Company presentation

November 2019

NASDAQ: ASLN
TPEx: 6497

ASLAN PHARMACEUTICALS

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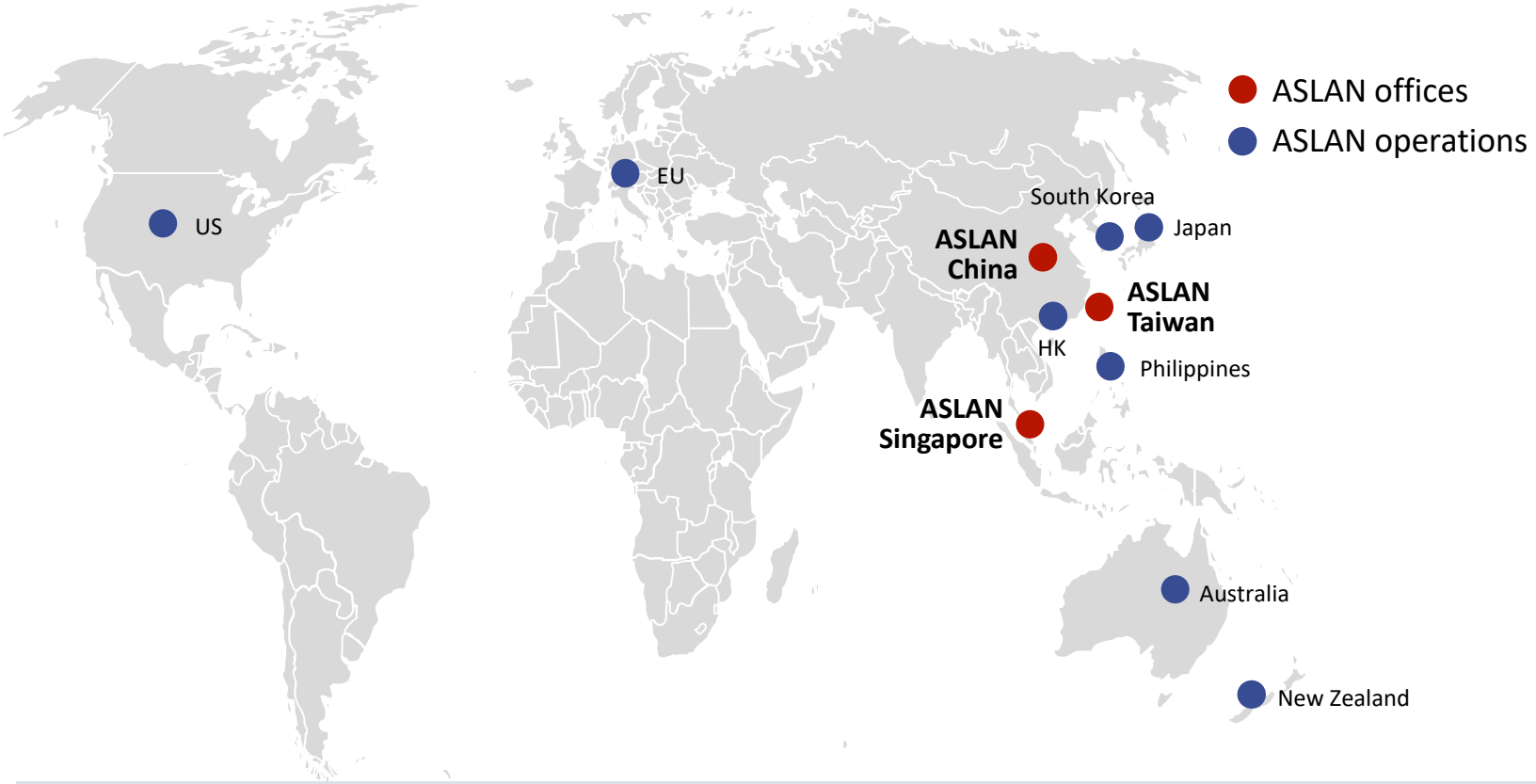
Clinical-stage oncology and immunology focused biopharma with deep pipeline and near-term readouts

Platform leverages Asia clinical centres combined with US/EU centres to accelerate clinical development

Varlitinib	Oral, reversible pan-HER inhibitor has shown activity in a range of tumour types with differentiated tolerability profile	**4Q 19**	2nd line BTC pivotal topline data
ASLAN003	Oral DHODH inhibitor with the potential to be first-in-class therapy for AML		
ASLAN004	IL-4R / IL-13R inhibitor with the potential to be best-in-class therapy for atopic dermatitis and asthma	**2H 20**	Atopic dermatitis MAD completion

Headquartered in Singapore with global footprint



- Most clinical trials run in Asia where the majority of patients live
- Data is leveraged to seek approvals in US, EU and other global markets
- Building commercial organisation in China, also planning to build in US

Asia offers a unique opportunity to accelerate global clinical development

Where the diseases are more prevalent

Cancer prevalence	US	Asia-Pac	Difference in prevalence
Biliary tract	12,601	200,968	2.8 x
Gastric	32,076	1,027,691	5.6 x
Liver	27,479	422,635	2.7 x
Nasopharyngeal	6,072	112,790	3.2 x

Where there are fewer competing clinical trials

Trials per M capita	US	Asia-Pac (ex-JP)	Difference in density
All diseases	367	18	20 x
AML	5.35	0.03	167 x
Atopic dermatitis	1.03	0.02	62 x

1 Gastric, liver and nasopharyngeal cancer: as of 2012, based on Globocan (2012); Bray et al (2013), Estimates of global cancer prevalence for 27 sites in the adult population in 2008.
2 Biliary tract cancer: as of 2016, based on Edison Investment Research, "Novel treatments for worldwide unmet needs," dated November 8, 2017, surveying Randi et al (2008), Epidemiology of biliary tract cancers: an update; Bridgewater et al (2014), Guidelines for the diagnosis and management of intrahepatic cholangiocarcinoma.
3 In this table, Asia-Pac refers to only China, Japan, Philippines, Singapore, South Korea, Thailand and Vietnam.
4 Clinical trial density is defined as number of trials per one million population.

Development pipeline

Programs	Discovery	Preclinical	Phase 1	Phase 2	Pivotal	Key milestones
GLOBAL RIGHTS						
Varlitinib **(ASLAN001)** *Pan-HER inhibitor*	Biliary tract cancer (2nd line)					• Topline data 4Q 19
	Gastric cancer (2nd line)[1]					
	Biliary tract cancer (1st line)					
ASLAN003 *DHODH inhibitor*	AML					
ASLAN004 IL-4/IL-13 *Receptor inhibitor*	Atopic dermatitis					• MAD completion 2H 20
	Asthma					

1 Part of the K-MASTER investigator initiated trial

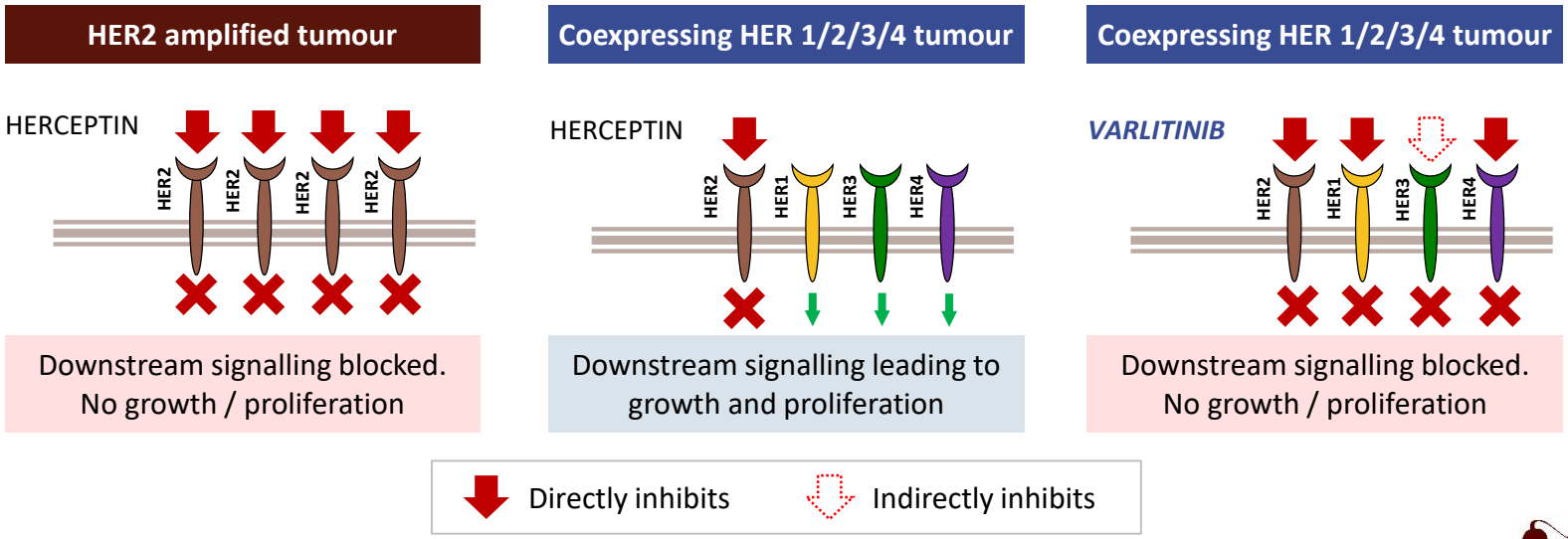
Varlitinib (ASLAN001)

Varlitinib in pivotal studies for BTC – readout in 4Q 2019

Pan-HER inhibitor	Highly potent, oral, reversible, small molecule with balanced inhibition across all HER family receptors.
Robust activity	Demonstrated activity in biliary tract, gastric, breast, colorectal cancer. Two phase 2 trials completed, over 600 patients dosed.
Competitive efficacy	Increase activity over standard of care: 44% ORR in 1st line BTC, 60% ORR in 2nd line HER2+ and 60% pCR in neoadj breast cancer.
Differentiated safety	Substantially lower GI tox compared to other pan-HER inhibitors. 1% drug-related grade 3/4 diarrhoea across all studies.
Focus on subsets of BTC	Only pan-HER being developed in BTC. US orphan drug designation obtained from the FDA.

Mechanism of action

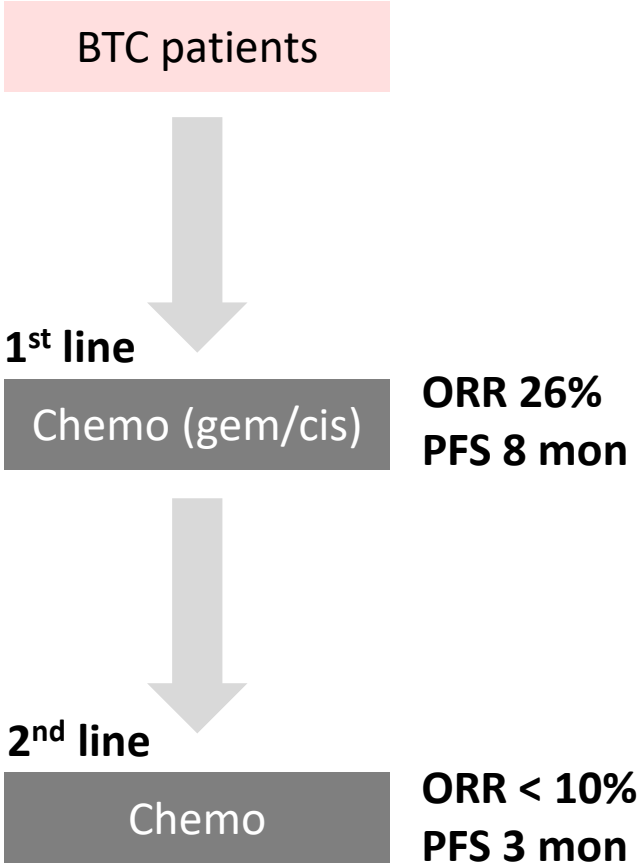
- Targets the HER family of receptors: HER1, HER2, HER3 and HER4
  - Responsible for driving growth in human epithelial cells
- HER-selective drugs such as Herceptin target only one type of HER receptor (HER2)
  - Established efficacy in tumours driven specifically by HER2
  - Blocking just one receptor type is ineffective for many patients
  - These tumours may be driven by a combination of HER1, HER2, HER3 and HER4
- *Varlitinib* has the potential to inhibit growth of a much broader range of tumours



Varlitinib has the potential to be the first targeted therapy for biliary tract cancer

- Often considered as subset of HCC, however drugs approved for HCC are not approved for BTC
- Median OS 12 months
- 5 year survival rate of less than 10%
- No approved targeted therapies
- Several drugs being developed for specific subpopulations: FGFR2 (<10%), IDH1 (10-15%)
- HER-family receptors are broadly expressed in around 70% of BTC

Region	Incidence	Incidence rate (per 100k)
Asia-Pac	201,000	11.0
China	145,000	10.5
EU5	14,000	4.2
US	12,600	3.9

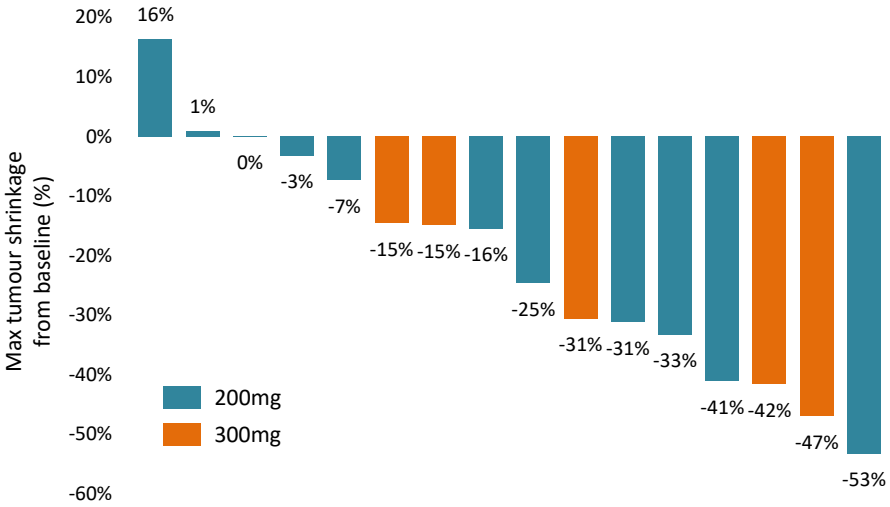


1 Biliary tract cancer incidence: as of 2016, based on Edison Investment Research, "Novel treatments for worldwide unmet needs," dated November 8, 2017, surveying Randi et al (2008), Epidemiology of biliary tract cancers: an update; Bridgewater et al (2014), Guidelines for the diagnosis and management of intrahepatic cholangiocarcinoma.

Positive phase 1b data in 1st line BTC demonstrate increased activity over standard of care

- Phase 1b trial of *varlitinib* in combination with gem/cis in 1st line BTC
- 21 patients dosed with 200-300mg *varlitinib* and gem/cis.
  16 patients evaluable for efficacy:
  - 44% ORR overall (60% ORR with 300mg *varlitinib*)
  - 94% DCR overall (100% DCR with 300mg *varlitinib*)
- Data compares favourably with published historical data (ABC-02 trial) which reported 26% ORR and 81% DCR for patients dosed with gem/cis alone

Population	ITT	Efficacy evaluable			ABC-02 gem/cis
		All	200 mg	300 mg	
No. of pts	21	16	11	5	161
Response					
CR	0	0	0	0	1 (0.6%)
PR	7 (33.3%)	7 (43.8%)	4 (36.4%)	3 (60%)	41 (25.5%)
SD (≥12 wk)	10 (47.6%)	8 (50.0%)	6 (54.5%)	2 (40%)	89 (55.3%)
SD (<12 wk)	2 (9.5%)	1 (6.3%)	1 (9.1%)	0	0
PD	0	0	0	0	30 (18.6%)
NE	2 (9.5%)	0	0	0	NA
Efficacy assessment					
ORR	33.3%	43.8%	36.4%	60%	26.1%
DCR	81.0%	93.8%	90.9%	100%	81.4%



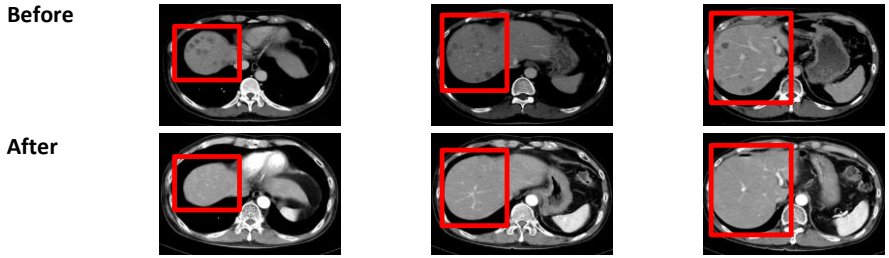
Data cut-off as of 26 Nov 2018
ASCO GI 2019

Promising signs of efficacy in a difficult to treat cancer even in pretreated patients

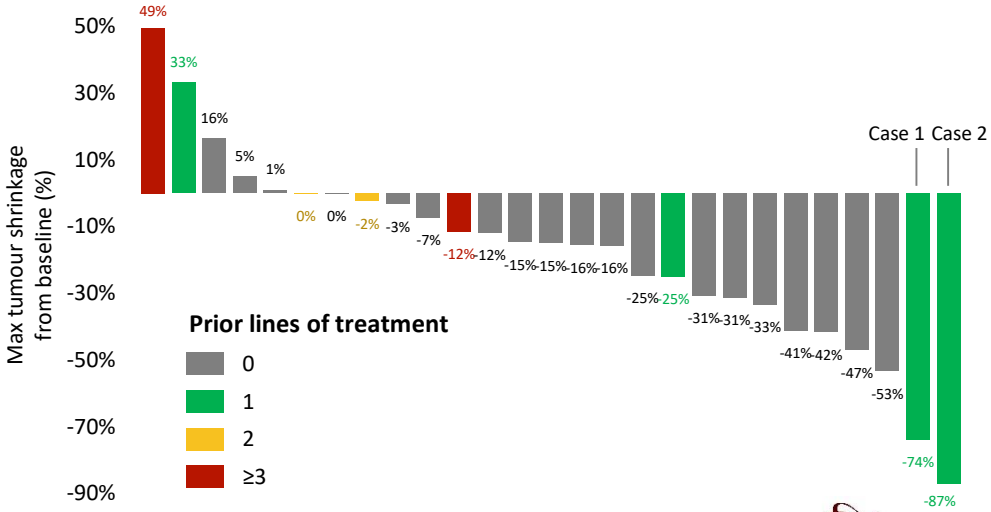
- Pooled analysis of three phase 1b trials of *varlitinib*
- 43 BTC patients treated with *varlitinib* and platinum-based doublet chemo followed by *varlitinib* monotherapy
- 27 patients evaluable for efficacy, 33% ORR, 81% DCR

	Case 1	Case 2
Demographics	51 years, female	58 years, male
Line of therapy	2nd	2nd
Best response	PR	PR
Days on study	653 (476 days monotherapy)	210 (91 days monotherapy)

CT scan images for Case 2



Population	Efficacy evaluable
No. of pts	27
Response	
PR	9 (33.3%)
SD	14 (51.9%)
PD	4 (14.8%)
Efficacy assessment	
ORR	33.3%
DCR (≥ 6 weeks)	81.5%



Data cut-off as of 26 Nov 2018
ASCO GI 2019

Recent data from China show *varlitinib* plus capecitabine may be an efficacious regimen for 2nd line BTC patients

62 patient single-arm phase 2 study in China testing *varlitinib* + capecitabine in 2nd line BTC patients that had progressed on gemcitabine-based chemotherapy

JadeTree[1]		Benchmark[2]
	BTC patients	
ORR 10% PFS 3.9 mon	**1st line** Chemo (gem/cis)	ORR 26% PFS 8 mon
var + cap ORR 11% DCR 70% PFS 2.7m OS 5.8m 12m survival 36%	**2nd line** Chemo	**FOLFOX** ORR 5% DCR 33% PFS 4.0m OS 6.2m 12m survival 26%

- JadeTree provides the first 'real world' data in Chinese patients in 2nd line BTC
- Patients appeared to present with more aggressive disease than in previously published studies
- Nevertheless, var + cap led to an ORR of 11% and OS of 5.8 months

1 Data presented in late-breaking presentation at CSCO 2019. First line data based on historical patient records *before* entering clinical study. Evaluable patients.
2 ABC-02, ABC-06 studies carried out in the UK

Pivotal TreeTopp trial (2nd line BTC)

- Pivotal "TreeTopp" clinical trial in 2nd line BTC
  - 56 sites including US, EU, Japan, China, AsiaPac
  - Led by Dr Milind Javle (MD Anderson)
  - Clinical trial design agreed with US FDA
- Enrolment completed ahead of schedule in December 2018
- Topline data expected in 4Q 19

2nd line BTC patients

varlitinib + capecitabine

placebo + capecitabine

N = 127
Primary endpoints: ORR, PFS
Secondary endpoints: OS, DOR, DCR, tumour size

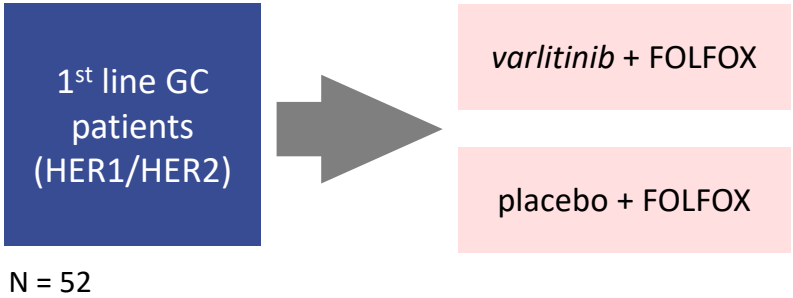
ABC-06 study[1] is the only randomised trial testing chemo in 2L BTC:

Drug	n	ORR	PFS (mon)	OS (mon)
FOLFOX + ASC[1]	81	5%	4.0	6.2
Control (ASC[1])	81	Not measured	Not measured	5.3

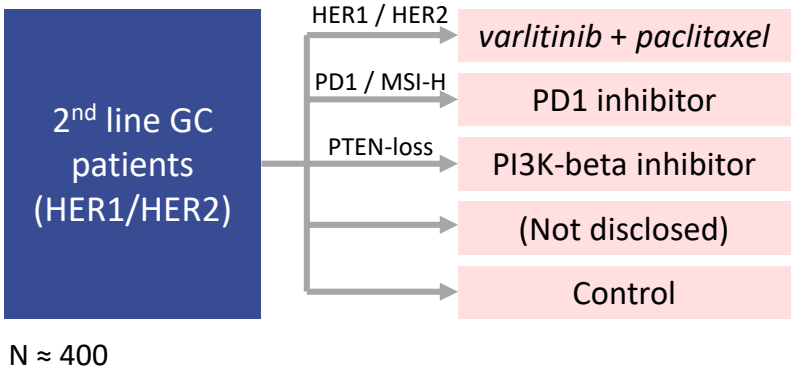
The trial will meet its primary objective if either endpoint is significant at the one-sided 5% level or if both endpoints are significant at the one-sided 10% significance level

1 ABC-06, A randomised phase 3, multi-centre, open-label study of active symptom control (ASC) alone or ASC with oxaliplatin/5-FU chemotherapy

Gastric cancer: moving from 1st line to 2nd line



In a recent phase 2 study in 1st line HER1/HER2 gastric cancer, there was a trend to increased tumour shrinkage in the *varlitinib* arm (22.0% vs 12.5%), however the primary endpoint was not met (required 20% difference between the arms).



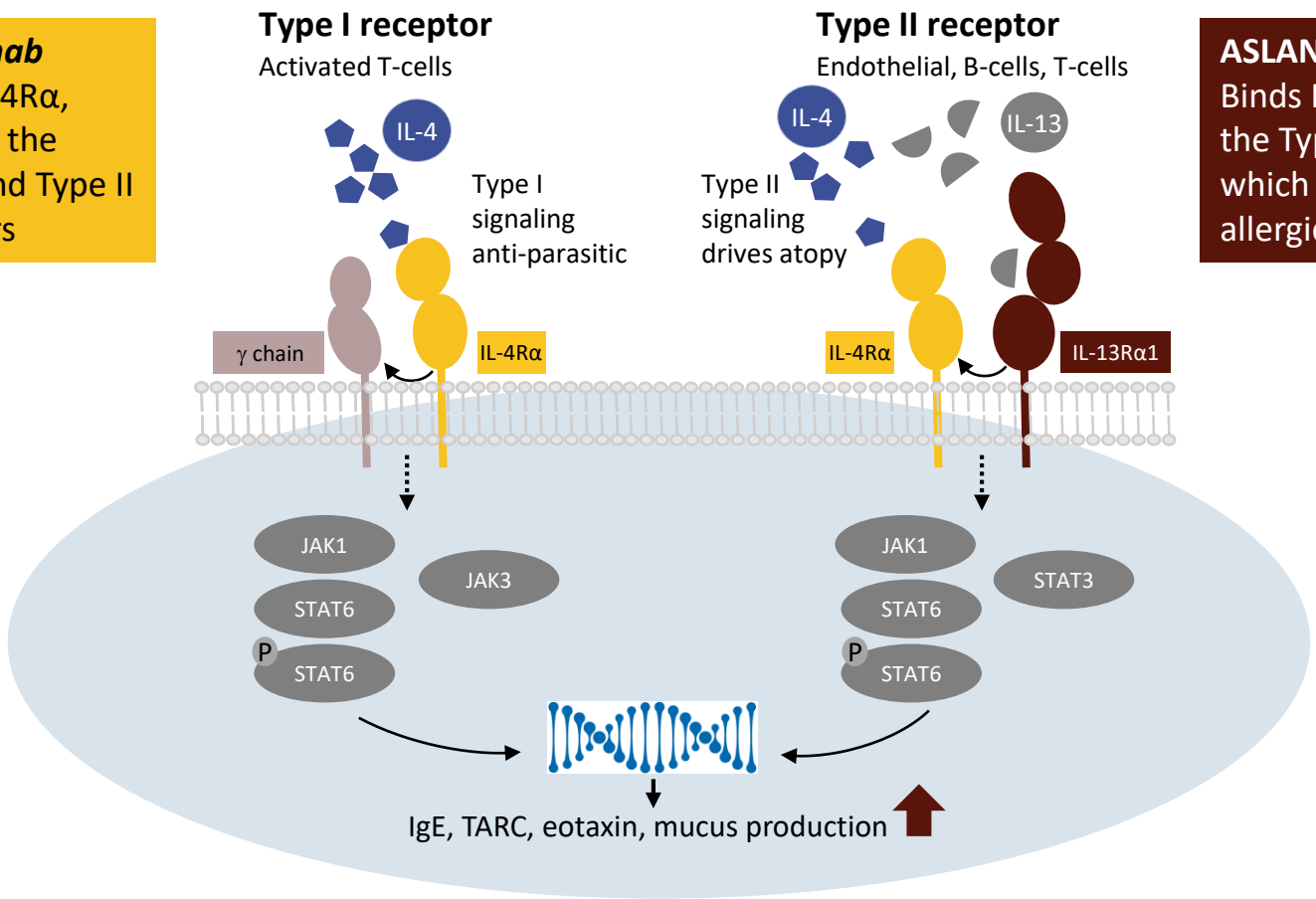
Subsequently, *varlitinib* has been selected by K-MASTER for a phase 2 umbrella study testing *varlitinib* in 2nd line HER1/HER2 gastric cancer. (K-MASTER is Korea's leading precision medicine research group, operated by Korea University, funded by the Korean government).

ASLAN004

ASLAN004 blocks signaling through IL-4 and IL-13

- ASLAN004 targets the IL-13 receptor α1 subunit
- Blocks same pathways responsible for allergic inflammation as *dupilumab*

Dupilumab
Binds IL-4Rα, blocking the Type I and Type II receptors

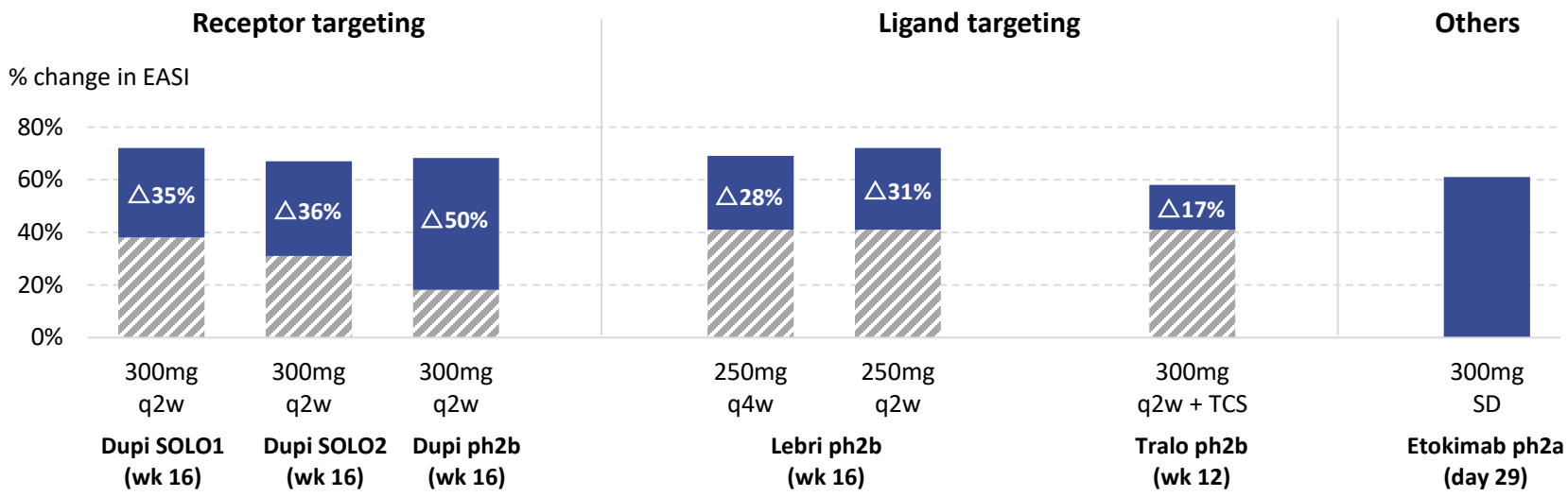


ASLAN004
Binds IL-13Rα1, blocking the Type II receptor, which is responsible for allergic inflammation

Receptor targeting is more effective than ligand targeting

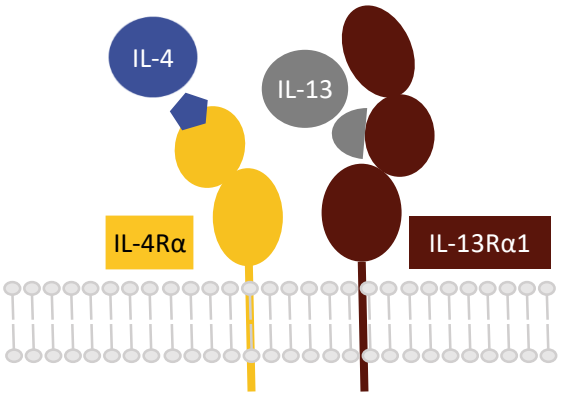
Receptor targeting		
ASLAN004	**IL-13Rα1**	**Phase 1 in atopic dermatitis**
Dupilumab	IL-4Rα	Approved in atopic dermatitis and allergic asthma

Ligand targeting		
Lebrikizumab	IL-13	Discontinued in asthma, phase 3 in atopic dermatitis
Tralokinumab	IL-13	Discontinued in asthma, phase 3 in atopic dermatitis
Anrukizumab	IL-13	Discontinued
Altrakincept	IL-4	Discontinued
Pascolizumab	IL-4	Discontinued
IL-4/IL-13 cytokine trap	IL-4 and IL-13	Discontinued
SAR-156597 bispecific	IL-4 and IL-13	Discontinued
QBX258, VAK-694, QAX-576	IL-4 and IL-13	Discontinued



ASLAN004 binds more strongly to receptor than *dupilumab* relative to its respective ligand

Receptor	Ligand	Kd (nM)	Comments
IL-13Rα1	IL-13	30	ASLAN004 has a 60 fold higher affinity for receptor than IL-13
IL-13Rα1	ASLAN004	0.5	
IL-4Rα	IL-4	0.1	*Dupilumab* only has a 3 fold higher affinity for receptor than IL-4
IL-4Rα	*Dupilumab*	0.03	

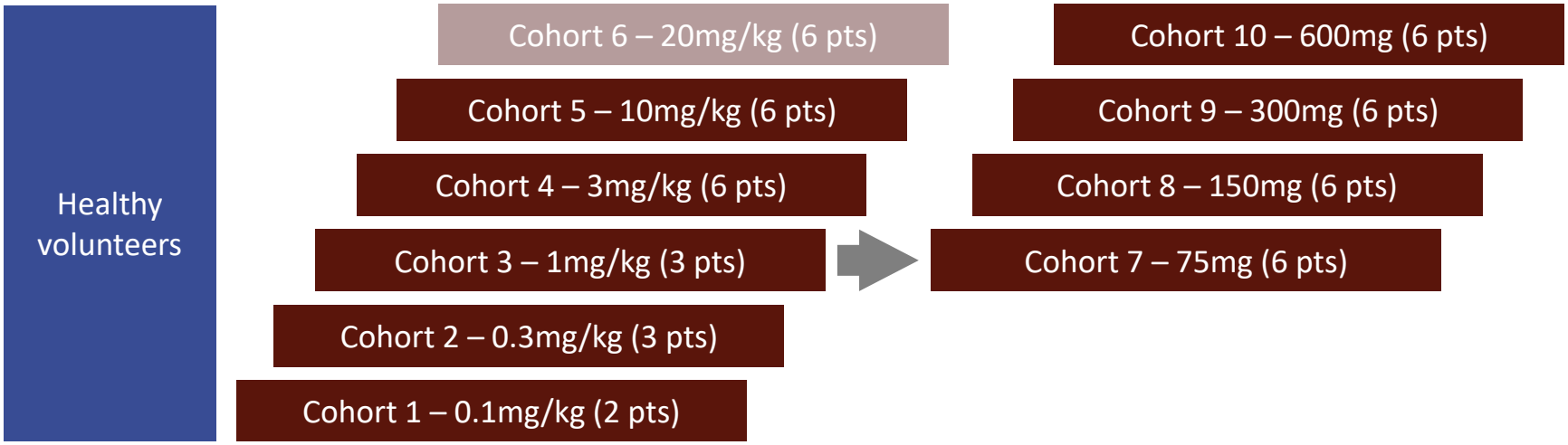


ASLAN004 offers a greater affinity difference between ligand and receptor binding which may translate to lower required concentration *in vivo*

Phase 1 SAD study in healthy volunteers completed

- Well tolerated at all doses when administered IV and subcut
  - No adverse events that led to discontinuations, no significant injection site reactions
- Analysis of downstream mediators including pSTAT6 demonstrated complete inhibition within one hour of dosing with IV and maintained for more than 29 days
- PK profile may allow for monthly dosing
- Trough level required to completely inhibit signal transduction via the receptor was over an order of magnitude lower than that of existing therapies

Cohort 6 not actioned as long PD effect >29 days achieved at 10 mg/kg



Part A (IV)
60 minute IV infusion via syringe driver pump

Part B (SC)
Parallel conduct after cohort 3 completed

ASLAN004 well-tolerated at all dose levels

Drug-related adverse event	N = 44				
	Any grade		Severity		
	N	(%)	Mild	Moderate	Severe
Decreased appetite	2	5	1	1	0
Alanine aminotransferase increased	1	2	1	0	0
Diarrhoea	1	2	1	0	0
Pyrexia	1	2	1	0	0
Blood lactate dehydrogenase increase	1	2	1	0	0
Weight decrease	1	2	1	0	0
Lymphocyte count decrease	1	2	1	0	0
Headache	1	2	0	1	0
C-reactive protein increase	1	2	1	0	0
Injection site pruritus (mild)	1	2	1	0	0

ASLAN004 MAD is designed to deliver PoC

- MAD / PoC study testing ASLAN004 in moderate-severe atopic dermatitis patients
- Expected to complete in 2H 20
- Double-blind, placebo controlled study
- Patients dosed for 8 weeks with a 12 week recovery period

Moderate-to-severe atopic dermatitis patients (N = 42)

Cohort 1 – Dose 1 QW (ASLAN004 N = 6, placebo N = 2)

Cohort 2 – Dose 2 QW (ASLAN004 N = 6, placebo N = 2)

Cohort 3 – Dose 3 QW (ASLAN004 N = 6, placebo N = 2)

Expansion cohort – Dose 1, 2 or 3 QW (ASLAN004 N = 12, placebo N = 6)

Primary endpoints are safety and tolerability

Secondary endpoints include percentage change in EASI score, EASI50, EASI75, pruritus score and IGA

ASLAN004 has the potential to be best-in-class therapy

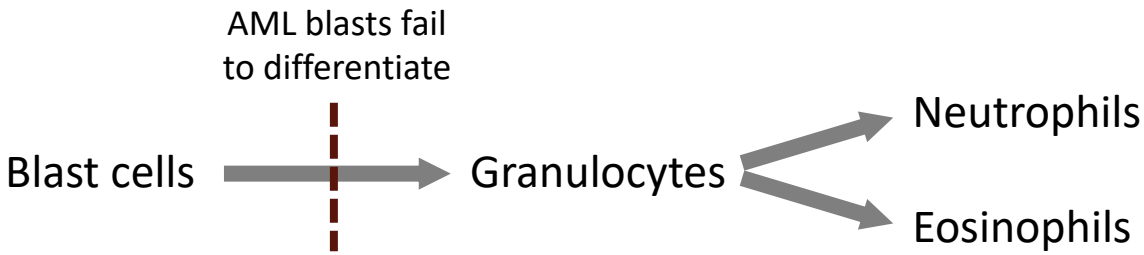
	Dupilumab	ASLAN004
Efficacy	• Blocks signaling through IL-4 and IL-13 • High steady state concentration	• Blocks signaling through IL-4 and IL-13 • Only 1mg/l needed for full target inhibition
Dosing	• Dosed 300mg every 2 weeks	• Complete inhibition of pSTAT6 to 29 days after a single IV dose • Potential for 4 weekly dosing
Safety	• Conjunctivitis reported between 25% and 50% in clinical practice • Injection site reactions common potentially due to formulation	• No conjunctivitis seen to date • 10 fold lower level of detergent in the formulation which may be an irritant
Stability	• 14 days max storage at room temperature and cannot be stored above 25°C • Up to 24 months shelf life (refrigerated)	• Greater flexibility for storage and travel • ≥9 months stability at 25°C • Up to 24 months shelf life (refrigerated) with stability trials ongoing

1 Reported 25-50% conjunctivitis: Wollenberg et al (2018), Conjunctivitis occurring in atopic dermatitis patients treated with dupilumab-clinical characteristics and treatment.

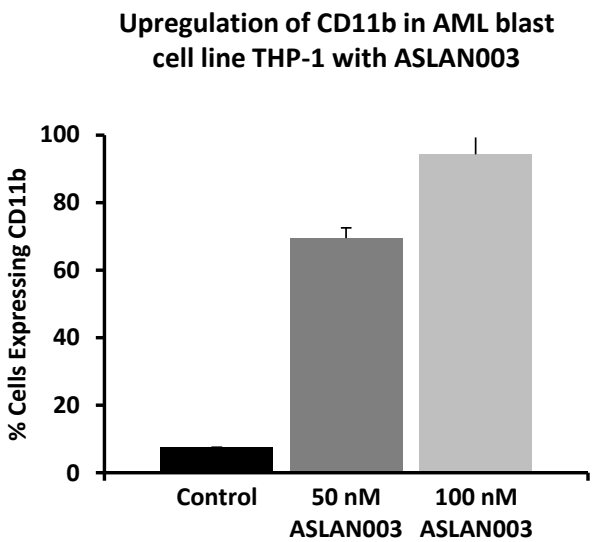
ASLAN003

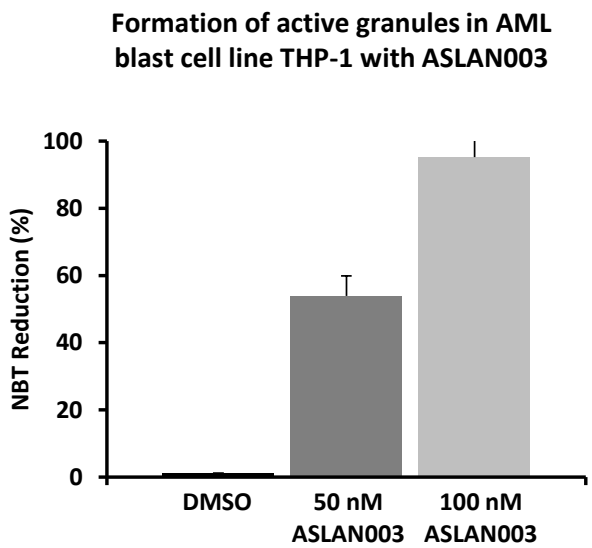
ASLAN003 is an orally active, potent inhibitor of DHODH

DHODH controls the rate-limiting step in the synthesis of pyrimidines and contributes to the production of ATP



ATRA differentiates blasts in up to 15% of AML patients with >90% CR

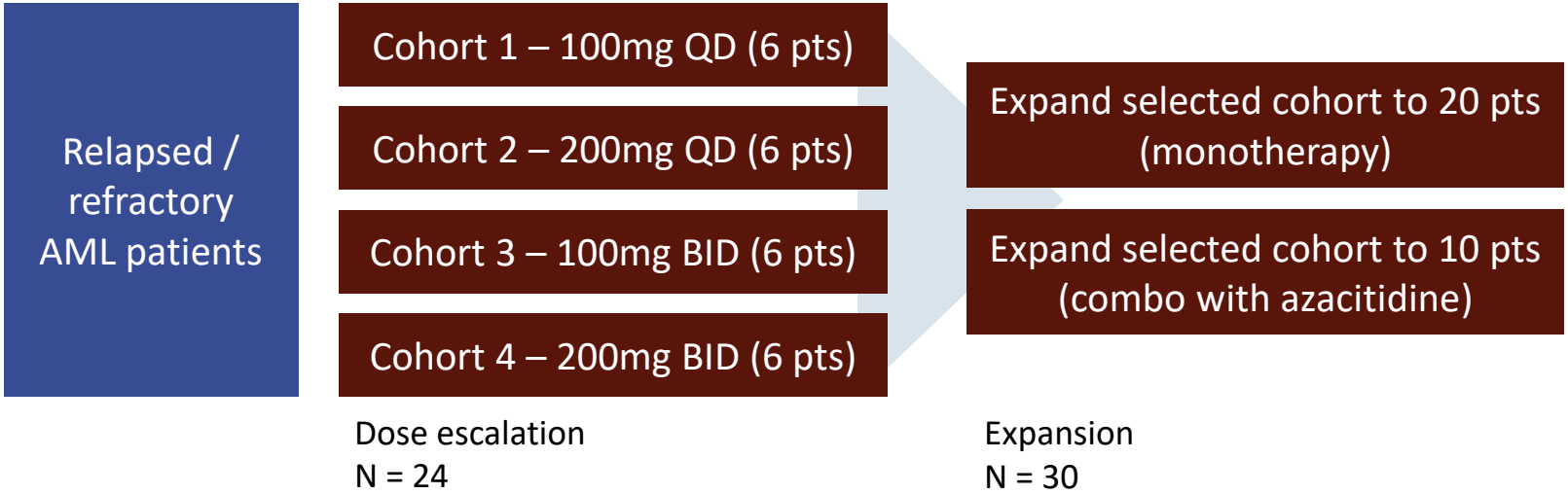




ASLAN003 promotes differentiation in multiple cell lines that are unresponsive to ATRA. This differentiation is mediated via DHODH.

Ongoing phase 2 in R/R AML

- ASLAN003 monotherapy
- Primary endpoint: CR / CRi rate
- AML mutation analysis and ex-vivo bone marrow differentiation will allow identification of patients that are sensitive to ASLAN003
- First part of study completed



ASLAN003 well-tolerated at all dose levels

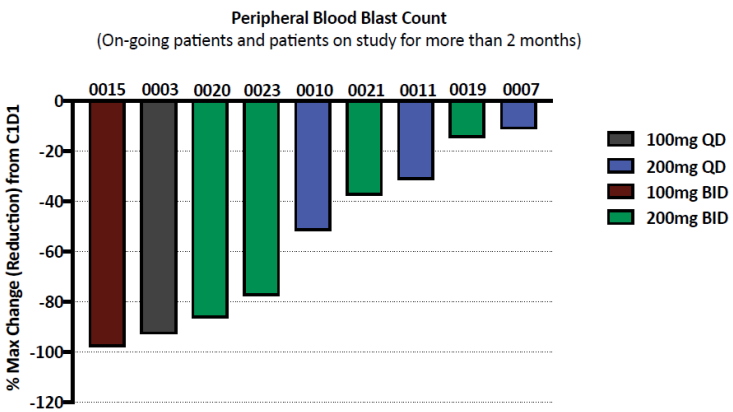
Drug-related adverse event	N = 24			
	Any grade		Grade ≥ 3	
	N	(%)	N	(%)
Leukocytosis	3	13	2	8
Nausea	3	13	0	0
Abdominal pain	2	8	0	0
Rash maculo-papular	2	8	0	0
Anaemia	1	4	1	4
Arthralgia	1	4	0	0
Conjunctivitis	1	4	0	0
Decreased appetite	1	4	0	0
Epistaxis	1	4	0	0
Fatigue	1	4	0	0
Febrile neutropenia	1	4	1	4
Hyperuricaemia	1	4	0	0
Hypokalaemia	1	4	0	0
Pleural effusion	1	4	1	4
Rash generalised	1	4	0	0
Tumor lysis syndrome	1	4	1	4
White blood cell count increased	1	4	1	4

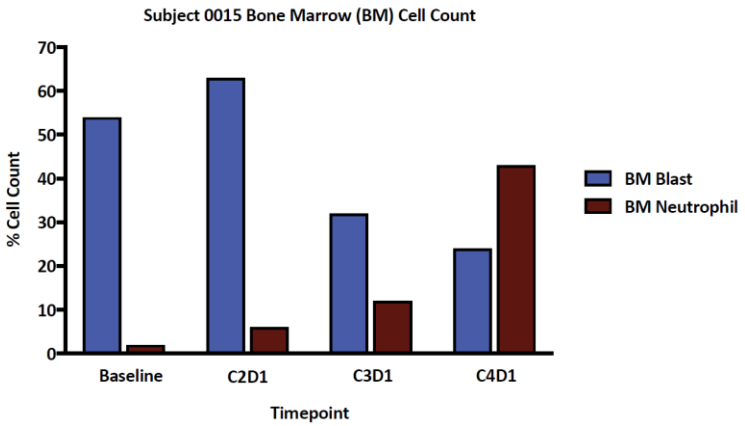
(Data cutoff 7 May 2019)

The most commonly occurring related adverse events were leukocytosis, nausea, abdominal pain and rash maculo-papular, with grade ≥3 leukocytosis in 2 patients

Encouraging activity observed – the first clinical data reported for a DHODH inhibitor in AML

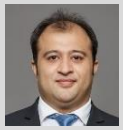
- 24 patients enrolled to date
- 6 patients on study for more than 2 months (efficacy evaluable) and 5 patients are ongoing
- In the evaluable patients:
  - Fall in peripheral blood blast cells in all evaluable patients (median >50%)
  - 1 PR (reduction in bone marrow blast cells from 54% at baseline to 24%) and 1 suspected CR (6% blast cells in peripheral blood, no bone marrow sample)
  - Evidence of differentiation syndrome seen in some patients
- Post-treatment bone marrow blast cells not yet mature for 200mg BID cohort





Summary

Management team with global development experience

Position		Experience	
Dr Carl Firth CEO		AstraZeneca Head of New Portfolio (China) Head of BD (Asia)	Bank of America Merrill Lynch Head of Asia Healthcare Banking
Dr Mark McHale CDO Head of R&D		AstraZeneca Head of Molecular Sciences, R&I Head of Early Asthma Portfolio	gsk
Dr Bertil Lindmark Acting CMO		AstraZeneca Head of Development, R&I Head of Development, Japan	almirall feel the science Global Head of R&D CSO
Stephen Doyle CBO		Boehringer Ingelheim VP Specialty Care & Diabetes (China)	SANOFI VP Oncology (China)
Kiran Asarpota VP Finance		GLOBAL BRANDS GROUP Group Finance Director	

Financials

As of 30 September 2019

Exchange / ticker	US – NASDAQ: ASLN Taiwan – TPEx: 6497
Shares outstanding	160.2M
Cash balance	US$ 8M (end Sep)
Recent financing	US$ 3.3M loan in Oct
Operating expenses	US$ 5M (3Q 19)

Anticipated near-term milestones

	Expected timeline	Program	Milestone
✓	Complete	ASLAN003	Interim phase 2 data (ASH, Dec 2018)
✓	Complete	*Varlitinib*	1st line BTC phase 1b data (ASCO GI, Jan 2019)
	4Q 19	*Varlitinib*	2nd line BTC pivotal topline data
	2H 20	ASLAN004	Completion of MAD in atopic dermatitis