KalVista Pharmaceuticals

Needham Healthcare Conference

April 10, 2019

Forward-Looking Statements

This presentation and the accompanying oral presentation contain “forward-looking” statements within the meaning of the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements can be identified by words such as: "anticipate," "intend," "plan," "goal," "seek," "believe," "project," "estimate," "expect," "strategy," "future, "likely," "may," "should," "will" and similar references to future periods. Examples of forward-looking statements include, among others, statements we make regarding our future financial performance, business plans and objectives, timing and success of our clinical trials, our ability to obtain regulatory approval or the timing of regulatory filings, the potential therapeutic benefits and economic value of our lead product candidates, financing plans, competitive position, industry environment and potential market opportunities.

Forward-looking statements are neither historical facts nor assurances of future performance. Instead, they are based only on our current beliefs, expectations and assumptions regarding the future of our business, future plans and strategies, projections, anticipated events and trends, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict and many of which are outside of our control. Our actual results and financial condition may differ materially from those indicated in the forward-looking statements. Therefore, you should not rely on any of these forward-looking statements. Important factors that could cause our actual results and financial condition to differ materially from those indicated in the forward-looking statements include, among others, the following: those related to our future financial performance, our ability to raise additional funding when needed, our ability to develop and maintain partnerships, our ability to identify and develop new products in a timely manner, the outcome, cost and timing of our product development activities and clinical trials, market size and acceptance of our products, our ability to maintain, protect and enhance our brand and intellectual property, our ability to continue to stay in compliance with applicable laws and regulations, our ability to scale our business and make key hires and such other factors as discussed under the section titled “Risk Factors” and elsewhere in our Annual Report on Form 10-K, definitive proxy statement and quarterly reports on Form 10-Q that we file with the Securities and Exchange Commission (“SEC”) as well as our other filings and the documents incorporated by reference therein, with the SEC.

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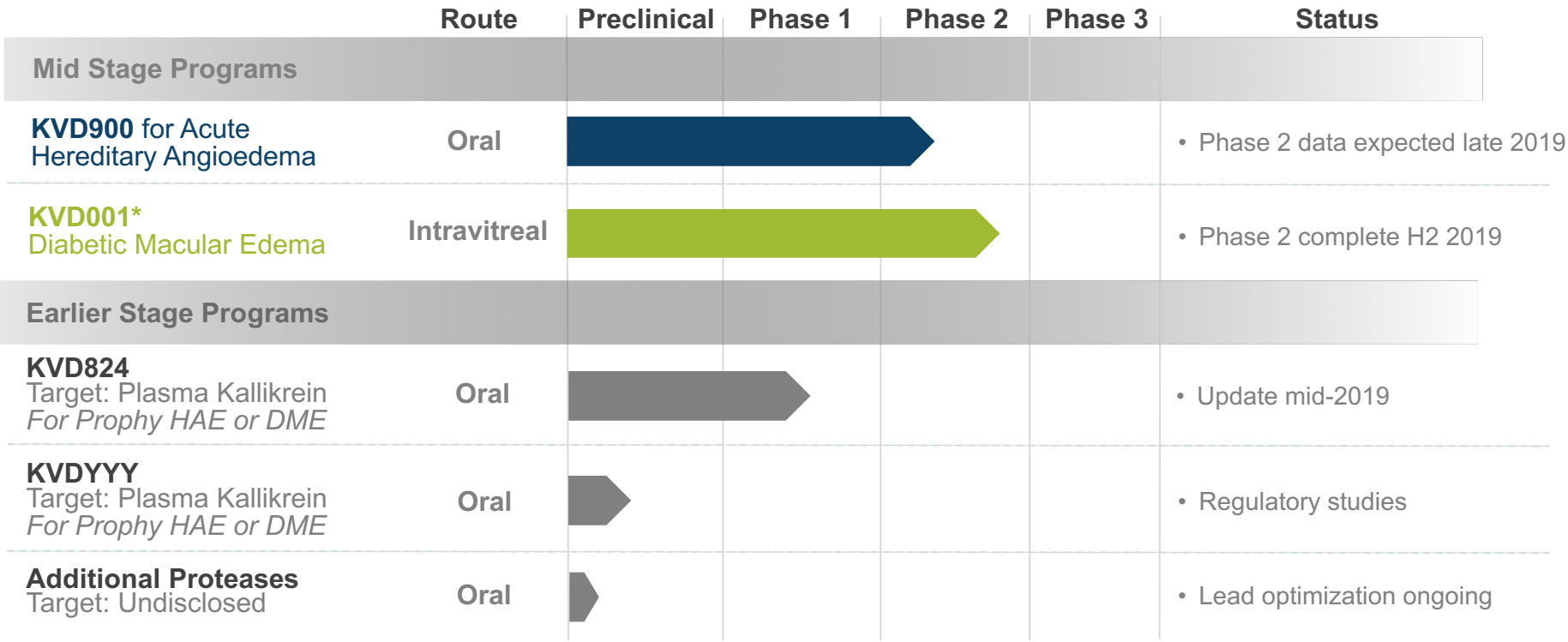
Company Highlights

- Discovery and development of small molecule protease inhibitors, with leading expertise on plasma kallikrein role in disease mechanisms
- Creating a portfolio of oral plasma kallikrein inhibitors to treat orphan disease hereditary angioedema (HAE) and diabetic macular edema (DME)
- HAE program KVD900 advanced to Phase 2 as acute therapy, with data expected in late 2019
- Collaboration with Merck in DME; lead program KVD001 Phase 2 completes H2 2019
- KVD824 filed in late 2018 as next clinical program; update to come mid-2019
- Internal discovery and development capabilities enable high productivity and strong IP positions
- Funded into 2021, with $111.1 million as of January 31, 2019

Product Portfolio



 **Under Option Agreement with Merck*

Hereditary Angioedema (HAE)

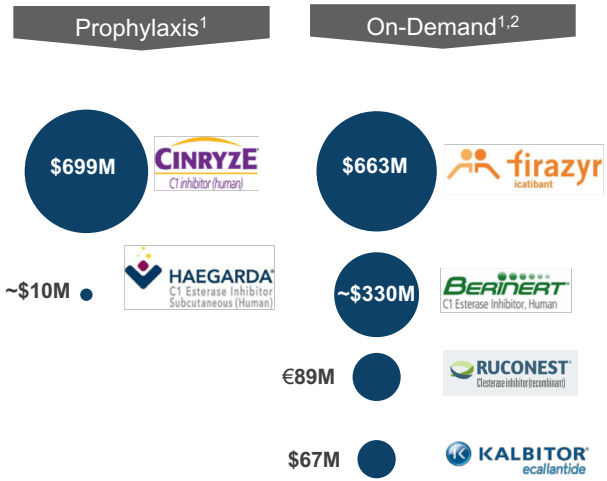
Hereditary Angioedema (HAE)

- Genetic condition causing painful and dramatic swelling in various parts of the body
- Orphan disease: incidence 1 in 10,000 to 1 in 50,000[1]
- Primarily caused by defect in C1 inhibitor activity which leads to uncontrolled plasma kallikrein activity and excessive bradykinin release
- Approved products target inhibition of plasma kallikrein
- All current approved therapies injected/infused - high unmet need for oral administration
- By 2020, total HAE market estimated to be over $2 billion
- We intend to bring multiple candidates through Phase 1 and target both acute and prophylactic segments

[1] *www.haei.org*

Oral Acute Therapy Meets Unmet Patient Needs

1. On-demand segment is the largest market opportunity
2. Oral treatment option represents a significant advancement for patients
3. Patients on prophylaxis still require therapy for breakthrough attacks
   - WAO/EAACI 2017 revision and update for management of HAE recommends all patients carry medication for on-demand treatment of two attacks, at all times

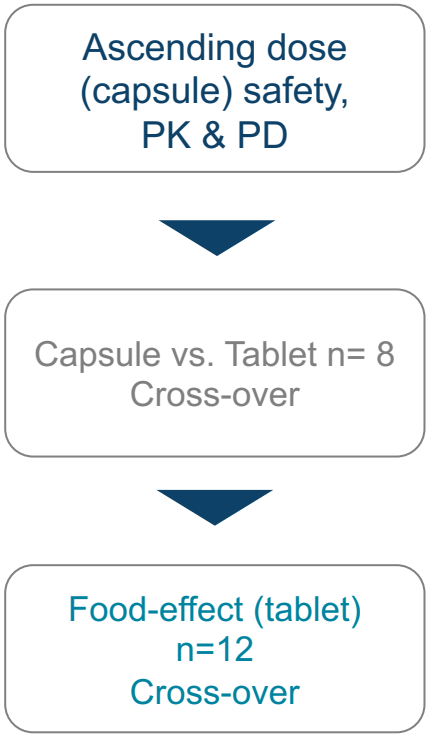


The majority of patients already manage their disease with acute therapies

[1]2017 Revenues from Shire full-year results, February 14, 2018 [2]2017 Revenue from Pharming Financial Results, March 7, 2018

KVD900 Phase 1 Overview

- Double-blind, randomized investigation of oral KVD900 recruited 84 healthy male volunteers
  - 68 received active treatment, 18 of which received 600 mg
  - Single ascending dose with crossover to tablet formulation
  - Food effect crossover using 600 mg tablet
- Safety and tolerability
  - AEs, laboratory measurements and clinical outcomes
- Pharmacokinetics
  - PK profile and PK parameters
- Pharmacodynamics
  - Ex vivo assays assessing enzyme activity and plasma kininogen substrate cleavage



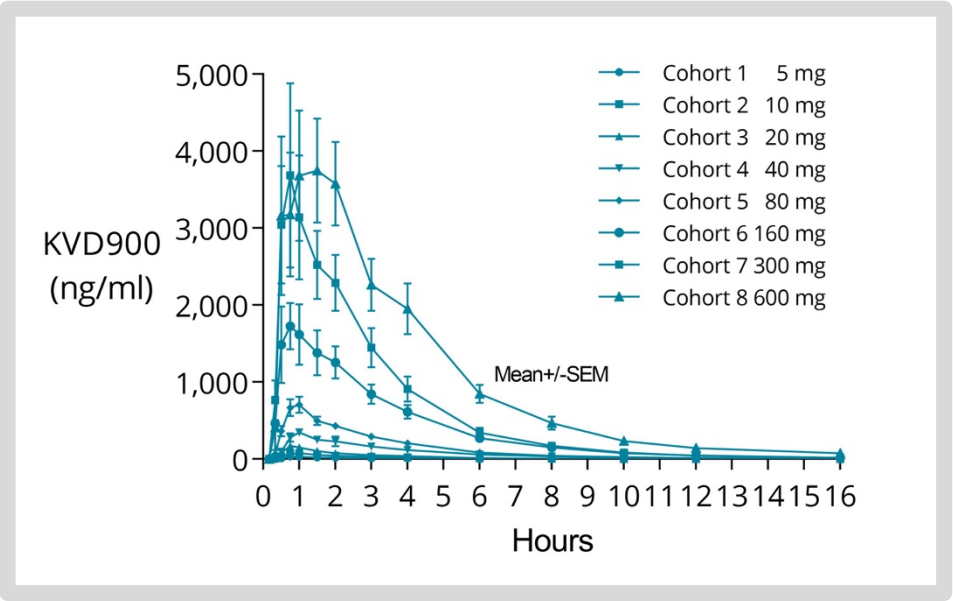
KVD900 Phase 1 Safety Profile

- No SAEs reported
- 44/45 AEs were mild
  - One moderate (headache at 10 mg)
  - No GI AEs considered related to KVD900
- No clinically significant changes in vital signs, ECG, safety labs
- No subjects withdrew

	Placebo	KVD900 5-160mg	KVD900 300mg	KVD900 600mg	KVD900 600mg	
Exposures / subjects					Fed	Fasted
	16 / 16	52 / 44	6 / 6	6 / 6	12 / 12	12 / 12
Vomiting*					1	
Fatigue					3	
Folliculitis						1
Nasopharyngitis		2				
Oral herpes	1	1				
Upper respiratory tract infection		1				
Arthropod bite					1	
Back pain	1	2				
Myalgia		1				
Dizziness		1			5	3
Headache		1			3	2
Lethargy					1	1
Syncope					1	
Cough		1				
Oropharyngeal pain	1	1				
Eczema						1

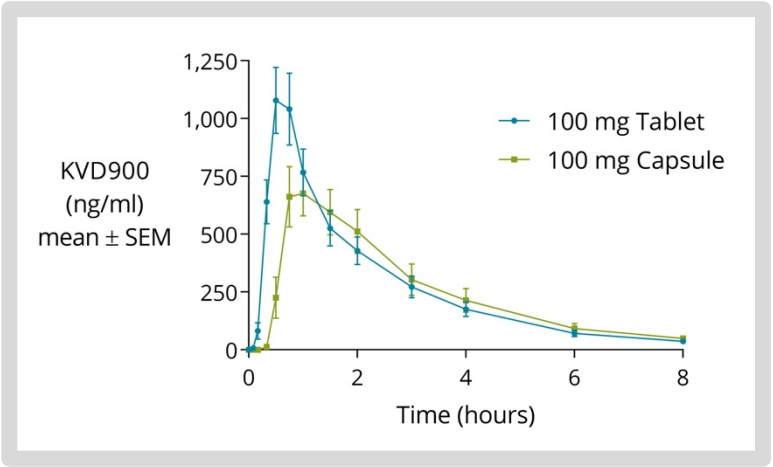
*3 days post-dose

KVD900 Rapidly and Highly Absorbed at All Doses



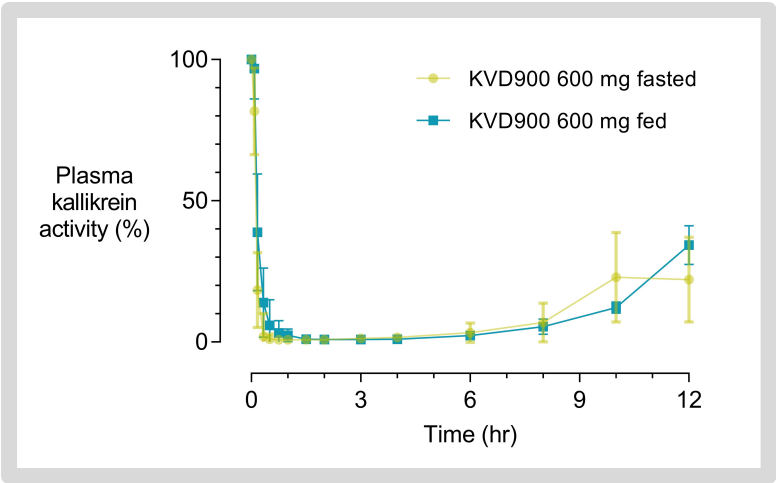
- Capsule formulation
- Mean T_{max} around 1 hour
- Mean C_{max} up to 3,500 ng/ml

KVD900 Phase 1 Trial – Tablet Formulation and Food Effect



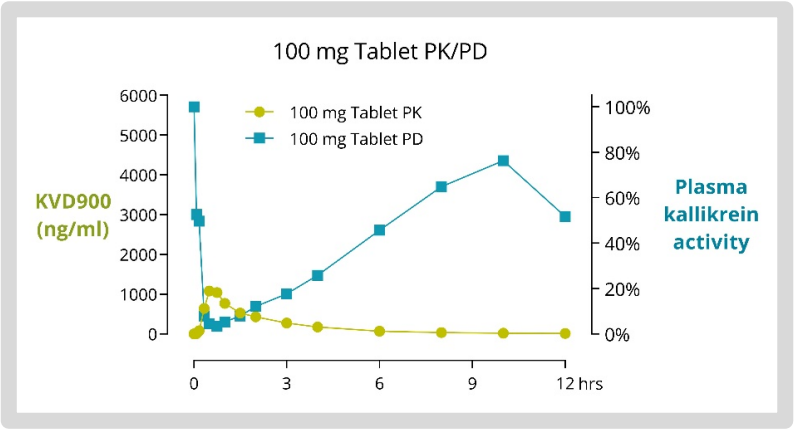
- Tablet formulation shows even faster absorption than capsule
- This is the intended commercial formulation

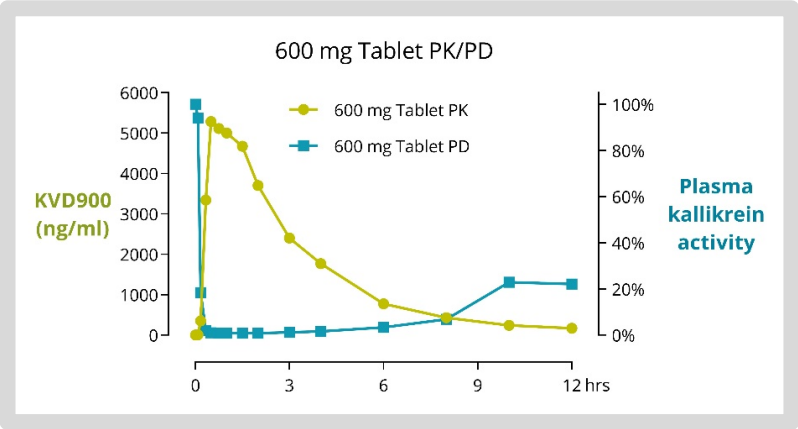
- Fed state has little impact on the PD profile of KVD900 tablets delivering 95% inhibition within 30 minutes



KVD900 Phase 1 Trial – Single Dose PK/PD of Tablets

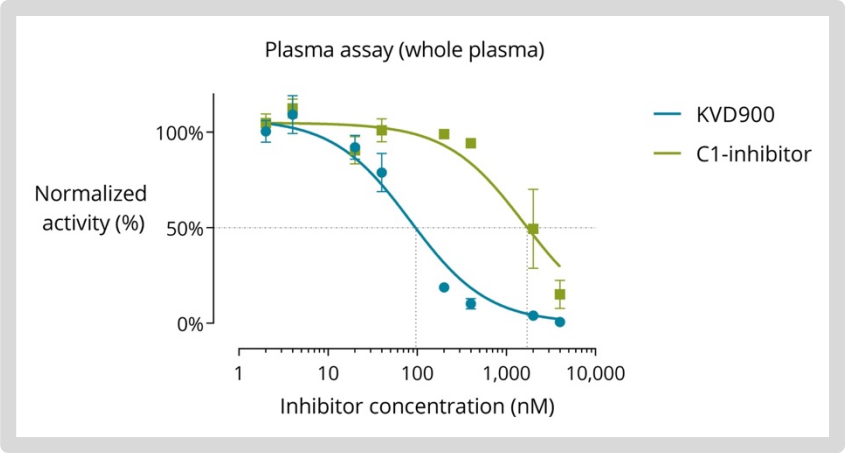
- Strong inhibition of plasma kallikrein activity following tablet administration
  - 100 mg and 600 mg shown
- Plasma activated by the addition of dextran sulfate
  - Plasma kallikrein activity monitored using a fluorescent substrate
- Rapid onset of inhibition
  - KVD900 exposure delivers rapid and potent inhibition of plasma kallikrein
  - 98% inhibition at 20 minutes





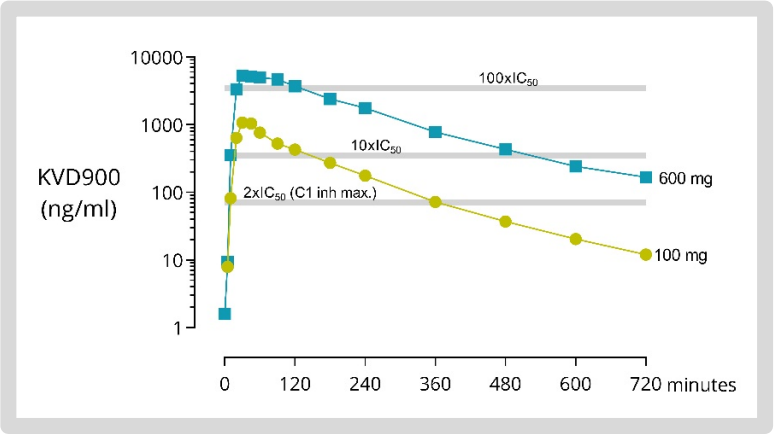
KVD900 Potency Compares Favorably to Berinert

- Comparing to approved, acute C1 inhibitor treatments demonstrates the level of plasma kallikrein inhibition that delivers clinical efficacy
- C1 inhibitor potency
  - IC_{50} in whole plasma is 1700 nM
  - KVD900 is 90 nM
- Berinert
  - Following administration of the approved dose of 20 IU/kg
  - Cmax »3,000 nM (0.32 mg/ml) reached within 48 minutes of dosing
  - Maximal concentration is ≈2x IC_{50}

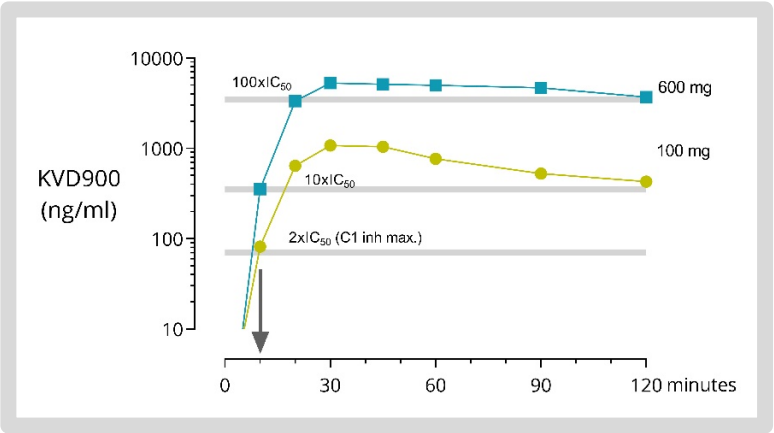


KVD900 Achieves 50-100x IC_{50}

- Multiple dose levels achieve sufficient plasma kallikrein inhibition
  - Based on clinically efficacious doses of C1-INH
- 600 mg tablet – exceeds 100x IC_{50}
- 100 mg tablet – exceeds 50x IC_{50}



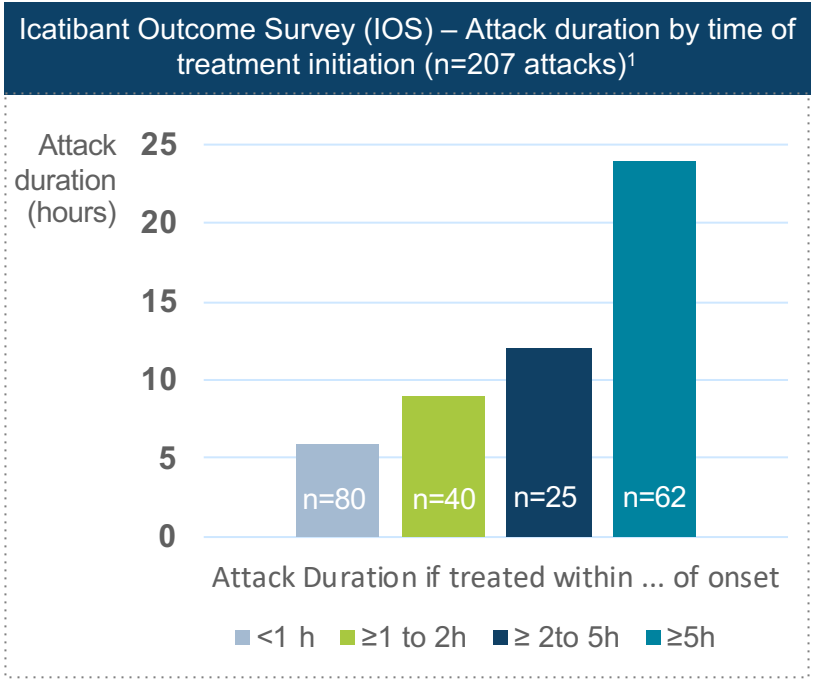
- Rapid exposure is important for acute efficacy
- 2x IC_{50} reached around 10 minutes
  - At least as quickly as C1-INH injection
- 100x IC_{50} before 30 minutes



KVD900: On-Demand Treatment of HAE Attacks

- Data shows what we believe is an ideal profile for acute oral therapy
  - Tablet formulation rapidly and highly absorbed driving very fast onset of effect
  - Effective concentrations maintained for at least 10 hours
  - No safety or tolerability signals to date
    - No GI effects
  - Short residence time to minimize any tolerability findings or impact on other medications
- KVD900 has the potential to be a patient-friendly treatment which offers the opportunity to intervene early resulting in higher efficacy
  - Efficacy of acute injectable treatments is often undermined by late dosing
  - Early treatment has been shown to be key in maximizing treatment outcomes
  - Potential label extension for treatment on prodromal symptoms → episodic prophylaxis

Early Treatment Significantly Reduces Attack Duration…



Delaying treatment dramatically extends attack duration

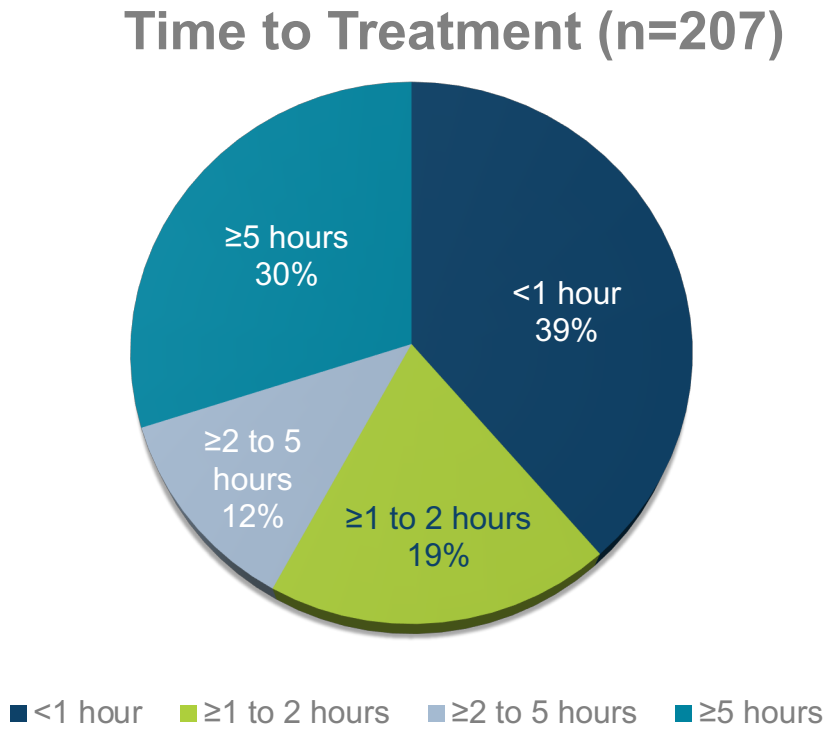
[1]*Maurer M et al. PLoS ONE 8(2): e53773. doi:10.1371/journal.pone.0053773*

…But Majority of Patients Do Not Treat Early Enough

>60% of patients administer their therapy more than one hour after the beginning of an attack, per IOS

We believe there are several reasons why treatment is delayed:

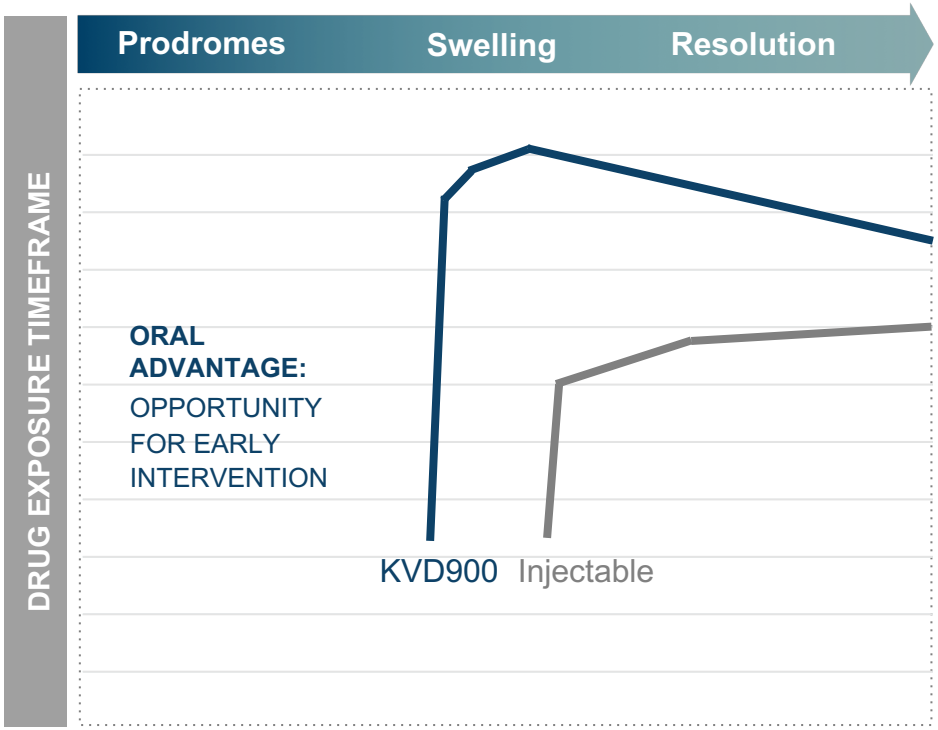
1. Inconvenient – many therapies require medical professional training
2. Painful – both during and after administration
3. Hope – rather than treat, patients frequently will just hope for a less severe attack



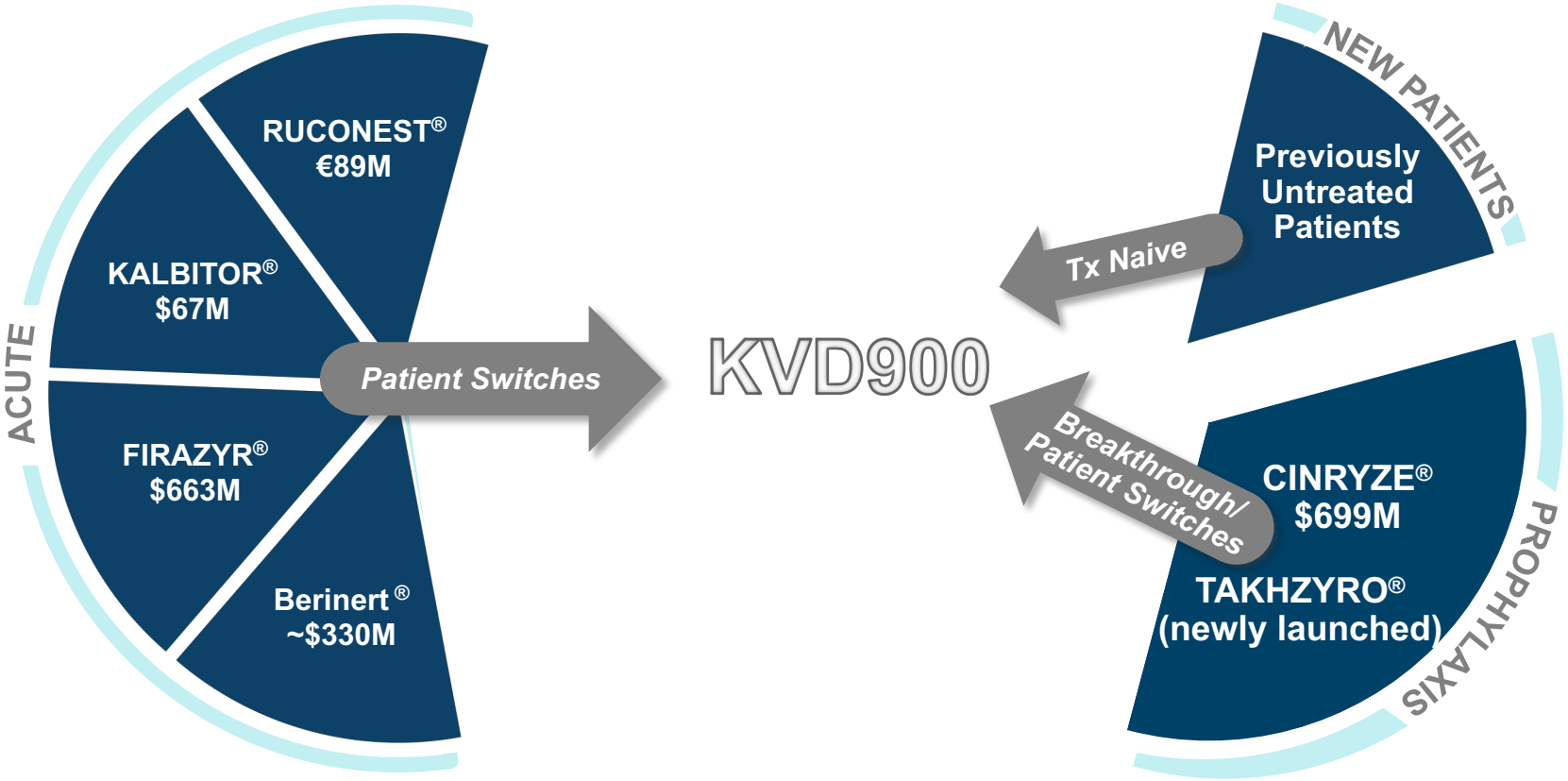
Source: Maurer M et al. PLoS ONE 8(2): e53773. doi:10.1371/journal.pone.0053773

KVD900 Supports Earlier Treatment and Faster Attack Resolution

- Convenience and tolerability of KVD900 compared to other therapies may encourage earlier dosing
- Rapid absorption of KVD900 yields high exposures which compare favorably to injectable therapies
- Combination of these attributes may lead to shorter and less severe attacks and better treatment outcomes
- **Offers the potential to dramatically improve patient quality of life by providing better disease control**



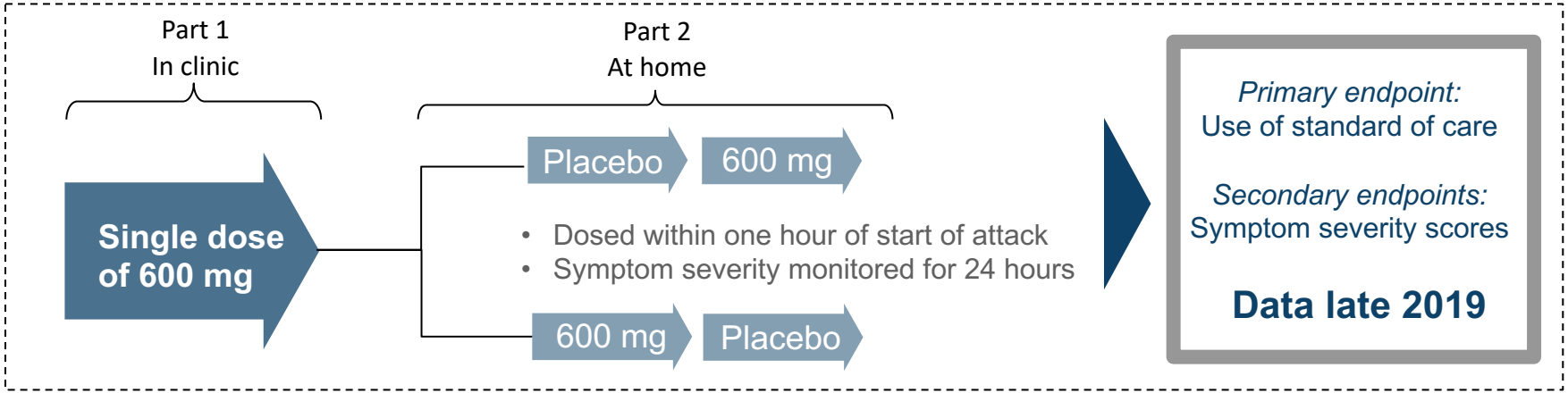
Opportunity: Capture Market Share and Growth of $2B Market



2017 Revenues from Shire full-year results, February 14, 2018 and 2017 Revenue from Pharming Financial Results, March 7, 2018

KVD900 Phase 2 Efficacy Study

- ~50 HAE patients at 10-15 sites in UK, Germany and several other European countries
  - Patients required to have at least 3 attacks in previous 90 days
- Part 1: All patients receive a single dose of KVD900 in clinic for PK/PD assessment
- Part 2: All patients then randomized to treat the first attack with either KVD900 or placebo and then treat a second attack with the alternative treatment



Diabetic Macular Edema (DME)

Diabetic Macular Edema: Over $1 Billion Market

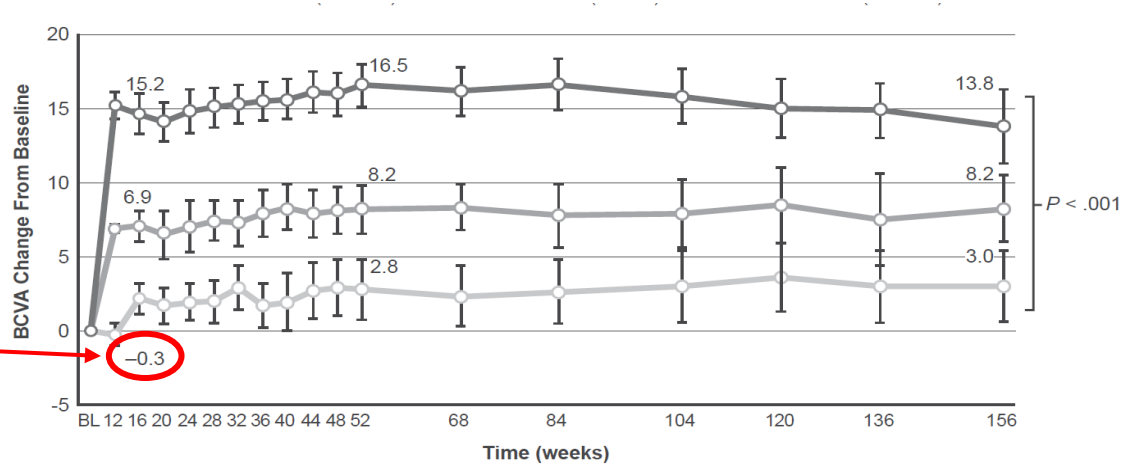
- Retinal swelling due to leaky blood vessels in the macula – a leading cause of blindness
- Approximately 900,000 patients in the United States have active DME and are at serious risk of vision loss
- Standard of care is anti-VEGF injected into the eye – currently there are no oral treatments for DME
- Over 40% of patients do not adequately respond and continue to have impaired visual function and macular edema – significant unmet clinical need
- Plasma kallikrein has been identified as a potential VEGF-independent mediator of DME
- KalVista developed KVD001 as an IVT therapy and is also working to develop an orally delivered plasma kallikrein inhibitor therapy for DME
  - The basis of Merck collaboration announced in October 2017

Over 40% of anti-VEGF Patients are Not Adequately Treated

- Large well controlled trial (DRCR Protocol I) of anti-VEGF treatment in DME patients evaluated 854 eyes
- 40% of eyes showed -0.3 letters of improvement in mean BCVA after 3 injections

Mean Change: 12 weeks	Eyes
15.2 letters	37% (126 of 340)
6.9 letters	23% (79 of 340)
-0.3 letters	40% (135 of 340)

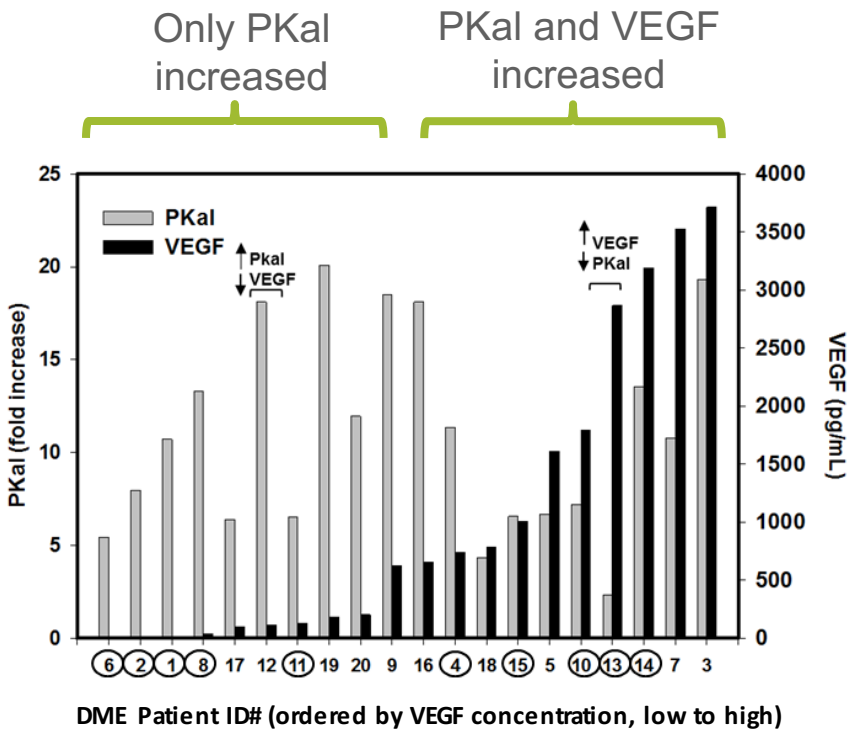
Protocol I analysis of ranibizumab treated eyes (n=340 at 12 wks)



Gonzalez et al 2016 Am J Ophthalmol

Plasma Kallikrein (Pkal) Elevated in DME Vitreous

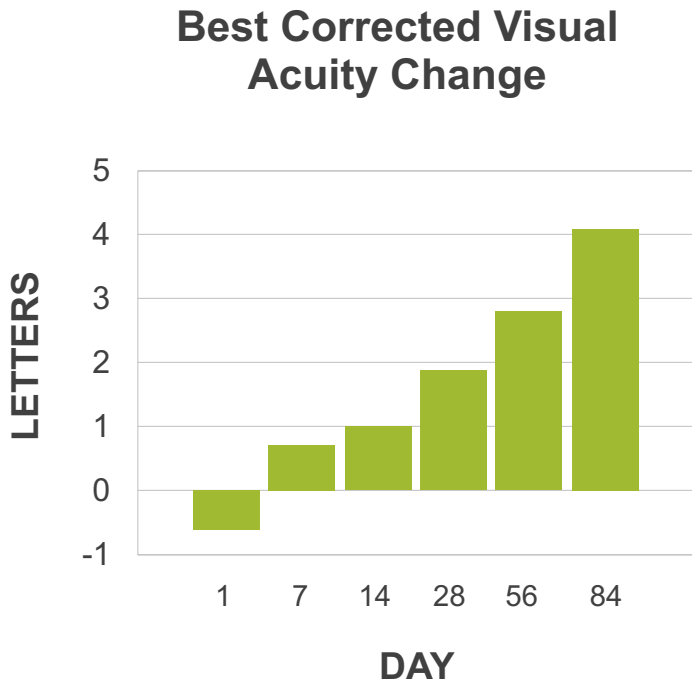
- Vitreous samples from patients with DME show increased Pkal levels
- Significant population has elevated Pkal and low VEGF
  - Patients who may respond well to Pkal inhibition and poorly to anti-VEGF treatment
  - Clear medical need
- Presence of Pkal in addition to VEGF suggests potential utility in broader population



Kita et al, Diabetes 2015

Phase 1 Trial Results

- KVD001: IVT first-in-class plasma kallikrein inhibitor for DME
- Open label, single ascending dose Phase 1 trial in 14 DME patients complete
  - All patients had previously received anti-VEGF treatment
  - Well tolerated
  - Signal of improved visual acuity following single dose
- Duration of animal exposure consistent with signal of improvement



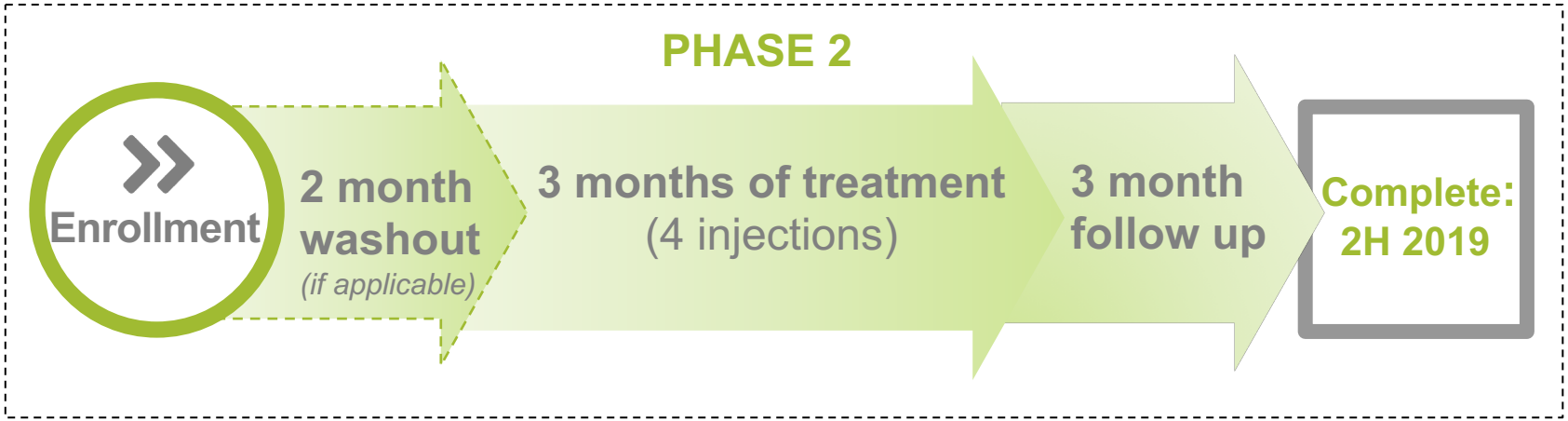
Mean change in visual acuity following a single dose of KVD001
N=14

Option Agreement With Merck on DME Programs

- In October 2017, KalVista and Merck announced a collaboration for KVD001, KalVista's intravitreal DME program, as well as future orally-delivered plasma kallikrein inhibitors for DME developed by KalVista
- Merck has two options, to acquire KVD001 and/or oral DME assets until a specified time following certain data on each
- Until the options are exercised, KalVista retains full ownership and control of the assets
  - KalVista to execute and fund the Phase 2 KVD001 trial and other activities
  - Merck pays all costs post-exercise
- $37 million upfront payment to KalVista
- $715 million in potential additional milestone payments
- Tiered sales royalties on global net sales
- Merck acquired a 9.9% stake in KalVista in a concurrent PIPE

KVD001 Phase 2 Enrollment on Track

- Approximately 123 patients who have discontinued treatment with anti-VEGF therapy and who still have significant edema and reduced visual acuity
- Sham-controlled, double-masked clinical trial will evaluate two doses
- Efficacy endpoints include best corrected visual acuity (BCVA), central subfield thickness (CST), and the diabetic retinopathy severity scale (DRSS)



2019 Milestones

KVD824 update	Mid-year
KVD001 Phase 2 complete	H2 2019
KVD900 Phase 2 data	Late 2019
KVD900 Orphan Drug application	2019

KalVista Pharmaceuticals

NASDAQ: KALV