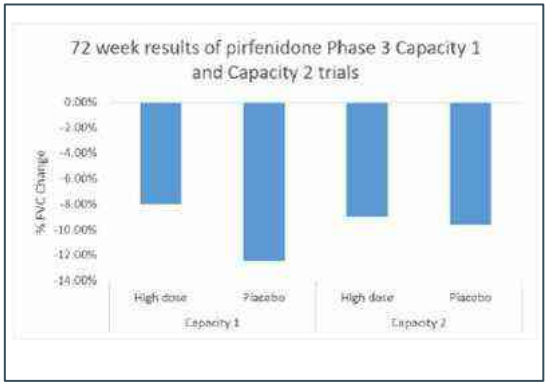
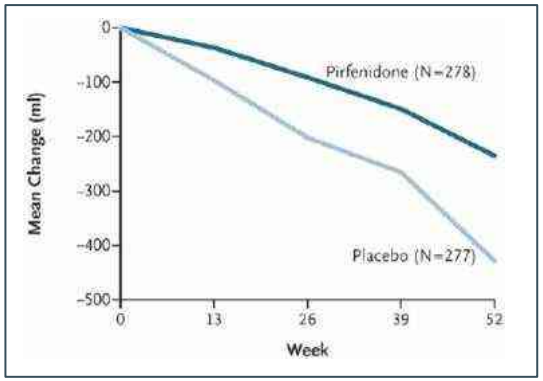
Currently approved IPF treatments only delay the inevitable

Pirfenidone phase 3 trials CAPACITY1 AND CAPACITY 2



Pirfenidone phase 3 trial ASCEND



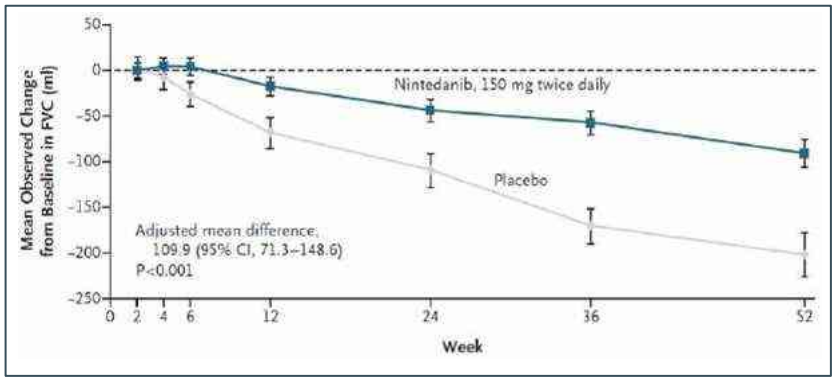
Pirfenidone

- Mechanism is unknown
- Safety: Skin rashes and gastrointestinal issues were the most common side effects. GI issues were milder than those associated with nintedanib.
- The Capacity 1 and Capacity 2 trials gave mixed results with one but not the other showing a significant difference in FVC decline vs placebo.
- The Ascend trial showed a significant difference in FVC at 52 weeks.
- In all three trials, the treat groups continued to show a decline in FVC.
- Patients on pirfenidone

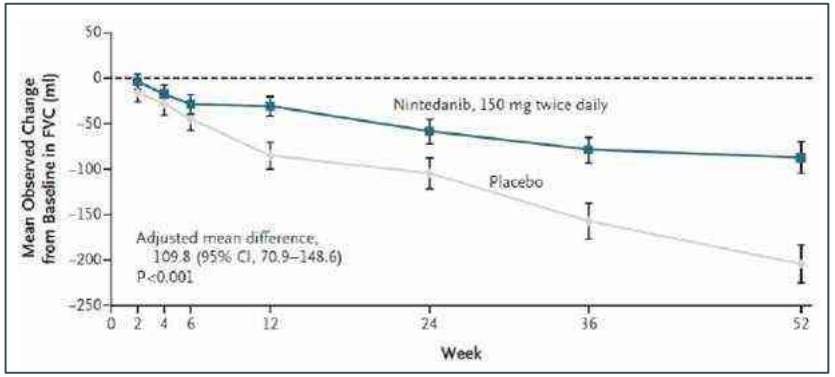
Nintedanib

- TKI inhibitor including VEGFR, FGFR and PDGFR
- Safety: Diarrhea and nausea with Diarrhea being the most common cause of tolerance related change of treatment
- Both Impulse trials showed a significant difference in rate of FVC decline vs placebo
- However, FVC continues to decline.

Nintedanib phase 3 trial IMPULSE 1



Nintedanib phase 3 trial IMPULSE 2



Neither pirfenidone or nintedanib is able to halt or reverse IPF progression leaving IPF patients with a continued unmet medical need

Source: Noble et al. 2011; King et al. 2014; Richeldi et al. 2014; Richeldi et al. 2010.

A thinning herd: Data to date suggest slight improvements over standard of care

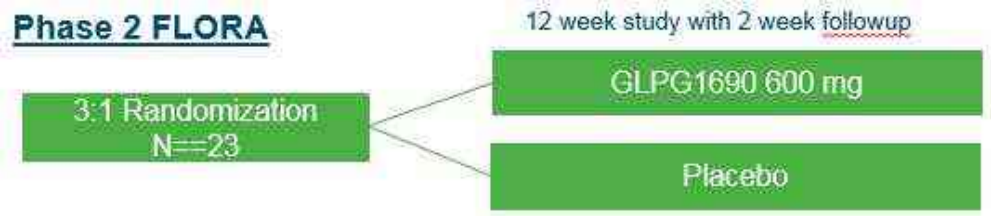
	Company	Mechanism	Phase of presented data	Study Size, n, on drug (placebo)	predicted %FVC decline from baseline, drug (placebo)	FVC (mL), mean change from baseline	Percent-predicted DL_{CO}, mean change from baseline	Other Results
GLPG1690 (12 week)	Galapagos	ATX inhibitor	Phase 2, FLORA	18		-87 (placebo) vs +8 (drug)		
BMS986020 (13 week, bid)	Bristol-Myers Squib	LPA receptor antagonist	Phase 2	48 (47)	≥10%, 12% of patients; <10% to >0, 50% of patients; no decline, 38% of patients	-40 (drug) vs -90 (placebo)		
BMS 986020 (26 week, bid)	Bristol-Myers Squib	LPA receptor antagonist	Phase 2	48 (47)	≥10%, 19% (15%) of patients; <10% to >0, 44% (68%) of patients; no decline, 37% (18%) of patients	-53 (drug) vs -139 placebo	Not significantly different vs placebo	
FM-3019 (48 week, 15mg)	Fibrogen	CTGF inhibitor	Phase 2	38	-3.00 mean, ±1.04	-150 ±40	-4.50 ±0.96	
FM-3019 (48 week, 30mg)	Fibrogen	CTGF inhibitor	Phase 2	28	-2.25 mean, ±1.34	-130 ±60	-5.61 ±1.08	
PBI-4050 (12 week)	Prometic	GPR40/GPR84 inhibitor	Phase 2	9	-1.11 mean, ±4.46	-12.2 ±137.1	-4.00 ±7.4	
Pirfenidone (52 weeks)	Genentech/Roche	Antifibrotic, antiinflammatory, antioxidant	Phase 3, CAPACITY I	174 (174)	-8%, mean vs -12.4% placebo; 20% of patients had decline ≥10% vs 35% of placebo patients	-90 ±20 (drug) vs -0.16 ±20 (placebo)		
Pirfenidone (52 weeks)	Genentech/Roche	Antifibrotic, antiinflammatory, antioxidant	Phase 3, CAPACITY II	171 (173)	-9% mean vs-9.6% placebo;			52-week PFS: 42% (drug) vs 38% placebo
Pirfenidone (52 weeks)	Genentech/Roche	Antifibrotic, antiinflammatory, antioxidant	Phase 3, ASCEND	278 (277)		-220 (drug) vs -450 (placebo)		52-week PFS: 52% (drug) vs 41% placebo
Nintedanib (52 weeks)	Boehringer Ingleheim	Tyrosine kinase inhibitor	Phase 3, INPULSIS I	309 (204)		-114.7 (drug) vs -239.9 (placebo)		Hazard Ratio: 1.15, p=0.67
Nintedanib (52 weeks)	Boehringer Ingleheim	Tyrosine kinase inhibitor	Phase 3, INPULSIS II	329 (219)		-113.6 (drug) vs -207.3 (placebo)		Hazard ratio: 0.77, p=0.005
Nintedanib (52 weeks)	Boehringer Ingleheim	Tyrosine kinase inhibitor	Phase 2, Tomorrow	85 (85)		-50 (drug) vs -190 (placebo)		

Notes: 1) Pirfenidone and nintedanib gained FDA approval in 2014; 2) Further development of BMS 986020 was discontinued due to safety issues

Comparisons in FVC change from baseline shows slowing but not reversal of IPF impacts on lung function in a majority of drugs approved or under development to treat IPF.

Source: Company Presentations; Noble et al. 2011; King et al. 2014; Richeldi et al. 2014; Richeldi et al. 2010; Khalil et al. 2018; Plamer et al. 2018; Rahu et al. 2017

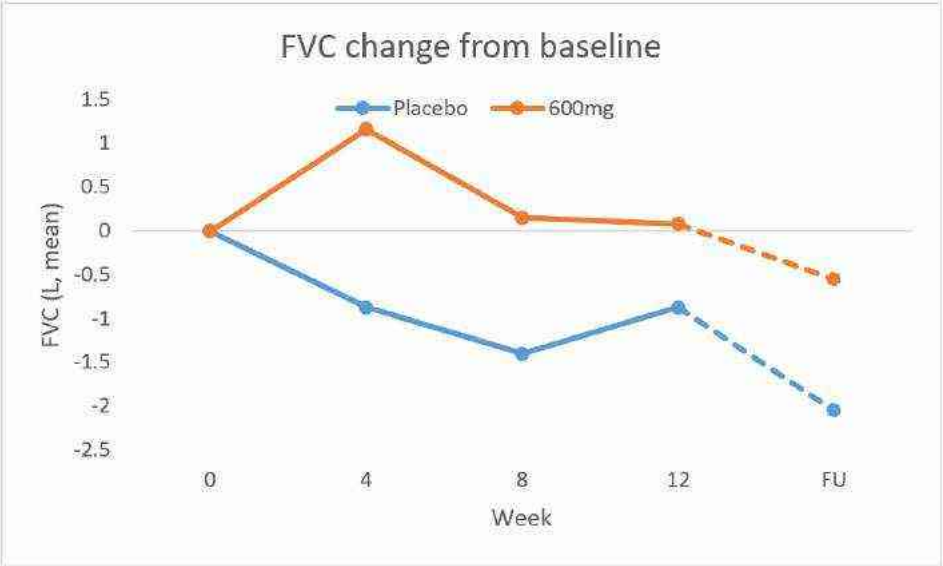
Enter GLPG1690: Phase 2 FLORA trial in IPF patients provided proof of concept

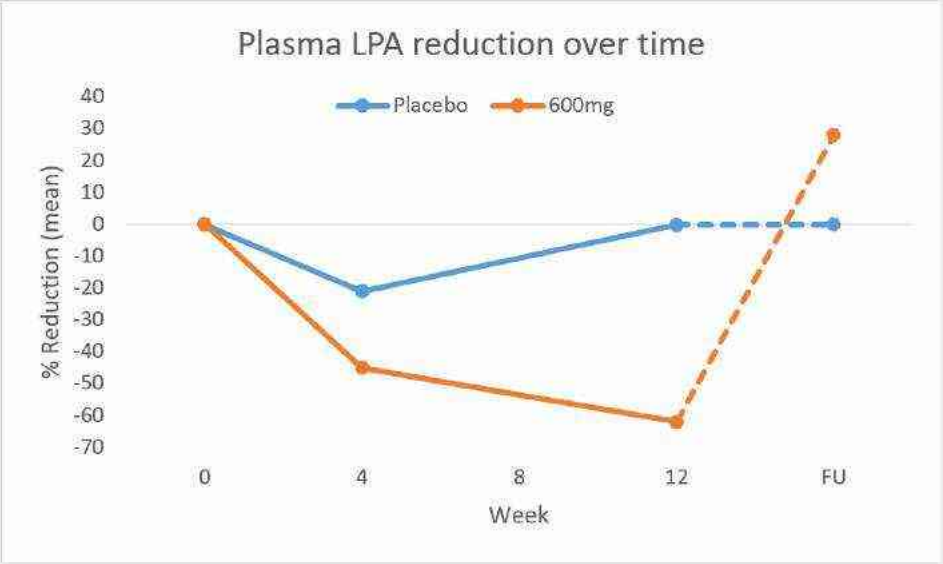


Safety

TEAEs	Placebo (n=6)	GLPG 1690 (n=17)
AE	67% (4)	65% (11)
Serious AE	33% (2)	6% (1)
Mild AE	0% (0)	24% (4)
Moderate AE	50% (3)	35% (6)
Severe AE	17% (1)	6% (1)
Related AE	0% (0)	12% (2)
Temporarily stopped treatment	0% (0)	12% (2)
Permanently stopped treatment	17% (1)	6% (1)

- The Phase 2a FLORA trial showed GLPG1690 reduced LPA blood plasma concentrations while stabilizing FVC.
- Although FVC differences were only statistically significant in week 8, a longer trial will be necessary to show true efficacy results.
- No safety or tolerability issues were identified during the study, consistent with tolerability results from a Phase 1 trial in healthy volunteers.





Source: Maher et al. 2018; Company presentations

Why are we really so confident in GLPG1690 (Part 1): Functional Respiratory Imaging (FRI)

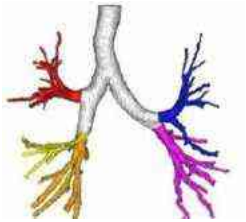
FLUIDDA
www.FLUIDDA.com

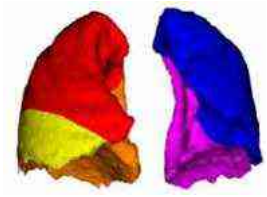
Functional Respiratory Imaging (FRI):

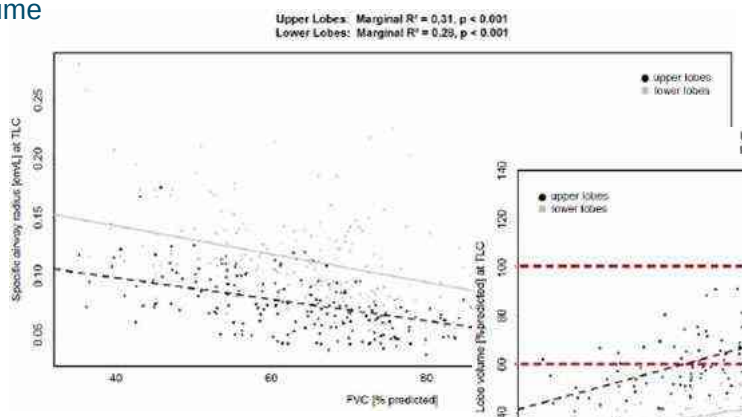
- Pioneered by Belgian based Fluidda NV
- Combination of high resolution computer topography (HRCT) and computation flow dynamics (CFD)
- Images taken after full inhalation and after normal exhalation allow the capturing of lung structure (HRCT) and lung function (CFD) information
- This enables assessment of:
  - Regional lung and lobe volumes
  - Pulmonary vasculature
  - Specific Airway wall volume

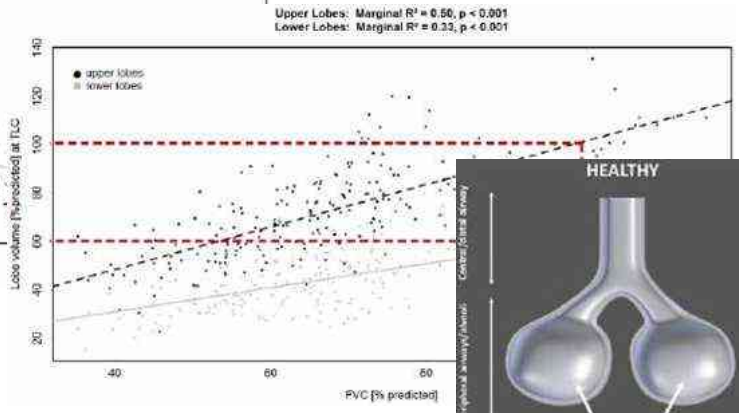
Qualification and Quantification of lung structure and function

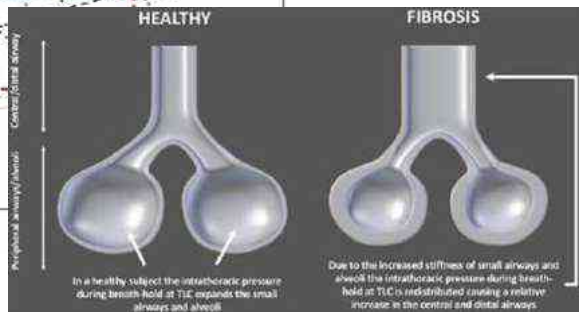
- Trapped volume combined with lung geometry allows for determination of changes over time
- Shows regions of over and under ventilation based on
  - Lobe volume analysis
  - Total lung capacity (TLC)
  - Forced exhalation capacity (FEC)
- Can differentiate between lung diseases based on comparative differences in alveolar and bronchial stiffening











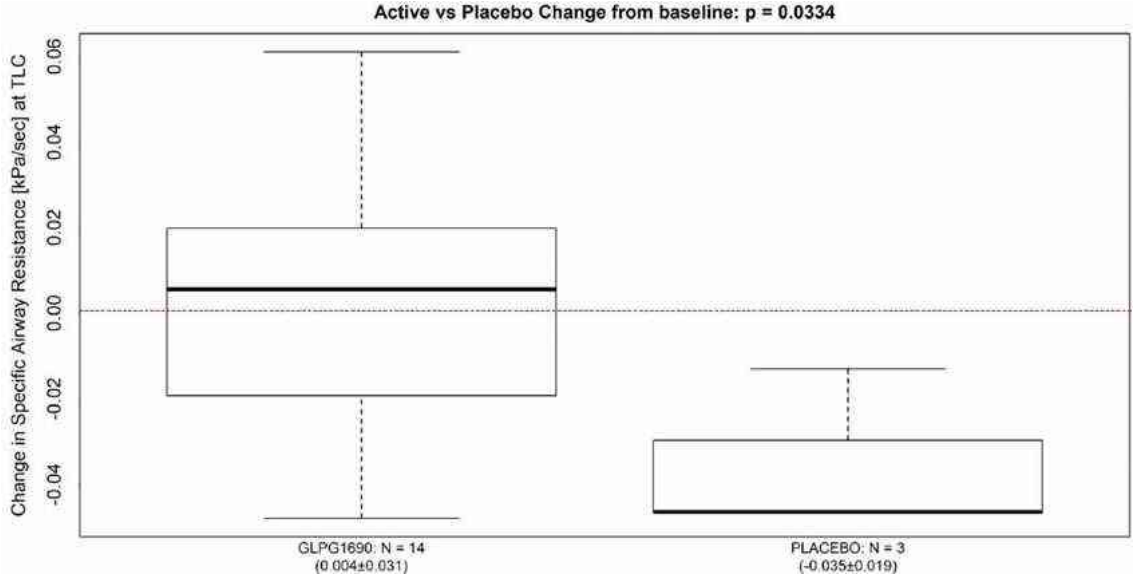
Higher sensitivity and structural resolution using FRI enables earlier and more accurate quantification of fibrosis progression

Source: Cluckers et al. 2017; Fluidda company presentations

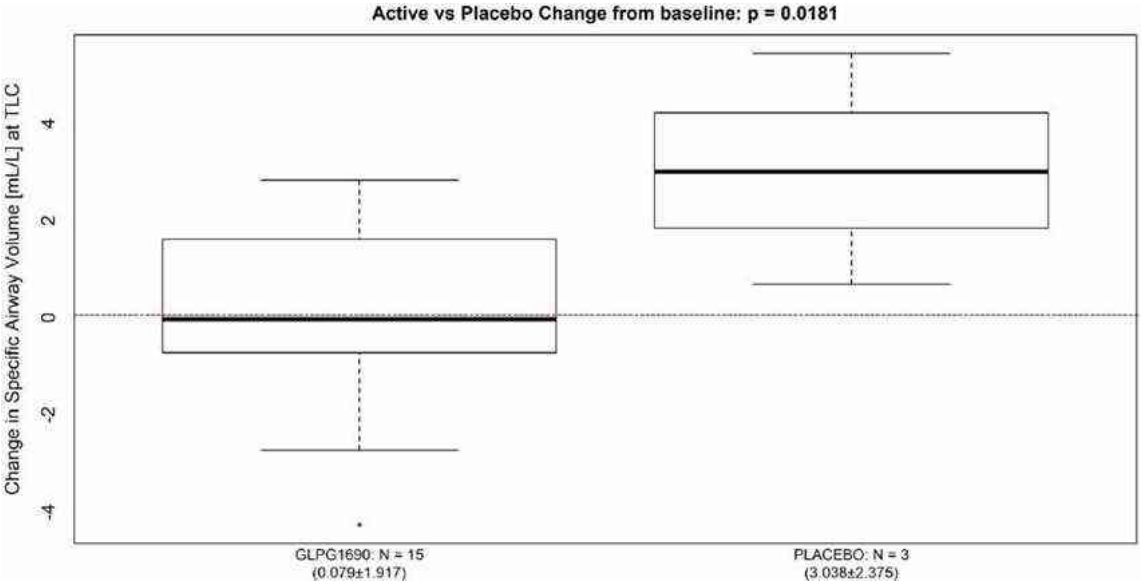
FRI analysis of Phase 2a FLORA trial

FRI shows a significant difference in lung structure and function in IPF patients taking GLPG1690 vs placebo when FVC is unable to determine a difference.

This gives us confidence that GLPG1690 will provide a meaningful medical benefit in IPF patients



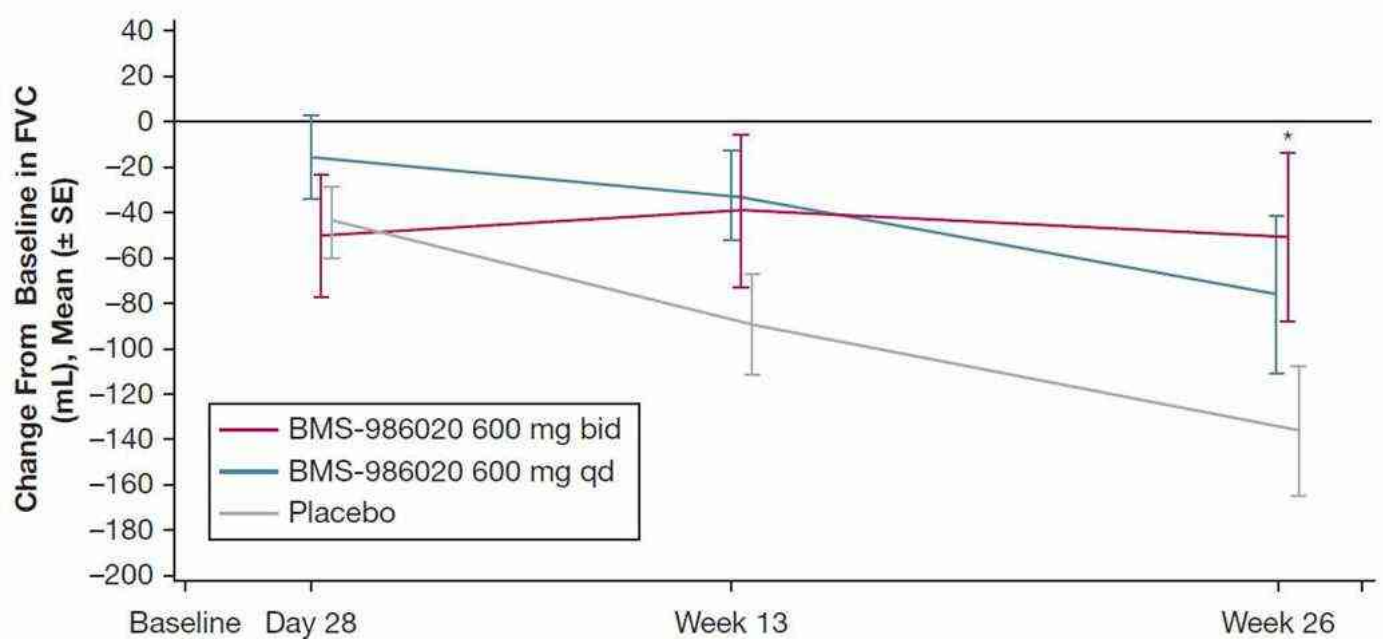
- Airway volume and resistance as determined by FRI showed differences between treated and placebo groups in the Phase 2a FLORA trial.
- FRI's sensitivity shows differences in IPF impact up to 24 weeks earlier than FVC.



Source: Fluidda company presentations

Other LPA1 Targeting Molecules Support Proof of Concept in IPF

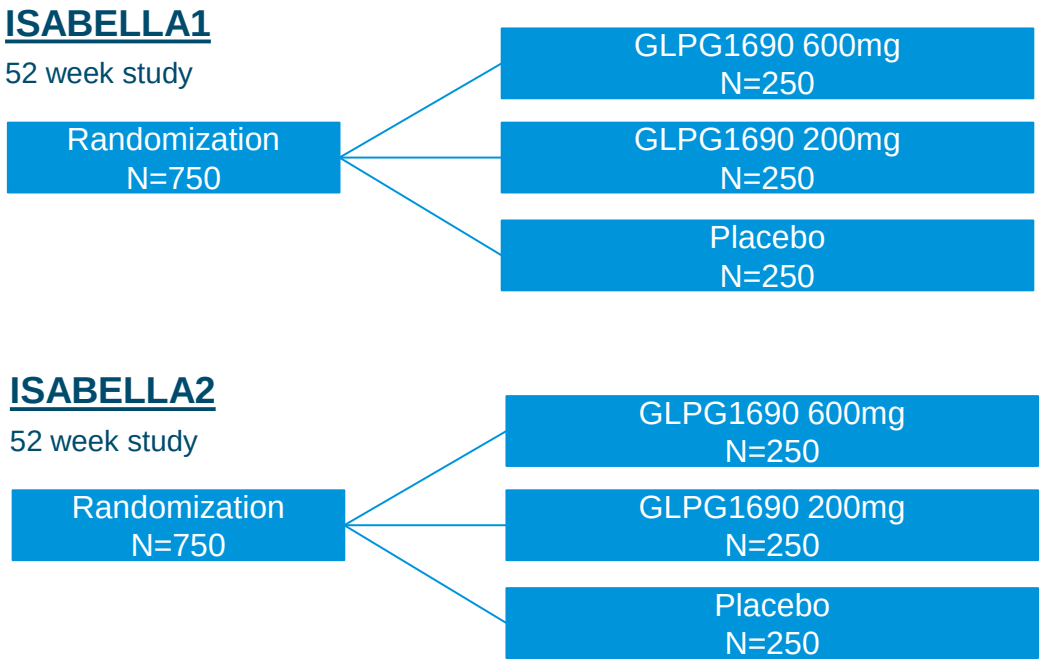
- Efficacy results of LPA1 inhibitor BMS-986020 support the potential to treat IPF by targeting the LPA signaling pathway.
- In a 26-week Phase 2 trial, IPF patients in twice daily (BID) dose of BMS-986020 showed a significantly slower FVC decline from baseline compared to patients taking placebo.
- BMS-986020 patients also showed improved levels of C3M, an IPF biomarker, compared to placebo
- Unfortunately, further development of BMS-986020 was halted due to off target liver toxicity determined to be caused by the drug. These off target effects were also observed in a follow-up non-clinical study.



Source: Palmer et al. 2018; Rosen et al. 2017.

Structure of the Phase 3 ISABELA trials for GLPG1690 in IPF

Key Inclusion/Exclusion Criteria
- IPF patients diagnosed within 5 years prior to screening
- Receiving local standard of care: pirfenidone, nintedanib or neither
- At least 30 months minimum life expectancy
- Able to perform 150m 6 minute walk test without complication
- No other pulmonary contraindications



Primary Endpoint
- Annual rate of decline of FVC at 52 weeks

Secondary Endpoint
- Exacerbations
- Mortality
- SGRQ score

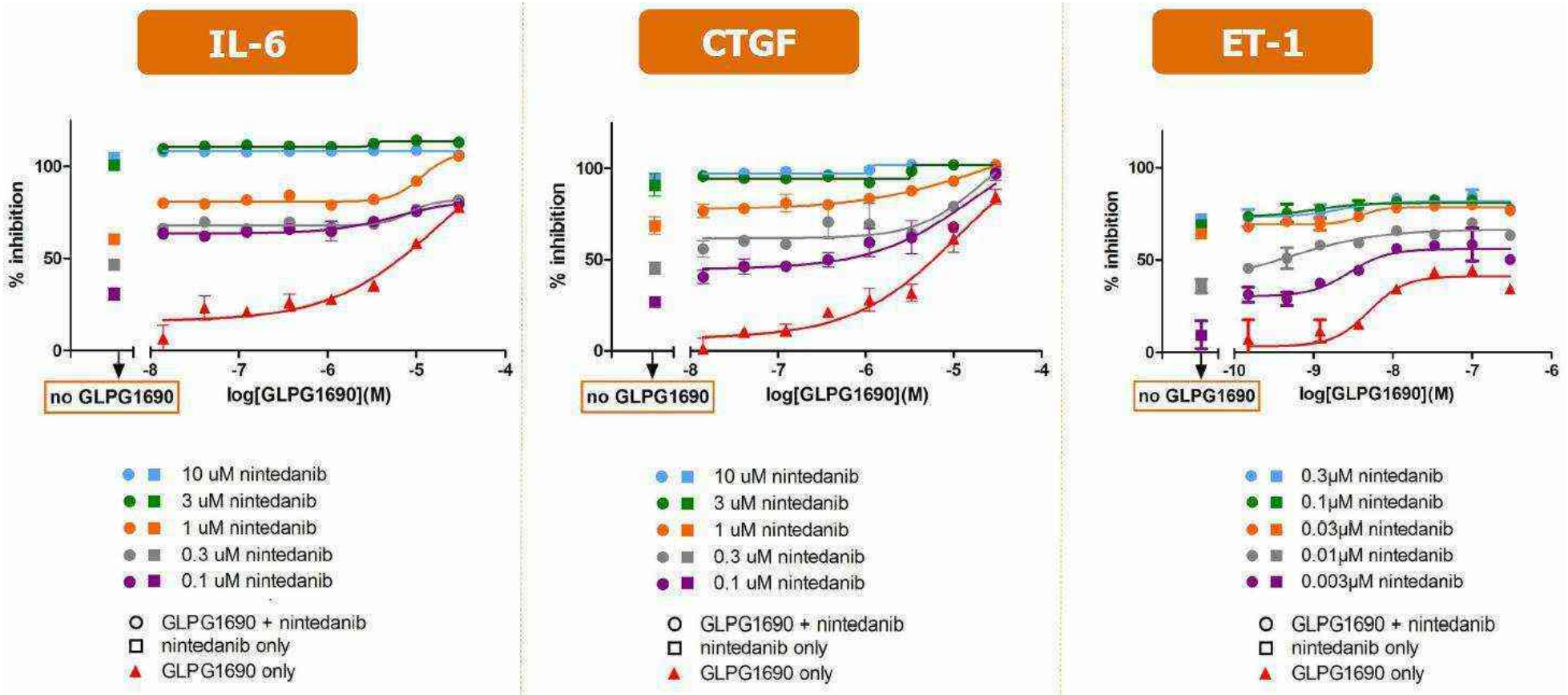
Topline results expected 1H21 for ISABELA1 and ISABELA2

- The FDA views the future treatment of IPF in the same fashion as the treatment of cancer in which multiple drugs in combination will be used.
- Therefore, the FDA recommended two identical trials be run in parallel with GLPG1690 to be given on top of local standard of care.
- These trials differ only in their participating trial sites.

Source: clinicaltrials.gov; Company Presentations

IPF cell culture assay supports the combination of GLPG1690 with nintedanib

- Low dose GLPG1690 plus low dose nintedanib inhibited TGFβ induced expression of pro-fibrotic signaling molecules IL-6, CTGF and ET-1 in an IPF cell culture assay.
- These results indicate the potential combination of GLPG1690 with nintedanib in the treatment of IPF and support the current structure of the two Phase 3 ISABELA trials.



Source: Coornaert et al. 2017; Company presentations.

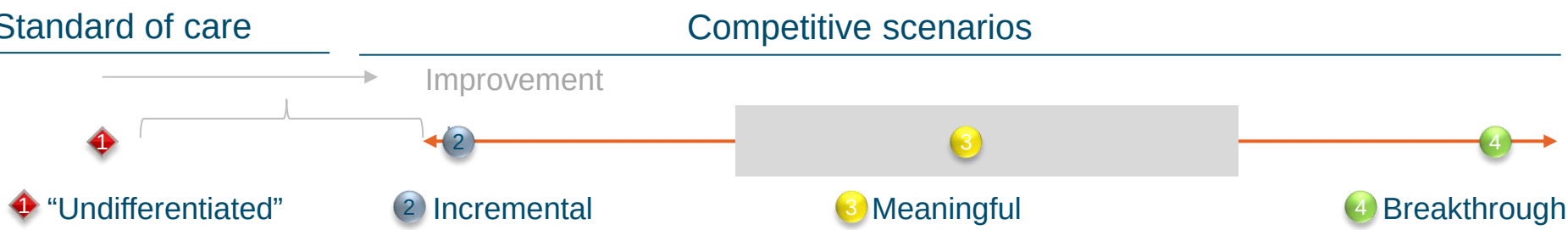
Race to the Finish Line: GLPG1690 vs FG-3019 (pamrevlumab)

	GLPG1690	FG3019	Comments
Phase 3 trial design	• Two randomized, double blind trials. • Each is being conducted in 750 mild to moderate IPF patients	• Single randomized double blind trial • Conducted in ~500 mild to moderate IPF patients	• GLPG's twin trial design and larger patient trials improves the potential robustness of the cumulative Phase 3 results
Treatment Arms	• 1:1:1 randomized to Low dose (200 mg) or high dose (600 mg) given on top of local standard of care, vs local standard of care alone	• 3:2 randomized to FG3019 or placebo	• The FDA has indicated a desire for IPF to be approached as a drug-combination treatment setting • GLPG may gain a regulatory and marketing advantage by directly targeting a combination treatment with their trials
Phase 2 trial design	• 18 patient 3:1 randomized double blind study vs placebo	• 103 patient 1:1 randomized study vs placebo with two extension arms to compare as add-on to nintedanib or pirfenidone	• FG3019 was developed in a larger and longer Phase 2 trial. More recently the FDA has shifted to recognizing results from small and shorter Phase 2 trials for IPF like that seen with the Phase 2 trial for GLPG1690
Phase 2 trial results	• GLPG1690 treatment stabilized FVC over the 12 week study period vs placebo which saw steady FVC decline over the course of the trial. This was confirmed with next generation imaging technology (FRI).	• FG3019 significantly reduced FVC decline vs placebo • In the extension arms, FG3019 was well tolerated in combination with pirfenidone or nintedanib	• FG3019 was developed in a more robust Phase 2 trial • The FDA allowed the advancement of GLPG1690 into Phase 3 trials.

We see potential regulatory and marketing advantages for GLPG1690 over FG3019 based on GLPG's stricter adherence to FDA feedback in the design of their Phase 3 trials in combination with SOC in IPF.

Sources: Company reports; Gorina et al. 2017; Raghu et al. 2017; Maher et al. 2018; SVB Leerink Research

GLPG1690 Positioned to Enter a Weak IPF Market

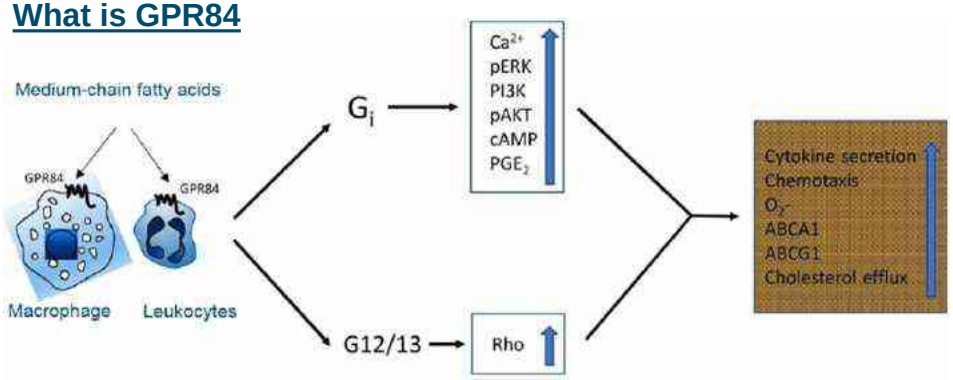


Efficacy		– 100 mL to 125 mL difference in FVC decline vs placebo	– 125mL to 200mL difference in annual FVC decline vs placebo	– Halting or reversing of FVC decline
Safety		– Reduced diarrhea vs SOC	– Minimal TEAEs	– No notable safety concerns
Pirfenidone and nintedanib		N/A	N/A	N/A
Commercial probability distribution	15%	35%	45%	5%

Source: MEDACorp KOL; Lederer et al. 2019; King et al. 2014; Nathan et al. 2016; Richeldi et al. 2014; SVB Leerink research

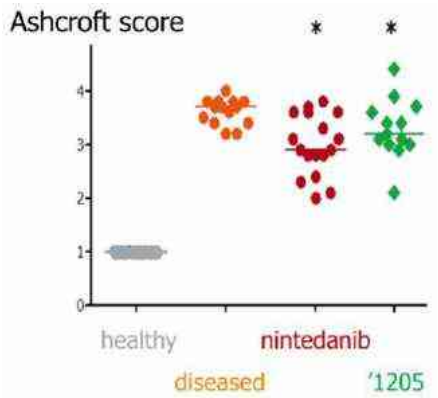
GPR84 inhibitor GLPG1205 provides a second shot at IPF

What is GPR84

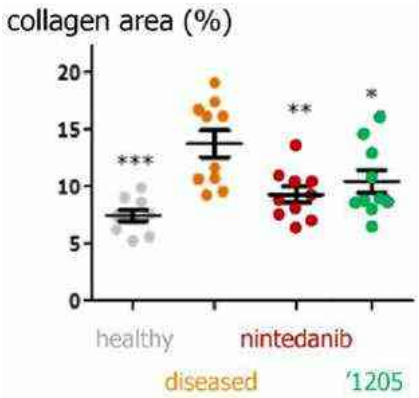


- Proinflammatory G protein-coupled receptor expressed in a range of tissues and hematopoietic cells including macrophages and leukocytes.
- Binding to medium-chain fatty acids results in enhance expression of certain cytokines including TNFα, IL-6, IL-8, IL-12b, CCL2, CCL5, and CXCL1.
- Activation also increased activation of multiple growth signaling pathways, increased phagocytosis in macrophages, and promoted chemotaxis.

Bleomycin IPF mouse model



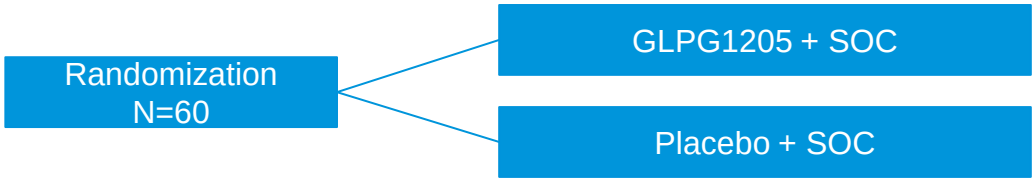
Radiation IPF mouse model



- Mouse models indicate potential efficacy in IPF
- Galapagos previously developed GLPG1205 through the end of a Phase 2 trial to treat ulcerative colitis, but stopped development due to lack of efficacy.
- GLPG1205 was well tolerated in earlier clinical trials

Phase 2 PINTA

- 26 week study
- Topline results expected late 1H20 to early 2H20



Primary Endpoint

- FVC change from baseline over 26 weeks

Secondary Endpoints

- Treatment emergent adverse events (TEAEs)
- Major health events
- FEC change from baseline
- Quality of life measures

Source: Gaidarov et al. 2018; Wei et al. 2017; Suzuki et al. 2013; Wang et al. 2006; clinicaltrials.gov; Company Presentations; SVB Leerink research

Chapter 3

GLPG1972- a high risk-reward opportunity in osteoarthritis

Massive opportunity in the OA market

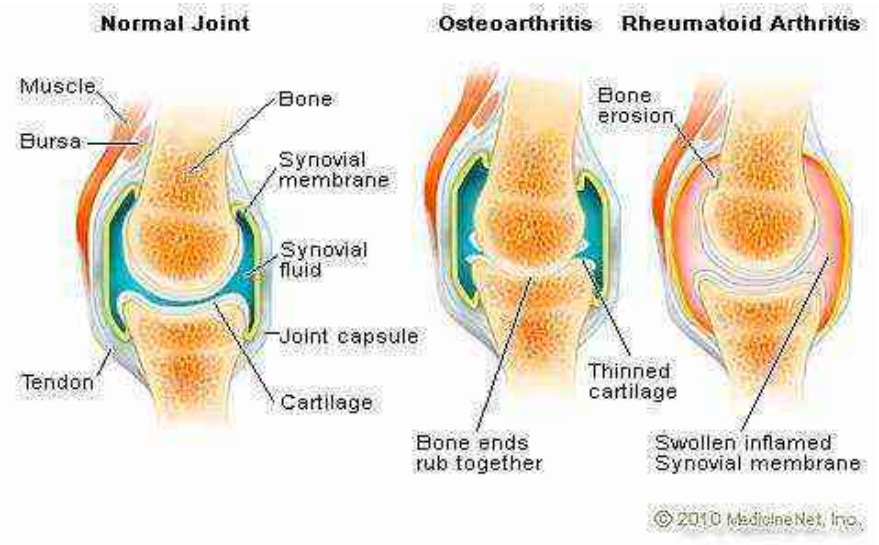
- Osteoarthritis (OA) is a highly prevalent degradative joint disease
- Not treatments have been approved for OA beyond palliative care
- Cartilage degradation is a key feature of OA progression
- Drugs designed to slowing or halt cartilage degradation may provide a pathway to improving OA treatment while reducing the need for surgical intervention
- ADAMTS5 has been heavily implicated in cartilage degradation and does not respond to anti-inflammatory drugs
- GLPG1972 is a highly selective ADAMTS5 inhibitor currently being developed in the Phase 2 ROCELLA trial

Osteoarthritis: the largest arthritis patient market

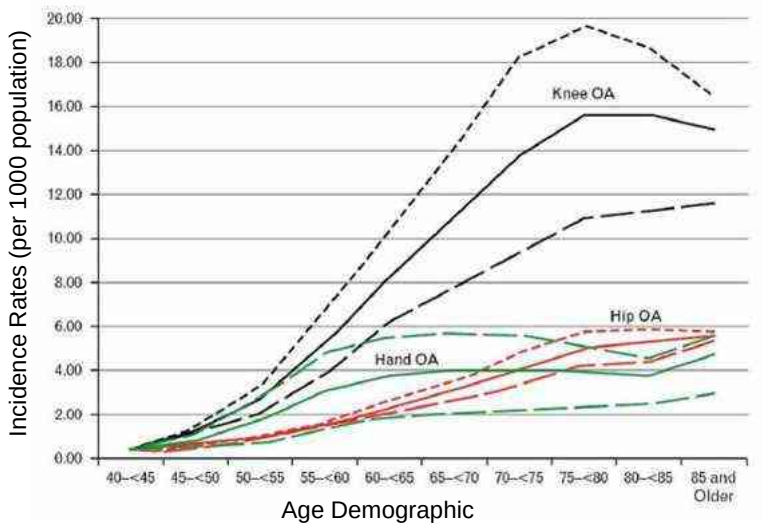
- Prevalence: ~25 million patients in U.S.
  - ~15 million knee osteoarthritis (KOA) patients
  - ~5 million hip osteoarthritis (HOA) patients
- Caused by wear and tear of the joints
- Within the joint, OA is characterized by synovium breakdown leading to:
  - Swelling and motion limitation
  - Joint remodeling,
  - Joint space narrowing
  - Degradation of articular cartilage
  - Disruption of bone morphology

OA vs RA

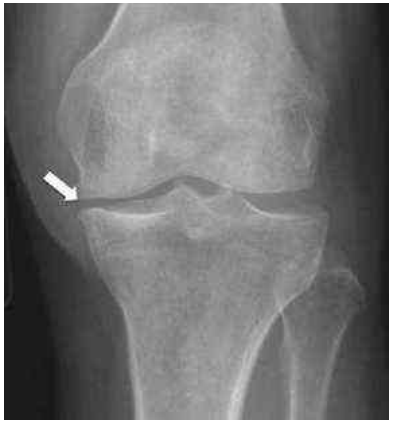
- OA: Mechanical joint breakdown leading to joint dysfunction and erosion
- RA: Inflammatory activity leading to joint dysfunction and erosion



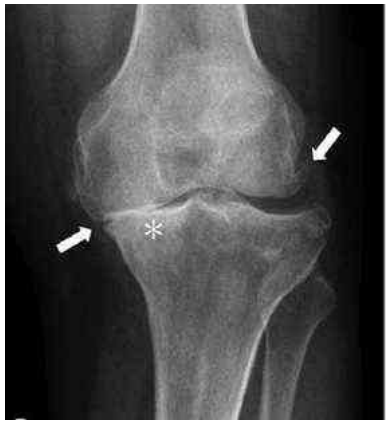
Osteoarthritis incidence by age group and OA type



Key: Short dash, female; Long dash, male; Solid, all population



Mild KOA with joint space narrowing



Severe KOA with joint space narrowing and osteophytes

Source: Allen et al. 2015; Dagenais et al. 2009; Lespasio et al. 2017; Lespasio et al. 2018

No bridge between palliative care and surgery

1) Disease modifying treatments are not available to treat osteoarthritis.
2) Patients are limited to palliative care options prior to surgical intervention
3) Joint replacement surgery may be limited to a 10 to 15 year shelf life depending on activity level

Treatments

Early Symptomatic Osteoarthritis

- Weight loss
- Low and non-impact exercise
- Physical therapy
- Modest use of topical NSAIDs

Moderate Osteoarthritis

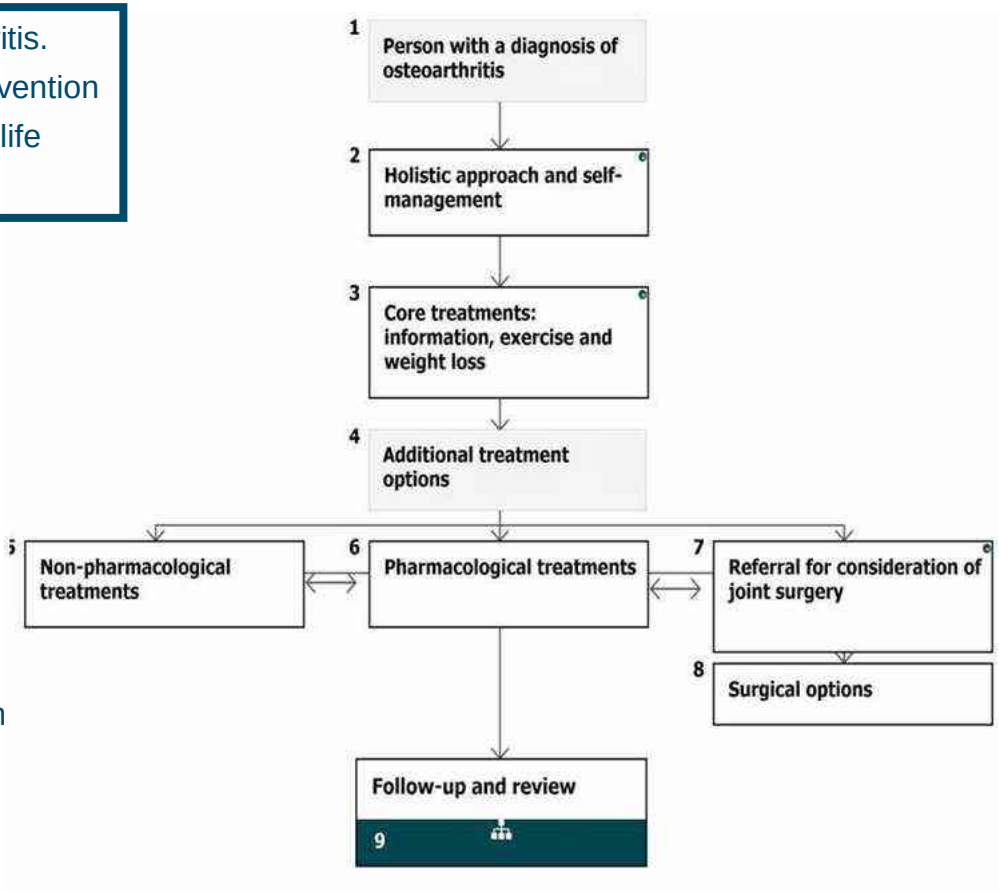
- Regular pain management with NSAIDs
- Needle lavage
- Joint-dependent intra-articular glucocorticoid injection
- In select cases walking aids or assistive devices may be used.

Mild Osteoarthritis

- Weight loss, change in exercise routine.
- Increased topical and oral NSAID use

Severe Osteoarthritis

- Pain management with high dose NSAIDS or low-dose opioids
- Joint-dependent intra-articular glucocorticoid injection
- Joint burden reduction using walking aids, wheelchairs or other assistive devices
- Joint replacement surgery



Source: AAOS 2017; ACR 2018; EULAR 2018; NICE 2019; Bayliss et al. 2017; Lespasio et al. 2017; Lespasio et al. 2018

ADAMTS5 is highly implicated in OA progression; lacks response to anti-inflammatory drugs

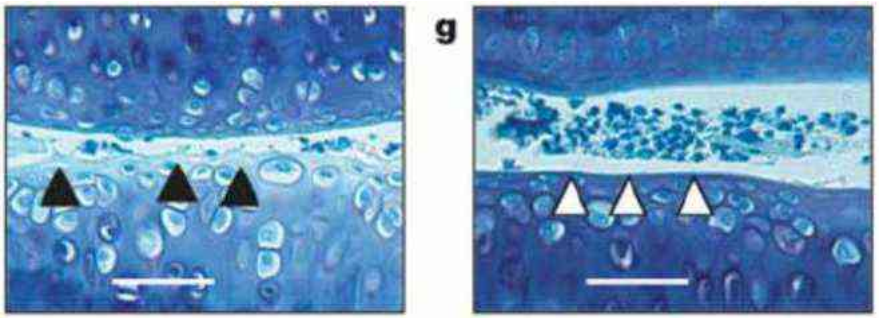
- Members of the matrix metalloproteinase (MMP) family and their fold change in OA cartilage relative to normal cartilage

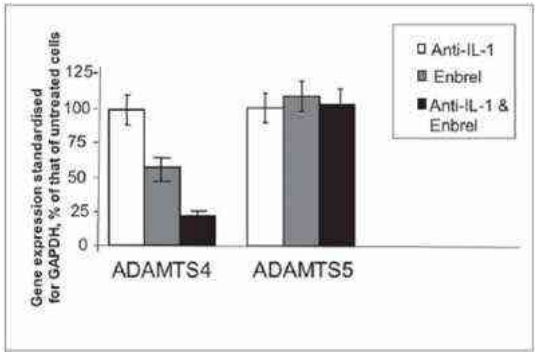
	Murine									Human							
	Early OA						Late OA			Late OA							
	1 week - Bateman	2 weeks - Bateman	2 weeks - Gardiner	2 weeks - Loeser	4 weeks - Gardiner	4 weeks - Loeser	6 weeks - Bateman	8 weeks - Gardiner	8 weeks - Loeser	16 weeks - Loeser	Sato	Geyer	Dunn	Ramos	Snelling	Karlsson	Swingler	Kevorkian	Davidson
ADAMTS-1			1.6		1.4			1.1				1.7	1.8	1.2		7.6	0.4		
ADAMTS-2			2.0	1.4	1.5	1.6		1.4	1.1	1.3			1.5			7.3	8.1		
ADAMTS-3			1.3	1.7		1.9		1.2	1.2	1.5			0.3				1.9		
ADAMTS-4			2.9		8.9			1.1									0.4		
ADAMTS-5		2.3										1.7	2.3			6.4	0.6		
ADAMTS-6			0.8		0.7									1.3	2.2		2.0		
ADAMTS-7													1.5				15.0		
ADAMTS-8			1.2		1.7			1.2											syn
ADAMTS-9			1.5		1.4								0.4				0.1		
ADAMTS-10		2.4						1.4					1.1				1.6		
ADAMTS-12			2.0	1.5	1.4	2.1		1.1		1.3			1.8				20.3		
ADAMTS-13													0.3						syn
ADAMTS-14	2.3												3.7				11.2		
ADAMTS-15			2.0		3.3								0.4				23.7		
ADAMTS-16			1.7		0.7			1.3					1.5				19.6		
ADAMTS-17			0.6		0.4			0.9					1.5				0.7		syn
ADAMTS-18	6.1		0.9		1.2			1.7									17.9		
ADAMTS-19																			
ADAMTS-20																			
ADAM7																			
ADAM8							2.7						0.5				2.0		
ADAM9			1.5										1.6			4.0	1.8		
ADAM10			1.7					1.2					1.4						
ADAM11													0.3						
ADAM12			2.2					0.9			4.4	2.3	1.8		2.1	9.5	4.0		
ADAM15													1.1				1.2		
ADAM17			1.5					1.2					1.1						
ADAM18																			
ADAM19													1.2				1.1		
ADAM20																	0.7		
ADAM21													0.5				0.7		
ADAM22			1.2										1.1				6.0		
ADAM23			1.7					0.9					0.5				5.1		
ADAM28																	40.2		
ADAM29			0.8					1.1									0.9		
ADAM30																			
ADAM32			1.1					1.3					0.4				0.8		
ADAM33																	138.4		

- ADAMTS are a secreted class of metalloproteinases that are highly correlated with cartilage degradation in OA.
- ADAMTS4 and ADAMTS5 catalyze degradation of aggrecan, an important structural molecule within the cartilage extracellular matrix. Both have been particularly implicated in driving cartilage degradation in OA joints.

Wild-type mouse

ADAMTS5-deleted mouse





- Biologics influence ADAMTS4 but not ADAMTS5. Targeting ADAMTS4 is not sufficient to deter cartilage degradation.
- ADAMTS5 is important for OA progression. That is why we need drugs specifically targeting ADAMTS5 in OA.

Source: Yang et al. 2017; Bondeson et al. 2007; Sandy 2006;Glasson et al. 2005; Stanton et al. 2005.

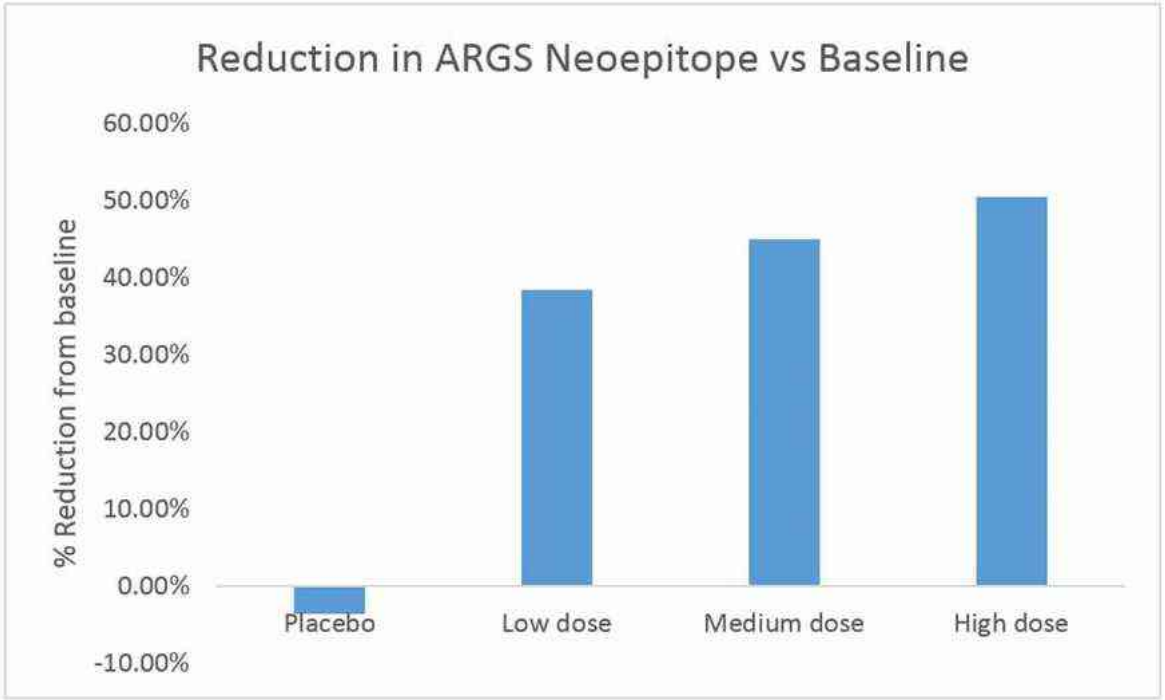
Phase 2 Candidate GLPG1972 Inhibits ADAMTS5

- GLPG1972 is an ADAMTS5 inhibitor that functions by blocking aggrecan cleavage in order to preserve joint cartilage.
- Based on positive Phase 1 and preclinical results, GLPG 1972 is being developed in a proof-of-concept Phase 2 ROCELLA trial.
- ROCELLA is an 852 patients, randomized, double-blinded, placebo controlled dose-ranging study.
- Patients randomized to one of three doses or placebo will be evaluated for change from baseline in cartilage thickness as well as for different pain assessment and disease progression evaluations.
- Upon positive results, we would expect a potentially pivotal Phase 3 trial beginning as early as 1H21 with a projected market launch in 2025.
- Servier licensed global rights, ex- U.S., to develop and commercialize GLPG1972 in OA for €6M upfront and €290M in potential milestones. GLPG is also eligible to receive low to mid single digit royalties on all commercial sales.

ADAMTS5	ADAMTS4	Mouse cartilage explant	Human cartilage explant
IC_{50}=20 nM	IC_{50}=57 nM	IC_{50}=2 µM	IC_{50}<1 µM

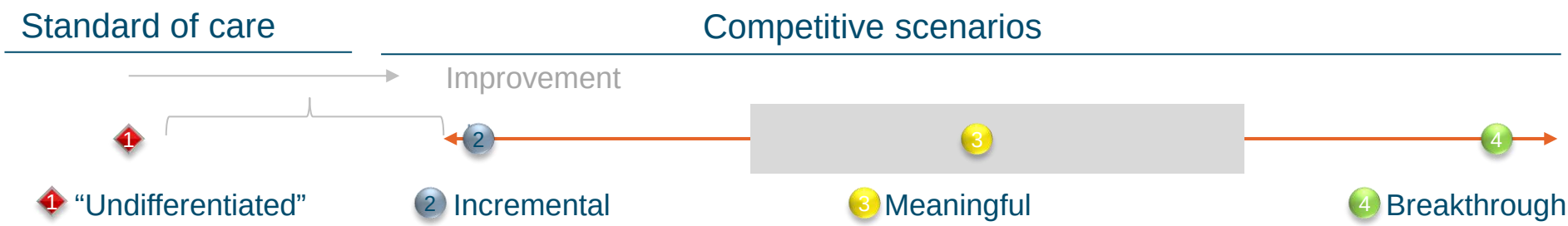
- 100-fold higher binding specificity for ADAMTS-5 versus a panel of zinc metalloproteinases

Phase 1 results show GLPG1972 reduced serum concentrations of ARGS neoepitope, an ADAMTS5 activity biomarker



Source: Clement-Lacroix et al. 2017; Company filings; SVB Leerink research

GLPG1972 Targeting Big Opportunity In OA



	Palliative Care, pain medication, corticosteroids	2 Incremental	3 Meaningful	4 Breakthrough
Efficacy		– % reduction in ARGS neoepitope vs baseline: 15% to 40% improvement vs placebo	– % reduction in ARGS neoepitope vs baseline: 40% to 70% improvement vs placebo	– % reduction in ARGS neoepitope vs baseline: >70% improvement vs placebo
Pain scores		– Mild slowing of joint damage progression as assessed by pain scores	– Moderate slowing of joint damage progression as assessed by pain scores	– No progression of joint damage as assessed by pain scores
Steroid use vs baseline		– Moderately reduced average corticosteroid use	– Significantly reduced average corticosteroid	– Completely eliminate the need for corticosteroids
Safety		– Moderate but tolerable TEAE's	– Mild but well tolerated TEAEs	– No notable TEAEs – No increased risk of infection
Likelihood of achieving commercial profile	18%	35%	45%	3%

Source: SVB Leerink research

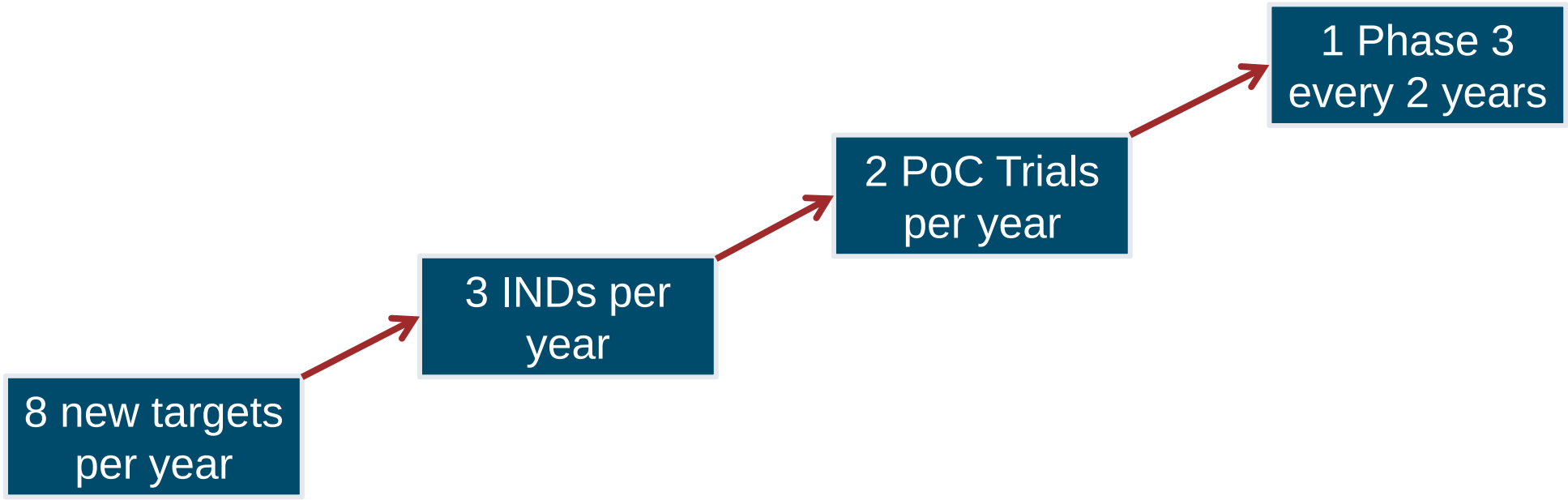
Chapter 4

GLPG's discovery platform continues to build the pipeline foundation

GLPG's proprietary discovery platform continues to fill the pipeline

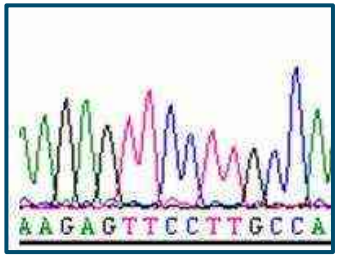
- GLPGs discovery platform combines high throughput technologies to screen for novel disease targets, identify potent and highly selective molecule drug candidates and optimize molecular properties
- The versatility of the platform has been showcased by:
  - the identification of multiple small molecule inhibitors that entered clinical development
  - partnered efforts such as with the MOR106, an anti-IL17 mAB developed in collaboration with Morphosys to treat atopic dermatitis
  - The Toledo program: a new class of anti-inflammatory molecules

GLPG's Developmental Goals



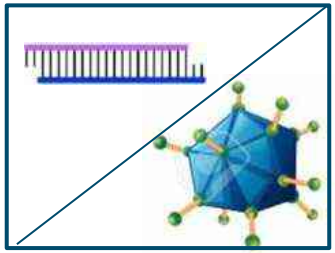
Proprietary discovery platform creates near limitless drug targeting capabilities

DNA Sequencing



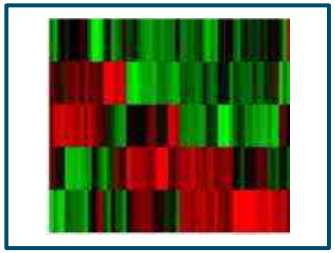
- DNA sequencing is used to develop siRNA or shRNA to screen for disease targets

Adenovirus siRNA Screen



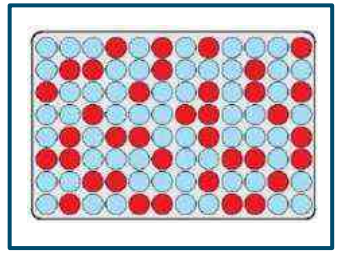
- State-of-the-art adenovirus siRNA delivery platform used to knock down expression of gene targets

Expressional Profiling



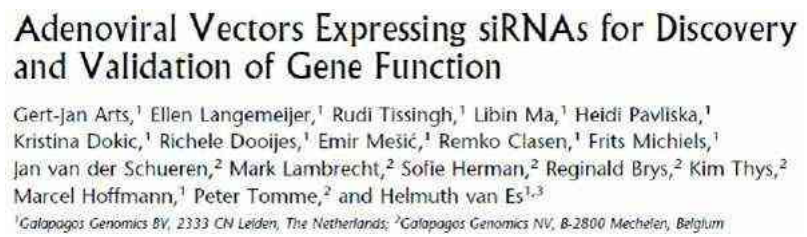
- Expressional profiling is used to identify specific drug target candidates

Disease primary cell assay



- Disease derived primary cell assays used to screen and select individual molecules for further development

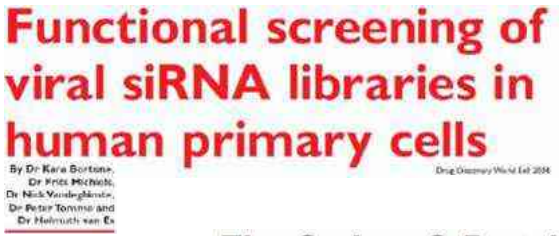
- Discovery approach applicable to a broad range of diseases
- Able to scan thousands of gene targets per disease
- Enables high throughput identification of drug candidates targeting those gene products
- Drug candidates and core molecules can be enhanced using x-ray crystallography and drug target assays to validate chemical optimization of molecular behavior



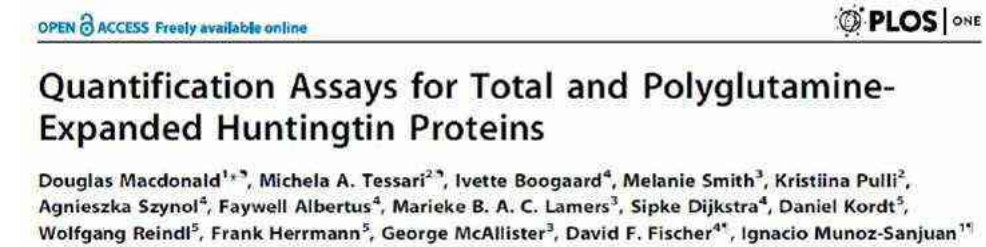
Adenoviral Vectors Expressing siRNAs for Discovery and Validation of Gene Function

Gert-Jan Arts,[1] Ellen Langemeijer,[1] Rudi Tissingh,[1] Libin Ma,[1] Heidi Pavliska,[1] Kristina Dokic,[1] Richele Dooijes,[1] Emir Mešić,[1] Remko Clasen,[1] Frits Michiels,[1] Jan van der Schueren,[2] Mark Lambrecht,[2] Sofie Herman,[2] Reginald Brys,[2] Kim Thys,[2] Marcel Hoffmann,[1] Peter Tomme,[2] and Helmuth van Es[1,3]

[1]Galapagos Genomics BV, 2333 CN Leiden, The Netherlands; [2]Galapagos Genomics NV, B-2800 Mechelen, Belgium



Functional screening of viral siRNA libraries in human primary cells



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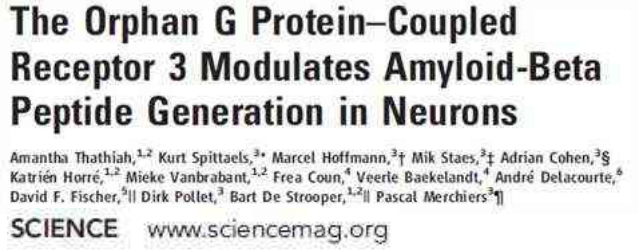
Quantification Assays for Total and Polyglutamine-Expanded Huntingtin Proteins

Douglas Macdonald[1]*, Michela A. Tessari[2], Ivette Boogaard[4], Melanie Smith[3], Kristiina Pulli[2], Agnieszka Szynol[5], Faywell Albertus[4], Marieke B. A. C. Lamers[3], Sipke Dijkstra[4], Daniel Kordt[5], Wolfgang Reindl[5], Frank Herrmann[5], George McAllister[3], David F. Fischer[4]*, Ignacio Munoz-Sanjuan[1]



The Orphan G Protein–Coupled Receptor 3 Modulates Amyloid-Beta Peptide Generation in Neurons

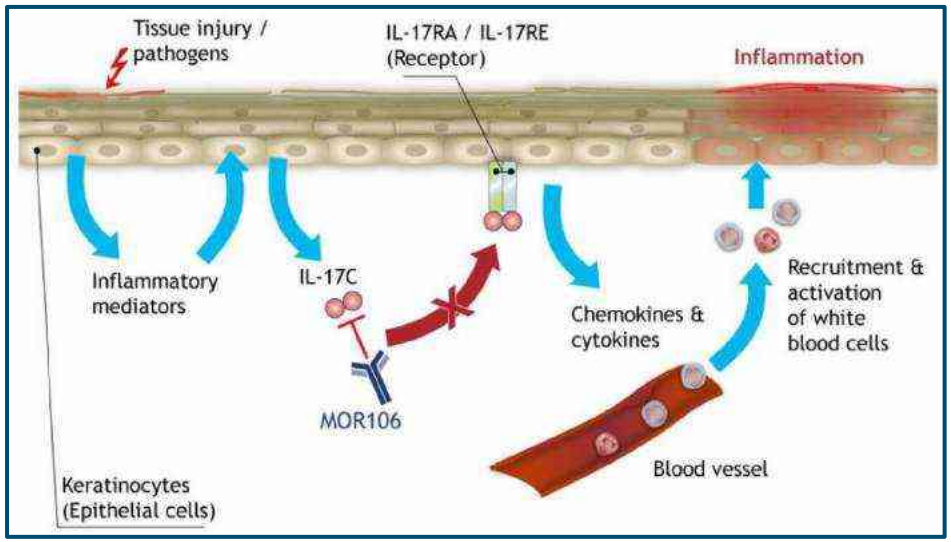
Amantha Thathiah,[1,2] Kurt Spittaels,[3]• Marcel Hoffmann,[3]† Mik Staes,[3]‡ Adrian Cohen,[3]§ Katrién Horré,[1,2] Mieke Vanbrabant,[1,2] Frea Coun,[4] Veerle Baekelandt,[4] André Delacourte,[6] David F. Fischer,[5]|| Dirk Pollet,[3] Bart De Strooper,[1,2]|| Pascal Merchiers[3]¶

SCIENCE www.sciencemag.org

Source: Company presentations; Arts et al. 2003; Bortone et al. 2004; Thathiah et al. 2009; Macdonald et al. 2014.

MOR106- Leveraging the Discovery Platform to Build Partnership Opportunities

- Anti-IL-17c IgG1 monoclonal antibody
- Developed using Morphosys' proprietary antibody discovery platform and Galapagos' target optimization platform
- IL-17c is a cytokine predominantly expressed by skin epithelial cells where it is involved in immune defense
- IL-17c is overexpressed in certain inflammatory skin diseases including atopic dermatitis (AD) and psoriatic arthritis (PA)
- Overexpression drives inflammatory response by promoting chemokine production upon binding to IL-17R receptors.
- Blocking IL-17c inhibits inflammatory response while reserving immune capabilities of IL-17R receptors
- Licensed to Novartis in July 2018



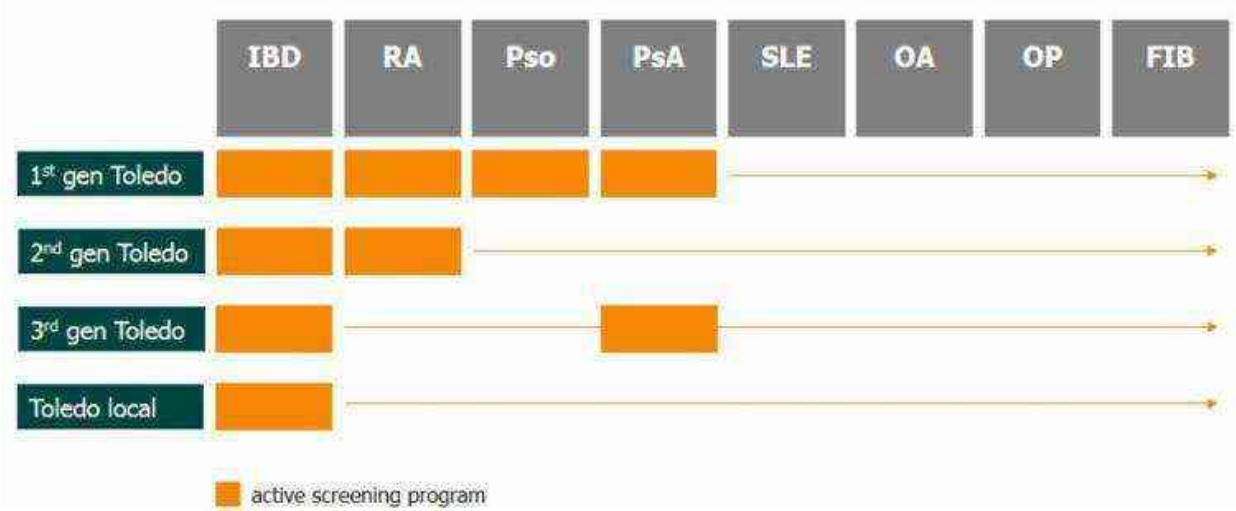
MorphoSys and Galapagos Sign Global License Agreement for MOR106 with Top Pharma Partner

19 July 2018 at 07:15 CET

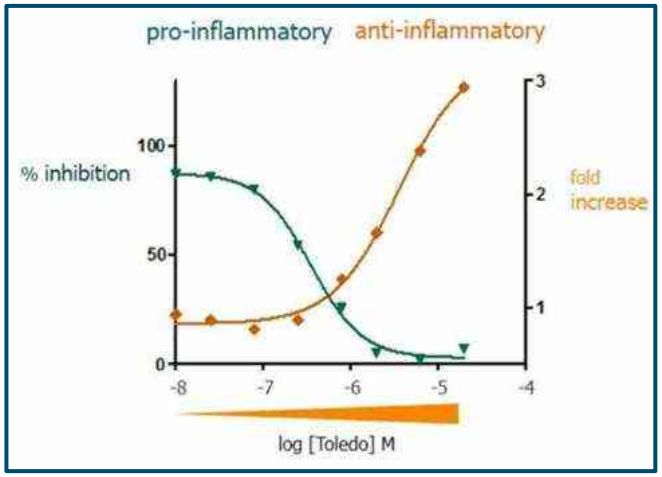
- Exclusive global license agreement with Novartis on MOR106
- MOR106, a monoclonal antibody directed against IL-17C, will be developed further in atopic dermatitis (AtD) and potentially other indications
- Up-front payment of EUR 95 million (USD 111 million*) and potential milestone payments of up to approximately EUR 850 million (USD 1 billion*) plus royalties up to low-teens to low-twenties
- Novartis to bear all future research, development, manufacturing and commercialization costs related to MOR106

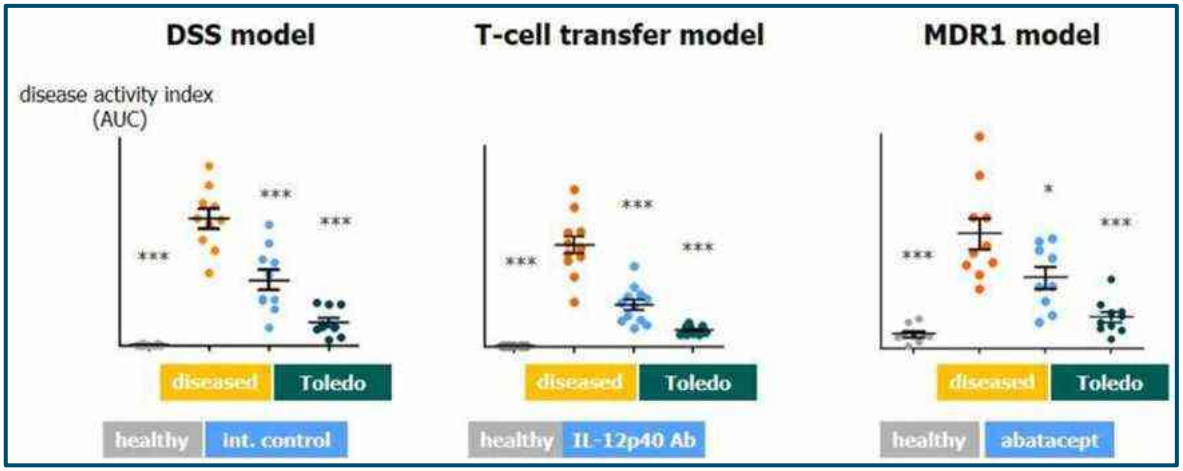
Source: Li et al. 2006; Vandeghinste et al. 2017; Yamaguchi et al. 2018; Brembilla et al. 2018; Company Filings

The Toledo Program Strikes a New Path for GLPG in Inflammatory Diseases



- GLPG began the first Phase 1 program for GLPG3312, their 1st generation Toledo drug, in healthy volunteers in January 2019.
- GLPG has guided to launching:
  - a Phase 1 trial for GLPG3970, a 2nd generation Toledo molecule, in 2H19
  - a PoC trial for GLPG3312 in 2H19

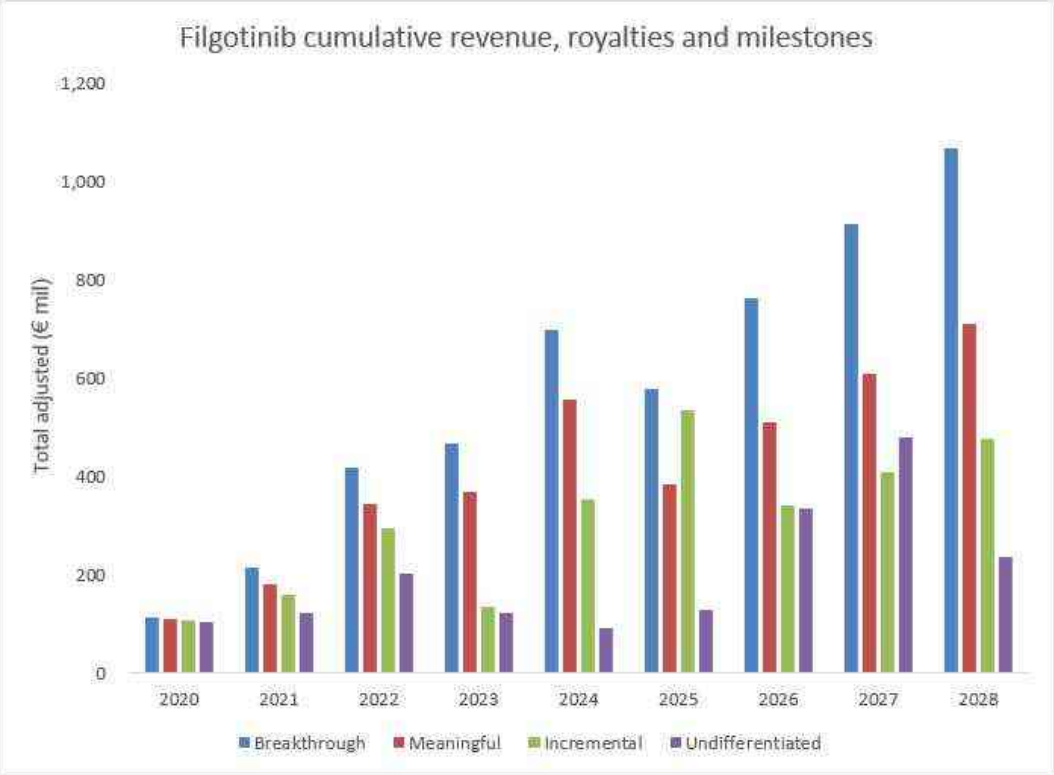




- Toledo is the name for a new class of drugs discovered by GLPG that inhibit pro-inflammatory cytokines while stimulating anti-inflammatory cytokines.
- The Toledo molecules significantly reduced disease index area under the curve (AUC) in three different mouse models of ulcerative colitis.
- Due to the early stage of development, the Toledo program has not yet been built into our model, providing an important source of future upside potential as the program progresses

Sources: Company releases; SVB Leerink Research

Adjusted Revenues, Royalties, and Milestones for Filgotinib Projected into 2028

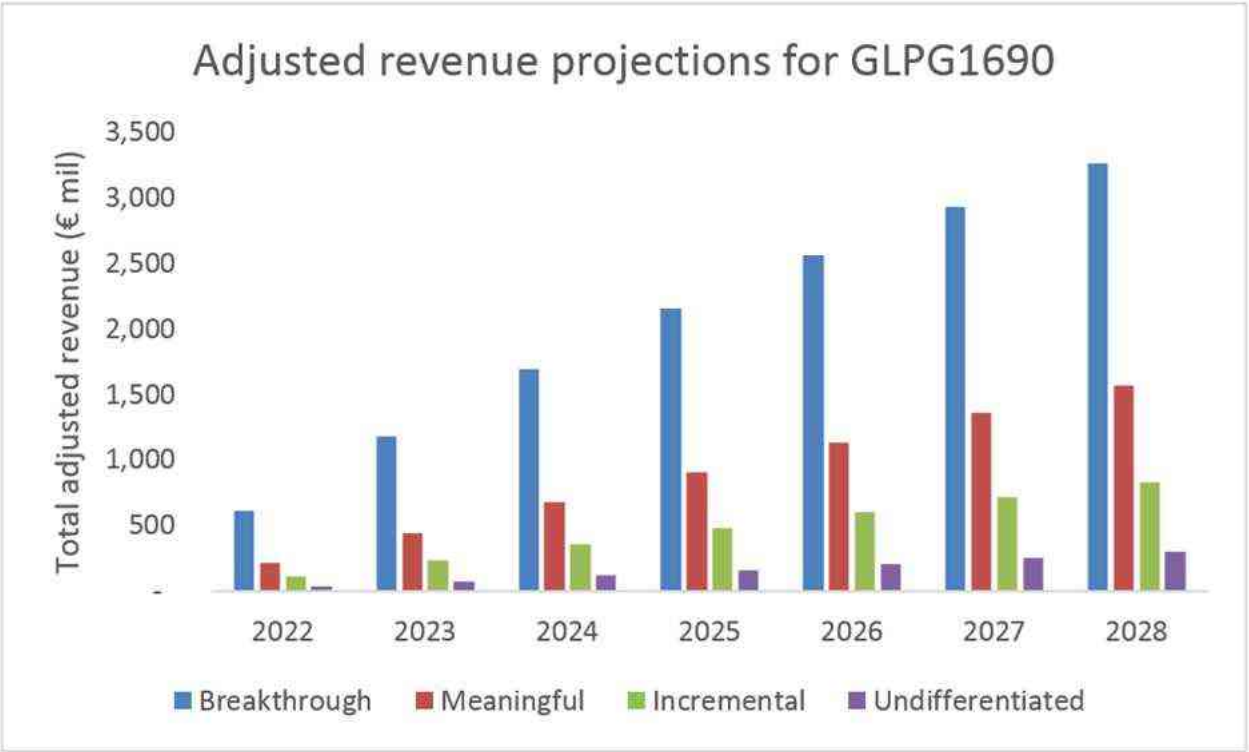


(€ mil)	2020	2021	2022	2023	2024	2025	2026	2027	2028
Breakthrough	112	213	416	467	696	577	763	912	1,065
Meaningful	108	181	342	367	557	384	509	608	710
Incremental	106	159	294	134	354	535	341	407	476
Undifferentiated	104	123	202	122	92	127	334	478	234

- Revenues were adjusted based on a 68% probability of regulatory approval for an anti-inflammatory drug in Phase 3
- The breakthrough scenario forecasts revenues with filgotinib becoming the best-in-class JAKi available with the ability to compete with aTNF as a 2nd line treatment in inflammatory diseases
- Under the undifferentiated scenario, filgotinib fails to be differentiated from other JAKis and is used as one of several drugs that get cycled through as a backline therapy.
- Individual years may be disproportionately increased by projected milestone payments

Source: BioMedTracker; SVB Leerink research

Adjusted revenues for GLPG1690 projected into 2028

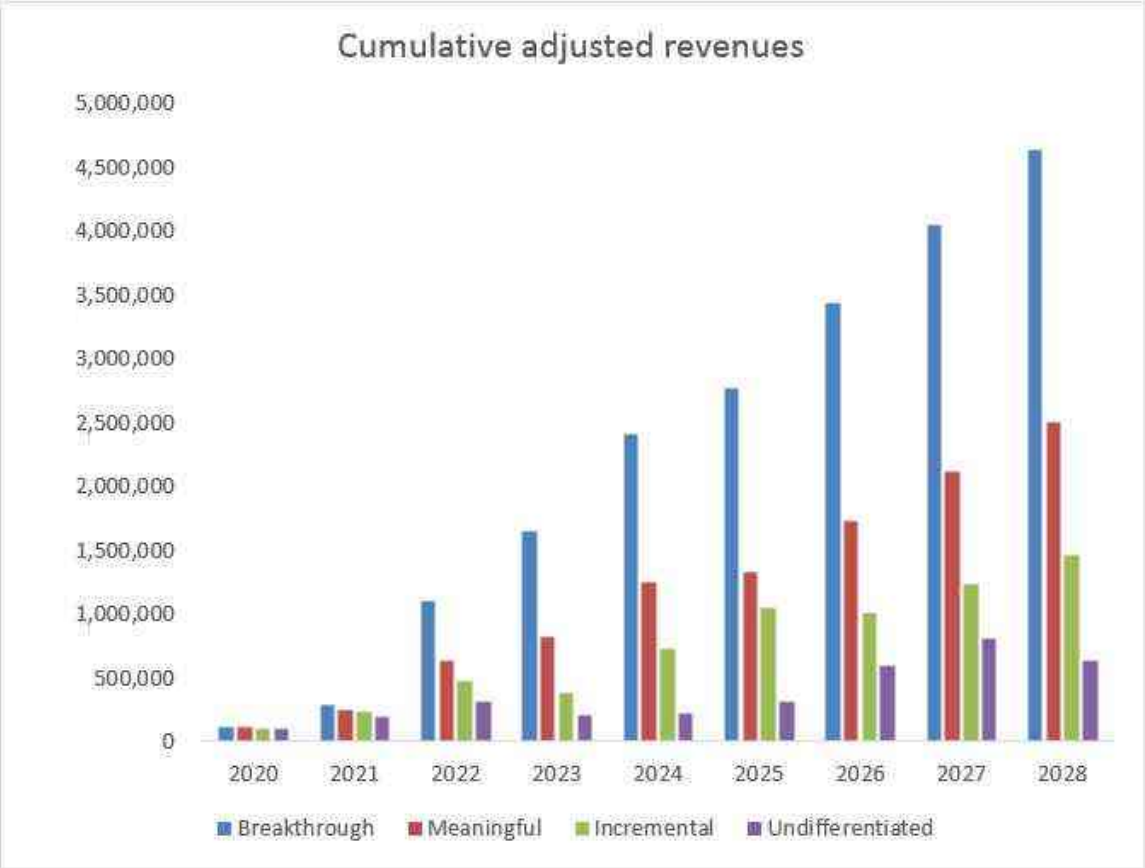


(€ mil)	2022	2023	2024	2025	2026	2027	2028
Breakthrough	613	1,178	1,691	2,151	2,563	2,931	3,261
Meaningful	217	446	679	911	1,138	1,359	1,572
Incremental	114	235	357	479	599	715	827
Undifferentiated	36	76	118	162	208	254	300

- Revenues were adjusted based on a 40.7% probability of regulatory approval for an IPF drug in Phase 3
- The breakthrough scenario forecasts revenues with GLPG1690 becoming the standard of care and a backbone therapy for all IPF drug combinations
- At the other end of the spectrum, GLPG1690 undifferentiated from pirfenidone and nintedanib becomes relegated to patients who are intolerant to or not responding to standard of care.

Source: BioMedTracker; SVB Leerink research

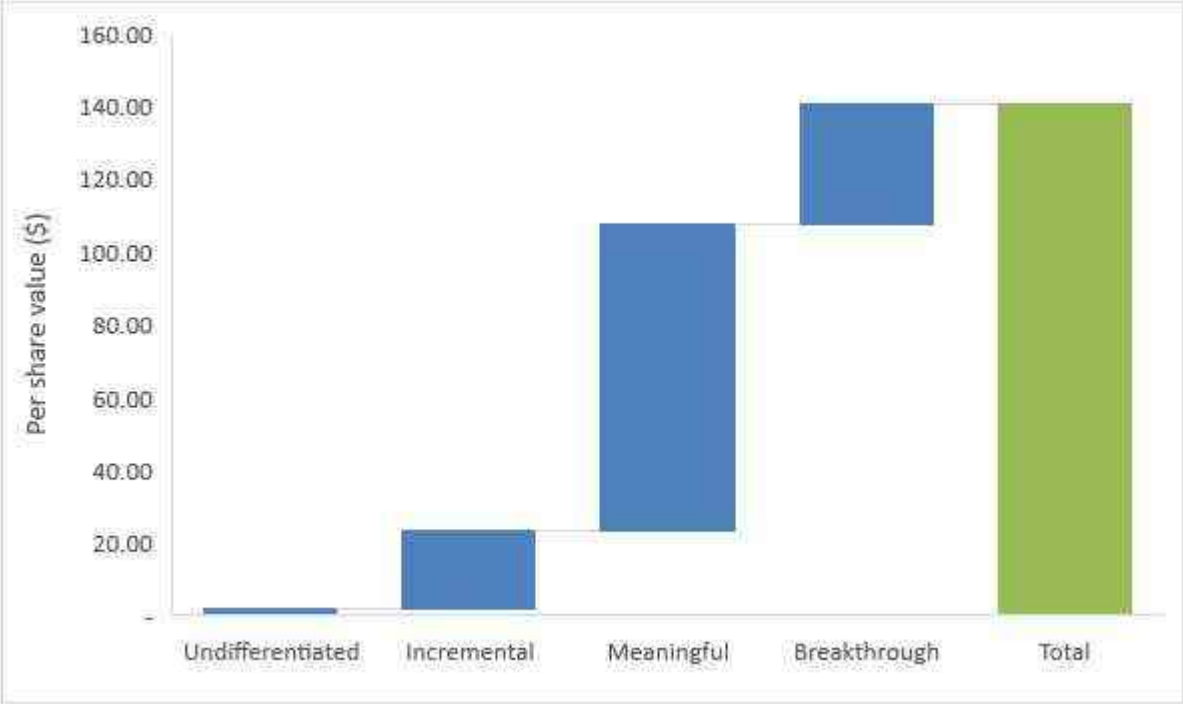
Cumulative Adjusted Revenue for GLPG



	2020	2021	2022	2023	2024	2025	2026	2027	2028
Breakthrough	111,542	283,443	1,098,248	1,651,589	2,402,496	2,763,710	3,433,284	4,045,418	4,633,191
Meaningful	108,211	250,774	629,596	819,305	1,250,563	1,326,283	1,728,409	2,113,715	2,498,319
Incremental	106,013	229,213	478,038	375,319	725,802	1,042,931	1,005,408	1,234,312	1,462,175
Undifferentiated	103,748	193,111	307,821	203,735	225,096	314,569	593,224	811,438	639,804

Source: BioMedTracker; SVB Leerink research

GLPG Valuation

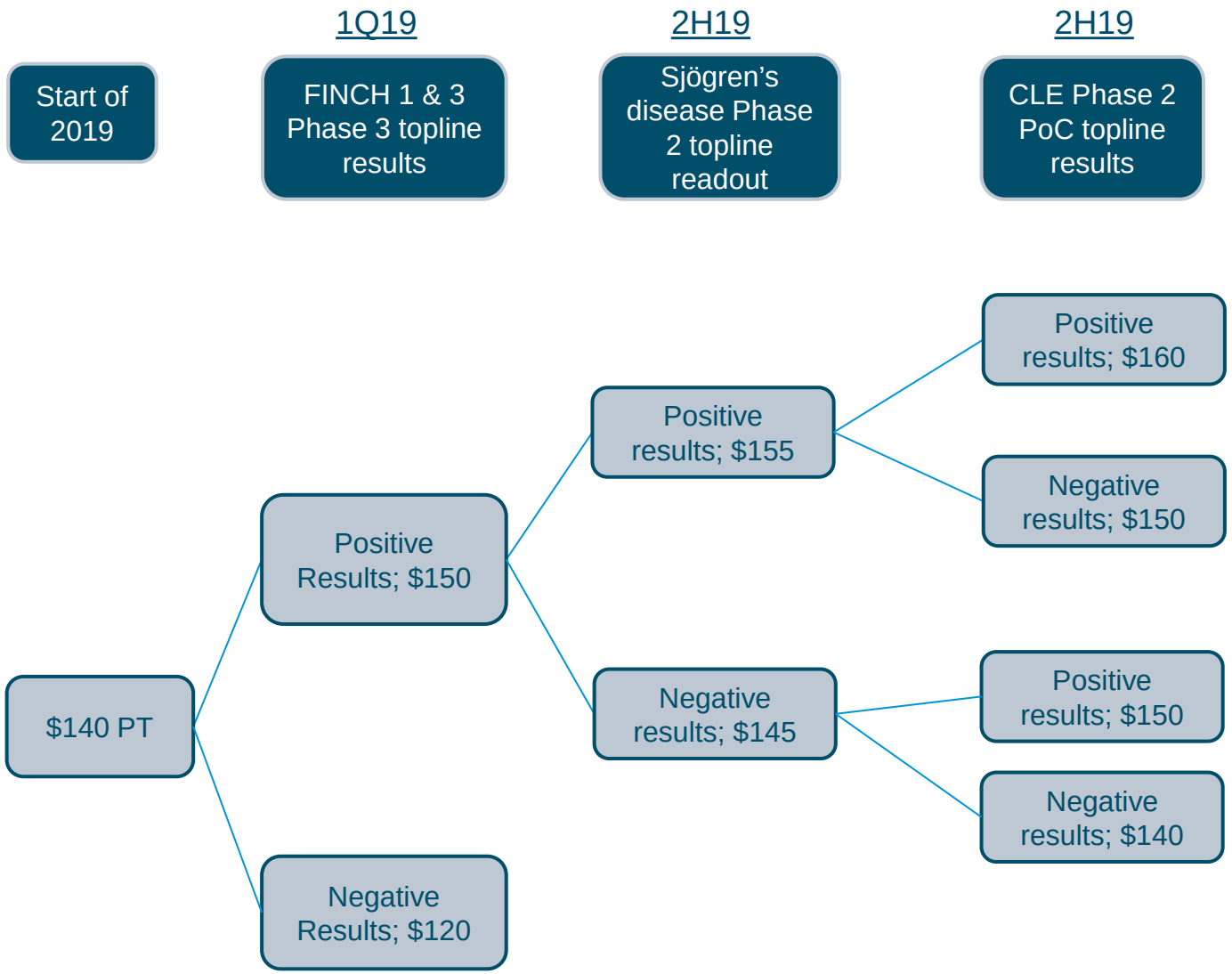


Per share value ($)	Undifferentiated	Incremental	Meaningful	Breakthrough
GLPG1690	24.05	71.65	138.52	302.33
GLPG1205	0.95	1.64	2.71	4.64
GLPG1972	2.85	6.10	9.26	14.06
Filogtinib	31.98	59.65	85.87	125.06
MOR106	7.15	7.15	7.15	7.15
Operations	(65.64)	(93.80)	(119.86)	(175.07)
Cash	26.78	26.78	26.78	26.78
Total	28.13	79.16	150.42	304.95
Commercial probability distribution	6.2%	27.1%	55.9%	10.8%
Commercial adjusted total	1.73	21.46	84.15	32.91
Sum of the parts total ($)	140.00			

- Our $140 PT was determined using a Sum of the parts valuation that applied a WACC calculated 11.9% discount rate and 2% terminal growth rate to revenues and cash flows projected into 2028.
- Revenues for each asset were adjusted independently twice:
  1) By probability of regulatory approval
  2) By asset specific commercial profile
- A commercial probability distribution was determined based on a revenue weighted distribution of independent commercial scenarios projected for each drug candidate.
- GLPG1690 and filgotinib comprise a majority of the valuation.
- Galapagos held €1.3B in cash and cash equivalents as of the end of 4Q18. Pro forma cash was not applied to this valuation.

Source: BioMedTracker; SVB Leerink research

Value Inflections In 2019



- We expect near term catalysts related to filgotinib to be the main value inflection drivers in 2019.
- Topline results from the FINCH 1 and FINCH 3 Phase 3 trials for filgotinib in RA are expected in 1Q19. We view this as an important binary event as RA currently represents ~47% of our total value attributed to Filgotinib.
- Positive topline results estimated to adjust the PoS for filgotinib in RA from 68% to 83.3% as we expect positive results would be followed by an NDA filing in 2H19.
- Proof-of-concept readouts in 2H19 for Sjögren's disease and CLE are estimated to have single percent value impacts on our price target reflected by a shifting of the market profile distribution in filgotinib towards a meaningful profile.

Sources: SVB Leerink research; Biomedtracker

GLPG Risks to Valuation

Product risk	One or more of the clinical trials for filgotinib or GLPG1690 may fail to meet its primary endpoint necessitating a deeper decision into continued development in that particular indication. Additionally, any safety issues that occur within one trial for filgotinib may read negatively across the entire filgotinib franchise.
Collaboration risk	Multiple products within GLPGs pipeline, including filgotinib and MOR106 are being developed and will be marketed away from GLPG's control. This gives GLPG limited ability to address situational issues surrounding the success of these drugs.
Regulatory risk	The FDA has previously indicated a belief in drug combinations as the likely future for IPF treatment. With this in mind, GLPG has pursued pivotal trial investigating GLPG1690 in combination with standard of care. While we believe this creates a safer path to approval, it nonetheless opens the door to potential competitors pursuing a path to approval as a monotherapy to significantly disrupt expectations for market competition
Financing risk	GLPG currently has no revenue producing products on the market. Though well capitalized over the near term, negative outcomes for any of their asset franchises may significantly impact their ability raise funds in the future.

Source: SVB Leerink research, company filings