong>Peanut Allergy</strong></td>
<td><strong>Bullous pemphigoid</strong></td>
<td>AD 6 – 11 years old (U.S., EU)</td>
</tr>
<tr>
<td><strong>Yellow Fever</strong></td>
<td><strong>2-L Basal Cell Carcinoma</strong></td>
<td><strong>venglustat</strong></td>
<td><strong>Lemtrada</strong>(8)</td>
</tr>
<tr>
<td>Vaccine (Vero cell)</td>
<td><strong>Breast Cancer adjuvant</strong></td>
<td><strong>Fabry Disease</strong></td>
<td>Relapsing Remitting MS - Pediatric</td>
</tr>
<tr>
<td>SAR439859</td>
<td><strong>Isatuximab</strong></td>
<td><strong>venglustat</strong></td>
<td><strong>Cerdelas</strong>(4)</td>
</tr>
<tr>
<td>Breast Cancer adjuvant</td>
<td><strong>1-2L AML / ALL pediatrics</strong></td>
<td><strong>Gaucher Type 3</strong></td>
<td>Gaucher T1, ERT switch Pediatric</td>
</tr>
<tr>
<td><strong>isatuximab</strong></td>
<td><strong>venglustat</strong></td>
<td><strong>dupilumab</strong>(2)</td>
<td><strong>venglustat</strong></td>
</tr>
<tr>
<td>patients awaiting kidney transplantation</td>
<td><strong>GPA-PD</strong>(2)</td>
<td><strong>Prurigo nodularis</strong></td>
<td>GM2 gangliosidosis</td>
</tr>
<tr>
<td><strong>isatuximab</strong></td>
<td><strong>SP0173</strong></td>
<td><strong>sarilumab</strong>(2)</td>
<td><strong>Praluent</strong>(5)</td>
</tr>
<tr>
<td><strong>伫optin rights products (other than Phase 3)</strong></td>
<td><strong>Tdap booster US</strong></td>
<td><strong>Giant Cell Arteritis</strong></td>
<td>LDL-C reduction - Pediatric</td>
</tr>
<tr>
<td><strong>Registritional study (other than Phase 3)</strong></td>
<td><strong>SAR439859</strong></td>
<td><strong>dupilumab</strong>(2)</td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td><strong>Opt-in rights products for which rights have not been exercised yet</strong></td>
<td><strong>Breast Cancer</strong></td>
<td><strong>sarilumab</strong>(2)</td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td><strong>(1) Developed in collaboration with Regeneron</strong></td>
<td><strong>adjuvant in CSCC</strong></td>
<td><strong>Giant Cell Arteritis</strong></td>
<td>6w+ (US / EU)</td>
</tr>
<tr>
<td><strong>(2) Regeneron product for which Sanofi has opt-in rights</strong></td>
<td><strong>cimotumlimab</strong>(2)</td>
<td><strong>membrane</strong></td>
<td><strong>Shan 6</strong></td>
</tr>
<tr>
<td><strong>(3) Pfizer product (palbociclib)</strong></td>
<td><strong>1L NSCLC</strong></td>
<td><strong>Pediatric hexavalent vaccine</strong></td>
<td>Pediatric  hexavalent vaccine</td>
</tr>
<tr>
<td><strong>(4) Developed in collaboration with Revolution Medicines – cimotumlimab is a Genentech product</strong></td>
<td><strong>cemiplimab</strong>(2)</td>
<td><strong>VX15-2101 (VRVg)</strong></td>
<td>Purified vero rabies vaccine</td>
</tr>
<tr>
<td><strong>(5) Developed in collaboration with Denali</strong></td>
<td><strong>chemotherapy</strong></td>
<td><strong>flusirilen</strong></td>
<td><strong>Hemophilia A and B pediatric</strong></td>
</tr>
<tr>
<td><strong>(7) Parkinson’s Disease with an associated GBA mutation</strong></td>
<td><strong>1L NSCLC</strong></td>
<td><strong>2L Cervical Cancer</strong></td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td><strong>(8) Transplant eligible</strong></td>
<td><strong>cemiplimab</strong>(2)</td>
<td><strong>adjuvant in CSCC</strong></td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td><strong>(9) Transplant ineligible</strong></td>
<td><strong>2L Cervical Cancer</strong></td>
<td><strong>cemiplimab</strong>(2)</td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td><strong>(1) Developed in collaboration with Genentech Inc. (atezolizumab)</strong></td>
<td><strong>Polyanglia Rheumatica</strong></td>
<td><strong>cemiplimab</strong>(2)</td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td><strong>(2) Partnership project with Sanofi</strong></td>
<td><strong>Praluent</strong>(5)</td>
<td><strong>2L Cervical Cancer</strong></td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td><strong>(3) Pfizer product (palbociclib)</strong></td>
<td><strong>LDL-C reduction</strong></td>
<td><strong>cemiplimab</strong>(2)</td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td><strong>(4) Developed in collaboration with Revolution Medicines – cimotumlimab is a Genentech product</strong></td>
<td><strong>Pediatric hexavalent vaccine</strong></td>
<td><strong>cemiplimab</strong>(2)</td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td><strong>(5) Developed in collaboration with Denali</strong></td>
<td><strong>Hemophilia A and B pediatric</strong></td>
<td><strong>cemiplimab</strong>(2)</td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td><strong>(7) Parkinson’s Disease with an associated GBA mutation</strong></td>
<td><strong>membrane</strong></td>
<td><strong>cemiplimab</strong>(2)</td>
<td><strong>MenQuadri</strong>(5)</td>
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<tr>
<td><strong>(8) Transplant eligible</strong></td>
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<td><strong>MenQuadri</strong>(5)</td>
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<tr>
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<td><strong>MenQuadri</strong>(5)</td>
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<tr>
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<td><strong>MenQuadri</strong>(5)</td>
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<td><strong>(2) Partnership project with Sanofi</strong></td>
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<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
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</tr>
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<td><strong>MenQuadri</strong>(5)</td>
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<tr>
<td><strong>(5) Developed in collaboration with Denali</strong></td>
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<td><strong>MenQuadri</strong>(5)</td>
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<td><strong>(7) Parkinson’s Disease with an associated GBA mutation</strong></td>
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<td><strong>MenQuadri</strong>(5)</td>
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<td><strong>2L Cervical Cancer</strong></td>
<td><strong>MenQuadri</strong>(5)</td>
</tr>
<tr>
<td><strong>(9) Transplant ineligible</strong></td>
<td><strong>Praluent</strong>(5)</td>
<td><strong>2L Cervical Cancer</strong></td>
<td><strong>MenQuadri</strong>(5)</td>
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</table>
Expected submission timeline

**NMEs**

- fitusiran
- Hemophilia A/B
- olipudase alfa
- ASMD® ad+ped
- venglustat
- ADPKD®
- SAR408701
- 2-3L NSCLC
- romilkimab
- Systemic Scleroderma
- nirsevimab® (TM)
- Respiratory syncytial virus
- BIVV01®
- Hemophilia A
- SAR439859
- mBC 2/3L
- mRNA vaccine
- COVID-19
- SAR442168®
- Multiple Sclerosis
- SARB339375
- Alport Syndrome
- avalglucosidase alfa
- Pompe Disease
- itilusiran
- Hemophilia A/B
- sarilumab
- Polyarticular Juvenile Idiopathic Arthritis
- cemiplimab®
- 2L NSCLC
- dupilumab®
- Eosinophilic Esophagitis
- dupilumab®
- Chronic spontaneous urticaria
- dupilumab®
- Bullous pemphigoid
- cemiplimab®
- 2L Cervical Cancer
- isatuximab
- 1L Newly Diagnosed MM Tl
- isatuximab
- 1-2L AML / ALL ped.
- lembrutinib
- RRMS Ped.
- MenQuadfi™
- U.S. & EU: 6w+
- sarilumab
- Systemic Juvenile Arthritis
- verorabVax® (VRVg)
- Purified vero rabies vaccine
- venglustat
- GMZ gangliosidosis
- cemiplimab®
- adjuvant in CSCC
- praluent®
- LDL-C reduction - Pediatric

**Additional Indications**

- BIVV001®
- Hemophilia A
- SAR439859
- mBC 2/3L
- mRNA vaccine
- COVID-19
- BIVV01®
- Hemophilia A
- SAR439859
- mBC 2/3L
- mRNA vaccine
- COVID-19
- fitusiran
- Hemophilia A/B
- olipudase alfa
- ASMD® ad+ped
- venglustat
- ADPKD®
- SAR408701
- 2-3L NSCLC
- romilkimab
- Systemic Scleroderma
- nirsevimab® (TM)
- Respiratory syncytial virus

**2020**

- isatuximab
  - 2L RRMM (IKEMA)
- Shan 6
  - Pediatric hexavalent vaccine
- cemiplimab®
  - 2L BCC
- cemiplimab®
  - 1L NSCLC
- dupilumab®
  - AD 6 months - 5 years old
- sarilumab®
  - Polyarticular Juvenile Idiopathic Arthritis
- cemiplimab®
  - Chemo + chemo
  - 1L NSCLC
- dupilumab®
  - Eosinophilic Esophagitis
- sarilumab
  - Polymyalgia Rheumatica
- dupilumab®
  - Chronic spontaneous urticaria
- dupilumab®
  - Bullous pemphigoid
- cemiplimab®
  - 2L Cervical Cancer
- isatuximab
  - 1L Newly Diagnosed MM Tl
- isatuximab
  - 1-2L AML / ALL ped.
- lembrutinib
  - RRMS Ped.
- MenQuadfi™
  - U.S. & EU: 6w+
- sarilumab
  - Systemic Juvenile Arthritis
- verorabVax® (VRVg)
  - Purified vero rabies vaccine
- venglustat
  - GMZ gangliosidosis
- cemiplimab®
  - adjuvant in CSCC
- praluent®
  - LDL-C reduction - Pediatric

**2021**

- isatuximab
  - 2L RRMM (IKEMA)
- Shan 6
  - Pediatric hexavalent vaccine
- cemiplimab®
  - 2L BCC
- cemiplimab®
  - 1L NSCLC
- dupilumab®
  - AD 6 months - 5 years old
- sarilumab®
  - Polyarticular Juvenile Idiopathic Arthritis
- cemiplimab®
  - Chemo + chemo
  - 1L NSCLC
- dupilumab®
  - Eosinophilic Esophagitis
- sarilumab
  - Polymyalgia Rheumatica
- dupilumab®
  - Chronic spontaneous urticaria
- dupilumab®
  - Bullous pemphigoid
- cemiplimab®
  - 2L Cervical Cancer
- isatuximab
  - 1L Newly Diagnosed MM Tl
- isatuximab
  - 1-2L AML / ALL ped.
- lembrutinib
  - RRMS Ped.
- MenQuadfi™
  - U.S. & EU: 6w+
- sarilumab
  - Systemic Juvenile Arthritis
- verorabVax® (VRVg)
  - Purified vero rabies vaccine
- venglustat
  - GMZ gangliosidosis
- cemiplimab®
  - adjuvant in CSCC
- praluent®
  - LDL-C reduction - Pediatric

**2022**

- isatuximab
  - 2L RRMM (IKEMA)
- Shan 6
  - Pediatric hexavalent vaccine
- cemiplimab®
  - 2L BCC
- cemiplimab®
  - 1L NSCLC
- dupilumab®
  - AD 6 months - 5 years old
- sarilumab®
  - Polyarticular Juvenile Idiopathic Arthritis
- cemiplimab®
  - Chemo + chemo
  - 1L NSCLC
- dupilumab®
  - Eosinophilic Esophagitis
- sarilumab
  - Polymyalgia Rheumatica
- dupilumab®
  - Chronic spontaneous urticaria
- dupilumab®
  - Bullous pemphigoid
- cemiplimab®
  - 2L Cervical Cancer
- isatuximab
  - 1L Newly Diagnosed MM Tl
- isatuximab
  - 1-2L AML / ALL ped.
- lembrutinib
  - RRMS Ped.
- MenQuadfi™
  - U.S. & EU: 6w+
- sarilumab
  - Systemic Juvenile Arthritis
- verorabVax® (VRVg)
  - Purified vero rabies vaccine
- venglustat
  - GMZ gangliosidosis
- cemiplimab®
  - adjuvant in CSCC
- praluent®
  - LDL-C reduction - Pediatric

**2023 and beyond**

- isatuximab
  - Newly Diagnosed MM Te
- sarilumab
  - COPD
- Dupixent®
  - COPD
- verorabVax® (VRVg)
  - Purified vero rabies vaccine
- venglustat
  - Fabry Disease
- Lemtrada®
  - RRMS Ped.
- verorabVax® (VRVg)
  - Purified vero rabies vaccine
- venglustat
  - Fabry Disease
- MenQuadfi™
  - U.S. & EU: 6w+
- sarilumab
  - Systemic Juvenile Arthritis
- verorabVax® (VRVg)
  - Purified vero rabies vaccine
- venglustat
  - Fabry Disease

**Legend**

- Immuno-inflammation
- MS & Neuro
- Oncology
- Diabetes
- Rare Diseases
- Cardiovascular & metabolism
- Rare Blood Disorders

(1) Excluding Phase 1 (without POC)
(2) Projects within a specified year are not arranged by submission timing
(3) Developed in collaboration with Regeneron
(4) Developed in collaboration with GSK and with funding from Biomedical Advanced Research and Development Authority (BARDA)
(5) Developed in collaboration with Translate Bio
(6) Acid Sphingomyelinase Deficiency
(7) Developed in collaboration with Sobi
(8) Autosomal Dominant Polycystic Kidney Disease
(9) Developed in collaboration with Principia
(10) Parkinson’s Disease with an associated GBA mutation
(11) Partnered and/or in collaboration – Sanofi may have limited or shared rights on some of these products
Pipeline movements since Q1 2020

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Additions / Moves</th>
<th>Removals from Sanofi pipeline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SAR442257 Anti-CD3xCD28xCD3 trispecific mAb, MM / N-H Lymphoma</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase 2</th>
<th>Additions / Moves</th>
<th>Removals from Sanofi pipeline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SAR408701 + ramucirumab NSCLC 2/3L</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase 3</th>
<th>Additions / Moves</th>
<th>Removals from Sanofi pipeline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SAR442168**(1) BTK inhibitor Multiple Sclerosis</td>
<td>Pediatric pentavalent vaccine**(2) Japan</td>
</tr>
<tr>
<td></td>
<td>sutimlimab Anti Complement C1s mAb Cold Agglutinin Disease</td>
<td>Aubagio® Relapsing MS – Pediatric</td>
</tr>
<tr>
<td>Registration</td>
<td>Aubagio® Relapsing MS – Pediatric</td>
<td></td>
</tr>
</tbody>
</table>