ONCONOVA
THERAPEUTICS

BIO INVESTOR FORUM

San Francisco, October 17-18, 2018

Nasdaq: ONTX

FORWARD-LOOKING STATEMENTS

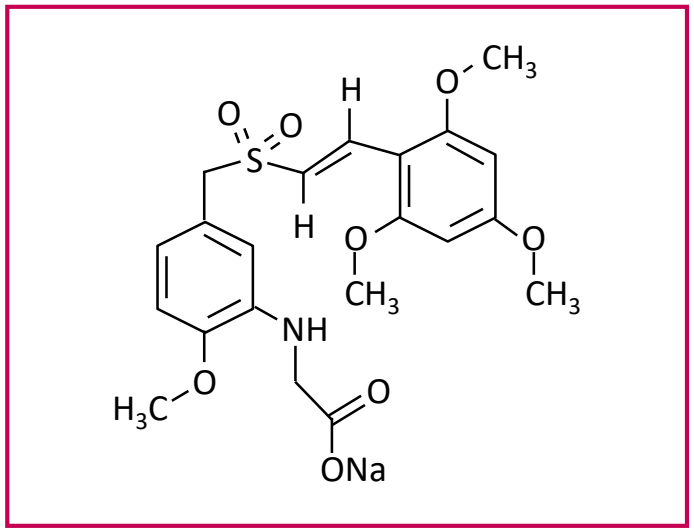
This presentation contains forward-looking statements about Onconova Therapeutics, Inc. based on management's current expectations which are subject to known and unknown uncertainties and risks. Onconova has attempted to identify forward-looking statements by terminology including "believes," "estimates," "anticipates," "expects," "plans," "intends," "may," "could," "might," "should," "approximately" or other words that convey uncertainty of future events or outcomes. This presentation assumes the Company raises capital for disclosed product development plans. Our actual results could differ materially from those discussed due to a number of factors, including, but not limited to, our ability to raise additional financing on favorable terms, the success of our clinical trials and our ability to obtain regulatory approvals and other risk factors outlined in our annual and quarterly reports filed with the Securities and Exchange Commission. We are providing this information as of the date of this presentation and do not undertake any obligation to update any forward-looking statements, whether written or oral, that may be made from time to time, as a result of new information, future events or otherwise except as required by law.

ONCONOVA THERAPEUTICS, INC.

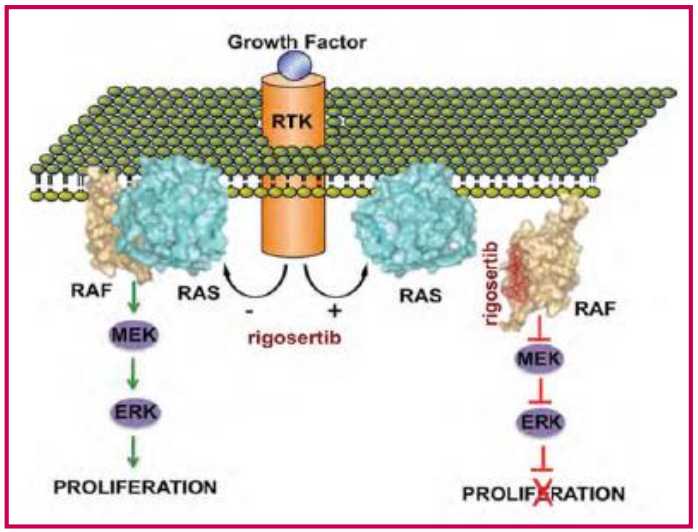
- Founded in 1998; IPO in 2013 (Nasdaq: ONTX)
- Phase 3 stage clinical candidate: rigosertib
  - Focused on Myelodysplastic Syndromes (MDS)
- Rigosertib partnered in Japan and Latin America
  - Additional partnerships to come
- Broad pipeline of drug candidates
  - Larger opportunities in solid tumor indications

ABOUT RIGOSERTIB: PHASE 3 STAGE LEAD DRUG

Patent protected new chemical entity (NCE)



RAS targeted novel mode of action



Two formulations in clinical trials worldwide

IV product for infusion

Oral soft gel capsules

PORTFOLIO: RIGOSERTIB AND OTHER OPPORTUNITIES

Lead

- Phase 3 INSPIRE trial progressing to completion after promising interim analysis and enhanced powering
- Trial completion projected in H2-2019

Oral

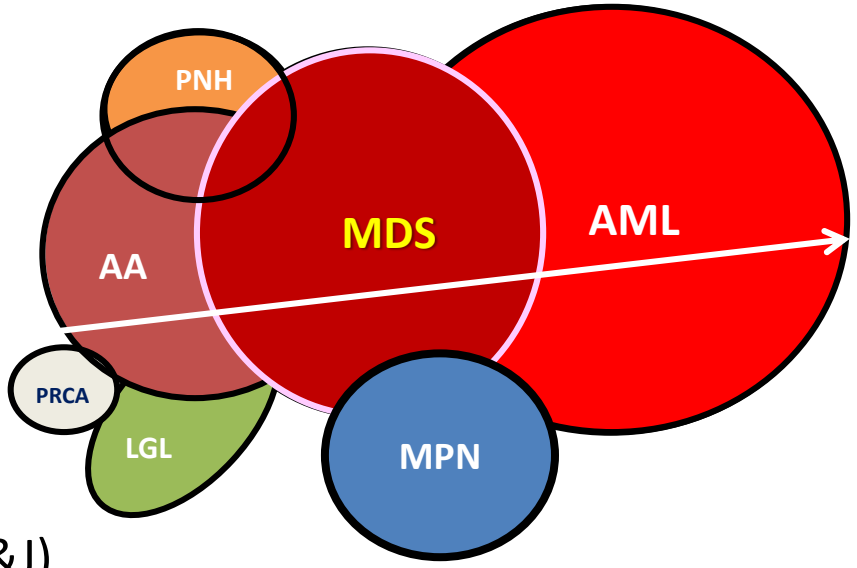
- Oral rigosertib provides two large-market opportunities
- Combination trial for front-line high risk MDS ready to advance to Phase 3 protocol in Q4-2018

More

- NCI funded RASopathies trial for rare pediatric indications
- New CDK inhibitor presents opportunities for the future

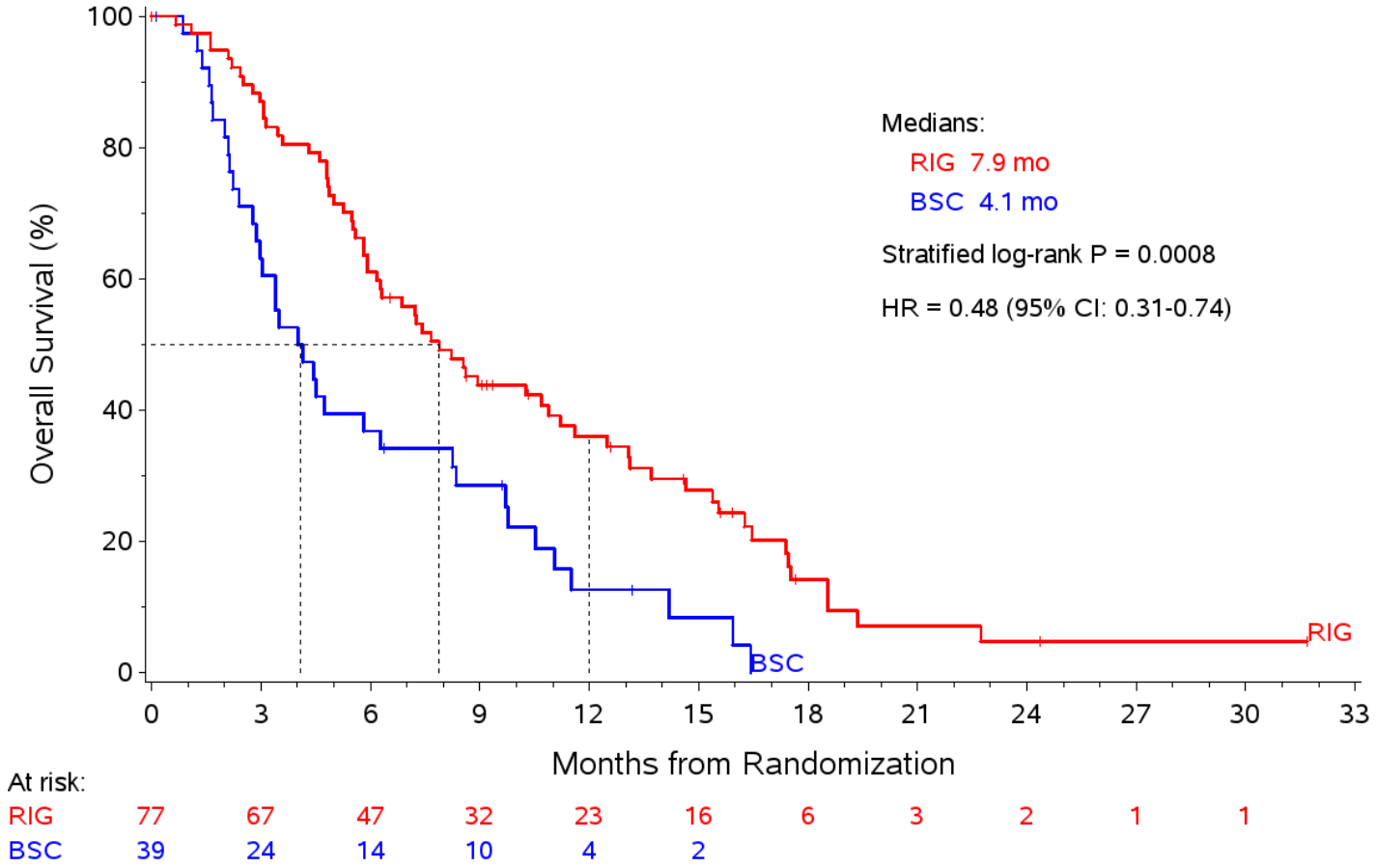
MDS IS RELATED TO OTHER BONE MARROW DISEASES

- MDS: malignant bone marrow disorder characterized by:
  - Acquired cytogenetic and genomic abnormalities, but typically only in the marrow.
- US prevalence is 59,000
  - ~13,000 have higher risk (HR) MDS
  - ~10,000 second-line patients
- Available Treatments limited to hypomethylating agents
  - Vidaza (Celgene); Dacogen (Eisai/J&J)
  - Approved >decade ago; now off-patent
  - No approved therapy following HMA failure
  - New therapy could have $billions opportunity



STUDY 04-21 : PROPOSED PATIENT POPULATION FOR INSPIRE

(≤9 HMA DoT; <82 years)



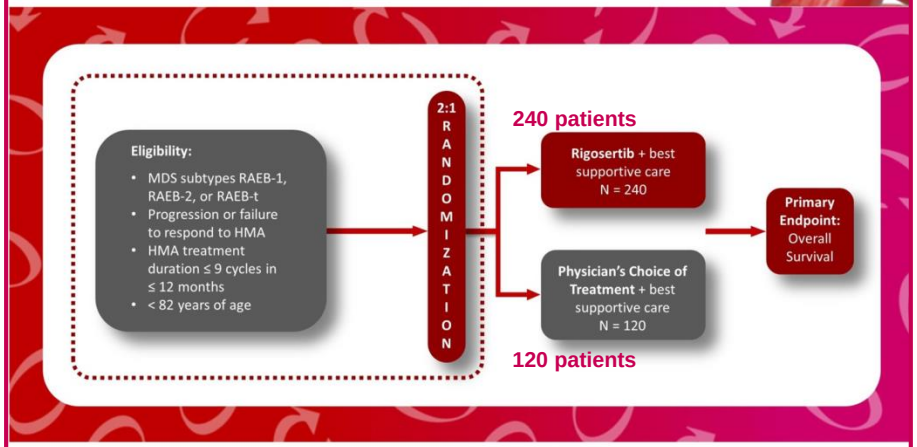
INSPIRE PHASE 3 TRIAL RESULTS EXPECTED IN 2019

The Pivotal MDS **INSPIRE** Trial is Now Recruiting Patients

INternational Study of Phase III Intravenous RigosErtib

STUDY DESCRIPTION

A Phase 3, international, randomized, controlled study of Rigosertib + best supportive care versus physician's choice of treatment + best supportive care in patients with myelodysplastic syndrome (MDS) after failure of a hypomethylating agent (HMA).



PRIMARY ENDPOINTS

Overall survival in the intention-to-treat population and in patients with very high risk per the Revised International Prognostic Scoring System (Greenberg et al, *Blood* 2012).

INTERNATIONAL TRIAL

More than 170 trial sites

INSPIRE start
December 2015

Interim Analysis
January 2018

Top-line Data
H2-2019 (projected)

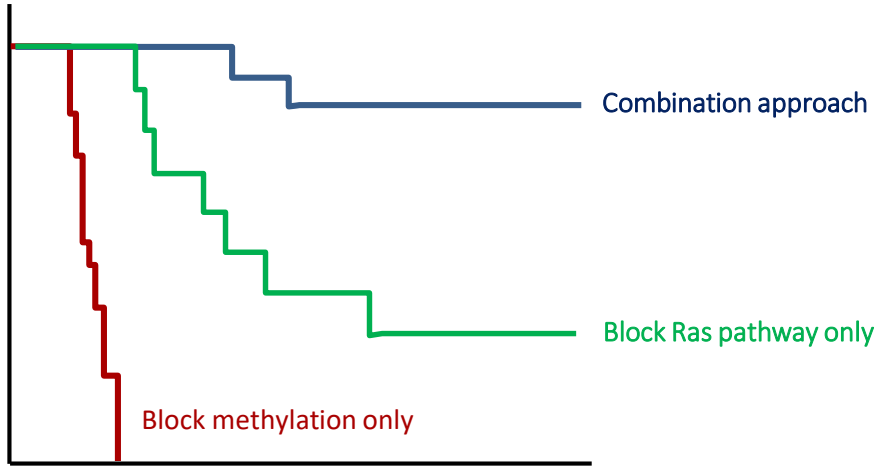
Trial size increased after "promising" signal

COMBINATION THERAPY WITH RIGOSERTIB + AZACITIDINE

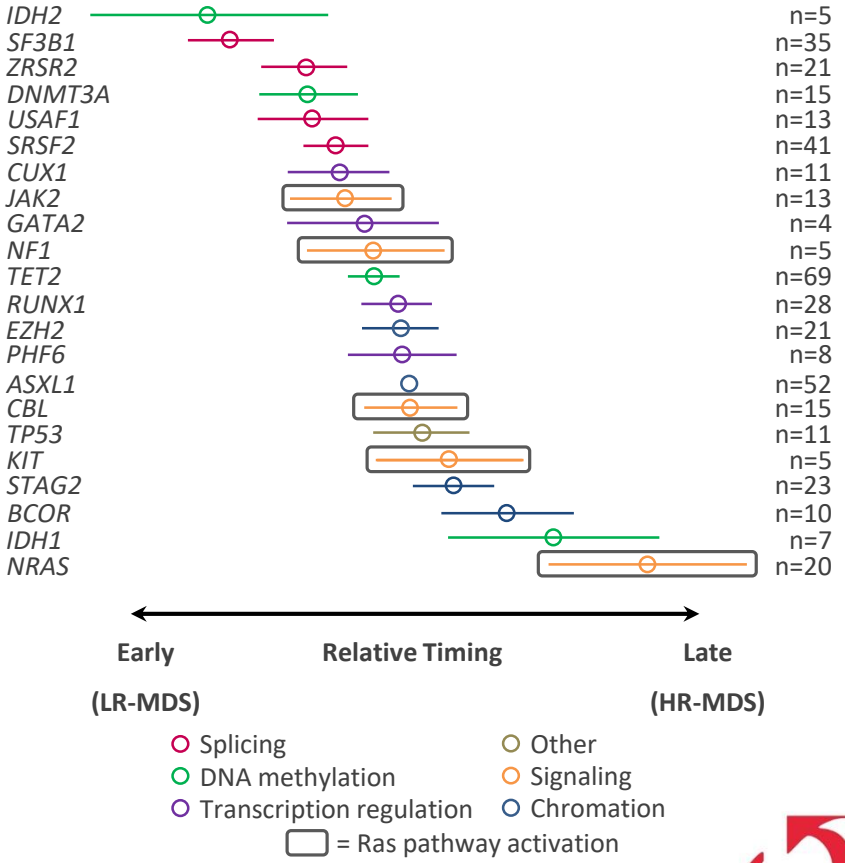
Preclinical evidence supports synergism of rigosertib + azacitidine combination

AML Animal Model

Validation of combination approach[1]



Temporal Order of Gene Mutations in 107 MDS Patients[2]



1. Lu et al., 2016 Cancer Cell
2. Adapted from Papaemmanuil et al., 2013 Blood
More than 80 patients enrolled in combination trial including expansion cohort

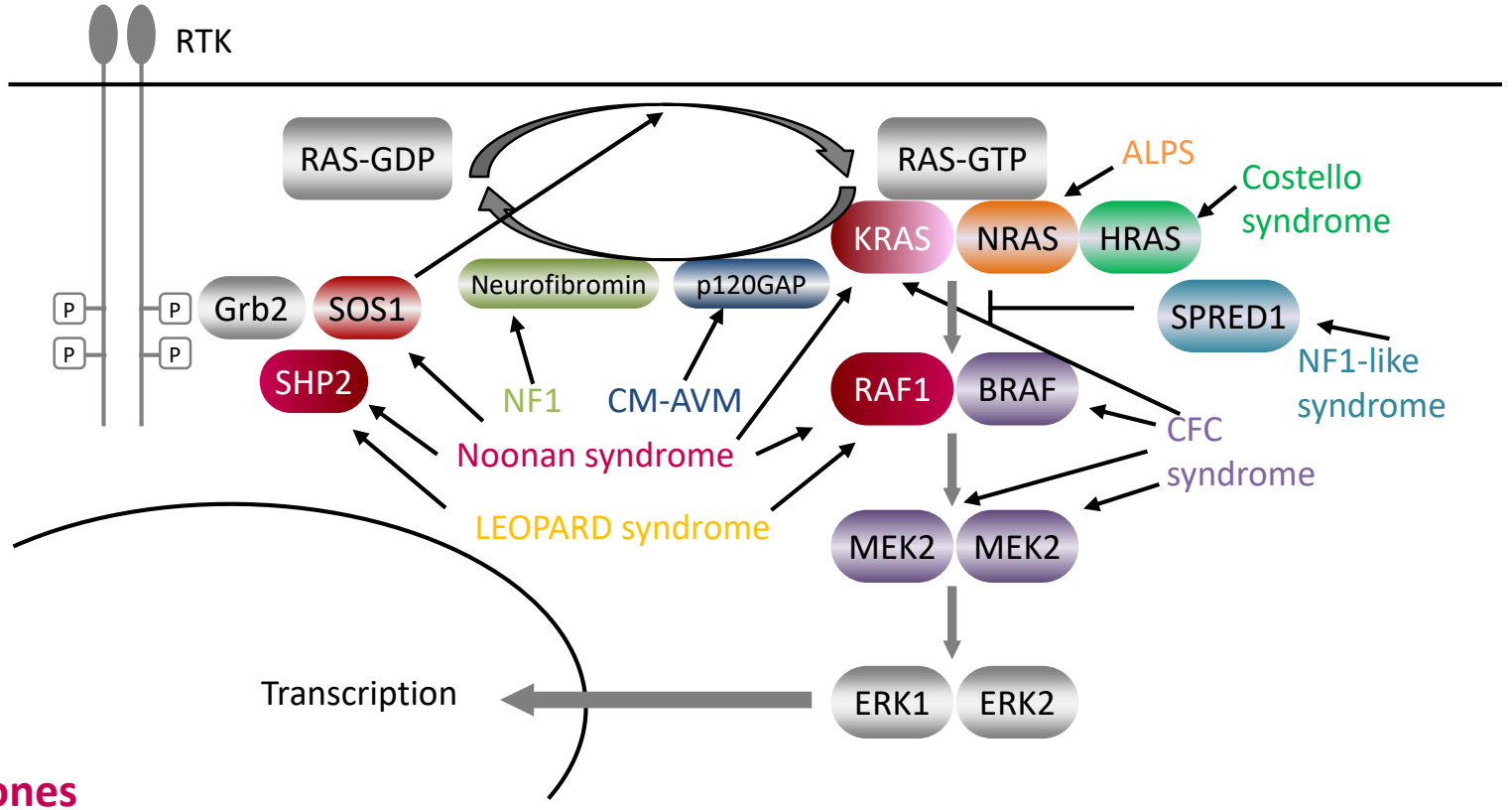
INITIAL RESPONSE DATA FOR ONGOING COMBINATION TRIAL

An additional 45 patients are enrolled in the expanded Phase 2 trial at an increased dose of oral rigosertib (1120 mg) to determine optimal efficacy and safety

Response Criteria	Response per IWG 2006	
	No prior HMA (N=20)	HMA resistant (N=13)
Complete Remission*	**7 (35%)**	**1 (8%)**
Marrow CR + Hematologic Improvement (HI)	6 (30%)	4 (31%)
Marrow CR alone	3 (15%)	3 (23%)
Stable Disease	3 (15%)	5 (38%)
Overall IWG Response	**17 (85%)**	**8 (62%)**

**All responders had CR and no PR was noted in this study*

RASOPATHIES: RIGOSERTIB FOR RARE PEDIATRIC DISEASES



Milestones

- NCI CRADA signed January 2018
- Potential for first patient in H2-2018
- UCSF non-clinical program initiated
  - Funded by LLS
- JMML clinical program could initiate in 2019

COMBINATION THERAPY: NEXT STEPS AND TIMELINES

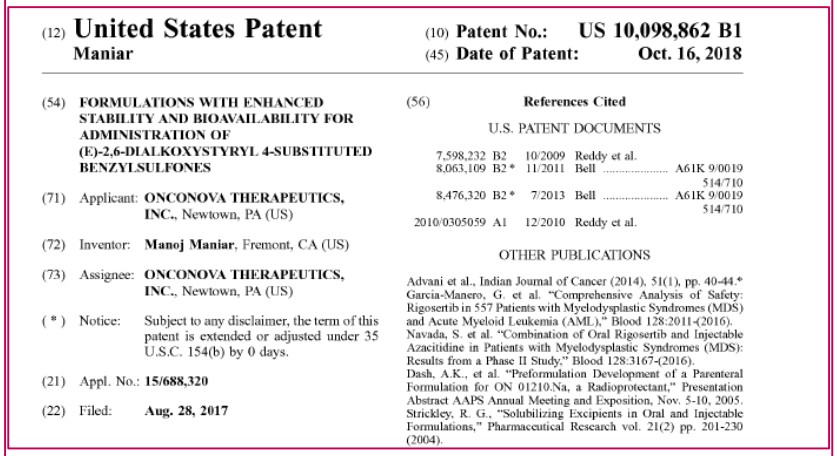
Step	Start	Complete	Remarks
Phase 2 expansion *Fully enrolled*	Q1-2017	Q2-2018	▪ Incidence of hematuria reduced (to date) in the trial ▪ Dose and schedule of 1120 mg daily dose explored*
Phase 3 protocol	Q1-2018	Q4-2018	▪ Synopsis created ▪ SPA and BTD submissions contemplated after complete efficacy assessment
Phase 3 trial	2019	2021	▪ Rapid enrollment expected ▪ All patients to receive active therapy ▪ Response endpoint can be achieved in <6-9 months after patient is enrolled

**Dose justification based on oral rigosertib optimal transfusion independence rate data in Lower-Risk MDS (ASH 2017)*

EXPANDING AND EXTENDING RIGOSERTIB PATENT COVERAGE

- Strong existing patent estate
  - Existing coverage of composition of matter (e.g. U.S. 7,598,232), formulations, combinations and methods in US and many countries worldwide
- Supplemented by Orphan Designation for MDS in US, Europe and Japan
- **New issued US patent 10,098,862 extends IP runway to 2037**

- US Patent 10,098,862
  - Pending in PCT and non-PCT countries worldwide
  - Covers injectable and oral products



(12) **United States Patent**
Maniar

(10) **Patent No.: US 10,098,862 B1**
(45) **Date of Patent: Oct. 16, 2018**

(54) **FORMULATIONS WITH ENHANCED STABILITY AND BIOAVAILABILITY FOR ADMINISTRATION OF (E)-2,6-DIALKOXYSTYRYL 4-SUBSTITUTED BENZYLSULFONES**

(71) Applicant: **ONCONOVA THERAPEUTICS, INC.**, Newtown, PA (US)

(72) Inventor: **Manoj Maniar**, Fremont, CA (US)

(73) Assignee: **ONCONOVA THERAPEUTICS, INC.**, Newtown, PA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/688,320**

(22) Filed: **Aug. 28, 2017**

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,598,232	B2	10/2009	Reddy et al.	
8,063,109	B2 *	11/2011	Bell	A61K 9/0019 514/710
8,476,320	B2 *	7/2013	Bell	A61K 9/0019 514/710
2010/0305059	A1	12/2010	Reddy et al.	

OTHER PUBLICATIONS

Advani et al., Indian Journal of Cancer (2014), 51(1), pp. 40-44.*
Garcia-Manero, G. et al. "Comprehensive Analysis of Safety: Rigosertib in 557 Patients with Myelodysplastic Syndromes (MDS) and Acute Myeloid Leukemia (AML)," Blood 128:2011-(2016).
Navada, S. et al. "Combination of Oral Rigosertib and Injectable Azacitidine in Patients with Myelodysplastic Syndromes (MDS): Results from a Phase II Study." Blood 128:3167-(2016).
Dash, A.K., et al. "Preformulation Development of a Parenteral Formulation for ON 01210.Na, a Radioprotectant," Presentation Abstract AAPS Annual Meeting and Exposition, Nov. 5-10, 2005.
Strickley, R. G., "Solubilizing Excipients in Oral and Injectable Formulations," Pharmaceutical Research vol. 21(2) pp. 201-230 (2004).

ON 123300: NEXT GENERATION CDK4/6 INHIBITOR

Also targets ARK5 (NUAK1)

Differentiation for a Competitive Field

- Recently launched Ibrance®, Kisqali® and Verzenio® have been hailed as potential breakthroughs in cancer therapy
  - First FDA approval for CDK 4/6 inhibitor is for breast cancer
- ON 123300 differentiated features
  - Also targets ARK5 controlling cellular metabolism and survival
  - Potential to act as single agent
  - May be active in resistant cells

Partnership with HanX Biopharmaceuticals

- License for Greater China
  - Onconova retains ROW rights
- HanX to fund IND-enabling studies
- Upfront, milestones, royalties
- HanX a specialty Oncology company
  - Phase 1 stage PD-1 checkpoint antibody
  - Checkpoint blockade and CDK inhibition believed to be synergistic
- Pre-IND consultation with the FDA
  - Guidance for manufacturing
  - Development plan for an IND application
- Next Milestone is IND
  - US IND anticipated in H1-2019

ONCONOVA BUSINESS DEVELOPMENT OPPORTUNITIES

Patent protected, differentiated small molecule compounds

Compound	Target	Stage	Next Step	Competition	Patents	Licensing Territories Available
Clinical Stage						
Rigosertib	• RAS pathway • MDS initial indication	Phase 3	Top-line data in 2019	Only HMAs approved for MDS	Worldwide issued and pending	Europe Asia, except Japan and Korea North America
Briciclib	eIF4E (Cyclin D)	Phase I*	Phase II Dose	4EGI-1	Issued US	Worldwide
Recilisib	GSK-3, Akt	Phase I	Primate efficacy	CBLB502	Issued WW	Ex-US rights
Advanced pre-IND stage						
ON 123300	CDK4/6; ARK5	IND in 2019	Toxicology underway	Palbociclib	Issued US, EP	Ex-China rights
Pre-clinical stage						
ON 150030	FLT3 + Src	Pre-clinical	Animal studies	Quizartinib	Issued US, EP	Worldwide
ON 1231320	PLK2	Formulation	Pre-IND	Volasertib	Issued	Worldwide
ON 108600	CK2	Formulation	Pre-IND	CX-4945	Issued	Worldwide
ON 146040	PI3K α/δ	Pre-clinical	Toxicology	IPI-145	In process	Worldwide

**Trial on hold, pending new manufacturing batch*

FINANCIAL DETAILS & SUMMARY

Onconova founded in 1998; public since 2013			
Ticker	Nasdaq ONTX	**Debt**	$0
Stock Information	▪ 5.7 million common shares outstanding ▪ 1:15 reverse split effective 9/26 allows for continued Nasdaq listing ▪ Public float ~95% ▪ YTD average daily volume: 102,000		Cash and cash equivalents of $29.5 million as of 06-30-2018
Ownership	683 Capital, EcoR1 Capital, Armistice Capital, Tyndall, Sabby; insiders including Board and management	**Burn-rate**	~$5.5 million per quarter over the last 8 quarters
Analyst Coverage*	H.C. Wainwright, Laidlaw, Maxim, Dawson James, Van Leeuwenhoeck Research (VLR)	**Partnerships**	▪ Rigosertib is partnered with SymBio Pharmaceuticals in Japan/Korea and Pint Pharma in Latin America ▪ CDK 4/6 & ARK-5 compound ON 123300 partnered with HanX for Greater China ▪ Onconova retains rights to the rest of the world

**Reports available upon request*

MANAGEMENT TEAM

Ramesh Kumar, Ph.D.
CEO & Co-founder

Bristol-Myers Squibb
DNX
Baxter
Kimeragen
Princeton University

Steven M. Fruchtman, M.D.
President & Chief Medical Officer

Novartis
Janssen
Syndax
Allos Therapeutics
Spectrum Pharmaceuticals
Mount Sinai

Mark Guerin
Chief Financial Officer

Barrier Therapeutics
Cardiokine
PriceWaterhouseCoopers

Manoj Maniar, Ph.D. Senior VP, Product Development	Alcon, SRI
Wolfgang Meyer, Ph.D. Sr. VP Regulatory Affairs GM, Onconova GmBh	Amgen, Micromet, GPC, Fujisawa
Michael Petrone, M.D. VP Clin. Dev. Medical Affairs and Pharmacovigilance	GSK, Roberts, GPC

UPCOMING CATALYSTS AND PRESENTATIONS

2018

- Expansion and Extension of Rigosertib Patent Portfolio
- Presentation of Expansion Phase 2 Combination Trial Data
  - Phase 3 trial protocol, potential Special Protocol Process

2019

- RASopathies Pediatric Oncology program
  - Initiation of clinical trial at NCI
- CDK 4/6+ARK5 Inhibitor program
  - IND process and start of Phase 1 program
- INSPIRE Phase 3 Trial
  - Full enrollment and top-line data

2018-2019

- Anticipated Business Development Activities
  - Additional regional alliances for Rigosertib
  - Additional alliances for CDK and other pre-clinical programs

PIPELINE SUMMARY

Initial focus on Rigosertib in MDS

Higher-risk MDS:

Phase 3 stage with top-line data in 2019

Lower-risk MDS:

Phase 2 trials completed

Additional indications

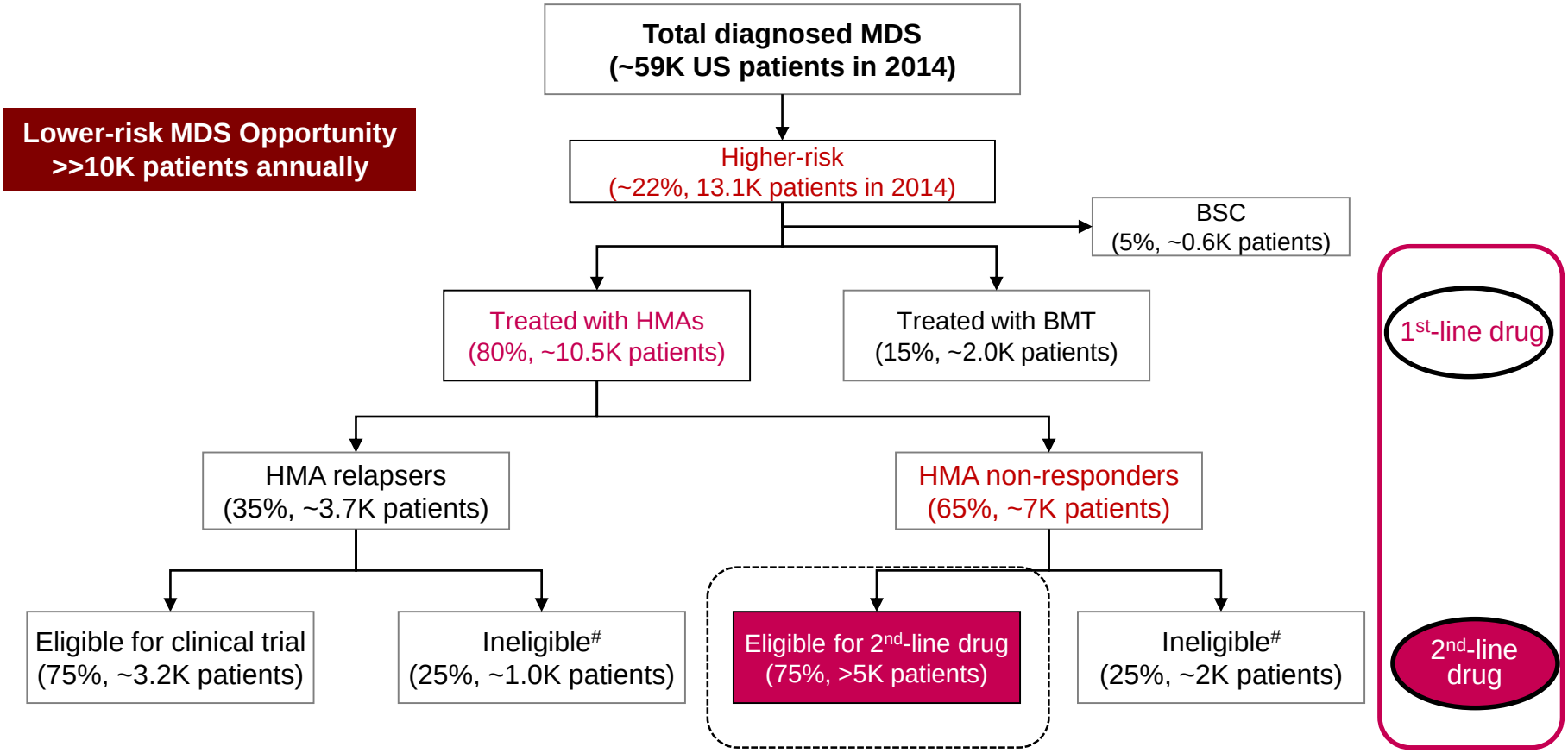
Rare diseases (RASopathies); other cancers

CDK targeted NCE

Phase 1 in 2019


ONCONOVA
THERAPEUTICS
info@onconova.us

RIGOSERTIB IN MYELODYSPLASTIC SYNDROMES



- Rigosertib for 2nd-line patients (INSPIRE Phase 3 trial)
- For 1st-line patients, in combination with Azacitidine, the current standard of care
- Oral rigosertib for transfusion dependent lower-risk patients