



# Clinical Trials Appendices

July 29, 2019

# R&D Pipeline – New Molecular Entities(\*)

Phase 1 (Total : 19)		Phase 2 (Total : 7)		Phase 3 (Total : 6)	Registration (Total : 2)
<b>SAR441344</b> <sup>(**)(1)</sup> Anti-CD40L mAb Multiple Sclerosis	<b>BIVV001</b> <sup>(**)(5)</sup> rFVIII Fc – VWF – XTEN <sup>(6)</sup> Hemophilia A	<b>SAR440340</b> <sup>(**)(12)</sup> Anti-IL33 mAb Atopic Dermatitis	<b>SAR422459</b> <sup>(**)(14)</sup> ABCA4 gene therapy Stargardt Disease	<b>avalglucosidase alfa</b> Neo GAA Pompe Disease	<b>isatuximab</b> Anti-CD38 mAb 3L RRRM (ICARIA) (U.S.,EU)
<b>SAR408701</b> Maytansin-loaded anti-CEACAM5 mAb, Solid Tumors	<b>ST400</b> <sup>(**)(7)</sup> Ex Vivo ZFN Gene-Edited Cell Therapy, Beta thalassemia	<b>SAR156597</b> IL4/IL13 bispecific mAb Systemic Sclerosis	<b>SAR442168</b> <sup>(**)(15)</sup> BTK inhibitor Multiple Sclerosis	<b>venglustat</b> Oral GCS inhibitor ADPKD <sup>(16)</sup>	<b>SAR341402 (insulin aspart)</b> Rapid acting insulin Type 1/2 Diabetes (EU)
<b>SAR439459</b> anti-TGFb mAb Advanced Solid Tumors	<b>BIVV003</b> <sup>(**)(7)</sup> Ex Vivo ZFN Gene-Edited Cell Therapy, Sickle Cell Disease	<b>olipudase alfa</b> rhASM AS Deficiency <sup>(13)</sup>	<b>HIV</b> Viral vector prime & rgp120 boost vaccine	<b>fitusiran</b> RNAi targeting anti-thrombin Hemophilia A and B	
<b>REGN5458</b> <sup>(**)(2)</sup> Anti-BCMA-CD3 bispecific mAb Relapsing Refractory MM	<b>SAR443060</b> <sup>(**)(8)</sup> RIPK1 inhibitor <sup>(9)</sup> Amyotrophic Lateral Sclerosis	<b>SAR339375</b> miRNA-21 Alport Syndrome		<b>sutimlimab</b> Anti Complement C1s mAb Cold Agglutinin Disease	
<b>REGN4018</b> <sup>(**)(2)</sup> Anti-MUC16-CD3 bispecific mAb Ovarian Cancer	<b>Next Gen PCV</b> <sup>(**)(10)</sup> Pneumococcal Conjugate Vaccines			<b>efpeglenatide</b> <sup>(**)(17)</sup> Long-acting GLP-1 agonist Type 2 Diabetes	
<b>SAR439859</b> SERD Metastatic Breast Cancer	<b>Herpes Simplex Virus Type 2</b> HSV-2 therapeutic vaccine			<b>nirsevimab</b> <sup>(**)(18)</sup> Respiratory syncytial virus Monoclonal Antibody	
<b>SAR442720</b> <sup>(**)(3)</sup> SHP2 inhibitor Solid Tumors	<b>Respiratory syncytial virus</b> Infants 4-month and older Vaccines				
<b>SAR440234</b> T cell engaging multi spe mAb Leukemia	<b>SAR441169</b> <sup>(**)(11)</sup> RORC (ROR gamma T) antagonist, Psoriasis				
<b>SAR441000</b> <sup>(**)(4)</sup> Cytokine mRNA Solid tumors	<b>SAR441255</b> Trigonal GLP1R/GIPR/GCGR agonist Obesity / Type 2 Diabetes				
<b>SAR441236</b> Tri-specific neutralizing mAb HIV					

**R** Registrational Study (other than Phase 3)

**O** 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

- (1) Developed in collaboration with Immunext
- (2) Regeneron product for which Sanofi has opt-in rights
- (3) Developed in collaboration with REVOLUTION Medicines
- (4) Developed in collaboration with BioNtech
- (5) Sanofi product for which Sobi has opt-in rights in SOBI territories
- (6) Recombinant Coagulation Factor VIII Fc – von Willebrand Factor – XTEN Fusion protein
- (7) Developed in collaboration with Sangamo
- (8) Developed in collaboration with Denali
- (9) Receptor-interacting serine/threonine-protein kinase 1
- (10) Developed in collaboration with SK
- (11) Developed in collaboration with Lead Pharma

- (12) Developed in collaboration with Regeneron
- (13) Acid Sphingomyelinase Deficiency also known as Niemann Pick type B
- (14) Identification of out-licensing partner ongoing
- (15) Developed in collaboration with Principia
- (16) Autosomal Dominant Polycystic Kidney Disease
- (17) Developed in collaboration with Hanmi
- (18) Developed in collaboration with AstraZeneca
- (\*) Phase of projects determined by clinicaltrials.gov disclosure timing
- (\*\*) Partnered and/or in collaboration – Sanofi may have limited or shared rights on some of these products

# Additional Indications(\*)

Phase 1 (Total : 5)	Phase 2 (Total : 17)	Phase 3 (Total : 23)	Registration (Total : 4)
<b>SAR439459 + cemiplimab</b> (**)(1) Anti-TGFβ mAb + PD-1 inh mAb Advanced Solid Tumors	<b>dupilumab</b> (**)(1) Anti-IL4Rα mAb Grass Immunotherapy	<b>isatuximab + cemiplimab</b> (**)(1) Anti-CD38 mAb + PD-1 inh mAb Relapsing Refractory MM	<b>Dupixent</b> (**)(1) dupilumab Asthma 6 - 11 years old
<b>O</b> <b>cemiplimab</b> (**)(1) + <b>REGN4018</b> (**)(2) PD-1 inh mAb + Anti-MUC16-CD3 bispe mAb - Ovarian Cancer	<b>R</b> <b>sarilumab</b> (**)(1) Anti-IL6R mAb Polyarticular Juvenile Idiopathic Arthritis	<b>isatuximab + cemiplimab</b> (**)(1) Anti-CD38 mAb + PD-1 inh mAb Advanced Malignancies	<b>isatuximab</b> Anti-CD38 mAb 1-3L RRMM (IKEMA)
<b>SAR439859 + palbociclib</b> (3) SERD + CDK4/6 inh Metastatic Breast Cancer	<b>sarilumab</b> (**)(1) Anti-IL6R mAb Systemic Juvenile Arthritis	<b>isatuximab + cemiplimab</b> (**)(1) Anti-CD38 mAb + PD-1 inh mAb Lymphoma	<b>Dupixent</b> (**)(1) dupilumab AD 6 – 11 years old
<b>sutimlimab</b> Anti Complement C1s mAb Immune Thrombocytopenic Purpura	<b>SAR440340</b> (**)(1) Anti-IL33 mAb COPD	<b>isatuximab + atezolizumab</b> (6) Anti-CD38 mAb + PD-L1 inh mAb mCRC	<b>Aubagio</b> <sup>®</sup> teriflunomide RMS – Pediatric
<b>SAR443060</b> (**)(4) RIPK1 inhibitor(5) Multiple sclerosis	<b>dupilumab</b> (**)(1) Anti-IL4Rα mAb Peanut Allergy - Pediatric	<b>isatuximab + atezolizumab</b> (6) Anti-CD38 mAb + PD-L1 inhibitor mAb Solid Tumors	<b>Lemtrada</b> <sup>®</sup> alemtuzumab RRMS - Pediatric
	<b>SAR440340</b> (**)(1) Anti-IL33 mAb Asthma	<b>isatuximab + atezolizumab</b> (6) Anti-CD38 mAb + PD-L1 inhibitor mAb Solid Tumors	<b>Cerdelga</b> <sup>®</sup> Eliglustat Gaucher T1, ERT switch Pediatric
	<b>R</b> <b>cemiplimab</b> (**)(1) PD-1 inhibitor mAb 2-L Basal Cell Carcinoma	<b>isatuximab + atezolizumab</b> (6) Anti-CD38 mAb + PD-L1 inhibitor mAb Solid Tumors	<b>Praluent</b> (**)(1) Alicumab LDL-C reduction - Pediatric
	<b>isatuximab</b> Anti-CD38 mAb 1-2L AML / ALL pediatrics	<b>isatuximab + atezolizumab</b> (6) Anti-CD38 mAb + PD-L1 inhibitor mAb Solid Tumors	<b>MenQuadfi</b> <sup>TM</sup> Advanced generation meningococcal ACYW conjugate vaccine EU 1y+, US/EU 6w+
		<b>SP0173</b> Tdap booster US	<b>Pediatric pentavalent vaccine</b> DTP-Polio-Hib Japan
		<b>SP0173</b> Tdap booster US	<b>Shan 6</b> DTP-HepB-Polio-Hib Pediatric hexavalent vaccine
		<b>cemiplimab</b> (**)(1)+ <b>chemotherapy</b> PD-1 inh mAb + chemotherapy 1L NSCLC	<b>VerorabVax</b> (**)(1) (VRVg) Purified vero rabies vaccine
		<b>cemiplimab</b> (**)(1) PD-1 inhibitor mAb 2L Cervical Cancer	<b>isatuximab</b> Anti-CD38 mAb 1L Newly Diag. MM T1(7) (IMROZ)
		<b>cemiplimab</b> (**)(1) PD-1 inhibitor mAb 2L Cervical Cancer	<b>isatuximab</b> Anti-CD38 mAb 1L Newly Diag. MM T1(7) (IMROZ)
		<b>fitusiran</b> RNAi targeting anti-thrombin Hemophilia A and B pediatric	

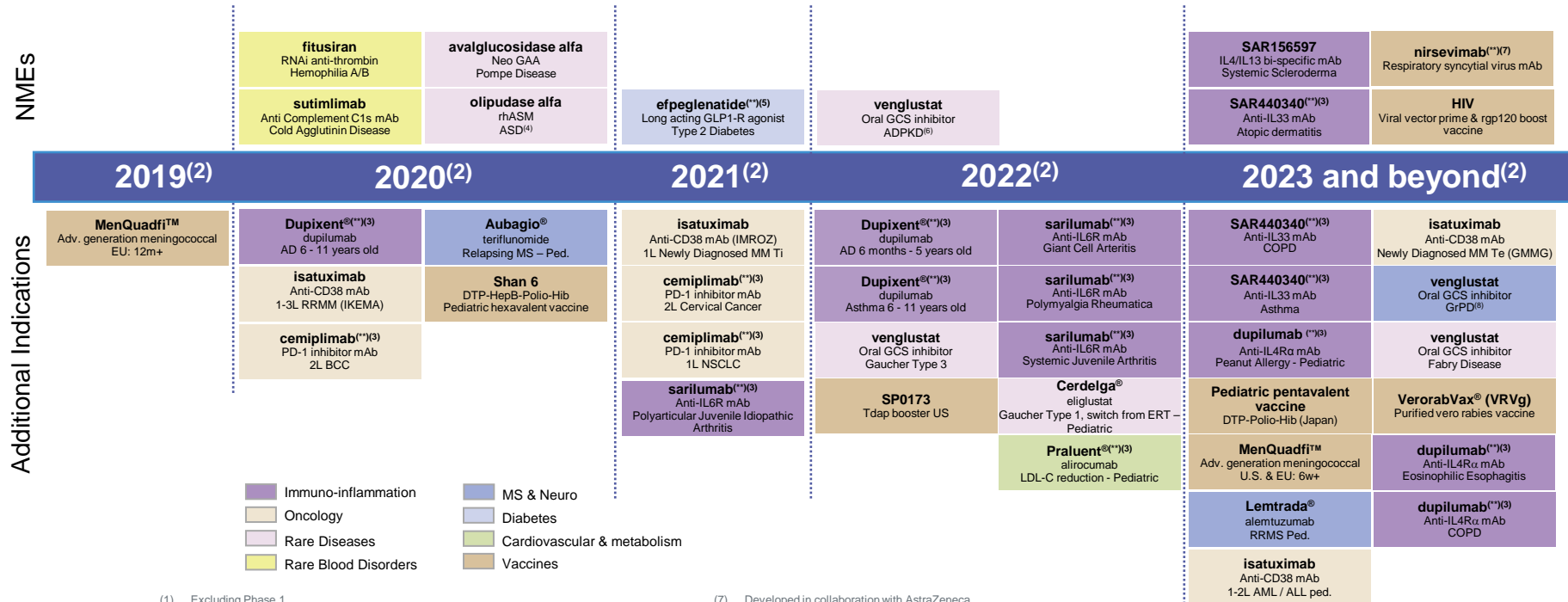
- Immuno-inflammation
- Oncology
- Rare Diseases
- Rare Blood Disorders
- MS & Neuro
- Diabetes
- Cardiovascular & metabolism
- Vaccines

**R** Registrational study (other than Phase 3)

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

- |   |  |
|---|--|
| (1) Developed in collaboration with Regeneron   | (6) Studies in collaboration with Roche (atezolizumab) |
| (2) Regeneron product for which Sanofi has opt-in rights  | (7) Transplant ineligible                              |
| (3) Pfizer product (palbociclib)  | (8) Transplant eligible                                |
| (4) Developed in collaboration with Denali  | (9) Chronic rhinosinusitis with nasal polyps           |
| (5) Receptor-interacting serine/threonine-protein kinase 1  |  |
| (*) Phase of projects determined by clinicaltrials.gov disclosure timing                                    |  |
| (**) Partnered and/or in collaboration - Sanofi may have limited or shared rights on some of these products |  |

# Expected Submission Timeline<sup>(1)</sup>



(1) Excluding Phase 1  
 (2) Projects within a specified year are not arranged by submission timing  
 (3) Developed in collaboration with Regeneron  
 (4) Acid Sphingomyelinase Deficiency  
 (5) Developed in collaboration with Hanmi  
 (6) Autosomal Dominant Polycystic Kidney Disease

(7) Developed in collaboration with AstraZeneca  
 (8) Gaucher related Parkinson's Disease  
 (\*\*\*) Partnered and/or in collaboration – Sanofi may have limited or shared rights on some of these products

# Pipeline Movements Since Q1 2019

	Additions / Moves	Removals from Sanofi pipeline
Registration	<p><b>isatuximab</b> Anti-CD38 mAb 3L RRMM (ICARIA) (U.S.,EU)</p>	<p><b>SAR341402, insulin aspart</b> Rapid acting insulin Type 1/2 Diabetes (EU)</p>
	<p><b>MenQuadfi™</b> Advanced generation meningococcal ACYW conjugate vaccine 2y+ (U.S.)</p>	<p><b>Zynquista™<sup>(**)(3)</sup> (sotagliflozin)</b> Oral SGLT-1&amp;2 inhibitor Type 1 Diabetes (U.S.)</p>
Phase 3	<p><b>dupilumab<sup>(**)(1)</sup></b> Anti-IL4Rα mAb COPD</p>	<p><b>cemiplimab<sup>(**)(1)</sup></b> PD-1 inhibitor mAb adjuvant in CSCC</p>
	<p><b>nirsevimab<sup>(**)(2)</sup></b> Respiratory syncytial virus Monoclonal Antibody</p>	<p><b>VerorabVax® (VRVg)</b> Purified vero rabies vaccine</p>
	<p><b>fitusiran</b> RNAi targeting anti-thrombin Hemophilia A and B pediatric</p>	<p><b>sotagliflozin<sup>(**)(3)</sup></b> Oral SGLT-1&amp;2 inhibitor Type 2 Diabetes</p>
Phase 2		<p><b>sotagliflozin<sup>(**)(3)</sup></b> Oral SGLT-1&amp;2 inhibitor Worsening Heart Failure in Diabetes</p>
	<p><b>SAR441236</b> Tri-specific neutralizing mAb HIV</p>	<p><b>SAR441255</b> Trigonal GLP1R/GIPR/GCGR agonist Obesity / Type 2 Diabetes</p>
Phase 1		

# R&D Pipeline Summary – Total Projects<sup>(1)</sup>

	Phase 1	Phase 2	Phase 3	Registration	TOTAL
Immuno-inflammation	2	8	7	2	19
Oncology	11	7	7	1	26
Rare Diseases	0	4	3	0	7
Rare Blood Disorders	4	0	3	0	7
Multiple Sclerosis and Neurology	3	3	2	0	8
Diabetes	1	0	1	1	3
Cardiovascular Disease	0	0	1	0	1
Vaccines	3	2	5	2	12
<b>TOTAL</b>	<b>24</b>	<b>24</b>	<b>29</b>	<b>6</b>	

**48**
**35**

83 **Total Projects**

# Expected R&D Milestones

Products	Expected milestones	Timing
SAR439859 (SERD)	Proof of concept study read-out in metastatic Breast Cancer	<b>Q3 2019</b>
Dupixent® <sup>(**)(1)</sup>	EU regulatory decision in Atopic Dermatitis in adolescent patients	<b>Q3 2019</b>
sutimlimab	Proof of concept study read-out in refractory Immune Thrombocytopenic Purpura	<b>Q4 2019</b>
Fluzone® QIV HD	U.S. regulatory decision for ≥ 65-year old age group	<b>Q4 2019</b>
sutimlimab	Pivotal trial read-out in Cold Agglutinin Disease	<b>Q4 2019</b>
Dupixent® <sup>(**)(1)</sup>	Pivotal trial read-out in Atopic Dermatitis in 6-11 years	<b>Q4 2019</b>
SAR440340 (Anti-IL33 mAb) <sup>(**)(1)</sup>	Proof of concept study read-out in Chronic Obstructive Pulmonary Disease	<b>Q4 2019</b>
dupilumab <sup>(**)(1)</sup>	EU regulatory decision in Chronic Rhinosinusitis with Nasal Polyps	<b>Q1 2020</b>
isatuximab	Pivotal trial read-out in 1-3L RRMM (IKEMA)	<b>Q1 2020</b>
olipudase alfa	Pivotal trial read-out in Acid Sphingomyelinase Deficiency	<b>Q1 2020</b>
isatuximab	U.S. regulatory decision in 3L Relapsed-Refractory Multiple Myeloma	<b>Q2 2020</b>
isatuximab	EU regulatory decision in 3L Relapsed-Refractory Multiple Myeloma	<b>Q2 2020</b>
MenQuadfi™	U.S. regulatory decision for > 2 year old age group	<b>Q2 2020</b>
Fluzone® QIV HD	EU regulatory decision for ≥ 65-years old age group	<b>Q2 2020</b>
avalglucosidase alfa	Pivotal trial read-out in Pompe Disease	<b>Q2 2020</b>

# List of abbreviations

<b>AE</b>	Adverse Events	<b>IAR</b>	Infusion Associated Reaction	<b>QNM</b>	Every N Months
<b>APO</b>	Apolipoprotein	<b>IC</b>	Investigator's Choice	<b>QOL</b>	Quality Of Life
<b>BOR</b>	Best Overall Response	<b>IGA</b>	Investigator's Global Assessment	<b>RECIST</b>	Response Evaluation Criteria in Solid Tumors
<b>BW</b>	Body Weight	<b>IMID</b>	Immunomodulatory Drug	<b>SAE</b>	Serious Adverse Events
<b>CB</b>	Clinical Benefit	<b>ITT</b>	Intent To Treat	<b>SBP</b>	Systolic Blood Pressure
<b>CNS</b>	Central Nervous System	<b>LP</b>	Lipoprotein	<b>SDMT</b>	Symbol Digit Modalities Test
<b>CR</b>	Complete Response	<b>MRI</b>	Magnetic Resonance Imaging	<b>SMPG</b>	Self Monitored Plasma Glucose
<b>CRR</b>	Complete Response Rate	<b>MTD</b>	Maximum Tolerated Dose	<b>SSD</b>	Study Start Date
<b>CT</b>	Computed Tomography	<b>N</b>	Number	<b>TC</b>	Total Cholesterol
<b>CV</b>	Cardiovascular	<b>NC</b>	Nasal Congestion/obstruction	<b>TEAE</b>	Treatment Emergent Adverse Events
<b>DE</b>	Data Expected	<b>NNT</b>	Number Needed to Treat	<b>TSS</b>	Total Symptom Score
<b>DCR</b>	Disease Control Rate	<b>OS</b>	Overall Survival	<b>TG</b>	Triglycerides
<b>DLT</b>	Dose-Limiting Toxicity	<b>ORR</b>	Overall Response Rate	<b>TTP</b>	Time To Progression
<b>DOD</b>	Duration Of Disease	<b>PD</b>	Pharmacodynamics	<b>TTR</b>	Time To Response
<b>DOR</b>	Duration Of Response	<b>PI</b>	Proteasome Inhibitor	<b>TX</b>	Treatment
<b>DPP4</b>	Dipeptidyl peptidase 4	<b>PFS</b>	Progression-Free Survival	<b>VGPR</b>	Very Good Partial Response
<b>EASI</b>	Eczema Area and Severity Index	<b>PK</b>	Pharmacokinetic		
<b>FPG</b>	Fasting Plasma Glucose	<b>PPG</b>	Postprandial Glucose		
<b>HbA1c</b>	Hemoglobin A1c	<b>PRO</b>	Patient Reported Outcome		
<b>IAE</b>	Incidence of Adverse Events	<b>QNW</b>	Every N Weeks		



# Dupilumab (anti-IL4R $\alpha$ mAb) Asthma (1/5)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>LIBERTY ASTHMA TRAVERSE</b>  LTS12551 NCT02134028	Phase 2/3  Open label extension study long-term safety & tolerability evaluation in patients with asthma who participated in previous studies	2 284 enrolled	<ul style="list-style-type: none"> <li>For patients coming from DRI12544, PDY14192, EFC13579, EFC13691 studies, added to current controller medications</li> <li>Open-label,</li> </ul>	<ul style="list-style-type: none"> <li>Primary: N and % of patients experiencing any TEAE</li> <li>Secondary: Safety</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jul. 2014</li> <li>DE: 2019</li> </ul>
<b>Continuation of LIBERTY ASTMA TRAVERSE</b>  LPS15023 NCT03620747	Phase 3  Continuation of TRAVERSE evaluating Dupilumab safety in Patients with Asthma (Long term follow-up)	750	<ul style="list-style-type: none"> <li>Patients with asthma who completed the treatment period in the previous dupilumab asthma clinical study LTS12551</li> <li>Open-label, Single group assignment</li> </ul>	<ul style="list-style-type: none"> <li>Primary: TEAEs: % of patients reporting TEAs, event rates per 100 patient-year</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Aug. 2018</li> <li>DE: 2022</li> </ul>

# Dupilumab (anti-IL4R $\alpha$ mAb) Asthma (2/5)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>LIBERTY ASTHMA EXCURSION</b>  LTS14424 NCT03560466	Phase 3  Long term safety and tolerability (1 year) of dupilumab in pediatric patients with asthma who participated in a previous dupilumab asthma clinical study	377	<ul style="list-style-type: none"> <li>• Open-label</li> <li>• 1 year of Tx</li> </ul>	<ul style="list-style-type: none"> <li>• Primary: N of patients experiencing any TEAE</li> <li>• Secondary: Severe asthma exacerbation events, change in % predicted FEV1, in absolute FEV1, in FVC, FEF, dupilumab concentrations, anti-dupilumab Ab, eosinophils, Ig, IgE</li> </ul>	<ul style="list-style-type: none"> <li>• SSD: June 2018</li> <li>• DE: 2026</li> </ul>

# Dupilumab (anti-IL4R $\alpha$ mAb) Asthma (3/5)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>CHILDREN ASTHMA VOYAGE</b>  EFC14153 NCT02948959	Phase 3  Evaluation of dupilumab in children (6 to <12 years) with uncontrolled asthma	471	<ul style="list-style-type: none"> <li>In children 6 to &lt;12 years of age with uncontrolled persistent asthma</li> <li>Randomized, Double-blind, Placebo-controlled, parallel group 52 weeks Tx, 12 weeks post Tx</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Annualized rate of severe exacerbation events during Tx period</li> <li>Secondary: Safety and tolerability, PROs, Systemic exposure and incidence of anti-drug antibodies, Association between dupilumab Tx and pediatric immune responses to vaccines</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jun. 2017</li> <li>DE: 2021</li> </ul>

# Dupilumab (anti-IL4R $\alpha$ mAb) Asthma (4/5)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Persistent Asthma - China</b>  EFC13995 NCT03782532	Phase 3  Efficacy and Safety of dupilumab in patients with Persistent Asthma	486	<ul style="list-style-type: none"> <li>In adults and adolescents with a diagnosis of asthma for <math>\geq</math> 12 months</li> <li>Randomized, Double-blind, Placebo-controlled, parallel group,</li> <li>2 arms: dupilumab and placebo, with in each arm patients with and without oral corticosteroids (OCS) maintenance therapy</li> <li>Study duration: 40 weeks study including 4 to 5 weeks of screening period, 24 weeks Tx and 12 weeks post Tx</li> </ul>	<ul style="list-style-type: none"> <li>Primary: change in pre-bronchodilator FEV1 at week 12 for patients without OCS</li> <li>Secondary: change in FEV1 in overall population, annualized rate of exacerbation events, of LOAC event, of severe exacerbation resulting in hospitalization, time to first exacerbation event, time to first LOAC, change in Asthma Control Questionnaire, asthma symptoms score, nocturnal awakenings, use of daily puffs of rescue medication, Asthma QoL</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jan. 2019</li> <li>DE: 2021</li> </ul>

# Dupilumab (anti-IL4R $\alpha$ mAb) Atopic Dermatitis (AD) (1/4)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>OLE</b> <b>Pediatrics</b> <b>AD</b>  R668-AD-Reg 1434 NCT02612454	Phase 3  A study to assess the long-term safety of dupilumab administered in patients 6 to <18 years of age with AD	765 expected	<ul style="list-style-type: none"> <li>For patients having participated in a prior dupilumab study in pediatrics with AD</li> <li>Open label extension study</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Incidence and rate of TEAEs</li> <li>Secondary: SAEs and TEAEs of special interest, % of patients who achieve and maintain remission, EASI-75: % of patients achieving and maintaining at least 75% reduction in EASI score over time, EASI-50: % of patients achieving and maintaining at least 50% reduction in EASI scores over time</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2015</li> <li>DE: 2023</li> </ul>

# Dupilumab (anti-IL4R $\alpha$ mAb) Atopic Dermatitis (AD) (2/4)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>LIBERTY AD PRESCHOOL</b>  R668-AD-1539 NTC03346434	Phase 2/3  Safety, Pharmacokinetics and Efficacy of Dupilumab in Patients $\geq 6$ Months to $< 6$ Years With Severe Atopic Dermatitis	280	<ul style="list-style-type: none"> <li>Part A: Open-label, single-ascending dose, sequential cohort phase 2 study</li> <li>Part B: Randomized, double-blind, parallel-group, placebo-controlled phase 3 study</li> </ul>	<ul style="list-style-type: none"> <li>Part A: PK</li> <li>Part B: Proportion of patients with Investigator's Global Assessment "0" or "1" (on a 5-point scale) at week 16</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Dec. 2017</li> <li>DE: 2021</li> </ul>
<b>AD in 6 - 11 Years Old</b>  R668-AD-1652 NCT03345914	Phase 3  Efficacy and safety of Dupilumab administered with Topical Corticosteroids in participants $\geq 6$ to $< 12$ years with Severe Atopic Dermatitis	367	<ul style="list-style-type: none"> <li>Randomized, Double-blind, Placebo-controlled Study</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Proportion of patients with Investigator's Global Assessment "0" or "1" (on a 5-point scale) at week 16</li> <li>Secondary: Change from baseline to week 16 in Children's Dermatology Life Quality Index, Percent change in EASI score from baseline to week 16, Incidence of serious TEAEs through week 16</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jan. 2018</li> <li>DE: 2019</li> </ul>

# Dupilumab (anti-IL4R $\alpha$ mAb) Atopic Dermatitis (AD) (3/4)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Open-Label</b>  R668-AD-1225 NCT01949311	Phase 3  Open-Label study of Dupilumab in patients with Atopic Dermatitis	2678	<ul style="list-style-type: none"> <li>Open label extension study for patients who participated in placebo-controlled dupilumab AD trials. The study primarily evaluates long term safety (adverse events) and immunogenicity. Efficacy parameters are based on IGA, EASI) and the NRS.</li> </ul>	<ul style="list-style-type: none"> <li>Primary: TEAEs,</li> <li>Secondary: SAEs and AEs of special interest, % of patients who achieve and maintain remission, EASI-75: % of patients achieving and maintaining at least 75% reduction in EASI score over time, EASI-50: % of patients achieving and maintaining at least 50% reduction in EASI scores over time</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2013</li> <li>DE: Last Patient Last Visit: 2022</li> </ul>

# Dupilumab (anti-IL4R $\alpha$ mAb) Atopic Dermatitis (AD) (4/4)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>AD in Chinese Patients</b>  EFC15116 NCT03912259	Phase 3  Efficacy and Safety of Dupilumab in Chinese Patients with Moderate-to-severe Atopic Dermatitis	160	<ul style="list-style-type: none"> <li>Chinese patients with chronic AD present for at least 3 years before the screening visit,</li> <li>Randomized, Double-Blind, Placebo-controlled</li> <li>2 Arms: dupilumab vs Placebo</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Investigator's Global Assessment (IGA),</li> <li>Secondary: % of patients with EASI-75 response, % of patients with reduction of peak daily pruritus NRS <math>\geq 4</math>, % of patients with reduction of peak daily pruritus NRS <math>\geq 3</math>, change in NRS, change in EASI score, change in BSA affected by AD, Dermatology QoL and EQ-5D, change in patients oriented eczema measure (POEM), sick-leave/missed school days proportion, AEs, dupilumab immunogenicity</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jan. 2019</li> <li>DE: 2020</li> </ul>



# Dupilumab (anti-IL4R $\alpha$ mAb) Grass Immunotherapy

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>GRASS</b>  R668 – ALG - 16115 NCT03558997	Phase 2  Evaluation of dupilumab as an adjunct for Subcutaneous Grass Immunotherapy to reduce Provoked Allergic Rhinitis Symptoms using The Nasal Allergen Challenge (NAC) Mode	100	<ul style="list-style-type: none"> <li>Patients with history of grass pollen-induced seasonal allergic rhinitis confirmed by SPT with Timothy grass extract and Timothy grass specific IgE,</li> <li>Randomized, double-blind, placebo-controlled study,</li> <li>4 arms: dupilumab + Timothy Grass SCIT; placebo dupilumab + SCIT; dupilumab + placebo SCIT; placebo dupilumab + placebo SCIT;</li> <li>16 weeks of Tx</li> </ul>	<ul style="list-style-type: none"> <li>Primary: % change from baseline in Total Nasal Symptom Score (TNSS) after nasal allergen challenge (NAC) with Timothy grass extract,</li> <li>Secondary: change from baseline in TNSS AUC post NAC over the 1<sup>st</sup> hour after the challenge across the arms, specific immunoglobulin G4, TEAEs</li> </ul>	<ul style="list-style-type: none"> <li>SSD: June 2018</li> <li>DE: 2019</li> </ul>

# Dupilumab (anti-IL4R $\alpha$ mAb) Eosinophilic Esophagitis (EoE)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<p>EoE</p> <p>R668 – EE - 1774</p> <p>NCT03633617</p>	<p>Phase 3</p> <p>Efficacy and Safety of Dupilumab in Adult and Adolescent patients with Eosinophilic Esophagitis</p>	425	<ul style="list-style-type: none"> <li>Patients with documented diagnosis of EoE by endoscopic biopsy,</li> <li>Randomized, double-blind, parallel assignment, placebo-controlled study,</li> <li>Part A: dupilumab or placebo (double-blind) for 24 weeks,</li> <li>Part B: dupilumab dose regimen 1, dupilumab dose regimen 2 or placebo (double-blind) for 24 weeks</li> <li>Part C: for patients eligible at the end of Part A and Part B, dupilumab dose regimen 1, dupilumab dose regimen 2 (double-blind) for 28 weeks</li> <li>12-week follow-up for all patients (eligible and non eligible)</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Proportion of patients achieving peak esophageal intraepithelial eosinophil count of <math>\leq 6</math> eosinophils per high-power field (eos/hpf), Absolute change in Dysphagia Symptom Questionnaire (DSQ) score</li> <li>Secondary: Absolute change in EoE endoscopic reference score (EREFS), Percent change in peak esophageal intraepithelial eosinophil count (eos/hpf), Absolute change in EoE grade score from EoE Histology Scoring System (EoEHSS), Proportion of patients achieving peak esophageal intraepithelial eosinophil count of <math>\leq 15</math>, Proportion of patients achieving peak esophageal intraepithelial eosinophil count of <math>\leq 1</math>, Percent change in DSQ, QOL, Absolute change in severity and/or frequency of EoE symptoms other than dysphagia</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Nov. 2018</li> <li>DE: primary completion: 2022, full completion: 2023</li> </ul>

# Dupilumab (anti-IL4R $\alpha$ mAb) adjunct to AR101 Peanut Allergy (1/2)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Peanut Allergy</b>  R668 –ALG - 16114 NCT03682770	Phase 2  Efficacy and Safety of Dupilumab as adjunct to AR101 in Pediatric Subjects with Peanut Allergy	156	<ul style="list-style-type: none"> <li>Child 6 to 17 years experiencing dose-limiting symptoms at or before the challenge dose of peanut protein on screening and not experiencing dose-limiting symptoms to placebo</li> <li>Randomized, double-blind, parallel assignment, placebo-controlled study,</li> <li>2 arms: dupilumab adjunct to AR101 vs placebo adjunct to AR101</li> </ul>	<ul style="list-style-type: none"> <li>Primary: % of subjects who “pass” a double-blind, placebo-controlled food challenge (DBPCFC) with peanut protein at week 28,</li> <li>Secondary: change in cumulative tolerated dose of peanut protein during DBPBFC, at week 28, % of subjects who « pass » the DBPCFC at week 52 (desensitization maintenance), safety and tolerability, change in peanut-specific IgE (sIgE), IgG4 and IgG4/sIgE ratio</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2018</li> <li>DE: primary completion: 2020, full completion: 2021</li> </ul>

# Dupilumab (anti-IL4R $\alpha$ mAb) Peanut Allergy (2/2)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Peanut Allergy</b>  R668 –ALG - 1702 NCT03793608	Phase 2  Efficacy and Safety of Dupilumab monotherapy in Pediatric Patients with Peanut Allergy	48	<ul style="list-style-type: none"> <li>Child 6 to 17 years experiencing dose-limiting symptoms at or before the challenge dose of peanut protein on screening: double-blind placebo-controlled food challenge (DBPCFC) and not experiencing dose-limiting symptoms to placebo</li> <li>Randomized, double-blind, parallel assignment, placebo-controlled study,</li> <li>2 arms: dupilumab vs placebo</li> </ul>	<ul style="list-style-type: none"> <li>Primary: % of patients who “pass” DBPCFC with low-dose (cumulative) peanut protein at week 24,</li> <li>Secondary: % of patients that pass a DBPCFC with low-dose, mid-dose and high-dose of peanut protein, change in cumulative tolerated dose of peanut protein during DBPCFC, % of change in peanut-specific IgE, change in titrated SPT.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: May 2019</li> <li>DE: 2022</li> </ul>

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

# Dupilumab (anti-IL4R $\alpha$ mAb) Chronic Obstructive Pulmonary Disease (COPD)

Study	Description	Patients	Design	Endpoints	Status
<b>COPD</b>  EFC15804 NCT03930732	Phase 3  Efficacy, Safety and Tolerability of Dupilumab in Patients with Moderate-to-Severe Chronic Obstructive Pulmonary Disease (COPD) with Type 2 inflammation	924	<ul style="list-style-type: none"> <li>Patients with COPD diagnosis,</li> <li>Randomized, double-blind, parallel assignment, placebo-controlled study,</li> <li>2 arms: dupilumab vs placebo</li> </ul>	<ul style="list-style-type: none"> <li>Primary: annual rate of acute COPD exacerbation,</li> <li>Secondary: change in pre-bronchodilator FEV1, change in SGRQ score, Improvement in SGRQ, change in post-bronchodilator FEV1, change in forced expiratory flow (FEF), annualized rate of severe COPD exacerbations (AECOPD), time to first AECOPD, AEs, PCSA changes, dupilumab immunogenicity.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: May 2019</li> <li>DE: 2022</li> </ul>

# Sarilumab (anti-IL6 mAb) Rheumatoid Arthritis (RA)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>SARIL-RA-EXTEND</b>  LTS11210 NCT01146652	Phase 3  Long-term evaluation of sarilumab in RA patients	2000	<ul style="list-style-type: none"> <li>In patients with RA having participated to previous trials</li> <li>Multi-center, uncontrolled extension, open-label; up to 1 week screening, at least 264 weeks of open label Tx and up to 516 weeks max., 6 weeks post-Tx</li> </ul>	<ul style="list-style-type: none"> <li>Primary: N of patients with AE</li> <li>Secondary: Long term efficacy of sarilumab in patients with RA (ACR20, DAS28, EULAR response)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jun. 2010</li> <li>DE: 2020</li> </ul>

# Sarilumab (anti-IL6 mAb) Juvenile Idiopathic Arthritis (JIA)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Polyarticular JIA Children &amp; Adolescents</b>  DRI13925 NCT02776735	Phase 2b  Dose-finding study of sarilumab in children and adolescents with Polyarticular-course Juvenile Idiopathic Arthritis (pcJIA)	36 in core part, 60 total	<ul style="list-style-type: none"> <li>In children and adolescents, Aged 2 to 17 years, with pcJIA</li> <li>Open-label, sequential, ascending, repeated dose-finding Study; 4-week screening, 12-week core Tx, 144-week extension, 6-week post-Tx</li> </ul>	<ul style="list-style-type: none"> <li>Primary: PK parameters (Up to week 12)</li> <li>Secondary: PD profile, The efficacy and the safety of sarilumab in patients with pcJIA, Long-term safety of sarilumab in patients with pcJIA</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2016</li> <li>DE: 2018 (36 patients CSR); 2021 (60 patients CSR); 2023 (CSR with 3-year extension)</li> </ul>
<b>Systemic JIA Children &amp; Adolescents</b>  DRI13926 NCT02991469 <sup>(1)</sup>	Phase 2b  Dose-finding study of sarilumab in children and adolescents with Systemic Juvenile Idiopathic Arthritis (sJIA)	24 in core part, 48 total	<ul style="list-style-type: none"> <li>In children and adolescents, aged 1 to 17 years, with sJIA</li> <li>Open-label, sequential, ascending, repeated dose finding study, 4-week screening, 12-week coreTx, 144-week extension, 6-week post-Tx</li> </ul>	<ul style="list-style-type: none"> <li>Primary: PK parameters (Up to week 12)</li> <li>Secondary: PD profile, efficacy and the safety of sarilumab in patients with sJIA, Long term safety of sarilumab in patients with sJIA</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sep. 2018</li> <li>DE: 2021 (24 patients CSR); 2023 (48 patients CSR), 2025 (CSR with 3-year extension)</li> </ul>

# Sarilumab (anti-IL6 mAb) Giant Cell Arteritis (GCA)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>GCA</b>  EFC15068 NCT03600805	Phase 3  Efficacy of sarilumab in combination with corticosteroid in patients with Giant Cell Arteritis	360	<ul style="list-style-type: none"> <li>Patients suffering from GCA; new onset active disease or refractory active disease</li> <li>Randomized, parallel assignment, double-blind, placebo controlled, 2 doses of sarilumab tested vs placebo, in association with prednisone</li> <li>Study duration per patient: approximately 82 weeks: up to 6 weeks screening, 52-week Tx period, 26-week follow-up period</li> </ul>	<ul style="list-style-type: none"> <li>Primary: % of patients achieving sustained remission at week 52</li> <li>Secondary: components of sustained remission, cumulative corticosteroid dose, time to 1<sup>st</sup> GCA flare, change in glucocorticoid toxicity index, AEs, PK,</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Nov. 2018</li> <li>DE: primary completion:2021, full completion 2022</li> </ul>



# Sarilumab (anti-IL6 mAb) Polymyalgia Rheumatica (PMR)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<p>PMR</p> <p>EFC15160 NCT03600818</p>	<p>Phase 3</p> <p>Efficacy of sarilumab in combination with corticosteroid (CS short tapering regimen) in comparison to placebo (CS long tapering regimen) in patients with Polymyalgia Rheumatica</p>	280	<ul style="list-style-type: none"> <li>Patients suffering from PMR,</li> <li>Randomized, parallel assignment, double-blind, placebo controlled, 2 groups: sarilumab + CS, placebo +CS</li> <li>Study duration per patient: approximately 62 weeks: up to 4 weeks screening, 52-week Tx period, 6-week follow-up period</li> </ul>	<ul style="list-style-type: none"> <li>Primary: % of patients achieving sustained remission at week 52</li> <li>Secondary: components of sustained remission, cumulative corticosteroid dose, time to 1<sup>st</sup> PMR flare, change in glucocorticoid toxicity index, AEs, PK,</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Nov. 2018</li> <li>DE: 2021</li> </ul>

# SAR440340 (Anti-IL33 mAb) Asthma Combination with dupilumab (1/2)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Asthma in combination with dupilumab</b>  R3500-AS-1633 NCT03112577	Phase 1  Effects of SAR440340 dupilumab, combination of both on markers of inflammation after bronchial allergen challenge in patients with Allergic Asthma	38	<ul style="list-style-type: none"> <li>Patients with mild allergic asthma for at least 6 months,</li> <li>Randomized, Placebo –controlled, Parallel Assignment</li> <li>5 arms: SAR440340 alone, dupilumab alone, SAR440340 + dupilumab, placebo and fluticasone propionate (active comparator, open label dosing)</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Difference in bronchial allergen challenge (BAC)-induced changes in sputum inflammatory markers in individuals treated with SAR440340, dupilumab and the combination of both, or placebo [Screening (pre-treatment) to week 4 after treatment initiation]</li> <li>Secondary: TEAEs (incidence and severity), PK profile, immunogenicity, difference in the BAC-induced changes in sputum inflammatory mRNA signature in individual patients treated with fluticasone</li> </ul>	<ul style="list-style-type: none"> <li>SSD: July 2017</li> <li>DE: 2020 (completion)</li> </ul>

# SAR440340 (Anti-IL33 mAb)

## Asthma Combination with dupilumab (2/2)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Asthma SA and combination with dupilumab</b>  ACT15102 NCT03387852	Phase 2  Efficacy, Safety and Tolerability (POC) of SAR440340 and the coadministration with dupilumab in patients with Moderate-to-severe Asthma, Not Well Controlled on Inhaled Corticosteroid (ICS) Plus Long-acting $\beta$ 2 Adrenergic Agonist (LABA) Therapy	297	<ul style="list-style-type: none"> <li>Adults patient with a physician diagnosis of asthma for at least 12 months,</li> <li>Randomized, Double-blind, Placebo-controlled, Parallel Group, with fluticasone w/wo salmeterol</li> <li>Arm 1: SAR440340 monotherapy</li> <li>Arm 2 : dupilumab monotherapy</li> <li>Arm 3: coadministration of SAR440340 and dupilumab</li> <li>Arm 4: placebo</li> <li>Ttmt every 2 weeks for 12 weeks</li> <li>Total duration for one patient: appr. 36 weeks, including 4 weeks screening, 12 weeks ttmt and 20 weeks post-ttmt</li> </ul>	<ul style="list-style-type: none"> <li>Primary: LOAC (lost of asthma control ) events</li> <li>Secondary: change in FEV1 (forced expiratory volume 1)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Mar. 2018</li> <li>DE: 2019</li> </ul>

# SAR440340 (Anti-IL33 mAb) COPD

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>POC in COPD</b>  ACT15104 NCT03546907	Phase 2  Efficacy, Safety and Tolerability (POC) of SAR440340 in patients with moderate-to-severe COPD	343	<ul style="list-style-type: none"> <li>Adults patients with a diagnosis of moderate-to-severe COPD for at least 1 year</li> <li>Randomized, Double-blind, Placebo-controlled, on top of standards of care</li> <li>Arm 1: SAR440340</li> <li>Arm 2 : placebo</li> <li>Total duration for one patient: 46 to 76 weeks including 10 days to 4 weeks of screening, 24 to 52 weeks Tx period and 20 weeks post IMP Tx period</li> </ul>	<ul style="list-style-type: none"> <li>Primary: AECOPD (Acute Exacerbations in COPD)</li> <li>Secondary: average change in pre-bronchodilator FEV1 (forced expiratory volume 1), time to 1<sup>st</sup> COPD exacerbations, AEs, change in post-bronchodilator FEV1</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jul. 2018</li> <li>DE: 2020</li> </ul>

# SAR440340 (Anti-IL33 mAb)

## Atopic Dermatitis, Combination with dupilumab (1/2)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
AD R3500-AD-1798 NCT03736967	Phase 2a  Efficacy and Safety of SAR440340 Monotherapy and in Combination with Dupilumab in patients with moderate-to-severe Atopic Dermatitis (AD)	280	<ul style="list-style-type: none"> <li>Patients with chronic AD present for at least 3 years</li> <li>Randomized, Double-blind, Placebo-controlled, Parallel-Group,</li> <li>4 Arms: SAR440340, dupilumab, combination SAR440340 + dupilumab, placebo</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Eczema Area and Severity Index (EASI) % of change</li> <li>Secondary: % of patients with EASI ≥ 50% improvement , % of patients with EASI ≥ 75% improvement, % of patients with EASI ≥ 90% improvement, absolute change in EASI scores, Investor's Global Assessment (IGA), Pruritus Numerical Rating Scale (NRS), SCORing Atopic Dermatitis (SCORAD), SAR440340 serum concentration and antibodies, TEAEs, SAEs, AESIs.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Nov. 2018</li> <li>DE: 2020</li> </ul>

# SAR440340 (Anti-IL33 mAb) Atopic Dermatitis (2/2)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>DR in AD</b>  R3500-AD-1805 NCT03738423	Phase 2b  Efficacy, Safety and Pharmacokinetics of SAR440340 in patients with moderate-to-severe Atopic Dermatitis (AD)	300	<ul style="list-style-type: none"> <li>Patients with chronic AD present for at least 3 years</li> <li>Randomized, Double-blind, Placebo-controlled, Parallel-Group, Dose-Ranging study</li> <li>5 Arms: 4 SAR440340 doses and placebo</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Eczema Area and Severity Index (EASI) % of change</li> <li>Secondary: % of patients with EASI <math>\geq</math> 50% improvement , % of patients with EASI <math>\geq</math> 75% improvement, % of patients with EASI <math>\geq</math> 90% improvement, absolute change in EASI scores, Investor's Global Assessment (IGA), Pruritus Numerical Rating Scale (NRS), SCORing Atopic Dermatitis (SCORAD), SAR440340 serum concentration and antibodies, TEAEs, SAEs, AESIs.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Nov. 2018</li> <li>DE: 2020</li> </ul>

# SAR441236 (Tri-specific neutralizing mAb) HIV

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>HIV</b>  TDU15867 NCT03705169	Phase 1  Pharmacokinetics of SAR441236 in Participants with HIV	60	<ul style="list-style-type: none"> <li>• Patients with HIV infection,</li> <li>• Randomized, Double-blind, Parallel-Group, Ascending dose study,</li> <li>• Arm A cohort 1A: SAR441236 (1mg/kg) + ART (antiretroviral Tx) from D0,</li> <li>• Arm A cohort 1B: placebo + ART from D0,</li> <li>• Arm A cohort 2A: SAR441236 (3mg/kg) + ART from D0,</li> <li>• Arm A cohort 2B: placebo + ART from D0</li> <li>• Arm A cohort 3A: SAR441236 (10mg/kg) + ART from D0,</li> <li>• Arm A cohort 3B: placebo + ART from D0,</li> <li>• Arm A cohort 4A: SAR441236 (30mg/kg) + ART from D0,</li> <li>• Arm A cohort 4B: placebo + ART from D0,</li> <li>• Arm B cohort 5: SAR441236 (1mg/kg) and ART initiated at D28,</li> <li>• Arm B cohort 6: SAR441236 (3mg/kg) and ART initiated at D28,</li> <li>• Arm B cohort 7: SAR441236 (10 mg/kg) + ART from D28,</li> <li>• Arm B cohort 8: SAR441236 (30 mg/kg) + ART from D28,</li> <li>• Arm B cohort 9: SAR441236 (0,3 mg/kg) + ART from D28,</li> </ul>	<ul style="list-style-type: none"> <li>• Primary: Occurrence of a Grade 3 or higher AE (DAIDS AE grading table), at any time, AUC12w, change in plasma HIV-1 RNA (Arm B cohorts)</li> <li>• Secondary: change in plasma HIV-1 RNA (Arm B cohorts) at different times, maximum reduction of plasma HIV-1 RNA, SAR441236 Antibodies, change in CD4+T cell counts, SAR441236 PK.</li> </ul>	<ul style="list-style-type: none"> <li>• SSD: April 2019</li> <li>• DE: 2021</li> </ul>

# Isatuximab (anti-CD38 mAb) Hematological Malignancies (HM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>CD38+HM</b>  TED10893 NCT01084252	Phase1/2  Dose escalation, Pharmacokinetics and efficacy study of isatuximab in patients with selected CD38+ HM	351 (enrollment completed)	<ul style="list-style-type: none"> <li>Phase 1: MTD</li> <li>Phase 2: Stage 1: isatuximab activity at different doses/schedules and to select dose and regimen as single agent or in combination with dexamethasone</li> <li>Stage 2: activity at the selected dose/schedule from stage1, as single agent (ISA arm) and in combination with dexamethasone (ISAdex arm)</li> <li>Randomized, Open-label, Parallel assignment</li> </ul>	<ul style="list-style-type: none"> <li>Primary: DLT, ORR</li> <li>Secondary: DOR, PFS, OS, Immune Response</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jun. 2010</li> <li>DE: 2019</li> </ul>



# Isatuximab (anti-CD38 mAb) Hematological Malignancies (HM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>CD38+HM</b>  TED15085 NCT03733717	Phase1  Pharmacokinetics Safety and Preliminary Efficacy of isatuximab in Chinese Patients with Relapsed and/or Refractory MM	20	<ul style="list-style-type: none"> <li>In Patients with known diagnosis of symptomatic multiple myeloma,</li> <li>Open-label, Single Group assignment</li> <li>Isatuximab every week in Cycle 1 (4 weeks) followed by every 2 weeks (Q2W) in subsequent cycles</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Pharmacokinetics</li> <li>Secondary: Aes, ORR, DOR, TTP, PFS, OS, immunogenicity</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2018</li> <li>DE: 1st data: 2020; Full completion 2022</li> </ul>

# Isatuximab (anti-CD38 mAb) Multiple Myeloma (MM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Lenalidomide Combination RRMM</b>  TCD11863 NCT01749969	Phase 1b  Isatuximab, in Combination With lenalidomide and dexamethasone for the Tx of Relapsed or Refractory MM	57 (enrollment completed)	<ul style="list-style-type: none"> <li>Patients with diagnosis of MM and documentation of at least 2 prior therapies (induction therapy, autologous stem cell transplant, consolidation and maintenance therapy is considered one prior therapy)</li> <li>Open-label, Parallel assignment</li> <li>Isatuximab (escalating doses) + lenalidomide + dexamethasone</li> <li>Total duration for one patient: up to 21 days screening, at least 4 weeks Tx, up to 60 days follow-up</li> </ul>	<ul style="list-style-type: none"> <li>Primary: N of patients with AE</li> <li>Secondary: ORR, PFS, PK, PD, Immunogenicity</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Feb. 2013</li> <li>DE: 2019</li> </ul>

# Isatuximab (anti-CD38 mAb) Multiple Myeloma (MM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Pomalidomide Combination RRMM</b>  TCD14079 NCT02283775	Phase 1b  Isatuximab, in combination with pomalidomide and dexamethasone for the Tx of Relapsed/Refractory MM	92 (enrollment completed: 45 patients in Part A; 47 patients in Part B)	<ul style="list-style-type: none"> <li>• Patients previously diagnosed with MM based on standard criteria and currently require Tx because MM has relapsed following a response</li> <li>• Open-label, Single-Group assignment</li> <li>• Isatuximab + pomalidomide + dexamethasone</li> <li>• Part A, doses ranging for isatuximab, (5mg/kg, 10mg/kg, 20mg/kg); Part B isatuximab (10mg/kg) from a fixed infusion volume</li> </ul>	<ul style="list-style-type: none"> <li>• Primary: DLTs, N of patients with AE</li> <li>• Secondary: ORR, PK, Immunogenicity, DOR, CB</li> </ul>	<ul style="list-style-type: none"> <li>• SSD: May 2015</li> <li>• DE: 2020</li> </ul> 1st set of data 2019 (included in Isatuximab BLA)

# Isatuximab (anti-CD38 mAb) Multiple Myeloma (MM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Bortezomib Combination NDMM</b>  TCD13983 NCT02513186	Phase 1  Isatuximab in combination with bortezomib - based regimens in adult patients with newly diagnosed MM non eligible for transplantation or with no intent for immediate transplantation	88 (17 pts in VCdl, 27 pts in VRdl cohort A, 44 pts in cohort B)	<ul style="list-style-type: none"> <li>Patients with a diagnosis of MM with evidence of measurable disease, having received prior Tx with an IMiD and with at least 3 prior lines of therapy</li> <li>Open-label, Single Group assignment</li> <li>Isatuximab (escalating dose) + bortezomib + cyclophosphamide + dexamethasone: VCDI cohort (3-week screening, 50-week duration for induction and then up to disease progression, or unacceptable AEs + follow-up)</li> <li>Isatuximab + bortezomib + dexamethasone + lenalidomide: VRDI cohort to begin after VCDI completion (4-week screening, 24-week duration for induction and then up to disease progression, or unacceptable AEs, + follow-up)</li> </ul>	<ul style="list-style-type: none"> <li>Primary VCDI cohort: MTD and Recommended Dose (RC), based on DLTs, ORR and CR;</li> <li>Primary VRDI cohort: CR</li> <li>Secondary: overall safety profile, PK, isatuximab immunogenicity, ORR, PFS, AE and tumor response, infusion duration, MRD in patients achieving CR or VGPR</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sep. 2015</li> <li>DE: 1st set of data: 2019; next 2020, Full completion: 2022</li> </ul>

# Isatuximab (anti-CD38 mAb) Multiple Myeloma (MM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>RRMM</b>  TED14154 NCT02514668	Phase 1  Safety, PK and Efficacy of isatuximab in patients with Relapsed/Refractory MM	58 (enrollment completed: 26 pts in Part A, 32 pts in Part B post-dara)	<ul style="list-style-type: none"> <li>• Patients with a diagnosis of MM with evidence of measurable disease and with evidence of disease progression</li> <li>• Open-label, Single Group assignment, isatuximab (escalating doses)</li> <li>• Total duration for one patient: up to 21 days screening, Tx period up to disease progression or AEs , 60- day follow-up at least</li> </ul>	<ul style="list-style-type: none"> <li>• Primary: Part A: DLTs, N of patients with AE; Part B: ORR</li> <li>• Secondary: PK, N of patients with AEs, DOR, CB, PFS, Immunogenicity</li> </ul>	<ul style="list-style-type: none"> <li>• SSD: Sep. 2015</li> <li>• DE: 2019</li> </ul>

# Isatuximab (anti-CD38 mAb) Multiple Myeloma (MM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>ISLANDS</b> (Japanese Patients) <b>RRMM</b>  TED14095 NCT02812706	Phase 1 Phase 2  Isatuximab single-agent in Japanese patients with Relapsed and Refractory MM	36 (enrollment completed)	<ul style="list-style-type: none"> <li>• Patients with a diagnosis of symptomatic MM, having received at least 3 prior lines of therapy OR whose disease is double refractory to an IMiD and a PI</li> <li>• Open-label, Single Group assignment, isatuximab monotherapy</li> <li>• Total duration for one patient: up to 21-day screening, Tx period up to disease progression or unacceptable AEs, post-Tx follow-up</li> </ul>	<ul style="list-style-type: none"> <li>• Primary: Phase 1: DLTs Phase 2: ORR</li> <li>• Secondary: N of patients with AE, CB, OS, PFS, DOR, TTR, PK, PD, Immunogenicity</li> </ul>	<ul style="list-style-type: none"> <li>• SSD: Sep. 2016</li> <li>• DE: primary completion 2018; full completion 2020</li> </ul>

# Isatuximab (anti-CD38 mAb) Multiple Myeloma (MM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Cemiplimab Combination RRMM</b>  TCD14906 NCT03194867	Phase 1 Phase 2  Safety, PK and Efficacy of isatuximab in combination with cemiplimab in patients with Relapsed/Refractory MM	109	<ul style="list-style-type: none"> <li>Patients with a diagnosis MM with evidence of measurable disease, having received prior Tx with an IMiD and with at least 3 prior lines of therapy</li> <li>Randomized, Open-label, Parallel Assignment</li> <li>Isatuximab + cemiplimab</li> <li>3 Arms: Isa +cemi regimen 1; isa + cemi regimen 2; isa alone</li> <li>Total duration for one patient: up to 21-day screening, Tx period up to disease progression or unacceptable AEs, 3-month post-Tx follow-up. Cycle duration 28 days</li> </ul>	<ul style="list-style-type: none"> <li>Primary: DLTs, N of patients with AE, ORR</li> <li>Secondary: CB, DOR, TTR, PFS, OS, PK, Immunogenicity (isatuximab and cemiplimab)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Feb. 2018</li> <li>DE: Primary: 2019, Next: 2021, Full completion :2020 (OS secondary analysis: 2020; Final and safety CSR : 2021)</li> </ul>

# Isatuximab (anti-CD38 mAb) Multiple Myeloma (MM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>ICARIA-MM RRMM</b>  EFC14335 NCT02990338	Phase 3  Isatuximab, pomalidomide, and dexamethasone to pomalidomide and dexamethasone in Refractory or Relapsed and RRMM	307 (enrollment completed)	<ul style="list-style-type: none"> <li>Isatuximab in combination with pomalidomide and low-dose dexamethasone, compared to pomalidomide and low-dose dexamethasone in patients with RRMM</li> <li>Randomized, Open-label, Parallel assignment</li> </ul>	<ul style="list-style-type: none"> <li>Primary: PFS</li> <li>Secondary: ORR, OS, TTP, PFS, DOR, safety, PK profile, immunogenicity</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jan. 2017</li> <li>DE (1st Part)<sup>(1)</sup>: 2019; full completion 2020</li> </ul>



# Isatuximab (anti-CD38 mAb) Multiple Myeloma (MM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>IKEMA RRMM</b>  EFC15246 NCT03275285	Phase 3  Isatuximab combined with carfilzomib and dexamethasone vs. carfilzomib with dexamethasone in patients With Relapse and/or Refractory MM previously treated with 1 to 3 prior lines	302 (enrollment completed)	<ul style="list-style-type: none"> <li>Patients with MM previously treated with prior 1 to 3 lines and with measurable serum M-protein (<math>\geq 0.5</math> g/dL) and/or urine M-protein (<math>\geq 200</math> mg/24 hours)</li> <li>Randomized, Open-label, Parallel assignment, 2-arm: (a) isatuximab +carfilzomib+dexamethasone, (b) carfilzomib+dexamethasone</li> </ul>	<ul style="list-style-type: none"> <li>Primary: PFS</li> <li>Secondary: ORR, % of patients with CR, and VGPR, OS, TTP, Second PFS, DOR, TTP, PFS2, AE, PK, Immunogenicity</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2017</li> <li>DE: Primary: 2020, Next: 2021, Full completion: 2023 (OS, CSR in 2024)</li> </ul>

# Isatuximab (anti-CD38 mAb) Multiple Myeloma (MM) Ti

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>IMROZ NDMM Ti</b>  EFC12522 NCT03319667	Phase 3  Isatuximab in combination with bortezomib (Velcade®), lenalidomide (Revlimid®) and dexamethasone vs. bortezomib, lenalidomide and dexamethasone in patients with newly diagnosed MM not eligible for transplant	483 (randomized)	<ul style="list-style-type: none"> <li>Newly diagnosed MM not eligible for transplant due to age (<math>\geq 65</math> years) or patients <math>&lt; 65</math> years with comorbidities impacting possibility of transplant</li> <li>Randomized, Open-label, Parallel assignment</li> <li>IVRd arm (Isatuximab/bortezomib/lenalidomide /dexamethasone)</li> <li>VRd arm (Bortezomib/lenalidomide /dexamethasone)</li> <li>Ird crossover arm (Isatuximab/lenalidomide/ dexamethasone)</li> <li>Total duration for each patient: screening period up to 4 weeks, induction period of 24 weeks, continuous Tx period and crossover when applicable</li> </ul>	<ul style="list-style-type: none"> <li>Primary: PFS</li> <li>Secondary: ORR, % of patients with CR, and VGPR, % of patients with MRD (Minimal Residual Disease) negative, OS, TTP, DOR, PFS on next line of therapy (PFS2), AE, PK, Immunogenicity, QOL</li> </ul>	<ul style="list-style-type: none"> <li>SSD: 2017</li> <li>DE: Primary: 2021, Next: 2023, Full completion: 2025</li> </ul>

# Isatuximab (anti-CD38 mAb) Multiple Myeloma (MM) Te

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>NDMM Te</b>  GMMG HD7 NCT03617731	Phase 3  Effect of Isatuximab in induction therapy with lenalidomide - bortezomib - dexamethasone (RVd) and lenalidomide maintenance Tx in patients with newly diagnosed myeloma	662	<ul style="list-style-type: none"> <li>Confirmed diagnosis of untreated multiple myeloma requiring systemic therapy and eligible for high dose therapy and autologous stem cell transplantation</li> <li>Randomized, Open-label, Parallel assignment</li> <li>Induction: 2 arms: IA: 3 cycles RVd, IB: 3 cycles RVd + isatuximab</li> <li>After induction therapy autologous stem cell transplantation performed,</li> <li>Maintenance: 2 arms: IIA lenalidomide for 3 years; IIB: lenalidomide + isatuximab for 3years</li> </ul>	<ul style="list-style-type: none"> <li>Primary: MRD negative after induction Tx, PFS after 2<sup>nd</sup> randomization (IIA &amp; IIB)</li> <li>Secondary: PFS, OS, CR, MRD, Best response to Tx, PFS after next line of therapy from 2<sup>nd</sup> randomization, AEs, QOL, PK, immunogenicity</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2018</li> <li>DE: 1st part Q4 2021 for MRD negativity after induction and 2023 (PFS IA); full completion 2025</li> </ul>

# Isatuximab (anti-CD38 mAb)

## Pediatrics: RR ALL/AML

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Pediatrics</b> <b>ALL/AML</b>  ACT15378 NCT03860844	Phase 2  Anti-tumor Activity, Safety and Pharmacokinetics of isatuximab in combination with Chemotherapy in Pediatric Patients from 28 days to less than 18 years of Age with Relapsed/Refractory B or T Acute Lymphoblastic Leukemia or Acute Myeloid Leukemia in First or Second Relapse	96	<ul style="list-style-type: none"> <li>Open-label, Single-group assignment</li> <li>2 cohorts: AML &amp; ALL, in combination with chemotherapy</li> </ul>	<ul style="list-style-type: none"> <li>Primary: CR in AML, B-ALL or T-ALL,</li> <li>Secondary: AE<sup>2</sup>s, incidence and severity of infusion reactions, isatuximab PK, minimal residual disease, ORR, OS, Event free survival, DR</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Apr. 2019</li> <li>DE: Interim analysis: 2020; Full completion: 2022</li> </ul>

# Isatuximab (anti-CD38 mAb) combination cemiplimab (PD-1 inhibitor) – Advanced Malignancies

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Advanced Malignancies</b>  ACT15319 NCT03367819	Phase 1/2  Safety and tolerability of Isatuximab in combination with cemiplimab in patients with metastatic castration-resistant prostate cancer (mCRPC) or patients with non-small cell lung cancer (NSCLC)	134	<ul style="list-style-type: none"> <li>In Patients with metastatic, castration-resistant prostate cancer (mCRPC) who are naïve to anti-programmed cell death-1 (PD-1)/programmed cell death-ligand 1 (PDL-1)-containing therapy, or non-small cell lung cancer (NSCLC) who progressed on anti-PD-1/PDL-1-containing therapy,</li> <li>Randomized, Open-Label, Parallel Assignment</li> <li>Isatuximab alone or in combination with cemiplimab</li> <li>Total duration per patient up to 28 months including 28 days screening period, , up to 24 months ttmt period and 3 months safety FU</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Safety, tolerability, RR</li> <li>Secondary: Immunogenicity (isa and cemi), PK, tumor burden change, DR, PFS, Disease Control Rate</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jan. 2018</li> <li>DE: Primary:2021, Full completion: 2021</li> </ul>

# Isatuximab (anti-CD38 mAb) combination cemiplimab (PD-1 inhibitor) – Lymphoma

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Advanced Malignancies</b>  ACT15320 NCT03769181	Phase 1/2  Safety, Preliminary Efficacy and Pharmacokinetics of Isatuximab in combination with cemiplimab in patients with Lymphoma	130	<ul style="list-style-type: none"> <li>In Patients with Lymphoma:                             <ul style="list-style-type: none"> <li><u>Cohort A1</u>: classic Hodgkin' Lymphoma (cHL) anti-PD-1/PD-L1 inhibitor naïve,</li> <li><u>Cohort A2</u>: cHL ) anti-PD-1/PD-L1 inhibitor progressor</li> <li><u>Cohort B</u>: diffuse large B-cell Lymphoma (DLBCL)</li> <li><u>Cohort C</u>: peripheral T-cell Lymphoma (PTCL)</li> </ul> </li> <li>Non-Randomized, Open-Label, Parallel Assignment</li> <li>Isatuximab in combination with cemiplimab</li> </ul>	<ul style="list-style-type: none"> <li>Primary:                             <ul style="list-style-type: none"> <li><u>Phase 1</u>: DLTs, recommended Phase 2 dose (RP2D),</li> <li><u>Phase 2</u>: Cohort A1: Complete Remission Rate (CRR); Cohort A2 RR</li> </ul> </li> <li>Secondary: Aes, SAEs, PK, tumor burden, disease control rate, DR, PFS</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jan. 2019</li> <li>DE: Primary: 2021, Full completion: 2023</li> </ul>

# Isatuximab (anti-CD38 mAb) combination atezolizumab (PD-1 inhibitor) – Advanced Malignancies

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Advanced Malignancies</b>  ACT15377 NCT03637764	Phase 1/2  Safety, Preliminary Efficacy and Pharmacokinetics of Isatuximab monotherapy or in combination with Atezolizumab in patients with Advanced Malignancies	350	<ul style="list-style-type: none"> <li>In Patients with a known diagnosis of either unresectable HCC, platinum-refractory /recurrent /metastatic SCCHN, platinum-resistant/refractory EOC with evidence of measurable disease or recurrent GBM,</li> <li>Non-Randomized, Open-Label, Parallel Assignment,</li> <li>Isatuximab alone or in combination with atezolizumab,</li> </ul>	<ul style="list-style-type: none"> <li>Primary: DLTs, AEs, MTD, Recommended Phase 2 dose, RR, PFS,</li> <li>Secondary: immunogenicity (Isatuximab and atezolizumab), tumor burden change, disease control rate, DR, PFS, RR, PK,</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Aug. 2018</li> <li>DE: Primary:2021, Full completion: 2023</li> </ul>

# Isatuximab (anti-CD38 mAb) combination atezolizumab (PD-1 inhibitor) – Solid Tumors

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
Umbrella Trial led by Roche For sanofi: ACT16241 NCT03555149	Phase 1b/2  Efficacy and Safety, of isatuximab in combination with atezolizumab in patients with Metastatic Colorectal Cancer	160	<ul style="list-style-type: none"> <li>• Umbrella study, Randomized, Open-Label, Parallel Assignment,</li> <li>• Isatuximab in combination with atezolizumab,</li> <li>• Patients will receive Tx until unacceptable toxicity or loss of clinical benefit as confirmed by disease progression or lack of continued benefit as determined by the investigator</li> </ul>	<ul style="list-style-type: none"> <li>• Primary: ORR, AEs</li> <li>• Secondary: PFS, OS, DOR, % of patients alive at Month 6, DCR, immunogenicity,</li> </ul>	<ul style="list-style-type: none"> <li>• SSD: Sep. 2018</li> <li>• DE: 2022</li> </ul>



# Cemiplimab (PD-1 inhibitor) Advanced Malignancies (AM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>AM</b>  R2810-ONC-1423 NCT02383212	Phase 1  A first-in-human study of repeat dosing with cemiplimab, as single therapy and in combination with other Anti-Cancer therapies in patients with AM	398	<ul style="list-style-type: none"> <li>• Non-Randomized, Open-label, Parallel assignment, ascending-dose</li> <li>• Monotherapy, cemiplimab alone</li> <li>• Dual combination: cemiplimab in combination with hypofractionated radiotherapy or with cyclophosphamide or with docetaxel</li> <li>• Triple combination: cemiplimab with hypofractionated radiotherapy plus cyclophosphamide, or hypofractionated radiotherapy plus GM-CSF or carboplatin plus paclitaxel or carboplatin plus pemetrexed or carboplatin plus docetaxel</li> <li>• Quadruple combination: cemiplimab with hypofractionated radiotherapy plus GM-CSF plus cyclophosphamide</li> </ul>	<ul style="list-style-type: none"> <li>• Primary: TEAE, Incidence of abnormal laboratory findings, N of participants with DLT</li> <li>• Secondary, RECIST as measured by CT or MRI, Immune-Related Response</li> </ul>	<ul style="list-style-type: none"> <li>• SSD: Jan. 2015</li> <li>• DE: 2020</li> </ul>

# Cemiplimab (PD-1 inhibitor) Advanced Malignancies (AM)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<p><b>PK in Japanese patients AM</b></p> <p>R2810-ONC-1622 NCT03233139</p>	<p>Phase 1</p> <p>To investigate the safety and PKs of cemiplimab in Japanese patients with AM</p>	81	<ul style="list-style-type: none"> <li>Part 1: Histologically or cytologically confirmed diagnosis of malignancy with no alternative standard-of-care therapeutic option</li> <li>Part 2: Histologically or cytologically documented squamous or non-squamous NSCLC with stage IIIB or stage IV disease who received no prior systematic tmt for recurrent or metastatic NSCLC. In Part 2 patients must have available archival or newly obtained formalin-fixed tumor tissue from a metastatic/recurrent site, which has not previously been irradiated.</li> <li>Sequential assignment, Open-label, non-randomized</li> <li>3 arms: Part 1: cemiplimab; Part 2/ cohort A: cemiplimab; Part 2/ cohort B: cemiplimab + ipilimumab + platinum doublet chemotherapy</li> </ul>	<ul style="list-style-type: none"> <li>Primary: TEAEs cemiplimab PK parameters</li> <li>Secondary: Immunogenicity against cemiplimab, ORR, DOR</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sep. 2017</li> <li>DE: primary completion 2019; full completion 2023</li> </ul>

# Cemiplimab (PD-1 inhibitor) Pediatrics

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
RR Solid tumors CNS tumors ND R Glioma  R2810-ONC-1690 NCT03690869	Phase 1 Phase 2  a) Safety and Pharmacokinetics of cemiplimab single agent in Pediatric Patients with Relapsed Refractory Solid or CNS Tumors  b) Safety and Efficacy of cemiplimab in combination with Radiotherapy in Pediatric Patients with Newly Diagnosed Diffuse Intrinsic Pontine Glioma, Newly Diagnosed High-Grade Glioma or Recurrent High-Grade Glioma	150	<ul style="list-style-type: none"> <li>Randomized, Parallel Group assignment, Open-label</li> <li>Phase1: cemiplimab monotherapy in both cohorts: Solid Tumor and CNS cohorts</li> <li>Phase 2: Newly Diagnosed DIPG, Newly Diagnosed HGG, recurrent HGG: cemiplimab in combination with radiation therapy</li> </ul>	<ul style="list-style-type: none"> <li>Primary: DLTs (Phase 1 &amp; 2), Anticipated recommended dose from Phase 1 to Phase 2, cemiplimab PK (monotherapy and in combination with radiation therapy), anticipated cemiplimab RP2D when co-administered with radiation therapy in DIPG and HGG, anti-tumor activity: OS12, PFS12,</li> <li>Secondary: anti-tumor activity (children objective response), immunogenicity, tolerability profile (DLTs &amp; AEs)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Early 2019</li> <li>DE: 2025</li> </ul>

# Cemiplimab (PD-1 inhibitor) Melanoma - Biomarkers

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Biomarkers Melanoma</b>  R2810-ONC-1606 NCT03002376	Phase 1  Exploratory Tumor Biopsy-driven study to understand the relationship between biomarkers and clinical response in Melanoma patients receiving cemiplimab	47 (actual)	<ul style="list-style-type: none"> <li>For Histologically confirmed diagnosis of stage III (unresectable) or stage IV cutaneous melanoma (non-acral lentiginous) with at least 1 lesion that is measurable by RECIST 1.1 criteria and accessible for biopsies</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Correlation between changes in the tumor microenvironment and the change in tumor volume following cemiplimab Tx</li> <li>Secondary: Correlation between baseline tumor characteristics and the change in tumor volume following Tx, cemiplimab serum concentrations, antibodies levels, PFS, ORR</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Apr. 2017</li> <li>DE: 2019</li> </ul>

# Cemiplimab (PD-1 inhibitor) Head and Neck - Biomarkers

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Biomarkers Head &amp; Neck</b>  R2810-ONC-1655 NCT03198130	Phase 1  Exploratory Tumor Biopsy-driven study to understand the relationship between biomarkers and clinical response in Immunomodulatory Treatment-Naïve patients with Recurrent and/or Metastatic Squamous Cell Carcinoma of Head and Neck receiving cemiplimab	33 (actual)	<ul style="list-style-type: none"> <li>For Histologically confirmed diagnosis recurrent and/or metastatic SCCHN (squamous cell carcinoma of the head and neck) with no curative options with at least 1 lesion that is measurable by Response Evaluation Criteria in Solid Tumors (RECIST)</li> <li>Open-label, Single Group Assignment</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Correlation between changes in the tumor microenvironment and the change in tumor volume following cemiplimab Tx</li> <li>Secondary: Correlation between baseline tumor characteristics and the change in tumor volume following Tx, ORR, PFS, TAES, cemiplimab serum concentration, anti-cemiplimab antibodies level</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jul. 2017</li> <li>DE (1st Part) <sup>(1)</sup>: 2019; full completion 2020</li> </ul>

# Cemiplimab (PD-1 inhibitor) Cutaneous Squamous Cell Carcinoma (CSCC)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Advanced CSCC</b>  R2810-ONC-1540 NCT02760498	Phase 2  Cemiplimab monotherapy for patients with metastatic (nodal or distant) CSCC (Groups 1 and 3) or with unresectable locally advanced CSCC (Group 2)	266	<ul style="list-style-type: none"> <li>Non-Randomized, Open-label, Parallel assignment</li> <li>Group 1: Patients with metastatic CSCC: to distant sites or lymph nodes cemiplimab administered intravenously every 2 weeks</li> <li>Group 2: Patients with unresectable locally advanced CSCC. cemiplimab administered intravenously every 2 weeks</li> <li>Group 3: Patients with metastatic CSCC: to distant sites or lymph nodes, cemiplimab administered intravenously every 3 weeks</li> <li>Group 4: Patients with advanced CSCC , metastatic (nodal or distant) or unresectable locally advanced , cemiplimab administered every 4 weeks</li> <li>Group 5: Patients in advanced CSCC receiving a single SC dose of cemiplimab, followed by cemiplimab IV Q3W (pilot Group)</li> </ul>	<ul style="list-style-type: none"> <li>Primary: ORR (96 weeks), Groups 1,3 and 4: RECIST version 1.1 will be used to determine ORR, Group 2 and 4: Clinical response criteria will be used to determine ORR</li> <li>Secondary: Investigator Assessments of ORR, DOR, PFS, OS, CRR, cemiplimab PK and antibodies levels.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: May 2016</li> <li>DE: Primary:2020; Full completion 2021</li> </ul>
<b>Expanded Access CSCC</b>  R2810-ONC-17103 NCT03492489	Expanded Access Tx IND/Protocol	Intermediate-size Population	Provide access to cemiplimab to patients with mCSCC or locally advanced CSCC, who are not candidate for surgery prior to cemiplimab being commercially available		

# Cemiplimab (PD-1 inhibitor) Neoadjuvant CSCC

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Neoadjuvant CSCC</b>  R2810-ONC-1787 NCT03889912	Phase 1  Study of Pre-Operative cemiplimab administered Intralesionally, for Patients with Recurrent Cutaneous Squamous Cell Carcinoma (CSCC)	36	<ul style="list-style-type: none"> <li>• Patients with history of recurrent resectable CSCC</li> <li>• Open-label, Single-Group assignment</li> <li>• Three dose cohorts planned followed by a 3+3 dose-escalation design with cohort expansion</li> </ul>	<ul style="list-style-type: none"> <li>• Primary: DLTs, TEAs, injection site reactions,</li> <li>• Secondary: ORR, pathologic complete response rate, major pathologic response rate, cemiplimab serum concentration, cemiplimab antibodies, selection of the recommended cemiplimab dose for further study based on clinical and PK observations.</li> </ul>	<ul style="list-style-type: none"> <li>• SSD: Apr. 2019</li> <li>• DE: 2020</li> </ul>

# Cemiplimab (PD-1 inhibitor) Neoadjuvant CSCC post surgery

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Neoadjuvant CSCC</b>  R2810-ONC-1788 NCT03969004	Phase 3  Adjuvant Cemiplimab vs Placebo after Surgery and Radiation Therapy in Patients with High risk CSCC	412	<ul style="list-style-type: none"> <li>Patients with resection of pathologically confirmed CSCC, and qualified as High Risk CSCC,</li> <li>Randomized, placebo-controlled, double-blind, parallel assignment,</li> <li>2 arms: cemiplimab and placebo,</li> </ul>	<ul style="list-style-type: none"> <li>Primary: DFS (time from randomization to the first documented disease recurrence)</li> <li>Secondary: OS, FFLRR (from randomization to the 1<sup>st</sup> locoregional recurrence LRR), FFDR (from randomization to the 1<sup>st</sup> distant recurrence), cumulative occurrence of second primary CSCC, TEAEs, incidence of deaths, lab. abnormalities,</li> </ul>	<ul style="list-style-type: none"> <li>SSD: June 2019</li> <li>DE: primary: 2025, full completion: 2026</li> </ul>



# Cemiplimab (PD-1 inhibitor) Basal Cell Carcinoma (BCC)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>BCC</b>  R2810-ONC-1620 NCT03132636	Phase 2  Cemiplimab in patients with Advanced BCC who experienced progression of disease on Hedgehog Pathway Inhibitor Therapy, or were intolerant of Prior Hedgehog Pathway Inhibitor Therapy	137	<ul style="list-style-type: none"> <li>Patients with confirmed diagnosis of invasive BCC</li> <li>Non-Randomized, Open-label, Parallel assignment</li> <li>Group 1: Patients with metastatic BCC</li> <li>Group 2: Patients with unresectable locally advanced BCC</li> </ul>	<ul style="list-style-type: none"> <li>Primary: ORR for mBCC measured by RECIST version 1.1 ORR for unresectable locally advanced BCC measured by Composite Response Criteria</li> <li>Secondary: DOR, CR, PFS, OS, TEAEs, PK, immunogenicity</li> </ul>	<ul style="list-style-type: none"> <li>SSD: July 2017</li> <li>DE: Primary: 2021, Full completion 2022</li> </ul>

# Cemiplimab (PD-1 inhibitor) Non-Small Cell Lung Cancer (NSCLC)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>mNSCLC</b>  R2810-ONC-1624 NCT03088540	Phase 3  First-line Tx in patients with advanced or metastatic NSCLC whose tumors express PD-L1, vs. Platinum Based Chemotherapy	700	<ul style="list-style-type: none"> <li>For histologically or cytologically documented squamous or non squamous NSCLC with stage IIIB or stage IIIC who are not candidates for Tx with definitive chemoradiation or patients with stage IV disease who received no prior systemic Tx for recurrent or metastatic NSCLC</li> <li>Randomized, Open-label, Cross-over assignment</li> <li>Active Comparator: Standard-of-care chemotherapy: paclitaxel + cisplatin OR paclitaxel + carboplatin OR gemcitabine + cisplatin or gemcitabine + carboplatin OR Pemetrexed + cisplatin followed by optional pemetrexed maintenance OR pemetrexed + carboplatin followed by optional pemetrexed maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Primary: PFS as assessed by a blinded Independent review committee using RECIST 1.1</li> <li>Secondary: OS, Objective response rates, BOR, DOR</li> </ul>	<ul style="list-style-type: none"> <li>SSD: May 2017</li> <li>DE: 2023</li> </ul>

# Cemiplimab (PD-1 inhibitor) Non-Small Cell Lung Cancer (NSCLC)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>mNSCLC</b>  R2810-ONC-16113 NCT03409614	Phase 3  Combination of cemiplimab and Platinum-based Doublet Chemotherapy in patients with Lung Cancer	Part 1: 360	<ul style="list-style-type: none"> <li>For histologically or cytologically documented squamous or non squamous NSCLC with stage IIIB or IIIC disease who are not candidates for Tx with definitive concurrent chemoradiation or stage IV disease who received no prior systemic Tx for recurrent or metastatic NSCLC</li> <li><b>Part 1:</b> Randomized, Open-label, Parallel assignment</li> <li>Arm 1: Standard of care Platinum-based doublet chemotherapy</li> <li>Arm 2: cemiplimab + Platinum-based doublet chemotherapy</li> <li>Arm 3: cemiplimab + abbreviated chemotherapy + ipilimumab</li> <li><b>Part 2:</b> Randomized, Double-Blind,</li> <li>Arm 1: Standard of care Platinum-based doublet chemotherapy</li> <li>Arm 2: cemiplimab + standard of care Platinum-based doublet chemotherapy</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Part 1: ORR; Part 2: OS and PFS as assessed by a blinded independent review committee using RECIST1.1</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Mar. 2018</li> <li>DE: 2023</li> </ul>

# Cemiplimab (PD-1 inhibitor) Non-Small Cell Lung Cancer (NSCLC)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>mNSCLC</b>  R2810-ONC-16111 NCT03515629	Phase 3  Combination of cemiplimab, Platinum-based Doublet Chemotherapy, and ipilimumab vs pembrolizumab in Patients with Lung Cancer	5*	<ul style="list-style-type: none"> <li>For histologically or cytologically documented squamous or non squamous NSCLC with stage IIIB or stage IV disease who received no prior systemic Tx for recurrent or metastatic NSCLC</li> <li>Randomized, Open-label, Parallel assignment</li> <li>Arm 1: pembrolizumab</li> <li>Arm 2: cemiplimab + ipilimumab</li> <li>Arm 3: cemiplimab + chemotherapy + ipilimumab</li> </ul>	<ul style="list-style-type: none"> <li>Primary: PFS as assessed by a blinded Independent review committee using RECIST 1.1</li> <li>Secondary: OS, ORR, TEAEs, DLTs, SAEs, death, lab. abnormalities, OS, QoL</li> </ul>	<ul style="list-style-type: none"> <li>SSD: June 2018</li> <li>DE: 2020</li> </ul>

\*: study ongoing with the patients included but recruitment stopped

# Cemiplimab (PD-1 inhibitor) Non-Small Cell Lung Cancer (NSCLC)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>mNSCLC</b>  R2810-ONC-1763 NCT03430063	Phase 2  Cemiplimab and Ipilimumab in Patients with Lung Cancer	28*	<ul style="list-style-type: none"> <li>For histologically or cytologically documented squamous or non squamous NSCLC with stage IIIB or IIIC and not candidates for definitive chemoradiation or stage IV. Patients must have PD after receiving one prior line of chemotherapy Tx for advanced NSCLC,</li> <li>Randomized, Open-label, Parallel assignment</li> <li>Arm 1: cemiplimab standard dose</li> <li>Arm 2: cemiplimab + ipilimumab standard doses</li> <li>Arm 3: cemiplimab High dose</li> </ul>	<ul style="list-style-type: none"> <li>Primary: ORR</li> <li>Secondary: OS, PFS, TEAEs, SAEs, death, lab. abnormalities</li> </ul>	<ul style="list-style-type: none"> <li>SSD: May 2018</li> <li>DE: 2020</li> </ul>

\*: study ongoing with the patients included but recruitment stopped

# Cemiplimab (PD-1 inhibitor) Cervical cancer (CC)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>CC</b>  R2810-ONC-1676 NCT03257267	Phase 3  Cemiplimab vs. therapy of Investigator Choice chemotherapy in Recurrent or Metastatic Platinum-Refractory CC	436	<ul style="list-style-type: none"> <li>Patients with recurrent or metastatic CC for which there is no curative intent option,</li> <li>Randomized, Open-label, Parallel assignment, Tx cycle 6 weeks, Planned Tx for up to 96 weeks</li> <li>2 arms: cemiplimab and Investigator Choice (IC) chemotherapy</li> </ul>	<ul style="list-style-type: none"> <li>Primary: OS</li> <li>Secondary: PFS, ORR, DOR, QOL</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2017</li> <li>DE: Primary: 2020; Next 2022; Full completion 2023</li> </ul>

# Cemiplimab (PD-1 inhibitor) Combination REGN4018 Ovarian cancer (OC)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>CC</b>  R4018-ONC-1721 NCT03564340	Phase 1/2  REGN4018 alone or in combination with cemiplimab in patients with Platinum-Resistant Ovarian Cancer	264	<ul style="list-style-type: none"> <li>Histologically or cytologically confirmed diagnosis of advanced, epithelial ovarian (except carcinosarcoma), primary peritoneal, or fallopian tube cancer with CA-125 <math>\geq</math> 2 xULN, progression or relapse within 6 months of the most recent Tx with Platinum-containing chemotherapy, documented progression and no standard therapy options</li> <li>Non- Randomized, Open-label, Parallel assignment,</li> <li>Arm 1: REGN4018</li> <li>Arm 2: REGN4018 + cemiplimab</li> </ul>	<ul style="list-style-type: none"> <li>Primary: DLTs, TEAEs, SAEs, deaths, lab abnormalities, drugs serum concentrations, ORR</li> <li>Secondary: BOR, DOR, disease control, PFS, CA-125</li> </ul>	<ul style="list-style-type: none"> <li>SSD: May 2018</li> <li>DE: 2022</li> </ul>

# SAR439459 (TGFβ inhibitor mAb)

## Advanced Solid Tumors (AST)

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>AST</b> <b>Monotherapy and combination with cemiplimab</b>  TCD14678 NCT03192345	Phase 1/1b  Safety, PK, PD and Anti-tumor activity of SAR439459 Monotherapy and in combination with cemiplimab in adult patients with Advanced Solid Tumors	130	<ul style="list-style-type: none"> <li>Patients with histologically confirmed, advanced unresectable or metastatic solid tumor</li> <li>Open-label, Parallel assignment</li> <li>Part 1A: SAR439459 monotherapy escalating doses</li> <li>Part 2A: SAR439459 monotherapy with the previously recommended dose</li> <li>Part 1B: SAR439459 escalating dose + cemiplimab standard dose</li> <li>Part 2B: SAR439459 at previously recommended dose + cemiplimab standard dose</li> <li>Escalation periods non randomized followed by expansion periods randomized</li> </ul>	<ul style="list-style-type: none"> <li>Primary: incidence of DLTs (Part 1), ORR (Part 2)</li> <li>Secondary: Safety profile, Immunogenicity, PK, PFS (Part 2), TTP (Part 2)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jun. 2017</li> <li>DE: 2022</li> </ul>



# SAR408701 (maytansin loaded anti-CEACAM5 mAb) Advanced Solid Tumors (AST) 1/2

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>First-in-Human</b>  TED13751 NCT02187848	Phase 1 Phase 2  Safety, PK and antitumor activity of SAR408701 in patients with AST	313	<ul style="list-style-type: none"> <li>Patients with locally advanced or metastatic solid malignant tumor</li> <li>Non-Randomized, Open-label, Parallel assignment</li> <li>Arm 1 : SAR408701 monotherapy escalating cohorts</li> <li>Arm 2: SAR408701 expansion cohort in CRC with MTD previously defined</li> <li>Arm 3: SAR408701 expansion cohort in non-squamous NSCLC high expresser patients (CEACAM5 &gt;50% of tumor cells ≥ 2+ intensity) at MTD</li> <li>Arm 4: SAR408701 expansion cohort gastric adenocarcinoma at MTD</li> <li>Arm 5: SAR408701 loading dose at first cycle followed by MTD</li> <li>Arm 6: SAR408701 expansion cohort in non-squamous NSCLC patients (Lung bis) with CEACAM5 &gt;1% of tumors cells ≥ 2+ intensity, at MTD</li> <li>Arm 7: SAR408701 expansion cohort SCLC at MTD</li> </ul>	<ul style="list-style-type: none"> <li>Primary: MTD, Anti-tumor response RECIST</li> <li>Secondary: Overall Safety, Immunogenicity, PK, duration of response, time to progression</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sep. 2014</li> <li>DE: 2021</li> </ul>

# SAR408701 (maytansin loaded anti-CEACAM5 mAb)

## Advanced Solid Tumors (AST) 2/2

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Japanese patients</b> <b>Monotherapy</b>  TCD15054 NCT03324113	Phase 1  Safety and PK of SAR408701 Monotherapy in Japanese patients with Advanced Malignant Solid Tumors	24 (expected)	<ul style="list-style-type: none"> <li>• Patients with malignant solid tumor</li> <li>• Non-Randomized, Open-label, Sequential assignment</li> <li>• Phase 1 : SAR408701 monotherapy escalating doses/ 4 weeks</li> <li>• Arm to test loading dose at first cycle followed by MTD</li> </ul>	<ul style="list-style-type: none"> <li>• Primary: DLTs, Phase 1 and 1B</li> <li>• Secondary: Safety, Immunogenicity, PK, Plasma CEACAM5 levels, Anti-tumor response RECIST</li> </ul>	<ul style="list-style-type: none"> <li>• SSD: Oct. 2017</li> <li>• DE: 2019</li> </ul>

# SAR439859 (SERD)

## Breast cancer

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
TED14856 NCT03284957	Phase 1 Phase 2  SAR439859 single agent and in combination with palbociclib in Postmenopausal Women with Estrogen Receptor Positive Advanced Breast Cancer	156	<ul style="list-style-type: none"> <li>Non-Randomized, Open-label, Parallel Assignment</li> <li>Part A: SAR439859 monotherapy dose escalation,</li> <li>Part C: dose escalation for the combination SAR439859 and palbociclib,</li> <li>Part B: SAR439859 dose expansion from the dose determined in part A,</li> <li>Part D: combination SAR439859 and palbociclib at the doses recommended from part C</li> <li>SAR439859 administered in 28-day cycle; palbociclib in 21-day cycle</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Parts A &amp; C:DLTs, Parts B &amp; D: ORR</li> <li>Secondary: Safety, ORR, DCR, DR, PK for both drugs, CYP450 3A induction/inhibition, ER occupancy/PET imaging</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sept. 2017</li> <li>DE: 2021</li> </ul>
TED15954 NCT03816839	Phase 1  Safety, Efficacy, Pharmacokinetics and Pharmacodynamics Evaluation of SAR439859 single agent in Japanese Postmenopausal Women with Estrogen Receptor Positive Advanced Breast Cancer	12	<ul style="list-style-type: none"> <li>Open-label, Single-Group Assignment</li> <li>SAR439859, administered orally once daily as monotherapy in fasted or fed conditions</li> </ul>	<ul style="list-style-type: none"> <li>Primary: :DLTs,</li> <li>Secondary: AEs, Pharmacokinetics of SAR439859, ORR, CBR,DR, non-progression rate,</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Apr. 2019</li> <li>DE: 2020</li> </ul>

# SAR440234 (T-cell engaging bispecific mAb) Leukemia and Myelodysplastic Syndrome

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
TED15138 NCT03594955	Phase 1 Phase 2  SAR440234 single agent in patients with Relapsed or Refractory Acute Myeloid Leukemia (RR AML), B-cell Acute Lymphoblastic Leukemia (B-ALL) or High Risk Myelodysplasia (HR-MDS)	77	<ul style="list-style-type: none"> <li>Patients with confirmed diagnosis of AML (except acute promyelocytic leukemia) or MDS with a risk category intermediate or higher, and not eligible for any Tx known to provide clinical benefit,</li> <li>Open-label, Single Group Assignment</li> <li>2 dose escalation schemes,</li> <li>Cycle defined as 6 weeks of study Tx</li> <li>Tx may be continued as long as it is clinically beneficial</li> </ul>	<ul style="list-style-type: none"> <li>Primary: DLTs, allergic reactions/hypersensitivity, ORR, DOR, event-free survival</li> <li>Secondary: AEs, PK, Preliminary Anti-Leukemia Activity, immunogenicity</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Nov. 2018</li> <li>DE: 2021</li> </ul>

Study on clinical hold; complete response letter sent to the FDA mid-July

# SAR442720 (SHP2 inhibitor)

## Relapsed/Refractory Solid Tumors

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
RMC-4630-01 NCT03634982	Phase 1  Safety, Tolerability, PK and PD profiles of SAR442720 single agent in patients with Relapsed/Refractory Solid Tumors	200	<ul style="list-style-type: none"> <li>Patients with advanced solid tumors that have failed, are intolerant or are considered ineligible for standard of care anticancer Tx</li> <li>Open-label, Single Group Assignment</li> <li>1 Arm: SAR442720, oral administration</li> </ul>	<ul style="list-style-type: none"> <li>Primary: AEs, DLTs,</li> <li>Secondary: PK, pERK (PD markers), ORR, DOR,</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2018</li> <li>DE: 2021</li> </ul>
RMC-4630-02 NCT03989115	Phase 1 Phase 2  Safety, Tolerability, PK and PD profiles of SAR442720 and Cobimetinib in Adult participants with Relapsed/Refractory Solid Tumors With Specific Genomics Aberrations	144	<ul style="list-style-type: none"> <li>Patients with advanced solid tumors that have failed, are intolerant or are considered ineligible for standard of care anticancer Tx</li> <li>Open-label, Single Group Assignment</li> <li>1 Arm: SAR442720 + Cobimetinib, oral administration</li> </ul>	<ul style="list-style-type: none"> <li>Primary: AEs, DLTs,</li> <li>Secondary: PK, ORR, DOR,</li> </ul>	<ul style="list-style-type: none"> <li>SSD: July 2019</li> <li>DE: 2022</li> </ul>

# SAR441000 (Cytokine mRNA)

## Advanced Solid Tumors

Immuno-inflammation	Diabetes
<b>Oncology</b>	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
TED15297 NCT03871348	Phase 1  Safety, Pharmacokinetics, Pharmacodynamics and Anti-Tumor activity of SAR441000 as Monotherapy and in Combination with cemiplimab in patients with Advanced Solid Tumors	264	<ul style="list-style-type: none"> <li>Patients with advanced solid malignant tumors for which no standard alternative therapy is available,</li> <li>Non-randomized, Open-label, Parallel Assignment,</li> <li>Dose escalation Phase, 2 arms: SAR441000 (intra-tumoral injection as monotherapy) and SAR441000 (intra-tumoral injection) + cemiplimab over a 21-day cycle,</li> <li>Expansion cohorts in melanoma with SAR441000 monotherapy and with the combination (SAR441000 + cemiplimab),</li> <li>Expansion cohorts in CSCC, HNSCC with the combination.</li> </ul>	<ul style="list-style-type: none"> <li>Primary: DLTs (SAR441000 alone and in combination), MTD (SAR441000 alone and in combination), TEAEs, ORR for expansion,</li> <li>Secondary: PK (SAR441000 alone and in combination), immunogenicity (SAR441000 and cemiplimab), DCR and DoR (SAR441000 alone and in combination), PFS, TEAEs, Recommended dose for SAR441000 alone and in combination for the expansion cohorts, ORR for dose escalation.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jan. 2019</li> <li>DE: 2021</li> </ul>

# GZ402666 (avalglucosidase alfa)

## Pompe disease (PD) 1/3

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
<b>Rare Diseases</b>	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>COMET</b> <b>Late Onset</b>  EFC14028 NCT02782741	Phase 3  To compare efficacy and safety of Enzyme Replacement therapies avalglucosidase alfa (neoGAA) and alglucosidase alfa (Myozyme®/Lumizyme®) in Tx-naïve patients with Late-onset PD	100	<ul style="list-style-type: none"> <li>Repeated Biweekly Infusions of avalglucosidase alfa (GZ402666) and alglucosidase alfa in Tx-naïve patients with late-onset PD age 3 years and older</li> <li>Randomized, Double-Blind, Parallel Assignment</li> <li>Total study duration for one patient: 3 years [14-day screening, 49-week blinded Tx period, 96-week open-label Tx and 4-week post-Tx observation period</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Change in percent predicted forced vital capacity (%FVC) in the upright position, from baseline to 12 months</li> <li>Secondary: Change from baseline to 12 months in six-minute walk test distance walked, maximal inspiratory / expiratory pressure (% predicted), hand-held dynamometry measurement of lower extremity muscle strength in Quick Motor Function Test scores, and 12- Item Short-form health survey scores</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2016</li> <li>DE Primary: 2020</li> <li>DE Full Completion: 2024</li> </ul>

# GZ402666 (avalglucosidase alfa)

## Pompe disease (PD) 2/3

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
<b>Rare Diseases</b>	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Mini-COMET Infantile Onset</b>  ACT14132 NCT03019406	Phase 2  To assess safety and efficacy of avalglucosidase alfa (neoGAA) in Pediatric patients with infantile-onset PD previously treated With alglucosidase alfa (Myozyme®/Lumizyme®)	22	<ul style="list-style-type: none"> <li>Repeated bi-weekly infusions of avalglucosidase alfa In Patients with Infantile-onset PD previously treated with alglucosidase alfa (Myozyme®/Lumizyme®) who demonstrate clinical decline or sub-optimal clinical response</li> <li>Randomized, Open-label, Ascending dose, Parallel assignment</li> <li>Total study duration for one patient: 3 years [14-day screening, 25-week Tx period, a 120-week extension period and 4-week post-Tx observation period</li> </ul>	<ul style="list-style-type: none"> <li>Primary: N of participants with AE, N of participants with immunogenicity response</li> <li>Secondary: PK parameters, Change at 6 months from baseline in Gross Motor Function (GMF) Measure-88 Test, revised GMF Classification System score, Pompe specific Pediatric Evaluation of Disability Inventory, Functional Skills Scale, Mobility Domain Test score and Quick Motor Function Test scores, Left Ventricular Mass Index, Eyelid position measurements, Creatine kinase value</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2017</li> <li>DE Primary: 2019</li> <li>DE Full completion: 2022</li> </ul>



# GZ402666 (avalglucosidase alfa)

## Pompe disease (PD) 3/3

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
<b>Rare Diseases</b>	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>NEO-EXT</b>  <b>LTS13769</b> <b>NCT02032524</b>	Phase 2 Phase 3  Long-term safety and PK of repeated biweekly infusions of avalglucosidase alfa (neoGAA) in patients with PD	21	<ul style="list-style-type: none"> <li>Repeated biweekly infusions of avalglucosidase alfa in patients with PD who previously completed a avalglucosidase alfa study [adult, senior]</li> <li>Non-randomized, Open-label, single group assignment</li> <li>Total study duration for one patient: 6 years [until the patient withdraws, the Investigator withdraws the patient, or the Sponsor terminates the study]</li> </ul>	<ul style="list-style-type: none"> <li>Primary: AEs and TEAEs, including IARs &amp; deaths, Hematology, biochemistry and urinalysis, vital signs</li> <li>Secondary: ECG, PK parameters, anti-avalglucosidase alfa antibodies, and neutralizing antibody formation in anti-avalglucosidase alfa positive patients, anti-avalglucosidase alfa IgG antibodies, Skeletal muscle glycogen content, Qualitative and quantitative muscle degenerative assessments MRI, Urinary Hex4, plasma analyses of circulating mRNA and micro RNA, Serum analyses of skeletal muscle RNA expression</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Feb. 2014</li> <li>DE: 2021 (for post trial access)</li> </ul>

# Olipudase Alfa (rhASM ERT) Acid Sphingomyelinase Deficiency (ASMD) (1/3)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
<b>Rare Diseases</b>	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>ASCEND Niemann-Pick disease type B<sup>(1)</sup></b>  DFI12712 NCT02004691	Phase 2 Phase 3  Efficacy, Safety, PD, and PK study of olipudase alfa in patients with ASMD	36	<ul style="list-style-type: none"> <li>Randomized, Double-blinded, Placebo-controlled, Parallel assignment</li> <li>Study duration is composed of blinded period and an open label extension allowing patients that were on placebo to cross over to active treatment</li> </ul>	<ul style="list-style-type: none"> <li>Primary: % change in spleen volume, % change in diffusing capacity of the lung for carbon monoxide (DLco)</li> <li>Secondary: Change in splenomegaly-related symptom score (except US, where it is part of the primary "combination spleen endpoint"), % change in liver volume, % change in platelet count, change in fatigue severity as measured by item 3 of the Brief Fatigue Inventory scale, change in pain severity as measured by item 3 of the Brief Pain Inventory scale, change in dyspnea severity as measured by the functional assessment of chronic illness therapy dyspnea tool</li> </ul>	<ul style="list-style-type: none"> <li>SSD: June 2016</li> <li>DE: 2019<sup>(2)</sup></li> <li>DE: 2023<sup>(3)</sup></li> </ul>

# Olipudase Alfa (rhASM ERT) Acid Sphingomyelinase Deficiency (ASMD) (2/3)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
<b>Rare Diseases</b>	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>ASCEND</b> <b>Peds</b>  DFI13803 NCT02292654	Phase 1 Phase 2  Safety, Tolerability, PK, and efficacy evaluation of olipudase alfa in pediatric patients <18 years of age with ASMD	20	<ul style="list-style-type: none"> <li>Open-label, ascending dose, Single group assignment</li> <li>Total study duration for one patient approximately 18 months [up to 60-day screening, 64-week Tx period, 37-day post Tx period except if patient enrolled in a long-term extension study]</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Safety parameters and Clinically significant changes in laboratory parameters, Clinically significant changes in physical examinations</li> <li>Secondary: PK parameters, Change in sphingomyelin levels and sphingomyelin metabolite levels</li> </ul>	<ul style="list-style-type: none"> <li>SSD: June 2015</li> <li>DE: 2020</li> </ul>

# Olipudase Alfa (rhASM ERT) Acid Sphingomyelinase Deficiency (ASMD) (3/3)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
<b>Rare Diseases</b>	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Long-Term</b>  LTS13632 NCT02004704	Phase 2  Long-term study of olipudase alfa in patients with ASMD	25	<ul style="list-style-type: none"> <li>For patients who have completed a previous study with olipudase alfa (DFI13803 for pediatric patients, and DFI13412 for adult patients)</li> <li>Open-label, Single group assignment</li> <li>Total study duration for one patient: up to 9 years</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Safety parameters, complete physical examinations including neurologic examinations, vital signs, echocardiograms and electrocardiograms, clinical laboratory tests, safety biomarkers, immune response assessment, liver biopsy (patients previously enrolled in DFI13412) and liver ultrasound/doppler (patients previously enrolled in DFI13803).</li> <li>Secondary: Spleen and liver volumes, pulmonary imaging and function tests, hematology and lipid profiles, health outcome questionnaires. For pediatrics patients: Hand X-ray for bone age and bone maturation, linear patient growth by height Z-score.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Dec. 2013</li> <li>DE: 2023</li> </ul>

# Venglustat (GCS inhibitor) Gaucher disease (GD) Type 3

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
<b>Rare Diseases</b>	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>LEAP GD Type 3</b>  PDY13949 NCT02843035	Phase 2  Tolerability, PK, PD, and exploratory efficacy of venglustat in combination with cerezyme in adult patients with GD Type 3	10	<ul style="list-style-type: none"> <li>156-week Three part, Open-label, Single group Assignment</li> <li>Part 1: Evaluate CNS biomarkers in adult GD type 3 patients that distinguish GD3 from GD type 1, Screen adult GD3 patients who qualify for Ttmt with venglustat in Part 2, Total duration 45 days</li> <li>Part 2 and 3: Safety and tolerability in GD3 patients, Total duration up to 156 weeks including : treatment of 52 weeks (Part 2) and 104 weeks (Part 3) for long term follow-up, respectively</li> </ul>	<ul style="list-style-type: none"> <li>Primary: N of patients with AE, assessment of PD parameters (GL-1 and lyso GL1 ) in CSF and plasma</li> <li>Secondary: PK parameters (CSF and Plasma)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jan. 2017</li> <li>DE (1st Part)<sup>(1)</sup>: 2021</li> </ul>

# Venglustat (GCS inhibitor)

## Autosomal Dominant Polycystic Kidney Disease (ADPKD)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
<b>Rare Diseases</b>	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>STAGED-PKD</b>  <b>EFC15392</b> <b>NCT03523728</b>	Phase 3  Efficacy, safety, tolerability and PK of venglustat in patients at risk of rapidly progressive ADPKD	560	<ul style="list-style-type: none"> <li>Randomized, double-blind, placebo-controlled 2-stage study (18 and 24 months)</li> <li>Study duration per participant is 26 months (maximal) per stage, including a screening period of 15 days, run-in period of 2 weeks, a 24-month treatment period, and a follow-up 30 days after final dose</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Rate of change in total kidney volume (TKV) based on magnetic resonance imaging (MRI) and rate of change in glomerular filtration rate (eGFR)</li> <li>Secondary: Rate of change in eGFR, rate of change in TKV, rate of change in urine osmolaity, rate of change in nocturia, adverse events, assessment of PK, change in lens clarity</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Feb. 2019</li> <li>DE <sup>(1st Part)</sup>(1): 2021</li> </ul>

# Eliglustat

## Gaucher's Disease (GD) (1/2)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
<b>Rare Diseases</b>	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>ELIKIDS</b>  <b>GD Type 1/ Type 3</b>  EFC13738 NCT03485677	Phase 3  PK, efficacy and safety with or without Imiglucerase in pediatric patients with GD Type1/Type 3	60	<ul style="list-style-type: none"> <li>Non-randomized, open label, two cohort (with and without imiglucerase)</li> <li>Cohort 1: eliglustat monotherapy</li> <li>Cohort 2: eligustat plus imiglucerase</li> </ul>	<ul style="list-style-type: none"> <li>Primary: PK (Cmax and AUC), adverse events</li> <li>Secondary: changes from baseline as absolute change in g/dL for hemoglobin, % change for platelets, liver volume, and spleen volume; improvement in pulmonary disease, improvement in bone disease, thrombocytopenia, and quality of life</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Apr. 2018</li> <li>DE Primary: 2022</li> <li>DE Full completion: 2023</li> </ul>

# Eliglustat

## Gaucher's Disease (GD) (2/2)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
<b>Rare Diseases</b>	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>EXOSKEL</b>  <b>GD Type 1</b>  <b>EFC13781</b> <b>NCT02536755</b>	Phase 3  Long Term skeletal response to eliglustat in GD Type 1 adult patients who successfully completed Phase 2 or phase 3 studies	32	<ul style="list-style-type: none"> <li>Single group assignment, open label</li> </ul>	<ul style="list-style-type: none"> <li>Primary: change from baseline in bone marrow infiltration, bone mineral density (hips and lumbar spine), skeletal imaging GD bone disease manifestations (lytic lesions, osteonecrosis, fractures and infarcts), clinical GD manifestations (mobility, bone pain, bone crisis), and bone biomarkers</li> <li>Secondary: quality of life, measurement of GD Type 1 biomarkers and safety (i.e. incidence of adverse events, change from baseline in laboratory assessments (hematology), physical examinations)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2015</li> <li>DE Primary (2y primary outcome): 2019</li> <li>DE Full completion: 2021</li> </ul>



# SAR339375 (Anti-miR21 RNA)

## Alport syndrome (ALPS)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
<b>Rare Diseases</b>	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>HERA</b>  ACT 16248 / RG012-03 NCT02855268	Phase 2a  Safety, Efficacy, Pharmacodynamics and Pharmacokinetics of SAR339375 (RG-012) in patients with ALPS	40	<ul style="list-style-type: none"> <li>18-60 year old males with ALPS</li> <li>Randomized, double-blind, placebo-control, Parallel assignment,</li> <li>2 arms: SAR339375 (RG012) and placebo,</li> <li>Duration: 48 week SC injections double-blinded treatment period. After 48 week treatment, subjects can receive a 48 week open-label extension period</li> </ul>	<ul style="list-style-type: none"> <li>Primary: AEs, eGFR slope,</li> <li>Secondary: PK, anti-drug antibodies, eGFR slope (week 24 and 94) , absolute change in eGFR, Tx responders.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Nov. 2017</li> <li>DE: 2022</li> </ul>

# Teriflunomide

## Multiple Sclerosis (MS)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
<b>MS, Neuro, Gene therapy</b>	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>TERIKIDS</b> <b>RMS</b>  EFC11759 NCT02201108	Phase 3  Efficacy, Safety and PK of teriflunomide in Pediatric Patients With Relapsing Forms of MS	165	<ul style="list-style-type: none"> <li>Patients with RMS meeting the criteria of MS based on McDonald criteria 2010 and International Pediatric MS Study Group criteria for pediatric MS</li> <li>With at least one relapse (or attack) in the 12 months preceding randomization or at least two relapses (or attack) in the 24 months preceding randomization</li> <li>Randomized, Double-Blind, Placebo-Controlled, Parallel Group , Tx 96 weeks followed by Open-label extension (96 weeks up to a max of 192 weeks after randomization), follow-up 4 weeks after Tx discontinuation</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Time to first clinical relapse after randomization</li> <li>Secondary: % of relapse free patients, N of new/newly enlarged T2 lesions, N of T1 Gd-enhancing T1 lesions , Change in volume of T2 lesions , of T1 hypointense lesions , brain atrophy, % of patients free of new or enlarged MRI T2-lesions, Change in performance on SDMT and Cognitive Battery Test , Safety, PK</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jul. 2014</li> <li>DE Primary: 2019</li> <li>DE Full completion: 2021</li> </ul>

# Alemtuzumab

## Relapsing Remitting Multiple Sclerosis (RRMS)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
<b>MS, Neuro, Gene therapy</b>	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>LemKids RRMS</b>  EFC13429 NCT03368664	Phase 3  Efficacy, Safety and Tolerability of Alemtuzumab in Pediatric Patients With Relapsing Remitting MS (RRMS) with disease activity on prior disease modifying therapy DMT	50	<ul style="list-style-type: none"> <li>In pediatric patients from 10 to &lt;18 years of age with RRMS with disease activity on prior DMT.</li> <li>Open-label, rater-blinded, single-arm, cross-over study</li> </ul> The study will consist of different phases: <ul style="list-style-type: none"> <li>Prior DMT Phase (~4 months) – efficacy measurements on current DMT</li> <li>Alemtuzumab Treatment Phase (~2 years) - The MRI based primary efficacy endpoint will be assessed over a 4 month period during this phase compared to an equal period during the prior DMT phase</li> <li>Safety Monitoring Phase – safety monitoring for all patients treated with alemtuzumab (4 years post last treatment with alemtuzumab)</li> </ul>	<ul style="list-style-type: none"> <li>Primary: The number of new or enlarging T2 lesions on brain MRI, during continuation of prior DMT (Period 1) compared to an equal period after the first course of alemtuzumab treatment (Period 2)</li> <li>Secondary: The proportion of patients with new or enlarging T2 lesions , Annualized relapse rate at Year 2, Assessment of cognition test scores, Additional secondary endpoints, including PK/PD parameters and Quality of Life (QoL) measures.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2017</li> <li>DE: 2026</li> </ul>

# SAR422459 (ABCA4 gene therapy)\*

## Stargardt Disease

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
<b>MS, Neuro, Gene therapy</b>	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Stargardt's Macular Degeneration</b>  TDU13583 NCT01367444	Phase 1 Phase 2/2a  Safety and tolerability of ascending doses of SAR422459 in patients with Stargardt's Macular Degeneration	41	<ul style="list-style-type: none"> <li>Patients with a diagnosis of Stargardt's Macular Degeneration, with at least one pathogenic mutant ABCA4 allele on each chromosome</li> <li>Non-randomized, Single Group assignment, Open-label, ascending doses</li> </ul>	<ul style="list-style-type: none"> <li>Primary: IAE, Change from baseline in ocular safety assessments</li> <li>Secondary: Delay in retinal degeneration</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jun. 2011</li> <li>DE: 2019</li> </ul>
<b>Stargardt's Macular Degeneration</b>  LTS13588 SG1/002/11 NCT01736592	Phase 1/2  Follow-up study of SAR422459 in patients With Stargardt 's Macular Degeneration	46	<ul style="list-style-type: none"> <li>Long Term safety and tolerability of SAR422459 in patients with Stargardt 's Macular Degeneration</li> <li>No ttmt administered, in this LTS only follow-up after ttmt in TDU13583</li> <li>Patients will be followed for 15 years after treatment</li> </ul>	<ul style="list-style-type: none"> <li>Primary: IAE</li> <li>Secondary: Delay in retinal degeneration</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Dec. 2012</li> <li>DE: 2034</li> </ul>

\* Identification of out-licensing partner ongoing

# SAR421869 (Myosin 7A gene therapy)\*

## Usher 1B Syndrome

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
<b>MS, Neuro, Gene therapy</b>	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>UshStat®</b> <b>Usher Syndrome Type 1B</b>  TDU13600 NCT01505062	Phase 1 Phase 2a  Safety and tolerability of ascending doses of subretinal injections of UshStat® in patients with Retinitis Pigmentosa associated with Usher syndrome Type 1B	27	<ul style="list-style-type: none"> <li>Patients with clinical and molecular diagnosis of Retinitis Pigmentosa associated with Usher Syndrome type 1B. With at least one pathogenic mutation in the MYO7A gene on each chromosome</li> <li>Non-randomized, Single Group assignment, Open-label, ascending doses</li> </ul>	<ul style="list-style-type: none"> <li>Primary: IAE</li> <li>Secondary: Delay in retinal degeneration</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Mar. 2012</li> <li>DE: 2021</li> </ul>
<b>UshStat®</b> <b>Usher Syndrome Type 1B</b>  LTS13619 NCT02065011	Phase 2b  Long-Term Safety, Tolerability and Biological Activity of UshStat® in Patients With Usher Syndrome Type 1B	18	<ul style="list-style-type: none"> <li>Long-term follow up of patients who received UshStat® in a previous study (TDU13600)</li> <li>Patients will be followed for 15 years after treatment</li> </ul>	<ul style="list-style-type: none"> <li>Primary: IAE</li> <li>Secondary: Change from baseline in ocular safety assessments, Delay in retinal degeneration</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sep. 2013</li> <li>DE: 2033</li> </ul>

\* Project discontinued and identification of out-licensing partner ongoing

# Venglustat (GCS inhibitor) GBA-PD

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
<b>MS, Neuro, Gene therapy</b>	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>MOVES-PD</b>  ACT14820 NCT02906020	Phase 2  Efficacy, safety, pharmacokinetics, and pharmacodynamics of venglustat (GZ402671) in patients with Parkinson's Disease (PD) carrying a glucocerebrosidase gene (GBA) mutation	243	<ul style="list-style-type: none"> <li>Patients with PD carrying a GBA mutation or other prespecified variant.</li> <li>Randomized, Double-blind, Placebo Controlled, Parallel Assignment</li> <li>Part 1: Increasing dose of venglustat administered once per day. Duration: up to 48 weeks outside Japan, and up to 64 weeks in Japan</li> <li>Part 2: venglustat dose determined in Part 1 administered once a day Duration: 5,6-week screening, 52-week Tx period, 104-week follow-up period and 6-week post Tx observation</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Change from baseline in Movement Disorder Society Unified PD Rating Scale Part II and III score</li> <li>Secondary: Change from baseline in PD Cognitive Rating Scale, Movement Disorder Society Unified PD Rating Scale Part I, II, and III score, Hoehn and Yahr score</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Dec. 2016</li> <li>DE Primary: 2021</li> <li>DE: Full completion: 2022</li> </ul>

# SAR443060 (DNL747) (RIPK1 inhibitor)

## Alzheimer's Disease

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
<b>MS, Neuro, Gene therapy</b>	Vaccines

Study	Description	Patients	Design	Endpoints	Status
DNLI-D-0002 NCT03757325	Phase 1*  Safety, Tolerability, Pharmacokinetics, and Pharmacodynamics of SAR443060(DNL747) in Subjects with Alzheimer's disease	16	<ul style="list-style-type: none"> <li>Patients suffering from Alzheimer's Disease</li> <li>Randomized, Double-blind, Placebo Controlled, Cross-over Assignment</li> <li>SAR443060 and placebo</li> </ul>	<ul style="list-style-type: none"> <li>Primary: AEs and SAEs, lab test abnormalities</li> <li>Secondary: Pharmacokinetics, Pharmacodynamics</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Feb. 2019</li> <li>DE: 2019</li> </ul>

\* Phase 1 study performed by Denali

# SAR443060 (DNL747) (RIPK1 inhibitor)

## Amyotrophic Lateral Sclerosis (ALS)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
<b>MS, Neuro, Gene therapy</b>	Vaccines

Study	Description	Patients	Design	Endpoints	Status
DNLI-D-0003 NCT03757351	Phase 1*  Safety, Tolerability, Pharmacokinetics, and Pharmacodynamics of SAR443060(DNL747) in Subjects with Amyotrophic Lateral Sclerosis	16	<ul style="list-style-type: none"> <li>Patients with a diagnosis of laboratory-supported probable, probable or definite ALS</li> <li>Randomized, Double-blind, Placebo Controlled, Cross-over Assignment</li> <li>SAR443060 and placebo</li> </ul>	<ul style="list-style-type: none"> <li>Primary: AEs and SAEs, lab test abnormalities, clinically significant neurological abnormalities</li> <li>Secondary: Pharmacokinetics, Pharmacodynamics</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Dec. 2018</li> <li>DE: 2019</li> </ul>

\* Phase 1 study performed by Denali



# SAR442168 (BTK inhibitor)

## Multiple Sclerosis (MS)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
<b>MS, Neuro, Gene therapy</b>	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Relapsing MS</b>  DRI15928 NCT03889639	Phase 2b  Dose finding study of SAR442168 in Patients with Relapsing Multiple Sclerosis	120	<ul style="list-style-type: none"> <li>18 to 55 years old Patients with a diagnosis of RMS,</li> <li>Dose-finding study, Randomized, Double-blind, Cross-over Assignment,</li> <li>Total 8 arms: 4 arms with SAR442168 (4 doses tested) 12 weeks Tx with SAR442168 + 4 weeks placebo; and 4 arms with SAR442168 (same 4 doses) but 4 weeks of placebo followed by 12 weeks of SAR442168 (same 4 doses)</li> <li>Duration: 24 weeks: 4-week screening period, 16-week Tx period and 4-week follow-up</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Number of new Gd-enhancing T1 hyperintense lesions,</li> <li>Secondary: Number of new or enlarging T2 lesions, total number of Gd-enhancing T1 hyperintense lesions, AEs.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Apr. 2019</li> <li>DE: 2019</li> </ul>

# Lixisenatide

## Type 2 Diabetes Mellitus (T2DM) Pediatrics

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
TDR14311 NCT02803918	Phase 1  PK and PD of lixisenatide in Pediatric Patients With T2DM not adequately controlled with metformin and/or basal insulin	24	<ul style="list-style-type: none"> <li>Pediatric patients (<math>\geq 10</math> and <math>&lt; 18</math> years old with documented T2DM insufficiently controlled with metformin and/or basal insulin</li> <li>Randomized, double-blind, placebo-controlled, dose escalation (3 ascending repeated doses)</li> <li>Study duration: up to 10 weeks including 6-week Tx period with dose escalation every 2 weeks</li> </ul>	<ul style="list-style-type: none"> <li>Primary: AEs, TEAEs, number of patients with anti-lixisenatide Ab,</li> <li>Secondary: lixisenatide PK parameters, PD ( plasma glucose AUC-0-4,5 hours)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: May 2017</li> <li>DE: 2020</li> </ul>

# iGlarLixi (Glargine/Lixisenatide) Type 2 Diabetes Mellitus (T2DM) (1/3)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Lixilan –O-AP</b>  <b>EFC14943</b> <b>NCT03798054</b>	Phase 3  Efficacy and Safety of iGlarLixi vs Insulin Glargine and Lixisenatide in Patients with Type 2 DM Insufficiently controlled with oral Antidiabetic Drugs	940	<ul style="list-style-type: none"> <li>Patients with T2DM diagnosed for at least 1 year, treated for at least 3 months with metformin alone or in combination with a second oral antidiabetic drug and who are not adequately controlled with this treatment,</li> <li>Randomized, Parallel Group assignment, Open label, Active-controlled,</li> <li>3 arms: iGlarLixi, Lantus (insuline glargine), Lixisenatide</li> <li>Study duration per patient approximately: 31 weeks: up to 6-week screening, 24-week randomized Tx and 3-day post-Tx safety follow-up</li> </ul>	<ul style="list-style-type: none"> <li>Primary: change in HbA1c</li> <li>Secondary: change in PPG, FPG, SMPG, patients with HbA1c &lt; 7% at week 24, patients with HbA1c ≤ 6,5% at week 24, change in body weight, patients with HbA1c &lt; 7% and no body weight gain at week 24, patients with HbA1c &lt; 7% and no body weight gain and no documented symptomatic hypoglycemia at week 24, confirmed hypoglycemia, AEs, anti-lixisenatide antibodies.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Feb. 2019</li> <li>DE: 2021</li> </ul>

# iGlarLixi (Glargine/Lixisenatide) Type 2 Diabetes Mellitus (T2DM) (3/3)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Lixilan-L-CN</b>  <b>EFC14944</b> <b>NCT03798080</b>	Phase 3  Efficacy and Safety of iGlarLixi to Insulin Glargine With or Without Metformin in Patients with T2DM Insufficiently controlled on Basal insulin With or Without Oral Antidiabetic Drug(s)	426	<ul style="list-style-type: none"> <li>Patients with T2DM diagnosed for at least 1 year and treated with basal insulin for at least 6 months</li> <li>Randomized, Parallel Group assignment, Open label, active-controlled</li> <li>2 arms: iGlarLixi, Lantus</li> <li>Study duration per patient approximately: 33 weeks: 2-week screening, 30-week randomized Tx and 3-day post-Tx safety follow-up</li> </ul>	<ul style="list-style-type: none"> <li>Primary: change in HbA1c</li> <li>Secondary: patients with HbA1c &lt; 7% at week 30, patients with HbA1c ≤ 6,5% at week 30, PPG, SMPG profile, patients with HbA1c &lt; 7% and with no body weight gain, change in body weight, patients with HbA1c &lt; 7% and with no body weight gain and no documented symptomatic hypoglycemia at week 30, patients requiring rescue therapy, FPG, confirmed hypoglycemia, AEs, anti-lixisenatide antibodies</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Feb. 2019</li> <li>DE: 2021</li> </ul>

# Efpeglenatide (Long acting GLP1-R agonist) Type 2 Diabetes Mellitus

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>AMPLITUDE-M</b>  <b>EFC14822</b> <b>NCT03353350</b>	Phase 3  Efficacy and Safety of efpeglenatide in Patients with T2DM Inadequately Controlled with Diet and Exercise	400	<ul style="list-style-type: none"> <li>A 56-week, multicenter, double-blind,</li> <li>placebo-controlled, 4 parallel arms, randomized study to demonstrate the superiority of once-weekly injection of efpeglenatide 2, 4, or 6 mg in comparison to placebo in HbA1c change from baseline to Week 30</li> </ul>	Primary: change in HbA1c (%) from Baseline to Week 30 Secondary <ul style="list-style-type: none"> <li>Number of participants with HbA1c &lt;7.0% at Week 30</li> <li>Change from Baseline to Weeks 30 and 56 in fasting plasma glucose</li> <li>Change in HbA1c (%) from Baseline to Week 56</li> <li>Change from Baseline to Weeks 30 and 56 in body weight</li> <li>Number of patients with at least one hypoglycemic event during treatment period</li> <li>Number of hypoglycemic events per participant-year during treatment period</li> <li>Number of patients with AEs</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Dec. 2017</li> <li>DE: 2020</li> </ul>

# Efpeglenatide (Long acting GLP1-R agonist)

## Type 2 Diabetes Mellitus

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>AMPLITUDE-O</b>  <b>EFC14828</b> <b>NCT03496298</b>	Phase 3  Effects of efpeglenatide on Cardiovascular outcomes in high cardiovascular risk T2DM patients	4000	<ul style="list-style-type: none"> <li>T2DM patients with Hb1Ac &gt; 7% with either established cardiovascular disease or renal impairment <math>25 \leq eGFR &lt; 60</math> mL/min and at least one cardiovascular risk factor</li> <li>Randomized, double-blind, placebo-controlled, parallel-group (efpeglenatide 4mg, 6mg, placebo)</li> <li>Estimated study duration per patient up to 36 months approximately</li> <li>Study is event driven; mean follow up of 2,5 years is expected</li> </ul>	<ul style="list-style-type: none"> <li>Primary: time to first Major Adverse Cardiovascular Event (MACE)</li> <li>Secondary: time to first, Expanded Cardiovascular Outcome event, Composite Renal event, AEs</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Apr. 2018</li> <li>DE: 2021</li> </ul>

# Efpeglenatide (Long acting GLP1-R agonist)

## Type 2 Diabetes Mellitus

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>AMPLITUDE-D</b>  <b>EFC14829</b> <b>NCT03684642</b>	Phase 3  Efficacy and safety of efpeglenatide vs duraglutide in patients with T2DM inadequately controlled with metformin	900	<ul style="list-style-type: none"> <li>Patients with T2DM on HbA1c between 7-10% (inclusive) on a stable dose of at least 1500 mg metformin or tolerated maximum dose for at least 3 months prior to screening</li> <li>Randomized, multi-center, open-label for the drug (efpeglenatide and dulaglutide) and double-blind for the doses of efpeglenatide, active-controlled</li> <li>Three arms: efpeglenatide 4, or 6 mg vs dulaglutide</li> <li>Study duration: overall 56 weeks</li> </ul>	<ul style="list-style-type: none"> <li>Primary: change from baseline to week 56 in HbA1c,</li> <li>Secondary:               <ul style="list-style-type: none"> <li>Change from baseline to week 56 in FPG</li> <li>Change from baseline to week 56 in body weight</li> <li>Number of patients with HbA1c &lt; 7% at week 56</li> <li>Number of patients with at least one hypoglycemic event during treatment period</li> <li>Number of hypoglycemic events per participant-year during treatment period</li> <li>Number of patients with Aes</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2018</li> <li>DE: 2020</li> </ul>

# Efpeglenatide (Long acting GLP1-R agonist) Type 2 Diabetes Mellitus

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>AMPLITUDE-L</b>  <b>EFC14893</b> NCT03713684	Phase 3  Efficacy and safety of efpeglenatide vs placebo in patients with T2DM inadequately controlled with basal insulin alone or in combination with oral antidiabetic drug(s)	400	<ul style="list-style-type: none"> <li>Patients with T2DM on HbA1c between 7-10% (inclusive) on basal insulin alone or in combination with oral antidiabetic drug(s) at a stable dose for at least 6 months prior to screening</li> <li>Randomized, multi-center, double-blind, parallel-arms, parallel groups</li> <li>Four arms: efpeglenatide 2, 4, or 6 mg vs placebo</li> <li>Study duration: overall 56 weeks</li> </ul>	<ul style="list-style-type: none"> <li>Primary: change from baseline to week 30 in HbA1c,</li> <li>Secondary:               <ul style="list-style-type: none"> <li>Change from baseline to week 56 HbA1c</li> <li>Change from baseline to week 56 in FPG</li> <li>Number of patients with HbA1c &lt; 7.0% at week 30</li> <li>Change from baseline to week 30 and week 56 in body weight</li> <li>Number of patients with at least one hypoglycemic event during treatment period</li> <li>Number of hypoglycemic events per participant-year during treatment period</li> <li>Number of patients with AEs</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>SSD: 2019</li> <li>DE: 2021</li> </ul>



# Efpeglenatide (Long acting GLP1-R agonist) Type 2 Diabetes Mellitus

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>AMPLITUDE-S</b>  <b>EFC15337</b> <b>NCT03770728</b>	Phase 3  Efficacy and safety of efpeglenatide vs placebo in patients with T2DM inadequately controlled with metformin alone or in combination with sulfonylurea	640	<ul style="list-style-type: none"> <li>Patients with T2DM on HbA1c between 7-10% (inclusive) on metformin with or without sulfonylurea at a stable dose for at least 12 weeks prior to screening</li> <li>Randomized, multi-center, double-blind, parallel-arms, parallel groups</li> <li>Four arms:</li> <li>efpeglenatide 2, 4, or 6 mg, placebo</li> <li>Study duration: 30 weeks,</li> </ul>	<ul style="list-style-type: none"> <li>Primary: change from baseline to week 30 in HbA1c</li> <li>Secondary:               <ul style="list-style-type: none"> <li>Number of patients with HbA1c &lt; 7.0% at week 30</li> <li>Change from baseline to week 56 in FPG</li> <li>Change from baseline to week 30 in body weight</li> <li>Number of patients with at least one hypoglycemic event during treatment period</li> <li>Number of hypoglycemic events per participant-year during treatment period</li> <li>Number of patients with Aes</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>SSD: 2019</li> <li>DE: 2021</li> </ul>

# SAR341402 (Rapid Acting Insulin)

## Type 1 & 2 Diabetes Mellitus

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>GEMELLI 1</b>  <b>EFC15081</b> NCT03211858	Phase 3  Comparison of SAR341402 to NovoLog®/NovoRapid® in adult patients with Diabetes also using Insulin Glargine, with a 6-month safety extension period	597	<ul style="list-style-type: none"> <li>Patients with T1DM or T2DM diagnosed for at least 12 months, who have been treated with a multiple daily injection regimen with NovoLog®/NovoRapid® OR insulin lispro (100 U/mL) in the last 6 months prior to screening visit AND insulin glargine (100 U/mL) in the last 6 months prior to screening visit OR insulin detemir (Levemir®) in the last 12 months prior to screening visit</li> <li>Randomized, Open-label, Parallel-group</li> <li>Active comparator: NovoLog®/NovoRapid®</li> <li>Study duration: 54-week per patient: 2-week screening period, 26-week Tx period, 26-week comparative safety extension, 1-day follow-up period</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Change in HbA1c (%) from baseline to Week 26</li> <li>Secondary: Change in HbA1c, Patients with HbA1c &lt;7%, Change in FPG, Change in mean 24-hour plasma glucose concentration, Change in PPG, Change in 7-point SMPG, Hypoglycemic patients, Hypoglycemic events, Anti-SAR341402/NovoLog/NovoRapid antibody status, Tx-induced, Tx-boosted and Tx-emergent anti-insulin antibodies</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Aug. 2017</li> <li>DE: 2019</li> </ul>

# SAR341402 (Rapid Acting Insulin) Type 1 Diabetes Mellitus

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>GEMELLI X</b>  <b>EFC15178</b> <b>NCT03874715</b>	Phase 3  Comparison of Pharmacokinetics and Immunogenicity of Alternating Use of SAR341402 to NovoLog® Versus Continuous Use of NovoLog® in Patients with T1DM also using Insulin Glargine	184	<ul style="list-style-type: none"> <li>Patients with T1DM, on continuous insulin Tx for at least 12 months prior to screening,</li> <li>Randomized, Open-label, Parallel-group</li> <li>2 arms: experimental: alternative use of SAR341402 and NovoLog 4 cycles of 4 weeks each, on top of lantus; Active comparator: NovoLog for 16 weeks on top of lantus</li> <li>Study duration: 18-week + 1 day, per patient: 2-week screening period, 16-week Tx period, 1-day post-Tx follow-up period.</li> </ul>	<ul style="list-style-type: none"> <li>Primary: AUClast, AUC and Cmax of SAR341402 and NovoLog (similarity),</li> <li>Secondary: Immunogenicity, hypoglycemic event, AEs, comparison of PK parameters between the to arms.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: 2019</li> <li>DE: 2019</li> </ul>

# Alirocumab (anti-PCSK-9 mAb) Heterozygous Familial Hypercholesterolemia (HeFH) (1/2)

Immuno-inflammation	Diabetes
Oncology	<b>Cardiovascular</b>
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>ODYSSEY KIDS</b>  DFI14223 NCT02890992	Phase 2  Efficacy and safety of alirocumab in children and adolescents with heFH followed by an extension phase	42	<ul style="list-style-type: none"> <li>Patients with diagnosis of HeFH through genotyping or clinical criteria., 8 to 17 years old, treated with optimal dose of statin +/- other LMT(s) or non-statin LMT(s) if statin intolerant at stable dose for at least 4 weeks prior to screening lipid sampling</li> <li>Open-Label, Sequential, Repeated Dose-Finding Study (6 doses tested)</li> <li>Background therapies: optimal dose of statin with or without other LMT or non-statin LMT if statin intolerant at stable dose</li> <li>Study duration: approximately 16-23 weeks: up to 6 (+1) weeks screening period, 8 weeks open-label Tx period, 6 to 8 weeks follow-up period</li> </ul>	<ul style="list-style-type: none"> <li>Primary: % change in calculated LDL-C from baseline to week 8</li> <li>Secondary: Absolute change in calculated LDL-C, % change in APO B (Apo B), % change in non-high density LP cholesterol (non HDL-C), % change in Total-C, in LP, in TG, in HDL-C, in Apo A-1, Absolute change in Apo B, in non-HDL-C, in Total C, in Lp(a), in TG, in HDL-C, in Apo A-1, in ratio apo B/Apo A-1, % of participants achieving a calculated LDL-C level lower than 130 mg/dL (3.37 mmol/L), % of participants achieving a calculated LDL-C level lower than 110 mg/dL (2.84 mmol/L)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sep. 2016</li> <li>DE: 2019</li> </ul>

# Alirocumab (anti-PCSK-9 mAb) Heterozygous Familial Hypercholesterolemia (HeFH) (2/2)

Immuno-inflammation	Diabetes
Oncology	<b>Cardiovascular</b>
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>HeFH in Children and Adolescents</b>  EFC14643 NCT03510884	Phase 3  Efficacy and safety of alirocumab in children and adolescents with HeFH	150	<ul style="list-style-type: none"> <li>Patients with diagnosis of HeFH, 8 to 17 years old, treated with optimal dose of statin +/- other LMT(s) or non-statin LMT(s) if statin intolerant at stable dose</li> <li>Randomized, double-Blind, placebo-controlled followed by an open label treatment period (2 dose tested)</li> <li>Study duration: approximately 110 weeks (run-in period, if needed,: up to 4 weeks [+2 days], screening period, up to 2 weeks (+5 days), double-blind treatment period: 24 weeks, open label treatment: 80 weeks)</li> </ul>	<ul style="list-style-type: none"> <li>Primary: % change in LDL-C from baseline to week 24</li> <li>Secondary: % change in LDL-C, % change in APO B (Apo B), % change in non-high density LP cholesterol (non HDL-C), % change in Total-C, patients with LDL-C level lower than 130 mg/dL (3.37 mmol/L), patients with LDL-C level lower than 110 mg/dL (2.84 mmol/L), % change in Lp(a), in HDL-C, in TG and in ApoA-1. Number of AE, maturing cognition (Cogstate battery test) and pubertal development (Tanner stage)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: May 2018</li> <li>DE: 2022</li> </ul>

# Alirocumab (anti-PCSK-9 mAb) Homozygous Familial Hypercholesterolemia (HoFH) (1/2)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>ODYSSEY HoFH Regeneron</b>  R727-CL-1628 NCT03156621	Phase 3  Evaluate the efficacy and safety of alirocumab in patients with HoFH	74	<ul style="list-style-type: none"> <li>Diagnosis of HoFH by specific genotype or clinical criteria (all patients on LDL apheresis must be diagnosed based on genotype)</li> <li>Randomized, Double-Blind, Placebo-Controlled, Parallel-Group, 2-Arm (alirocumab Q2W, placebo)</li> <li>Study duration: 12-week double-blind Tx period followed by 10-week alirocumab open-label Tx period</li> </ul>	<ul style="list-style-type: none"> <li>Primary: % change in LDL-C ITT population from baseline to week 12</li> <li>Secondary: % change in Apo B, % change in non-HDL-C, % change in TC, % change in LP(a), % change in HDL-C, % change in fasting TG, % change in Apo A-1, % change in LDL-C, % change in LDL-C, ApoB B, non-HDL-C, TC, Lp(a), HDL-C, fasting TG, Apo A-1 / (m)ITT population, Absolute change in the ratio of Apo B/Apo A-1 (ITT), % of patients with ≥15% reduction in LDL-C, % of patients with ≥30% reduction in LDL-C, % of patients with ≥50% reduction in LDL-C, % of patients with ≥15% reduction, ≥30% reduction, and ≥50% reduction in LDL-C</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2017</li> <li>DE: 2020</li> </ul>

# Alirocumab (anti-PCSK-9 mAb) Homozygous Familial Hypercholesterolemia (HoFH) (2/2)

Immuno-inflammation	Diabetes
Oncology	<b>Cardiovascular</b>
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>HoFH Children and Adolescents</b>  EFC14660 NCT03510715	Phase 3  Efficacy and safety of alirocumab in children and adolescents with HoFH	18	<ul style="list-style-type: none"> <li>Patients with diagnosis of HoFH, 8 to 17 years old, treated with optimal dose of statin +/- other LMT(s) or non-statin LMT(s) if statin intolerant at stable dose</li> <li>Single group assignment, open label (2 doses)</li> <li>Study duration: up to 62 weeks, includes (if needed) a run-in period of up to 4 weeks, a screening period of up to 2 weeks, a treatment period of up to 48 weeks, and a follow-up of 8 weeks</li> </ul>	<ul style="list-style-type: none"> <li>Primary: % change in calculated LDL-C from baseline to week 12</li> <li>Secondary: % change in LDL-C, % change in APO B (Apo B), % change in non-high density LP cholesterol (non HDL-C), % change in Total-C, % change in Lp(a), in HDL-C, in TG and in ApoA-1. Absolute change in LDL-C, number of patients with AE and pubertal development (Tanner stage)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sep. 2018</li> <li>DE: 2020</li> </ul>

# Alirocumab (anti-PCSK-9 mAb) Neurocognitive Evaluation (1/2)

Immuno-inflammation	Diabetes
Oncology	<b>Cardiovascular</b>
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Neurocognitive Evaluation Regeneron</b>  R727-CL-1532 NCT02957682	Phase 4  Evaluate the effect of alirocumab on Neurocognitive function in patients with HeFH and non-HeFH at high and very high cardiovascular risk	2176	<ul style="list-style-type: none"> <li>Patients with hypercholesterolemia and established coronary heart disease (CHD) or CHD risk equivalents who are not adequately controlled with a maximally tolerated daily dose of statin at a stable dose for at least 4 weeks prior to the screening visit</li> <li>Randomized, Double-Blind, Placebo-Controlled, Parallel-Group, 2-Arm (alirocumab Q2W, placebo, 1:1)</li> <li>Study duration: 3 weeks screening, 96-weeks double-blind Tx period</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Change in Cambridge Neuropsychological Test Automated Battery (CANTAB) cognitive domain Spatial Working Memory (SWM) strategy score from baseline to week 96.</li> <li>Secondary (efficacy): % change in calculated LDL-C, % change in Apo B, in non-HDL-C, in TC, in Lp(a), in HDL-C, in fasting TG, in Apo A-1, % of patients reaching calculated LDL-C &lt;70 mg/dL (1.81 mmol/L) and LDL-C &lt; 50mg/dL(1.29 mmol/L).</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Nov 2016</li> <li>DE: 2020</li> </ul>



# Alirocumab (anti-PCSK-9 mAb) Neurocognitive Evaluation (2/2)

Immuno-inflammation	Diabetes
Oncology	<b>Cardiovascular</b>
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Long Term Safety Study of Praluent Regeneron</b>  R727-CL-1609 NCT03694197	Phase 4  Evaluate the long term safety of PRALUENT in participants with heterozygous familial hypercholesterolemia (heFH) or non-familial hypercholesterolemia (FH) patients at high or very high cardiovascular risk who completed the neurocognitive function study (R727-CL-1532: NCT02957682)	1600	<ul style="list-style-type: none"> <li>Participants randomized into the neurocognitive function study (R727-CL-1532) who completed treatment and the end of study (EOS) visit with no premature or permanent discontinuation of study drug</li> <li>Open Label, up to 192 weeks</li> <li>Drug: Praluent</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Incidence of adverse events (AEs) after first administration of study drug through the last dose of study drug plus 2 weeks</li> <li>Secondary: Changes in LDL-C and other lipid parameters, changes in gonadal steroid hormones</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sep 2018</li> <li>DE: 2023</li> </ul>

# Fitusiran (siRNA targeting Antithrombin/AT3) Hemophilia A & B (1/6)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	<b>Rare Blood Disorders</b>
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Hemophilia A or B</b>  <b>LTE14762</b> <b>ALN- AT3SC-002</b> <b>NCT02554773</b>	Phase 1/2 Hemophilia A Hemophilia B  Long term Safety and Efficacy of Fitusiran in patients with moderate or severe Hemophilia A or B, who have previously participated in ALN-AT3SC-001	34	<ul style="list-style-type: none"> <li>In male patients (≥ 18 years old)</li> <li>Single Group assignment, Open-label</li> <li>Subjects are administered SC fitusiran once every month for approximately 4 years.</li> </ul>	<ul style="list-style-type: none"> <li>Primary: incidence of treatment-emergent AEs, SAEs, and AEs leading to study drug discontinuation</li> <li>Secondary: Annualized bleed rate, time intervals between bleeding episodes, Weight-adjusted consumption of FVIII, FIX, or BPA, QOL assessed by an EQ-5D questionnaire and HAEM-A-QoL, Antithrombin levels, Thrombin Generation levels</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sep. 2015</li> <li>DE: 2024</li> </ul>

# Fitusiran (siRNA targeting Antithrombin/AT3) Hemophilia A & B (2/6)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>ATLAS-INH</b>  <b>EFC14768</b> <b>ALN- AT3SC-003</b> <b>NCT03417102</b>	Phase 3 Hemophilia A Hemophilia B  Efficacy and Safety of Fitusiran in patients with Hemophilia A or B, with Inhibitory Antibodies to Factor VIII or IX, who are not receiving prophylactic treatment	54	<ul style="list-style-type: none"> <li>In patients (Males <math>\geq</math> 12 years old)</li> <li>Randomized in a 2:1 ratio</li> <li>- Patients randomized to the fitusiran treatment arm will receive open label fitusiran as an SC injection once monthly, for a total of 9 months</li> <li>- Patients in on-demand arm will receive on-demand BPA therapy per Investigator discretion to treat bleeding episodes</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Annualized Bleeding Rate (ABR) in the efficacy period</li> <li>Secondary: ABR in the treatment period, Annualized spontaneous bleeding rate in the efficacy period, Annualized joint bleeding rate in the efficacy period, Change in HAEM-A-QOL score in the treatment period, ABR in the onset period</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Mar. 2018</li> <li>DE: 2020</li> </ul>

# Fitusiran (siRNA targeting Antithrombin/AT3) Hemophilia A & B (3/6)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>ATLAS-A/B</b>  <b>EFC14769</b> <b>ALN- AT3SC-004</b> <b>NCT03417245</b>	Phase 3 Hemophilia A Hemophilia B  Efficacy and Safety of Fitusiran in patients with Hemophilia A or B, without Inhibitory Antibodies to Factor VIII or IX, who are not receiving prophylactic treatment	120	<ul style="list-style-type: none"> <li>In patients (Males <math>\geq</math> 12 years old),</li> <li>Randomized in a 2:1 ratio:               <ul style="list-style-type: none"> <li>Patients randomized to the fitusiran treatment arm will receive open-label fitusiran once monthly for a total of 9 months;</li> <li>Patients in the on-demand arm will receive on-demand factor concentrate therapy per Investigator discretion to treat bleeding episodes</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Primary: Annualized Bleeding Rate (ABR) in the efficacy period</li> <li>Secondary: ABR in the treatment period, Annualized spontaneous bleeding rate in the efficacy period, Annualized joint bleeding rate in the efficacy period, Change in HAEM-A-QOL score in the treatment period, ABR in the onset period</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jul. 2018</li> <li>DE: 2020</li> </ul>

# Fitusiran (siRNA targeting Antithrombin/AT3) Hemophilia A & B (4/6)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>ATLAS-PPX</b>  <b>EFC15110</b> <b>ALN- AT3SC-009</b> <b>NCT03549871</b>	Phase 3 Hemophilia A Hemophilia B  Switching study to describe the Efficacy and safety of Fitusiran prophylaxis in Patients with Hemophilia A or B, with or without inhibitory antibodies to factor VIII (FVIII) or factor IX, and previously receiving Factor or Bypassing Agent Prophylaxis	70	<ul style="list-style-type: none"> <li>In patients (males <math>\geq</math> 12 years old),</li> <li>Single Group assignment, Open-label</li> <li>The study has 3 periods:               <ul style="list-style-type: none"> <li>6-Month factor/bypassing agent prophylaxis period in which patients will continue their pre study, regularly scheduled prophylaxis regimen with factor concentrates or bypassing agents</li> <li>1-Month onset period in which patients receive their first dose of fitusiran while continuing their factor/bypassing agent prophylaxis for up to 14 days</li> <li>6-Month fitusiran efficacy period in which patients receive fitusiran as a once monthly prophylaxis</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Primary: annualized bleeding rate (ABR) in the fitusiran efficacy period and the factor or BPA in prophylaxis period</li> <li>Secondary: annualized spontaneous bleeding rate and annualized joint bleed rate in the fitusiran efficacy period and the factor or BPA in prophylaxis period, Quality of Life (QOL) measured by Haem-A-QOL Questionnaire, ABR in the fitusiran onset period (1 month), ABR in the fitusiran Tx period (7 months)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sept 2018</li> <li>DE: 2021</li> </ul>

# Fitusiran (siRNA targeting Antithrombin/AT3) Hemophilia A & B (5/6)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	<b>Rare Blood Disorders</b>
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>LTE15174</b> <b>ALN-AT3SC-005</b> <b>NCT03754790</b>	<p>Phase 3 Hemophilia A Hemophilia B</p> <p>Long-term Safety and Efficacy of Fitusiran in Patients with Hemophilia A or B With or Without Inhibitory Antibodies to Factor VIII or X , who have previously participated in any of the phases 3 studies with fitusiran</p>	244	<ul style="list-style-type: none"> <li>In patients (≥ 12 years old),</li> <li>Single Group assignment, Open-label</li> <li>Study duration: the study consists in screening period up to 30 days, a 48-month open label Tx period and a follow-up period up to 6 months after the last dose of fitusiran.</li> </ul>	<ul style="list-style-type: none"> <li>Primary: Incidence, severity, relatedness, and seriousness of AEs, and laboratory assessments,</li> <li>Secondary: annualized bleeding rate (ABR), annualized spontaneous bleeding rate and annualized joint bleed rate in the Tx period, Quality of Life (QOL) measured by HAEM-A-QOL Questionnaire</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jan. 2019</li> <li>DE: 2024</li> </ul>

# Fitusiran (siRNA targeting Antithrombin/AT3) Hemophilia A & B (Pediatric) (6/6)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>ATLAS-PEDS</b> Hemophilia A Hemophilia B  <b>ALN-AT3SC-005</b> <b>NCT03754790</b>	Phase 3  An Open-label, Multinational Study of Fitusiran Prophylaxis in Male Pediatric Subjects Aged 1 to Less Than 12 Years With Hemophilia A or B	12	<ul style="list-style-type: none"> <li>• Male, aged 1 to &lt;12 years,</li> <li>• Single Group assignment, Open-label</li> <li>• Study duration per participant is approximately 160 weeks, including a 12-week fitusiran efficacy period</li> </ul>	<ul style="list-style-type: none"> <li>• Primary: Lowering of plasma antithrombin (AT) activity level [ Time Frame: Day 1 to Day 85 ]</li> <li>• Secondary: Number of participants reported with adverse events , pharmacokinetics (PK): Cmax, Tmax, Ctrough.</li> </ul>	<ul style="list-style-type: none"> <li>• SSD: 2019</li> <li>• DE: 2022</li> </ul>

# Sutimlimab (BIVV009 - Anti Complement C1s mAb) Complement Mediated Disorders

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	<b>Rare Blood Disorders</b>
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>BIVV009-01</b> NCT02502903	Phase 1  Safety, Tolerability and Activity of BIVV009 in Healthy Volunteers and Patients with Complement-Mediated Disorders	122	<ul style="list-style-type: none"> <li>• Healthy male and female volunteers,</li> <li>• Randomized, Double-blind, Parallel assignment,</li> <li>• Part A : single ascending dose (7 BIVV009 dose levels) or placebo</li> <li>• Part B: Multiple ascending dose (2 BIVV009 dose levels) or placebo,</li> <li>• Part C: Multiple dose in a single cohort of patients with various complement-mediated disorders,</li> <li>• Part E: Multiple dose in a single cohort of patients with CAD previously treated by BIVV009.</li> </ul>	<ul style="list-style-type: none"> <li>• Primary: AEs,</li> <li>• Secondary: PK, classical pathway complement system activity, complement system-related biomarkers, coagulation system-related biomarkers, disease-related biomarkers.</li> </ul>	<ul style="list-style-type: none"> <li>• SSD: 2015</li> <li>• DE: 2021</li> </ul>



# Sutimlimab (BIVV009 - Anti Complement C1s mAb) Cold Agglutinin Disease (CAgD) (1/2)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Cardinal</b>  <b>BIVV009-03</b> NCT03347396	Phase 3  Efficacy and Safety of BIVV009 in patients with Primary Cold Agglutinin Disease with a recent history of Blood Transfusion	24	<ul style="list-style-type: none"> <li>Patients suffering from primary cold agglutinin disease (CAD) with at least one blood transfusion within 6 months of enrollment</li> <li>Open-label, Single Group assignment</li> <li>Part A (required for registration): biweekly IV infusion of BIVV009 up to week 26</li> <li>Part B: long-term safety and durability of response extension phase for patients having completed Part A, BIVV009 dosing for up to 1 year after Part A LPO</li> </ul>	<ul style="list-style-type: none"> <li>Primary (Part A): response rate (<math>\geq 2\text{g/dl}</math> increase in Hgb OR Hgb <math>&gt;12\text{g/dl}</math> AND no transfusion required);</li> <li>Secondary (Part A): change in bilirubin, change in FACIT-Fatigue Scale Score, change in LDH, number of transfusions and blood units and change in Hgb;</li> <li>Part B: TEAEs, hemoglobin, bilirubin, FACIT-F, LDH, transfusion, haptoglobin, HRU.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Nov. 2017</li> <li>DE: Part A: 2019, Part B: 2020</li> </ul>

# Sutimlimab (BIVV009 - Anti Complement C1s mAb) Cold Agglutinin Disease (CAgD) (2/2)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Cadenza</b>  <b>BIVV009-04</b> NCT03347422	Phase 3  Efficacy and Safety of BIVV009 in patients with Primary Cold Agglutinin Disease without a recent history of Blood Transfusion	40	<ul style="list-style-type: none"> <li>Patients suffering from primary cold agglutinin disease (CAD) with no blood transfusions in prior 6 months and no more than 1 blood transfusion in the prior 1 year</li> <li>Randomized, double-blind, placebo controlled</li> <li>Part A: biweekly IV infusion of BIVV009 or placebo (up to 26 weeks)</li> <li>Part B: long-term safety and durability of response extension phase for patients having completed Part A. Blinded cross-over loading doses to allow all participants to receive BIVV009 while maintaining Part A blinding. BIVV009 dosing for up to 1 year after Part A LPO</li> </ul>	<ul style="list-style-type: none"> <li>Primary (Part A); response rate (<math>\geq 1.5\text{g/dl}</math> increase in Hgb AND no transfusion required);</li> <li>Secondary (Part A): change in Hgb, change in bilirubin, change in FACIT-Fatigue Scale Score, change in LDH, incidence of symptomatic anemia symptoms</li> <li>Part B: TEAEs, hemoglobin, bilirubin, FACIT-F, LDH, transfusion, haptoglobin, HRU.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Nov. 2017</li> <li>DE: : Part A: 2020, Part B: 2021</li> </ul>

# Sutimlimab (BIVV009 - Anti Complement C1s mAb) Chronic Immune Thrombocytopenia (ITP)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>TNT009-201/ BIVV009-201 TDR16218 NCT03275454</b>	Phase 1  Safety, PK and PD of BIVV009 in patients with Chronic Immune Thrombocytopenia (ITP)	16	<ul style="list-style-type: none"> <li>Patients suffering from chronic ITP. Open-label, Single Group assignment</li> <li>Part A: Bi-weekly IV infusion of BIVV009 up to 21 weeks</li> <li>Part B: long-term treatment period (for 52 weeks) for patients who have had benefit from BIVV009 during Part A; patients undergo monitored washout from BIVV009 at end of Part A and enter Part B upon return of thrombocytopenia.</li> </ul>	<ul style="list-style-type: none"> <li>Primary: TEAEs, premature study terminations, Clinical Laboratory Abnormalities</li> <li>Efficacy endpoints: Part A &amp; B: Change in platelet count; independence from additional ITP therapy; Number of patient who achieve complete response (CR), response (R); Duration of CR and R; Time to increased platelet count &gt; 30, 50, and 100 x 10<sup>9</sup>/L; number of patients with loss of CR, loss of R,</li> <li>PK/PD endpoints: PK parameters, anti-drug antibodies, PD measures (Complement factor measures, thrombopoietin levels, immature platelet fraction, platelet autoantibody/autoantigen)</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Aug. 2017</li> <li>DE: 2021</li> </ul>

# ST400 (gene-editing technology) Beta-thalassemia

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	<b>Rare Blood Disorders</b>
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Transfusion-dependent Beta-thalassemia (TDT)</b>  <b>ST-400-01</b> <b>NCT03432364</b>	Phase 1/2  Safety, Tolerability and Efficacy of ST400 Autologous Hematopoietic Stem Cell transplant for Tx of Transfusion-Dependent Beta-thalassemia (TDT)	6	<ul style="list-style-type: none"> <li>Patients with clinical diagnosis of TDT with at least 8 documented RBC transfusion events per year and confirmed diagnosis of beta-thalassemia (genetic testing)</li> <li>Open-Label, Single Group Assignment, single dose</li> </ul>	<ul style="list-style-type: none"> <li>Primary: AEs and SAEs</li> <li>Secondary: change from baseline in Hb fractions measurements and % HbF, change in frequency and volume of packed red blood cells (PRBC) transfusions</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Mar. 2018</li> <li>DE: Primary: 2020, Full completion: 2022</li> </ul>

# BIVV003 (gene-editing technology) Sickle Cell Disease (SCD)

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<p><b>PRECIZN-1</b></p> <p><b>003SCD101</b> <b>NCT03653247</b></p>	<p>Phase 1/2</p> <p>Safety, Tolerability and Efficacy of BIVV003 for Autologous Hematopoietic Stem Cell Transplantation in Patients With severe Sickle Cell Disease</p>	8	<ul style="list-style-type: none"> <li>Patients suffering from severe SCD</li> <li>Open-Label, Single Group Assignment, single dose</li> </ul>	<ul style="list-style-type: none"> <li>Primary: % of patients alive post-transplantation at D100, at week 52, at week 104, % of patients with successful engraftment, AEs, SAEs,</li> <li>Secondary: CD34+HSPC yield from Plerixafor stem cell mobilization, % of patients with sufficient stem cell mobilization, yield of ZFN-edited IP, time to initial neutrophil recovery, time to platelet recovery, % of patients with maintenance of absolute neutrophil count <math>\geq</math> 500/mcL, % of patients with maintenance of platelets count <math>\geq</math> 50 000/mcL, change from baseline in HbF, in %F, in HbS, in REC, in LDH, in haptoglobin and bilirubin, QoL</li> </ul>	<ul style="list-style-type: none"> <li>SSD: 2019</li> <li>DE: 2022</li> </ul>

# Caplacizumab - Cablivi™

## Acquired Thrombotic Thrombocytopenic Purpura

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	<b>Rare Blood Disorders</b>
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
<b>Post-HERCULES</b>  <b>ALX0681-C302</b> <b>NCT02878603</b>	Phase 3  Evaluate the long-term safety and efficacy of caplacizumab, evaluate safety and efficacy of repeated use of caplacizumab and characterize the long-term impact of acquired Thrombotic Thrombocytopenic Purpura (aTTP).	104	<ul style="list-style-type: none"> <li>Prospective follow-up for adult patients (18 years and older) with acquired TTP who completed HERCULES</li> <li>Single group assignment, open label</li> <li>Study duration: Initial IV loading dose, followed by daily SC caplacizumab injections for the duration of daily PEX and 30 days thereafter. Treatment may be extended for a maximum of 4 weeks.</li> </ul>	<ul style="list-style-type: none"> <li>Primary: proportion of subjects with TTP-related events, # of and time to TTP-related events, mortality rate, proportion of subjects with, # of and time to recurrence of disease, proportion of subjects with reported major thromboembolic events, # of and time to major thromboembolic events, cognitive function, quality of life assessment and immunogenicity.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Aug. 2016</li> <li>DE: 2020</li> </ul>

# Dengue Vaccine

## Co-administration w/ Tdap booster

### Asia Pacific Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT02992418	Phase 3  Study of a Tetravalent Dengue Vaccine Administered Concomitantly or Sequentially With Adacel® in Healthy Subjects	688	<ul style="list-style-type: none"> <li>Randomized, multicenter, open-label study in 688 subjects aged from 9 to 60 years</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and safety of CYD dengue vaccine and Tdap vaccine when both vaccines are administered concomitantly or sequentially</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Dec. 2016</li> <li>DE: 2020</li> </ul>

# Dengue Vaccine

## Different schedules

### Asia Pacific, Latin America Regions

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT02628444	Phase 2a  Immunogenicity and Safety of 3-Dose and Booster Dose of Tetravalent Dengue Vaccine in Healthy Subjects 9 to 50 Years of Age	1050	<ul style="list-style-type: none"> <li>Two-stage, multi-national, multi-center, observer-blind, randomized, placebo-controlled Phase II immunogenicity and safety study of tetravalent dengue vaccine</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and safety of 3-dose primary series and booster dose</li> </ul>	<ul style="list-style-type: none"> <li>SSD: May. 2016</li> <li>DE: 2020</li> </ul>



# Dengue Vaccine

## Booster dose

### Latin America Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT02623725	Phase 2b  Study of a Booster Dose of a Tetravalent Dengue Vaccine in Subjects Who Previously Completed the 3-dose Schedule	251	<ul style="list-style-type: none"> <li>Multi-center, observer-blind, randomized, placebo-controlled, Phase II trial</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and safety of a booster dose</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Apr. 2016</li> <li>DE: 2019</li> </ul>

# Rabies Vaccine

## Verorab

### Asia Pacific Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT01622062	Phase 3  Immunogenicity and Safety of Verorab® in a "One-week" Intradermal Post-exposure Prophylaxis Regimen	600	<ul style="list-style-type: none"> <li>Open-label, randomized, controlled, multi-center, multi-country trial</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and safety of Verorab® in a "One-week" intradermal post-exposure prophylaxis regimen</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jun. 2012</li> <li>DE: 2019</li> </ul>

# Meninge Vaccine

## MenQuadfi

### Greater Europe, Latin America, Asia Pacific Regions

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03205371	Phase 3  Immunogenicity and Safety of a Meningococcal Conjugate Vaccine Given Concomitantly With Other Vaccines in Toddlers	1183	<ul style="list-style-type: none"><li>Open-label (immunology laboratory technicians will be blinded to group assignment), randomized, parallel-group, active-controlled, multi-center study</li></ul>	<ul style="list-style-type: none"><li>Immunogenicity and safety</li></ul>	<ul style="list-style-type: none"><li>SSD: Nov. 2016</li><li>DE: 2019</li></ul>

# Dengue Vaccine Booster Asia Pacific Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT02824198	Phase 2b  Immunogenicity and Safety of a Tetravalent Dengue Vaccine Booster Injection in Subjects Who Previously Completed a 3-dose Schedule	260	<ul style="list-style-type: none"><li>Multi-center, observer-blind, randomized, placebo-controlled, Phase II non-inferiority trial</li></ul>	<ul style="list-style-type: none"><li>Immunogenicity and safety of a booster dose</li></ul>	<ul style="list-style-type: none"><li>SSD: Jul. 2016</li><li>DE: 2019</li></ul>

# Dengue Vaccine

## Co-administration w/ HPV

### Latin America Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT02979535	Phase 3b  Immunogenicity and Safety of a Tetravalent Dengue Vaccine Administered Concomitantly or Sequentially With Cervarix®	480	<ul style="list-style-type: none"> <li>Randomized, open-label, multicenter study</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and safety of a Tetravalent Dengue Vaccine administered concomitantly or sequentially with Cervarix®</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Nov. 2016</li> <li>DE: 2019</li> </ul>

# Dengue Vaccine

## Co-administration w/ HPV

### Asia Pacific Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT02993757	Phase 3b  Immunogenicity and Safety of a Tetravalent Dengue Vaccine Administered Concomitantly or Sequentially With Gardasil®	528	<ul style="list-style-type: none"> <li>Randomized, open-label, multicenter study</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and safety of a Tetravalent Dengue Vaccine administered concomitantly or sequentially with Gardasil®</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Dec. 2016</li> <li>DE: 2020</li> </ul>

# AcP Primary Africa and Middle East Regions

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT02817451	Phase 4  DTaP-IPV-HB-PRP-T Combined Vaccine as a Primary Series and a 2nd Year of Life Booster in HIV-Exposed Infected and Uninfected	100	<ul style="list-style-type: none"> <li>multicenter, open-label, two-arm study</li> </ul>	<ul style="list-style-type: none"> <li>immunogenicity and safety of 3-dose primary series and booster dose</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jul. 2016</li> <li>DE: 2019</li> </ul>

# Dengue Vaccine Asia Pacific

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT02827162	<p>Exploratory Phase</p> <p>Association of Host Genetics With Vaccine Efficacy and Study of Immune Correlates of Risk From a Tetravalent Dengue Vaccine</p>	334	<ul style="list-style-type: none"> <li>Exploratory, single-center study</li> </ul>	<ul style="list-style-type: none"> <li>Host generic analysis and correlate of protection</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Mar. 2016</li> <li>DE: 2019</li> </ul>



# Dengue Vaccine

## Latin America, Asia Pacific Regions

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT02948933	<p>Epidemiology Phase</p> <p>Cohort Event Monitoring for Dengvaxia®, CYD-TDV Dengue Vaccine</p>	30 000	<ul style="list-style-type: none"> <li>Observational</li> </ul>	<ul style="list-style-type: none"> <li>Incidence of selected AEs and SAEs, occurrence and frequency of hospitalized dengue disease and SAEs leading to hospitalization or death</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Dec. 2016</li> <li>DE: 2025</li> </ul>

# AcP Primary Vaccine North America Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT00855855	Phase 4  Surveillance Program to Determine Product Specific Rates of Invasive Hib Disease	510 000	<ul style="list-style-type: none"><li>Observational</li></ul>	<ul style="list-style-type: none"><li>Surveillance for Hib disease.</li></ul>	<ul style="list-style-type: none"><li>SSD: Feb. 2009</li><li>DE: 2020</li></ul>

# AcP Primary Vaccine North America Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT01129362	<p>Phase 4</p> <p>Rates of Pertussis Disease Among Persons Receiving Pentacel® or Other Pertussis Vaccines</p>	1 538	<ul style="list-style-type: none"> <li>Observational</li> </ul>	<ul style="list-style-type: none"> <li>Occurrence of pertussis disease, as determined by the Wisconsin Division of Public Health (WDPH).</li> </ul>	<ul style="list-style-type: none"> <li>SSD: May 2010</li> <li>DE: 2019</li> </ul>

# Meninge Vaccine Asia Pacific Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT02864927	Phase 4  Postmarketing Surveillance Study for Use of Menactra® in the Republic of Korea	600	<ul style="list-style-type: none"> <li>Open, Multi-center, observational, active safety surveillance study</li> </ul>	<ul style="list-style-type: none"> <li>Occurrence of solicited and unsolicited events</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jul. 2016</li> <li>DE: 2020</li> </ul>

# New Pertussis Vaccine

## Latin America Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03147898	Phase Epidemiology  Observational Study Describing the Immune Profile Induced By Pertussis Vaccines	90	<ul style="list-style-type: none"> <li>Observational, multicenter trial</li> </ul>	<ul style="list-style-type: none"> <li>Immune response to booster dose</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Apr. 2017</li> <li>DE: 2019</li> </ul>

# Flu seasonal Vaccine North America Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT01945424	Phase Epidemiology  Sanofi Pasteur Quadrivalent Influenza Vaccine (QIV) Pregnancy Registry	500	<ul style="list-style-type: none"><li>Observational</li></ul>	<ul style="list-style-type: none"><li>Pregnancy registry</li></ul>	<ul style="list-style-type: none"><li>SSD: Aug.2013</li><li>DE: 2020</li></ul>

# Japanese Encephalitis Vaccine Asia Pacific Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT02933710	Phase 4  Postmarketing Surveillance Study for IMOJEV® in Republic of Korea	50	<ul style="list-style-type: none"> <li>Multi-center, open, observational, active safety surveillance study.</li> </ul>	<ul style="list-style-type: none"> <li>Occurrence of solicited and unsolicited events</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jul. 2016</li> <li>DE: 2019</li> </ul>

# Meninge Vaccine MenQuadfi - Booster Greater Europe Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03476135	Phase 3  Immunogenicity and safety booster dose in subjects previously vaccinated as toddlers	91	<ul style="list-style-type: none"> <li>Open label, multicenter study to describe immune persistence of the priming dose and immuno and safety of booster dose</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and safety</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Feb. 2018</li> <li>DE: 2019</li> </ul>



# Meninge Vaccine

## MenQuadfi - Co administration

### North America Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03537508	Phase 3 Safety and Immunogenicity for Infants, with co administration with routine pediatric vaccines	2475	Modified double blind study, randomized, parallel groups, active controlled, multicenter	<ul style="list-style-type: none"> <li>Immunogenicity and safety</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Apr. 2018</li> <li>DE: 2023</li> </ul>

# Meninge Vaccine

## MenQuadfi - Alternative schedules

### Greater Europe Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03547271	Phase 3 Safety and Immunogenicity for alternative schedules in infants	1540	<ul style="list-style-type: none"> <li>Partially modified double blind, randomized, parallel group, active controlled, multi center</li> </ul>	<ul style="list-style-type: none"> <li>immunogenicity and safety</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Dec. 2018</li> <li>DE: 2023</li> </ul>

# Flu seasonal Vaccine North America Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03617523	Phase 4  Safety and immunogenicity Fluzone Quadrivalent, Flublock Quadrivalent and Fluzone High Dose	240	<ul style="list-style-type: none"> <li>Interventional, open label, randomized,</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and safety</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Sep. 2018</li> <li>DE: 2019</li> </ul>

# Meninge Vaccine

## MenQuadfi

### Latin America, Asia Pacific, Greater Europe Regions

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03630705	Phase 3 Safety and immunogenicity 3 dose schedule Quadrivalent Meningococcal conjugate vaccine	825	<ul style="list-style-type: none"><li>Interventional, randomized, parallel assignment, active controlled multi center study</li></ul>	<ul style="list-style-type: none"><li>Immunogenicity and safety</li></ul>	<ul style="list-style-type: none"><li>SSD: Oct. 2018</li><li>DE: 2023</li></ul>

# Meninge Vaccine

## MenQuadfi

### Latin America, North America

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03691610	Phase 3 Safety & Immunogenicity 2-dose Trial in Toddlers	940	<ul style="list-style-type: none"> <li>Interventional, modified double blind, Randomized, parrallel assignement active controlled multi center study.</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and safety</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2018</li> <li>DE: 2021</li> </ul>

# Flu QIV HD Vaccine North America Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03698279	Phase 2b Safety and immunogenicity of Flu Quadrivalent HD 3 dose schedule in Pediatric population	700	<ul style="list-style-type: none"> <li>Interventional, Randomized, Sequential Assignment, modified double blind, multi center study</li> </ul>	<ul style="list-style-type: none"> <li>Dose response, immunogenicity and safety</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Oct. 2018</li> <li>DE: 2020</li> </ul>

# Rabies Vaccine

## Asia Pacific Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03700242	Phase3 Immunogenicity and safety of HDCV with abbreviated pre-exposure regimens Trial	570	<ul style="list-style-type: none"><li>Interventional, Randomized, Parallel Assignment,</li></ul>	<ul style="list-style-type: none"><li>Immunogenicity and safety</li></ul>	<ul style="list-style-type: none"><li>SSD: Sep. 2018</li><li>DE: 2020</li></ul>

# Flu Vaccine

## Asia Pacific Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03765437	Phase 3 Safety of a Quadrivalent Influenza Vaccine in Subjects Aged 6 Months and Older in Vietnam	230	<ul style="list-style-type: none"> <li>Open-label, uncontrolled, mono-center study to be conducted in Vietnam.</li> </ul>	<ul style="list-style-type: none"> <li>Safety Assessment.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jan.2019</li> <li>DE: 2019</li> </ul>



# Meninge Vaccine

## MenQuadfi Men C

### Greater Europe Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03890367	Phase 3 Immunogenicity and Safety of Quadrivalent Meningococcal Conjugate Vaccine Compared With Two Meningococcal Reference Vaccines in Europeans Toddlers	675	<ul style="list-style-type: none"> <li>Randomized, parallel assignment, modified double-blind (triple masking - Participant, Investigator, Outcomes Assessor) conducted in Denmark, Finland, and Germany.</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and Safety Assessment.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jul.2019</li> <li>DE: 2020</li> </ul>

# Meninge Vaccine

## MenQuadfi

### Africa and Middle-East Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03869866	Phase 3  Immunogenicity and Safety of a Quadrivalent Meningococcal Conjugate Vaccine in Potential Pilgrims Aged 56 Years and Older in Turkey	330	<ul style="list-style-type: none"> <li>Interventional, single group assignment, open label conducted in Turkey.</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and Safety Assessment.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Apr.2019</li> <li>DE: 2020</li> </ul>

# Rabies Vaccine

## VRVg

### Greater Europe Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03965962	Phase 3 Purified Vero Rabies Vaccine Compared With Two Reference Rabies Vaccines in a Simulated Post-Exposure Regimen in Adults	504	<ul style="list-style-type: none"> <li>Interventional, randomized, parallel assignment: three modified double-blind groups + one open label group.</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and Safety Assessment.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jun.2019</li> <li>DE: 2020</li> </ul>

# New Pertussis Vaccine North American Region

Immuno-inflammation	Diabetes
Oncology	Cardiovascular
Rare Diseases	Rare Blood Disorders
MS, Neuro, Gene therapy	Vaccines

Study	Description	Patients	Design	Endpoints	Status
NCT03958799	<p>Phase 1</p> <p>Describe the Safety Profile and Compare the Immune Response of 4 Different Formulations of an Investigational Tdap Vaccine When Compared to Licensed Tdap Vaccine in Young Adults in Canada</p>	90	<ul style="list-style-type: none"> <li>Interventional, randomized, parallel assignment, modified double-blind.</li> </ul>	<ul style="list-style-type: none"> <li>Immunogenicity and Safety Assessment.</li> </ul>	<ul style="list-style-type: none"> <li>SSD: Jun.2019</li> <li>DE: 2021</li> </ul>