TAKEAIM LYMPHOMA- AN OPEN-LABEL, DOSE ESCALATION AND EXPANSION TRIAL OF EMAVUSERTIB (CA-4948) IN COMBINATION WITH IBRUTINIB IN PATIENTS WITH RELAPSED OR REFRACTORY HEMATOLOGIC MALIGNANCIES

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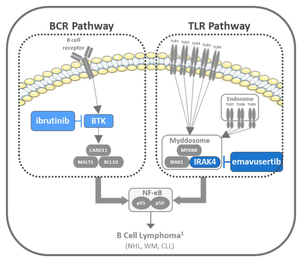
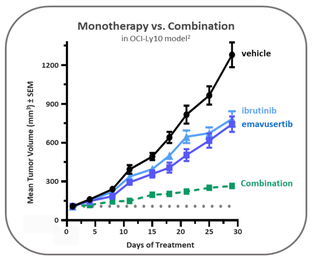
INTRODUCTION

BCR and TLR Pathways independently drive NF-κB overactivity (IMBRUVICA Package Insert. Rev 08/2018)



In preclinical testing, blocking both IRAK4 and BTK drove tumor reduction better than blocking either one alone (Booher et al. Waldenström Roadmap Symposium 2019)



IRAK4 is essential for TLR and IL-1R signaling in B-cell proliferation forming multiprotein complexes causing inflammation and tumor growth [1, 2]

Emavusertib, a novel oral IRAK4 inhibitor, dosed twice daily has previously shown:

- Single agent activity in R/R non-Hodgkin Lymphoma patients [3]
- Demonstrated in preclinical studies to overcome tumor resistance to ibrutinib and PI3K inhibitors [4]
- Crossed the blood-brain barrier, reversed IRAK4 pathway activity and caused tumor regression, including cure in a murine PDX model with transplanted A20 NHL to the brain [5]
- Showed in-vivo synergy in B-cell NHL in combination with ibrutinib [6]

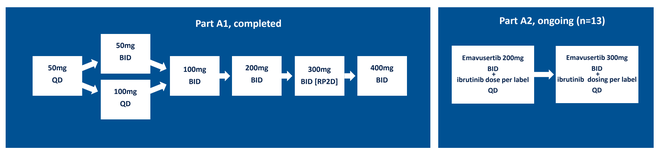
STUDY DESIGN

TakeAim-Lymphoma (NCT03328078)

1. **Part A1**: dose escalation of emavusertib as monotherapy

2. **Part A2**: dose escalation of emavusertib in combination with ibrutinib
   - Endpoints of Part A1 and A2 include safety, tolerability, and RP2D
   - Treatment: Oral, once-daily (QD), or twice-daily (BID), dosing in continuous 21-day cycles

3. **Part B**: expansion cohorts of emavusertib in combination with ibrutinib (not yet initiated)



Abbreviations
Relapsed/Refractory (R/R), Marginal Zone Lymphoma (MZL), Diffuse Large B-Cell Lymphoma (DLBCL), Primary Central Nervous System Lymphoma (PCNSL), Non-Hodgkin Lymphomas (NHL), Mantle Cell Lymphoma (MCL), Complete Response (CR), Partial Response (PR), Stable Disease (SD), Progressive Disease (PD), Recommended Phase II Dose (RP2D)

RESULTS

- 13 patients received emavusertib + ibrutinib combination therapy: 8 patients discontinued treatment due to adverse event (2), PD (3), and other (3)
- Emavusertib in combination with ibrutinib is well tolerated
- No DLTs observed at 200mg, 2 DLTs observed at 300mg (Stomatitis and Syncope)

Baseline characteristics

Combination therapy	Total (N = 13)
Female n : Male n	6 : 7
Age (yrs): median (range)	66 (56, 92)
Diagnosis	
CLL	2
PCNSL	2
DLBCL	2
MCL	2
MZL	3
WM	2
Prior lines of therapy: median (range)	3 (1-8)
Prior BTK inhibitor	6

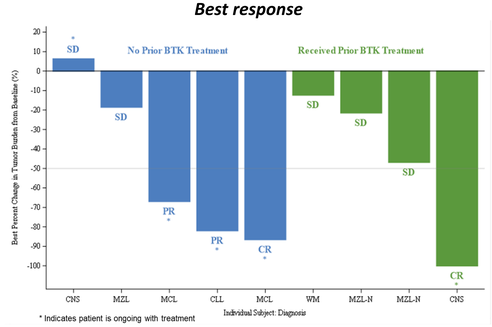
Safety

Grade 3+ Treatment-Related Adverse Event	Emavusertib 200 mg BID		Emavusertib 300 mg BID	
	Ibrutinib 420 mg QD (N = 1)	Ibrutinib 560 mg QD (N = 5)	Ibrutinib 420 mg QD (N = 3)	Ibrutinib 560 mg QD (N = 4)
# patients having grade 3+ TRAEs	1	4	1	3
Platelet count decreased		2	1	
Alanine aminotransferase increased	1			
Anaemia		1		
Aspartate aminotransferase increased	1			
Asthenia		1		
Blood alkaline phosphatase increased		1		
Diarrhea				1
Fatigue		1		
Hyponatraemia	1			
Lipase increased		1		
Muscular weakness				1
Pain				1
Stomatitis				1
Syncope			1	
Thrombocytopenia				1
Vomiting				1

Evaluable Patients treated with emavusertib + ibrutinib

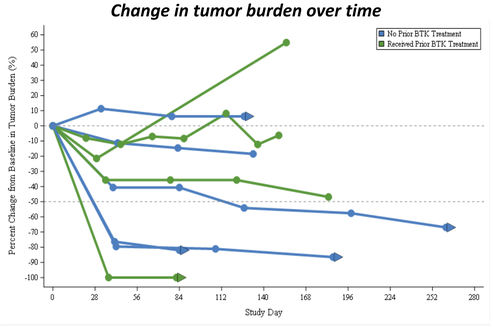
- 4 patients that received prior BTK treatment show promising anti-cancer activity (SD/CR)
- 4/13 patients were not evaluable for tumor burden; 1 patient progressed without evaluable tumor burden; 3 patients had no response assessments prior to discontinuation from treatment (1 due to adverse event, 1 died, 1 other)

Best response



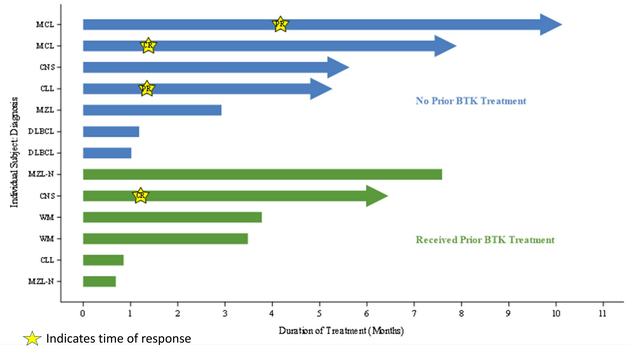
- Majority of patients had decreases In tumor burden or SD over time

Change in tumor burden over time



RESULTS

Preliminary *Efficacy Data From Patients with Combination Therapy*



Data extracted May 6th, 2022

SUMMARY

- In prior clinical studies oral emavusertib monotherapy appears to be well tolerated with an acceptable long term safety profile
- Preliminary data suggest that combination therapy may overcome ibrutinib resistance in hematological malignances
- Objective responses occurred at both 200mg and 300mg BID dose levels. All responding patients are presently being treated at 200mg BID of emavusertib with full dose of ibrutinib

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