ONCONOVA
THERAPEUTICS

# BIO INVESTOR FORUM

San Francisco, CA

**October 17-18, 2017**

**Nasdaq: ONTX**

# FORWARD LOOKING STATEMENTS

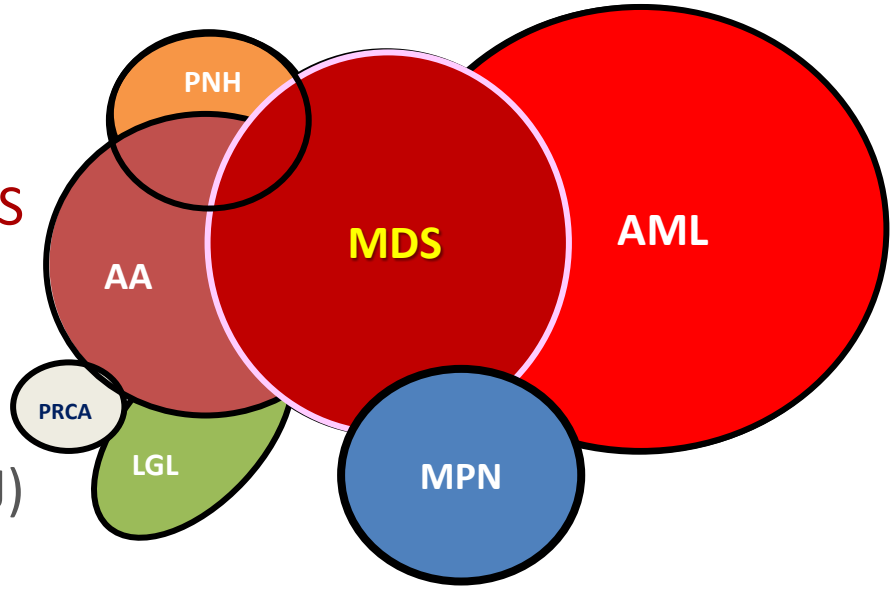
This presentation contains forward-looking statements about Onconova Therapeutics, Inc. based on management's current expectations which are subject to known and unknown uncertainties and risks. Onconova has attempted to identify forward-looking statements by terminology including "believes," "estimates," "anticipates," "expects," "plans," "intends," "may," "could," "might," "should," "approximately" or other words that convey uncertainty of future events or outcomes. 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 AT A GLANCE

- Founded in 1998; IPO in 2013 (Nasdaq: ONTX)
- Lead clinical candidate: rigosertib
  - Targets RAS effector pathways (Cell, 2016)
  - Two formulations (IV & Oral)
  - Focused on Myelodysplastic Syndromes (MDS)
- Broad pipeline with earlier stage drug candidates
- Partnered with SymBio in Japan/Korea for rigosertib
  - Additional partnerships sought

# MDS OVERLAPS WITH OTHER DISEASES

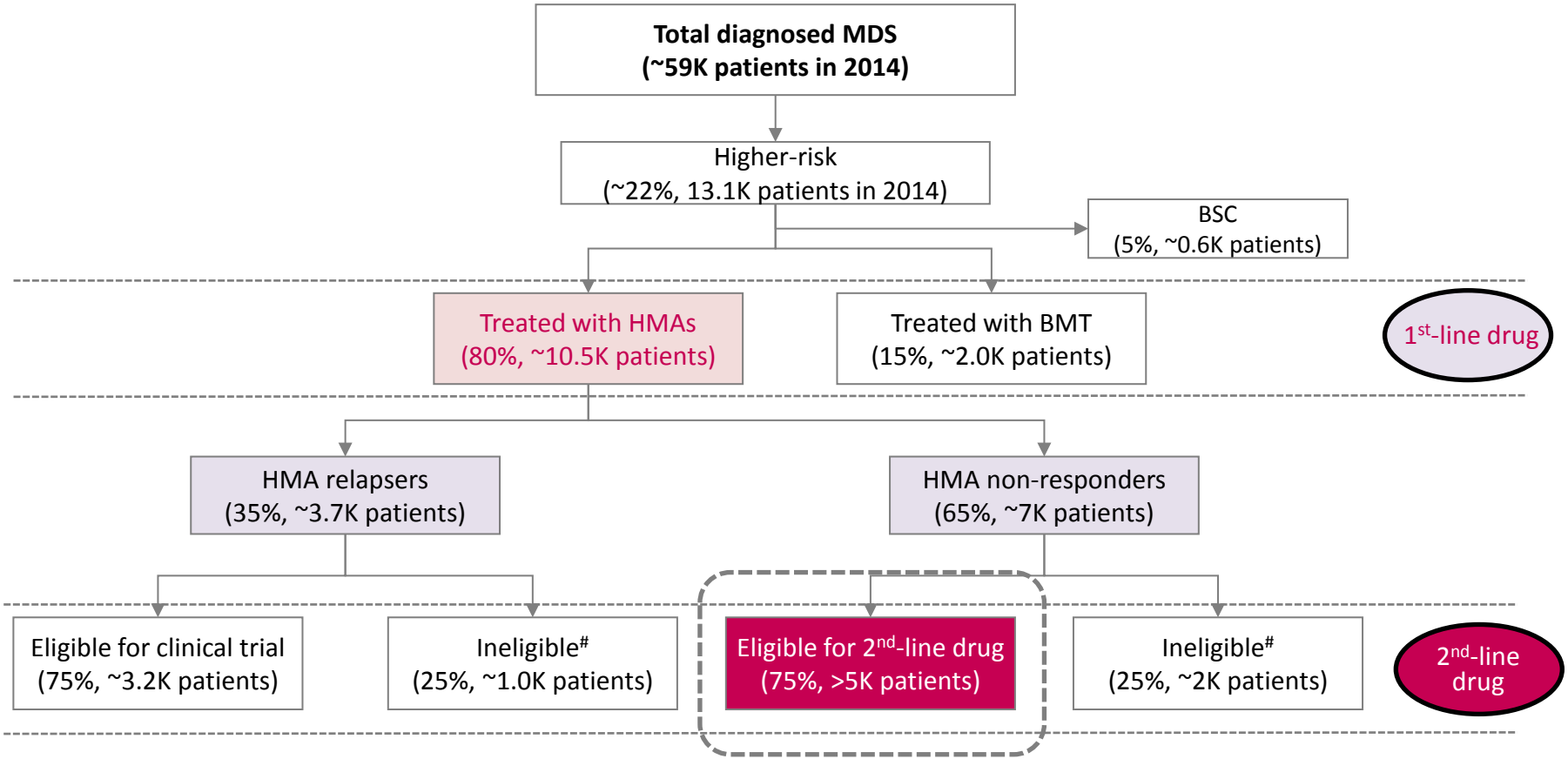
- MDS, a malignant hematopoietic disorder characterized by:[1]
  - Bone marrow failure
  - Cytopenias
  - 30% of patients progress to AML
- US prevalence estimate is 59,000
  - 18,000 patients have higher risk MDS
- Treatment options limited to hypomethylating agents (HMAs)
  - Vidaza (Celgene); Dacogen (Eisai/J&J)
  - Both approved a decade ago




[1]Young NS. Ann Intern Med. 2002;136:534-546.

Slide credit: clinicaloptions.com

# RIGOSERTIB IN HIGHER-RISK MDS




- Rigosertib is being developed for 2nd-line patients (INSPIRE Phase 3 trial)
- And for 1st-line patients, in combination with Azacitidine, the current standard of care

# RIGOSERTIB HIGHLIGHTS

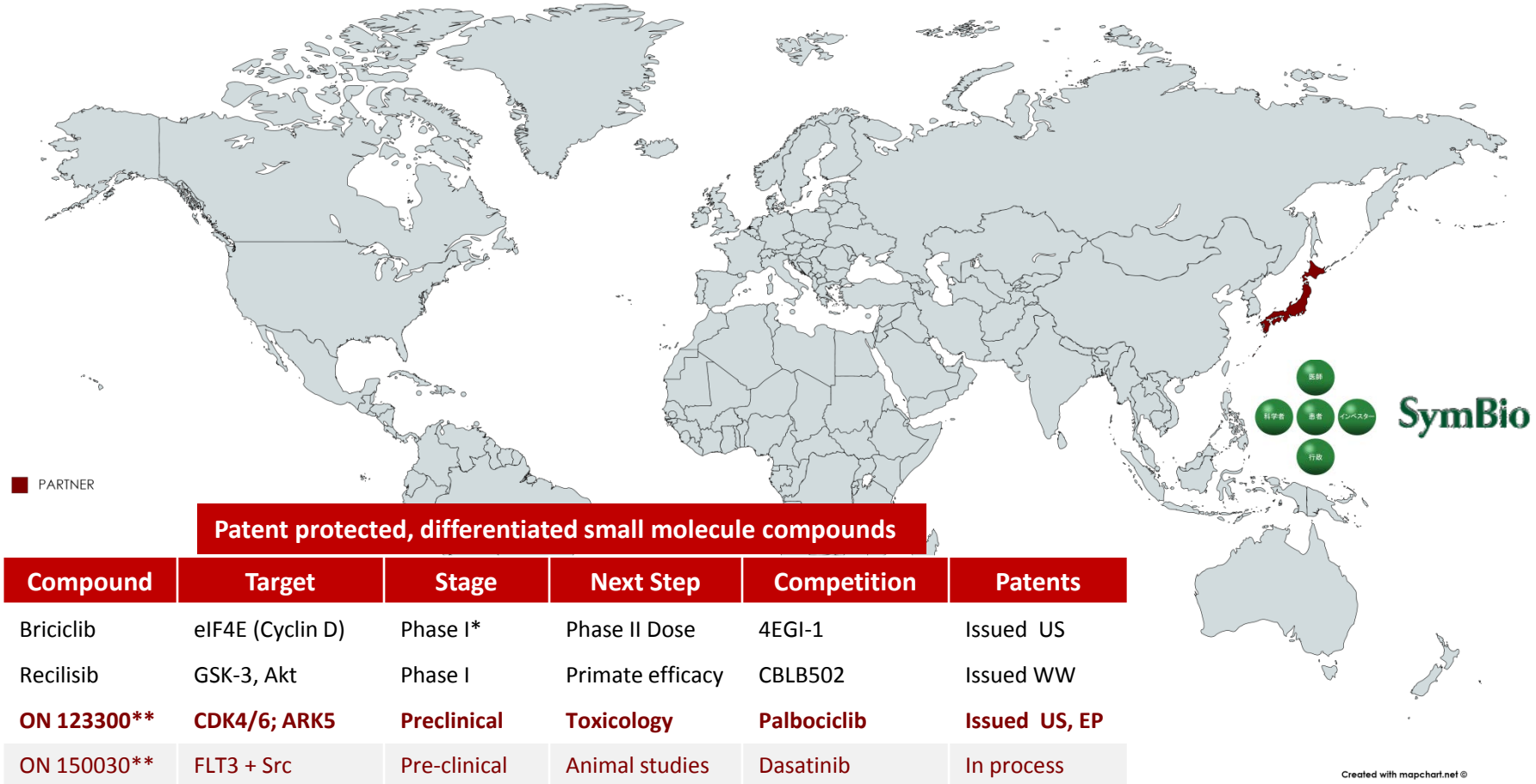
- Rigosertib in Phase 3 "INSPIRE" trial for 2nd line HR MDS
- Patents & Orphan Designation in the US, Europe and Japan
- Designing Phase 3 trial for 1st line HR MDS
  - Oral rigosertib + azacitidine combination
  - End of Phase 2 meeting discussions with FDA and EMA

- Key upcoming milestones
  - INSPIRE (IV) Phase 3 interim analysis expected in **Q4-2017**
  - Full trial enrollment and Top-line Phase 3 data in **2018**

# BUSINESS DEVELOPMENT OPPORTUNITIES:

## RIGOSERTIB IS PARTNERED IN JAPAN/KOREA SINCE 2011

*Partnerships for pipeline products sought in other territories*

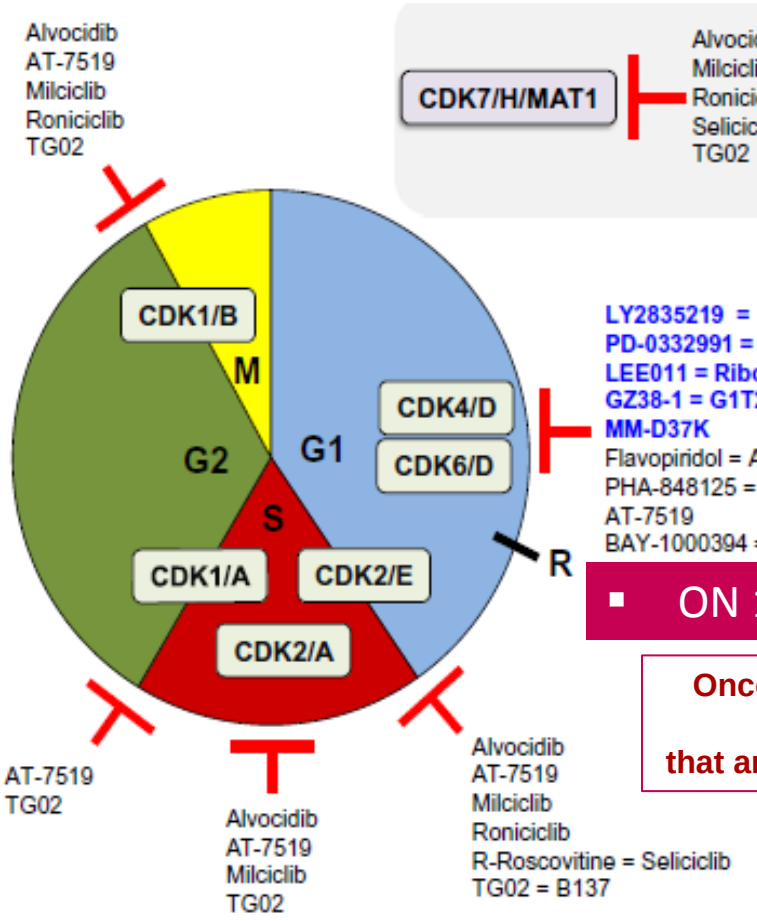



**Patent protected, differentiated small molecule compounds**

| Compound | Target | Stage | Next Step | Competition | Patents |
|---|---|---|---|---|---|
| Briciclib | eIF4E (Cyclin D) | Phase I* | Phase II Dose | 4EGI-1 | Issued US |
| Recilisib | GSK-3, Akt | Phase I | Primate efficacy | CBLB502 | Issued WW |
| **ON 123300**** | **CDK4/6; ARK5** | **Preclinical** | **Toxicology** | **Palbociclib** | **Issued US, EP** |
| ON 150030** | FLT3 + Src | Pre-clinical | Animal studies | Dasatinib | In process |
| ON 1231320 | PLK2 | Formulation | Pre-IND | Volasertib | Issued |
| ON 108600 | CK2 | Formulation | Pre-IND | CX-4945 | Issued |
| ON 146040 | PI3K a/d | Pre-clinical | Toxicology | IPI-145 | In process |

**On hold, pending new drug product* ***New data presented at 2017 AACR conference*

# MULTIPLE CDKS & CELL CYCLE INHIBITORS*





LY2835219 = Abemaciclib (Ibrance® Pfizer)
PD-0332991 = Palbociclib
LEE011 = Ribociclib
GZ38-1 = G1T28-1
MM-D37K
Flavopiridol = Alvocidib
PHA-848125 = Milciclib
AT-7519
BAY-1000394 = Roniciclib

- ON 123300

**Pfizer's Ibrance reached $Billion in US sales in 1 year after 2015 launch**

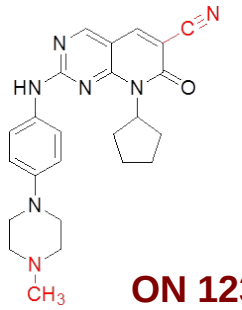
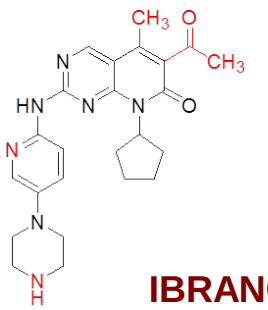
**Novartis' Kisqali approved in March 2017 and projected to reach $2.5 billion in annual sales**

**Onconova differentiated compound could be used for additional indications that are not accessible for second generation compounds**

**Figure 5.** Cell cycle and transcription regulation CDK inhibitors under clinical evaluation. Specific CDK4 and CDK6 inhibitors are indicated in blue.

* C. Sánchez-Martínez et al./Bioorg. Med. Chem. Lett. 25 (2015) 3420–3435

# DIFFERENTIATED KINASE INHIBITION: TARGETING OF ARK5

| Comparison of Two Compounds in Reaction Biology Kinase Assays | |
|---|---|
|  **ON 123300** |  **IBRANCE®** |

| Kinase | Comparative $IC_{50}$ profile (nM) | |
|---|---|---|
| | ON 123300 | IBRANCE® |
| ARK5 | 4.95 | >5000 |
| CDK4/D1 | 3.87 | 5.36 |
| CDK6/D1 | 9.82 | 3.76 |

Reddy MVR et al., Journal of Medicinal Chemistry 2014 57 (3), 578-599

# LEAD INDICATIONS FOR RIGOSERTIB IN MDS

# ONCONOVA MDS PIPELINE

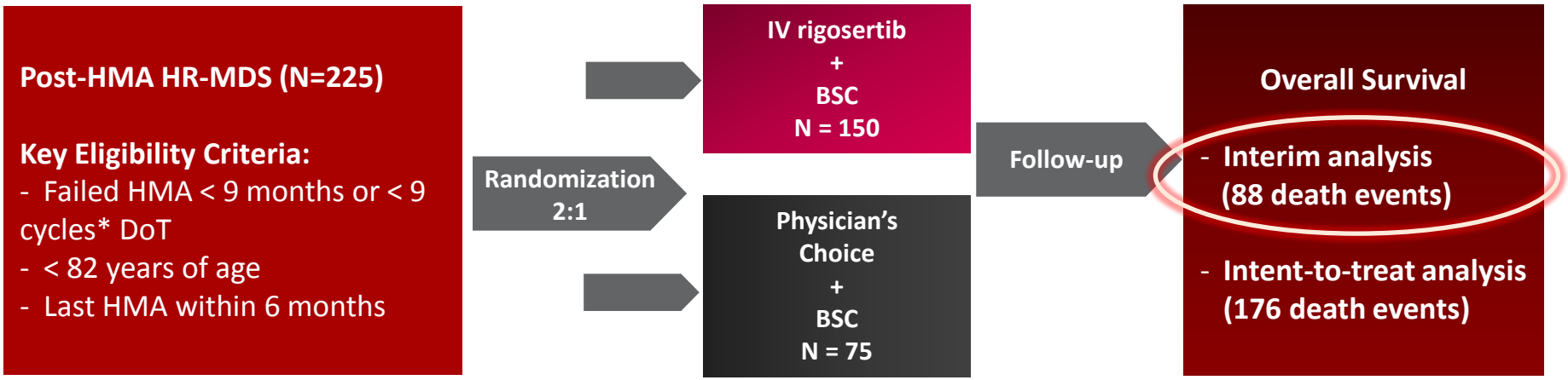
| Program | Partnership | Indication | Preclinical | Phase 1 | Phase 2 | Phase 3 | NDA/MAA |
|---|---|---|---|---|---|---|---|
| **Single-agent IV rigosertib** | **Partnered with SymBio in Japan/Korea*** | 2nd-line Higher-risk (HR-MDS) | **INSPIRE Phase 3 Trial; Global trial running on 4 continents** | | | | |
| Oral rigosertib + azacitidine | | 1st-line Higher-risk (HR-MDS) | **End of Phase 2 Meeting with FDA conducted, Phase 2 expansion underway** | | | | |

**Key Focus**

IV product for infusion

Oral soft gel capsules

# INSPIRE STUDY DESIGN FOR GLOBAL PHASE 3 TRIAL




**9 cycles within 12 months of starting treatment*

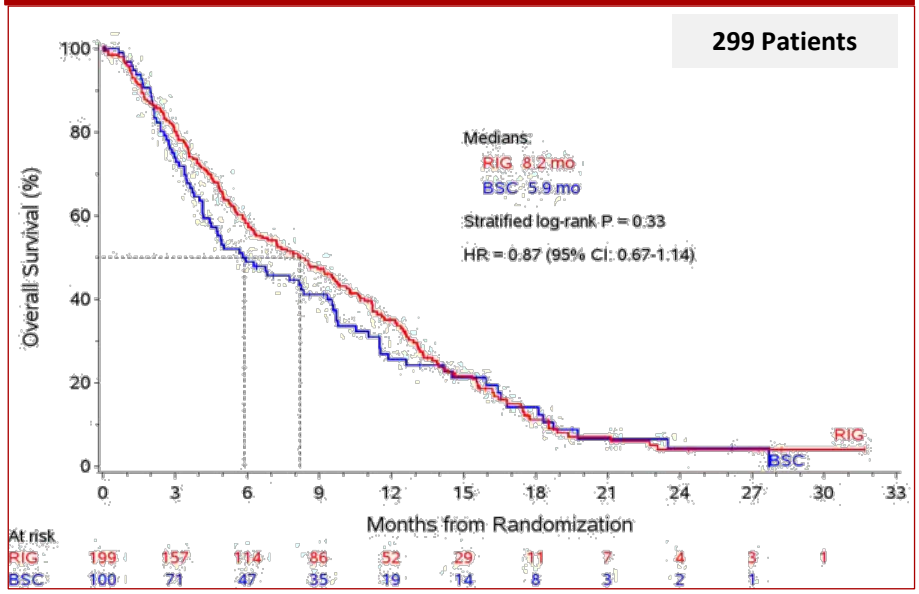
- Interim analysis is expected to occur in Q4-2017
- Survival endpoint with two successive analyses planned
  - ITT population enriched for higher-risk MDS
  - Second analysis of IPSS-Very High Risk (VHR) predefined group
    - Second cut allows for another chance to succeed in this subpopulation

*Commentary on new trial in recent publication: Emilio P Alessandrino, Matteo G Della Porta. Novel trial designs for high-risk myelodysplastic syndromes; The Lancet Oncology 2016 (17): 410–412*

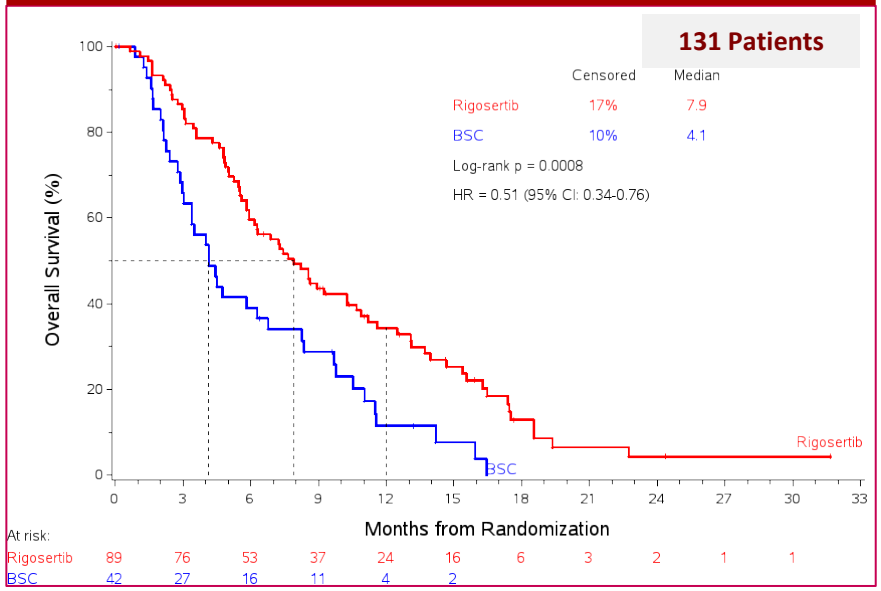
# SELECTING PATIENT POPULATION FOR PHASE 3 INSPIRE TRIAL

Data from ONTIME paper* published in *Lancet Oncology*

**ITT for ONTIME Trial**




**Subpopulation for INSPIRE Trial (ONTIME subset)**




ITT OS analysis of ONTIME – HR= 0.87; NS survival benefit

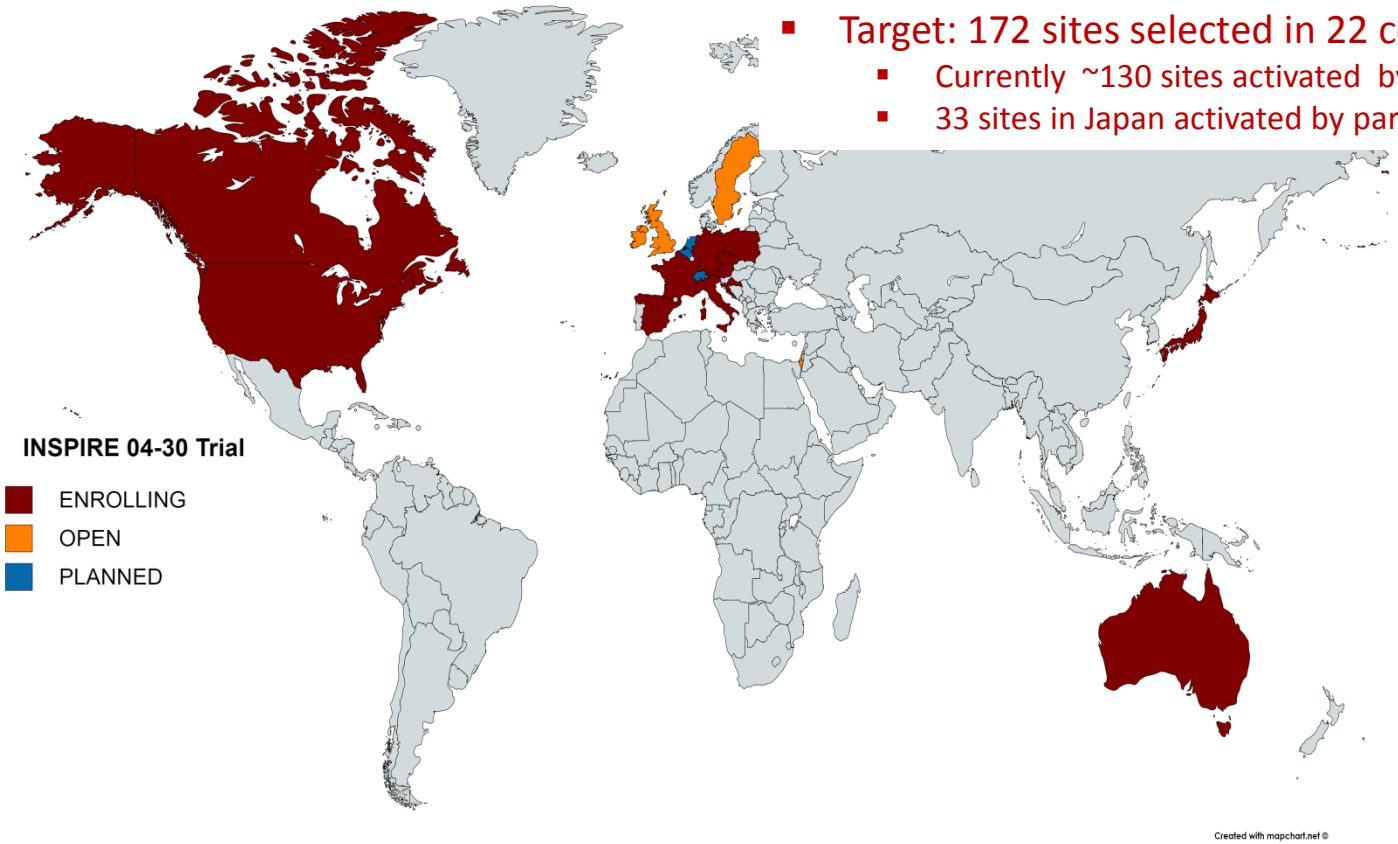
ITT OS of proposed INSPIRE population – HR = 0.51; P = 0.0008

*Guillermo Garcia-Manero, Pierre Fenaux, Aref Al-Kali, Maria R Baer, Mikkael A Sekeres, Gail J Roboz, et al. Rigosertib versus best supportive care for patients with higher-risk myelodysplastic syndromes after failure of hypomethylating drugs (ONTIME): a randomised, controlled, Phase 3 trial; *The Lancet Oncology* 2016 (17): 496–508

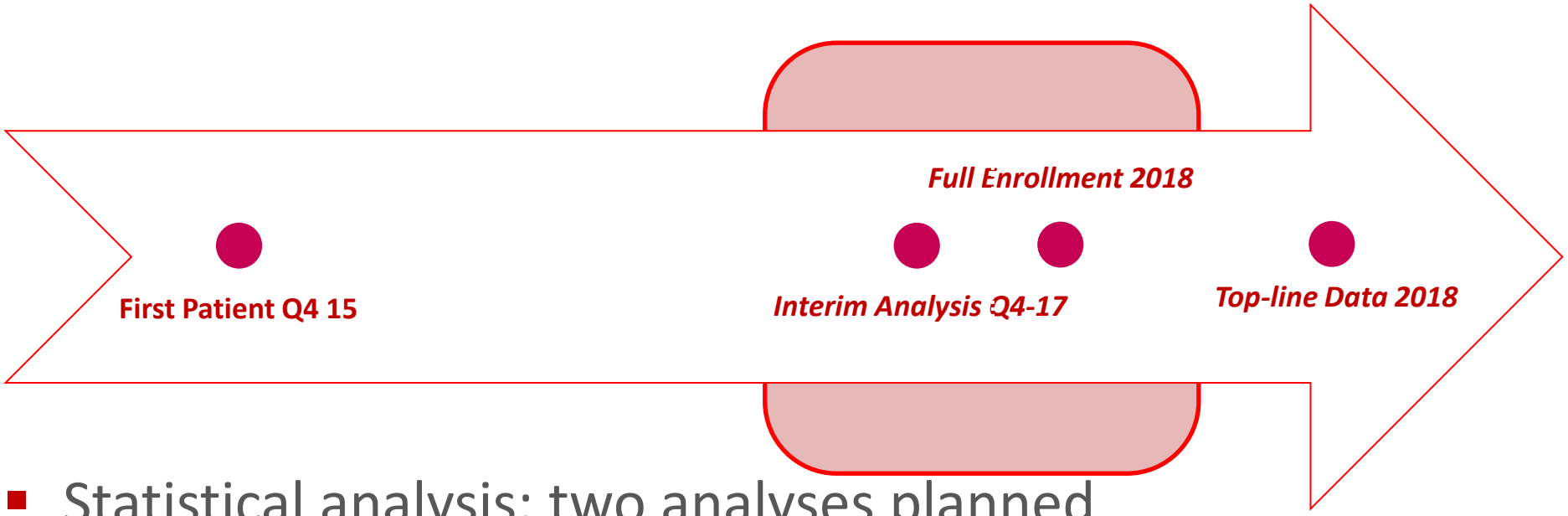
# GLOBAL INSPIRE TRIAL PROGRESS

*The **IN**ternational **S**tudy of **P**hase III **IV** **R**igos**E**rtib, or INSPIRE, designed following feedback from the U.S. Food and Drug Administration and European Medicines Agency and derives from findings of the ONTIME Phase 3 trial. Our partner SymBio is enrolling in Japan after discussions with the PMDA.*

- 225 patients to be enrolled
- Target: 172 sites selected in 22 countries on 4 continents
  - Currently ~130 sites activated by Onconova
  - 33 sites in Japan activated by partner SymBio



# TIMELINES FOR DATA ANALYSIS FOR INSPIRE TRIAL




- Statistical analysis: two analyses planned
  - Power 0.80; Target HR < 0.625; (reduce mortality by > 37.5%)
  - $\alpha$ for ITT = 0.04; $\alpha$ for IPSS-R VHR = 0.01
    - Dual primary endpoints: Overall survival in ITT population or IPSS-R Very High Risk
- Exploratory genomic sequencing of patient samples

# OVERVIEW OF SAFETY IN TRIAL PATIENTS

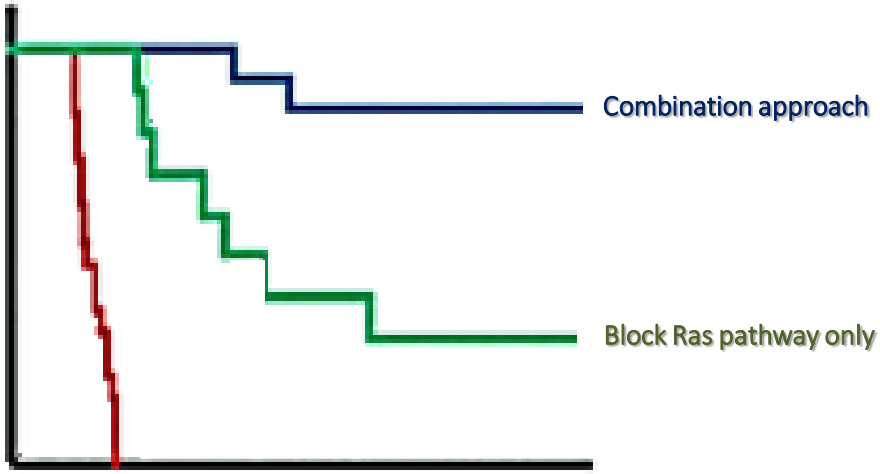
- Over 1,180 patients  treated with rigosertib in 27 Phase 1-3 trials evaluated
  - MDS/other hematologic malignancies (N = 672)
  - advanced cancer/solid tumors (N = 508) were treated in 27 Phase 1-3 clinical trials
- No treatment emergent myelosuppression, cardiotoxicity, or neurotoxicity
  - Minimal myelosuppression by rigosertib might represent a distinct advantage given the compromised bone marrow function of patients with MDS
- Generally, no need for premedication during the studies
- Potential safety signals are being monitored on an ongoing basis
- Current Investigator Brochure and Development Safety Update Report
  - July 2017

# MECHANISTIC RATIONALE FOR COMBINATION THERAPY WITH RIGOSERTIB + AZACITIDINE

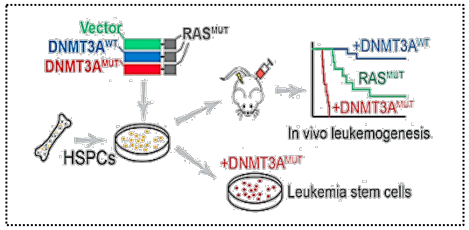
Preclinical evidence supports synergism of rigosertib + azacitidine combination

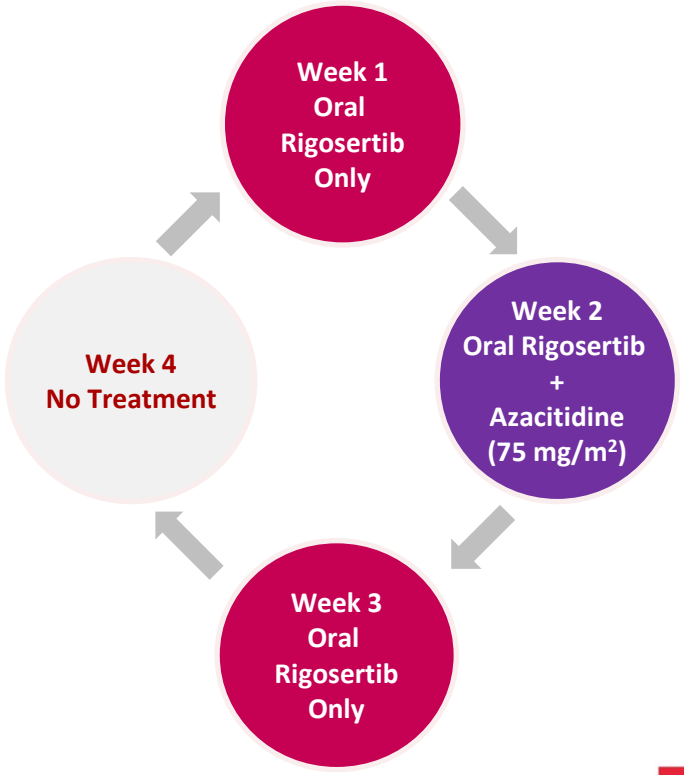
## AML Animal Model

**Validation of combination approach**




Lu et al., 2016 *Cancer Cell*



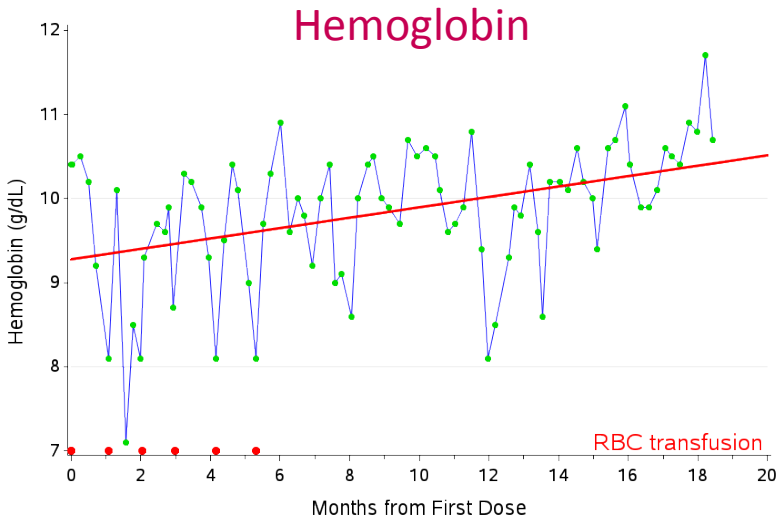

*More than 60 patient enrolled*

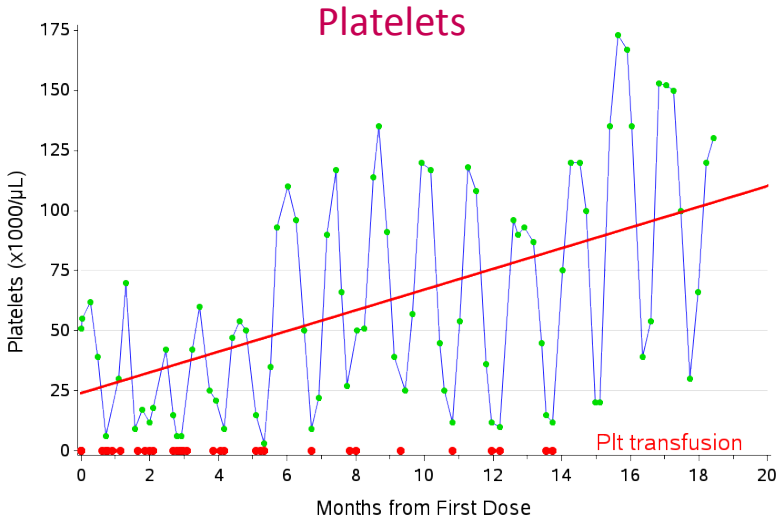
# EFFICACY RESULTS FOR COMBINATION TRIAL

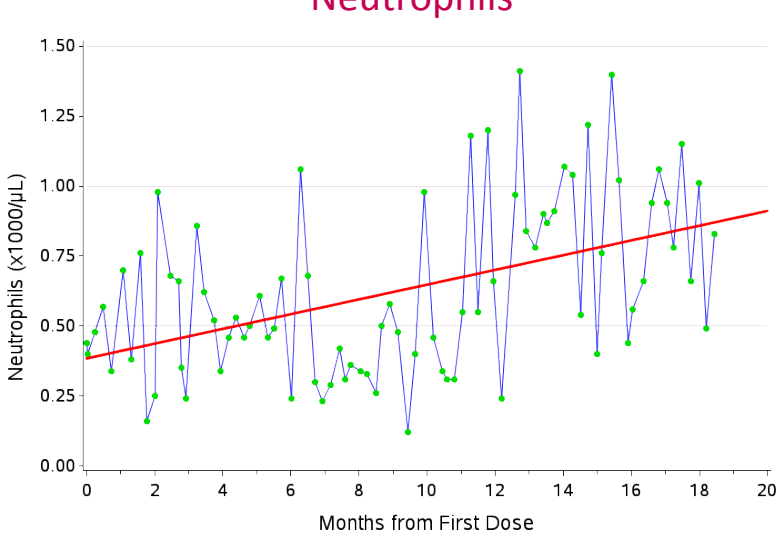
| Response Criteria | Response per IWG 2006 | | |
|---|---|---|---|
| | Overall evaluable (N=33) | **No prior HMA (N=20)** | HMA resistant (N=13) |
| **Complete Remission*** | **8 (24%)** | **7 (35%)** | **1 (8%)** |
| Marrow CR + Hematologic Improvement (HI) | 10 (30%) | 6 (30%) | 4 (31%) |
| Marrow CR alone | 6 (18%) | 3 (15%) | 3 (23%) |
| Hematologic Improvement alone | 1 (3%) | 1 (5%) | 0 |
| Stable Disease | 8 (24%) | 3 (15%) | 5 (38%) |
| **Overall IWG Response** | **25 (76%)** | **17 (85%)** | **8 (62%)** |
| Clinical Benefit Response | 19 (58%) | 14 (70%) | 5 (38%) |

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

# HEMATOLOGY TRENDS FOR PATIENT 101-006




- 12 cycles of AZA – stable disease
- RBC and platelet transfusions
- Blasts 7%
- Monosomy 7
- Runx-1
- AZA + RIG in 09-08 for 20+ months
- Complete remission
- RBC transfusion independent
- <5% blasts
- PB CR criteria

# KEY SAFETY DATA FROM RIGOSERTIB COMBINATION TRIAL (STUDY 09-08)

| Azacitidine Package Insert[1] | |
|---|---|
| Adverse Event | Grade ≥3 |
| Haematuria | 2.3% |
| Anemia | 13.7% |
| Neutropenia | 61.1% |
| Thrombocytopenia | 58.3% |

| Oral Rigosertib + Aza | |
|---|---|
| Adverse Event | Grade ≥3 |
| Haematuria | 7.0% |
| Anemia | 0 |
| Neutropenia | 19.0% |
| Thrombocytopenia | 27.0% |

- Rigosertib + azacitidine generally well tolerated
  - 4/37 MDS patients withdrew due to AE
  - 2/37 MDS patients had dose reduction
- Safety profile of combination did not differ from reported toxicities of azacitidine alone

[1]http://www.vidaza.com/pi.pdf

# NEXT STEPS FOR RIGOSERTIB + AZACITIDINE DEVELOPMENT

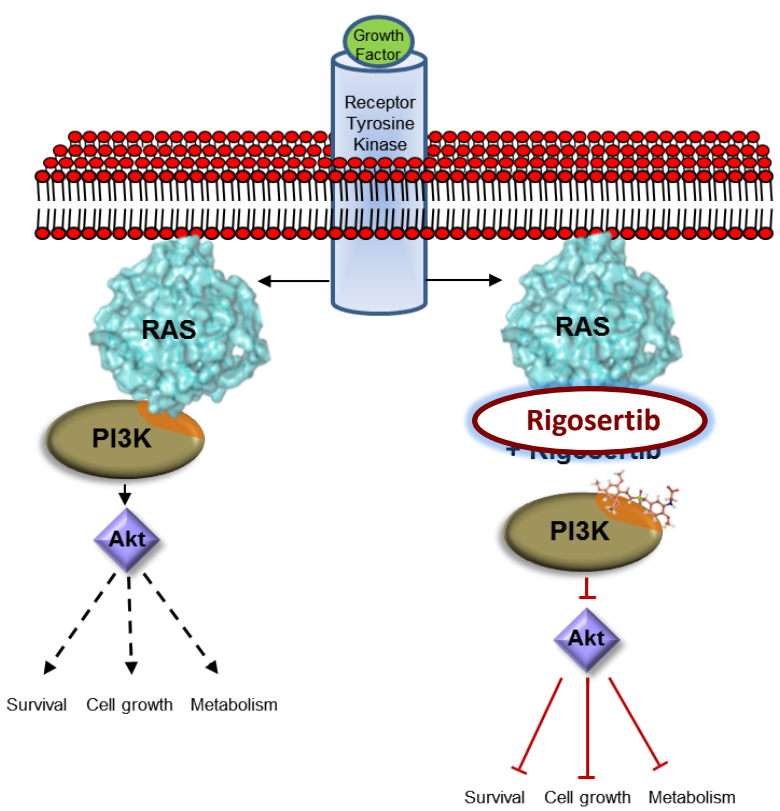
| Key Parameters and Milestones for Oral Rigosertib + Azacitidine Phase 3 Program | | |
|---|---|---|
| Phase 3 Design | Randomized Controlled | 1:1 randomization between Aza + placebo and Aza + oral rigosertib |
| Patient Population | First-line MDS | Higher risk patients indicated for azacitidine (Vidaza) |
| Primary Endpoint | Composite Response | Complete and Partial Remission per IWG 2006 criteria for MDS |
| Regulatory Path | To be explored | Special Protocol Assessment (SPA), Fast-track etc. |
| Protocol Details | 2017/18 | After regulatory discussions are completed |

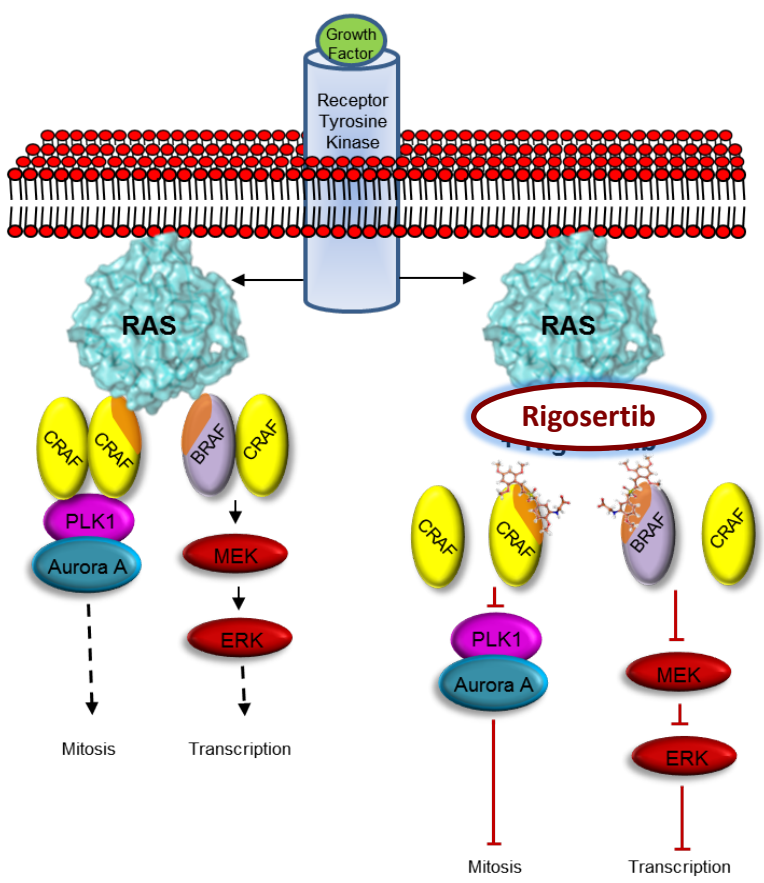
Current activities:

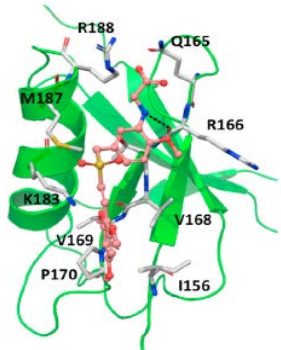
- Phase 2 trial expanded
  - Up to 40 more patients; more than 10 sites
  - Dose and schedule optimization
  - Gain additional efficacy data
  - Enrollment proceeding briskly
- Phase 3 protocol synopsis created
- Scientific advice obtained from EMA
- FDA Special Protocol Assessment process to start after completing expansion

# NOVEL MECHANISM OF ACTION

Rigosertib is believed to block downstream signaling by RAS effectors including PI3K and RAF by binding to Ras Binding Domain (RBD) found in many effector proteins



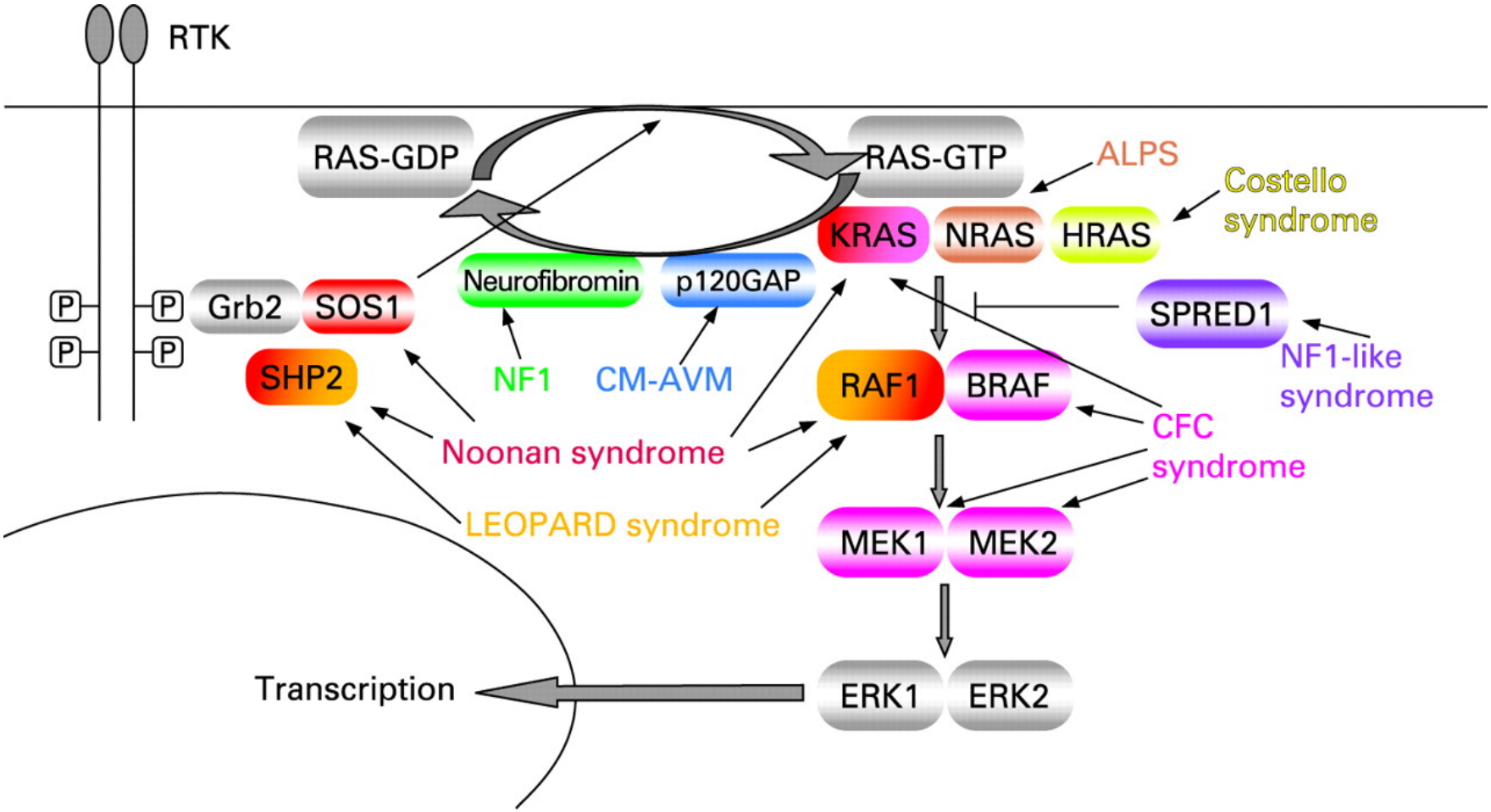




Rigosertib bound to Ras Binding Domain

*Published in Cell, 2016*

# RASOPATHIES: CAUSATIVE MUTATIONS NOT LIMITED TO RAS IN RARE PEDIATRIC DISEASES




*Key Opinion Leader meeting held on October 11th, in New York City; webcast at www.onconova.com*

# FINANCIAL DETAILS & SUMMARY

**Onconova founded in 1998; public since 2013**

| | | | |
|---|---|---|---|
| **Ticker** | Nasdaq ONTX | **Debt** | $0 |
| **Stock Information** | ▪ 9.9 million shares<br>▪ Public float >84%<br>▪ 52-week range: $1.51 - $3.50<br>▪ Average daily volume: 105,000 | **Liquidity** | ▪ Cash and cash equivalents of $15 million as of 6-30-2017<br>▪ Funded to deliver key milestones in 2017 |
| **Ownership** | Tyndall, Tavistock, Sabby, Shire; insiders including management | **Burn-rate** | Average $5.6 million per quarter over the last 5 quarters |
| **Analyst Coverage** | H.C. Wainwright, Laidlaw, Maxim, LifeSci Capital, Van Leeuwenhoeck Research (VLR), SeeThru Equity, Dawson James | **Partnerships** | Rigosertib is partnered with SymBio Pharmaceuticals in Japan/Korea; Onconova retains rights to the rest of the world |

- Advanced clinical trials
  - Phase 3 underway (IV rigosertib)
- Funded to deliver key 2017 milestones
  - IV Phase 3 interim analysis Q4-2017; top-line data 2018
- Underserved and growing market in MDS
  - >10,000 patients diagnosed annually
  - No new approved therapies in over a decade
- Rigosertib + pipeline present business development opportunities
- Seasoned management team and board of directors

# MANAGEMENT TEAM

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

- Bristol-Myers Squibb
- DNX
- Baxter
- Kimeragen
- Princeton University

**Steven M. Fruchtman, M.D.**
*Chief Medical Officer*

- Novartis
- Janssen
- Syndax
- Allos Therapeutics
- Spectrum Pharmaceuticals
- Mount Sinai

**Mark Guerin**
*Chief Financial Officer*

- Barrier Therapeutics
- Cardiokine
- PriceWaterhouseCooper

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


ONCONOVA
THERAPEUTICS
info@onconova.us

# BACK-UP SLIDES

# BOARD OF DIRECTORS

| | |
|---|---|
| Michael B. Hoffman<br>Chairman | Partner, Riverstone Holdings LLC |
| Henry S. Bienen Ph.D. | Served as the 15th President of Northwestern University |
| Jerome E. Groopman M.D. | Chief of Experimental Medicine at the Beth Israel Deaconess Medical Center, Harvard |
| Ramesh Kumar Ph.D. | President and CEO, Onconova Therapeutics Inc., co-founder |
| Viren Mehta Pharm.D. | Managing Member of Mehta Partners |
| E. Premkumar Reddy Ph.D.<br>Co-founder, Lead Scientific Advisor | Professor in the Department of Oncological Sciences & Department of Structural & Chemical Biology at the Mount Sinai School of Medicine |
| James J. Marino, Esq. | Former partner at Dechert LLP |
| Jack Stover | CEO, Interpace Diagnostics; former partner PwC |

# ADVISORY BOARD

| | |
|---|---|
| Ross C. Donehower, M.D. | Johns Hopkins Sidney Kimmel Comprehensive Cancer Center |
| James F. Holland, M.D. | Mount Sinai School of Medicine |
| Stephen Nimer, M.D. | Sylvester Cancer Center at the University of Miami Hospitals and Clinics |
| David R. Parkinson, M.D. | Venture Partner at NEA |
| Alan R. Williamson, Ph.D.<br>Chairman | Retired Merck and Glaxo pharmaceutical executive; former Abingworth |
| Anna Marie Skalka, Ph.D. | Fox Chase Cancer Center |
| George F. VandeWoude, Ph.D. | Van Andel Research Institute |
| Peter K. Vogt, Ph.D. | The Scripps Institute |

# KEY PARAMETERS OF INSPIRE TRIAL

- A 2:1 random assignment ratio; 225 patients total
- Type 1 error $\alpha = 0.04$ using a 2-sided log-rank test
  - Primary endpoint of overall survival in the intention-to-treat population
  - Exponential distribution of survival on treatment groups with constant death rate
- Type 2 error $\beta = 0.20$ (80% power)
- Expected mOS of 4.5 (control) and 7.2 months (rigosertib) groups
  - Target hazard ratio of 0.625
- An interim look for futility after the observation of 50% of deaths on both arms
- A uniform accrual period of 24 months
  - An additional follow-up period of 6 months after the last patient is randomized

# REVISED IPSS: PROGNOSTIC SCORE VALUES AND RISK CATEGORIES/SCORES

| Prognostic Variable | Prognostic Score Value | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0 | 0.5 | 1.0 | 1.5 | 2.0 | 3.0 | 4.0 |
| Cytogenetics | Very good | -- | Good | -- | Intermediate | Poor | Very poor |
| BM blast, % | ≤ 2 | -- | > 2 to < 5 | -- | 5-10 | > 10 | -- |
| Hemoglobin, g/dL | ≥ 10 | -- | 8 to < 10 | < 8 | -- | -- | -- |
| Platelets, x $10^9$/L | ≥ 100 | 50 to < 100 | < 50 | -- | -- | -- | -- |
| ANC, x $10^9$/L | ≥ 0.8 | < 0.8 | -- | -- | -- | -- | -- |

| Risk | Score |
|---|---|
| Very low | ≤ 1.5 |
| Low | > 1.5 to 3.0 |
| Intermediate | > 3.0 to 4.5 |
| High | > 4.5 to 6.0 |
| Very high | > 6 |

Greenberg PL, et al. Blood. 2012;120:2454-2465.

Slide credit: clinicaloptions.com

# INSPIRE: KEY OPINION LEADERS PARTICIPATING IN THE PHASE 3 TRIAL

*ONTIME participants in red (highest accruing sites in bold)*

*Sites in Japan not included in this list*

**Sites in USA**

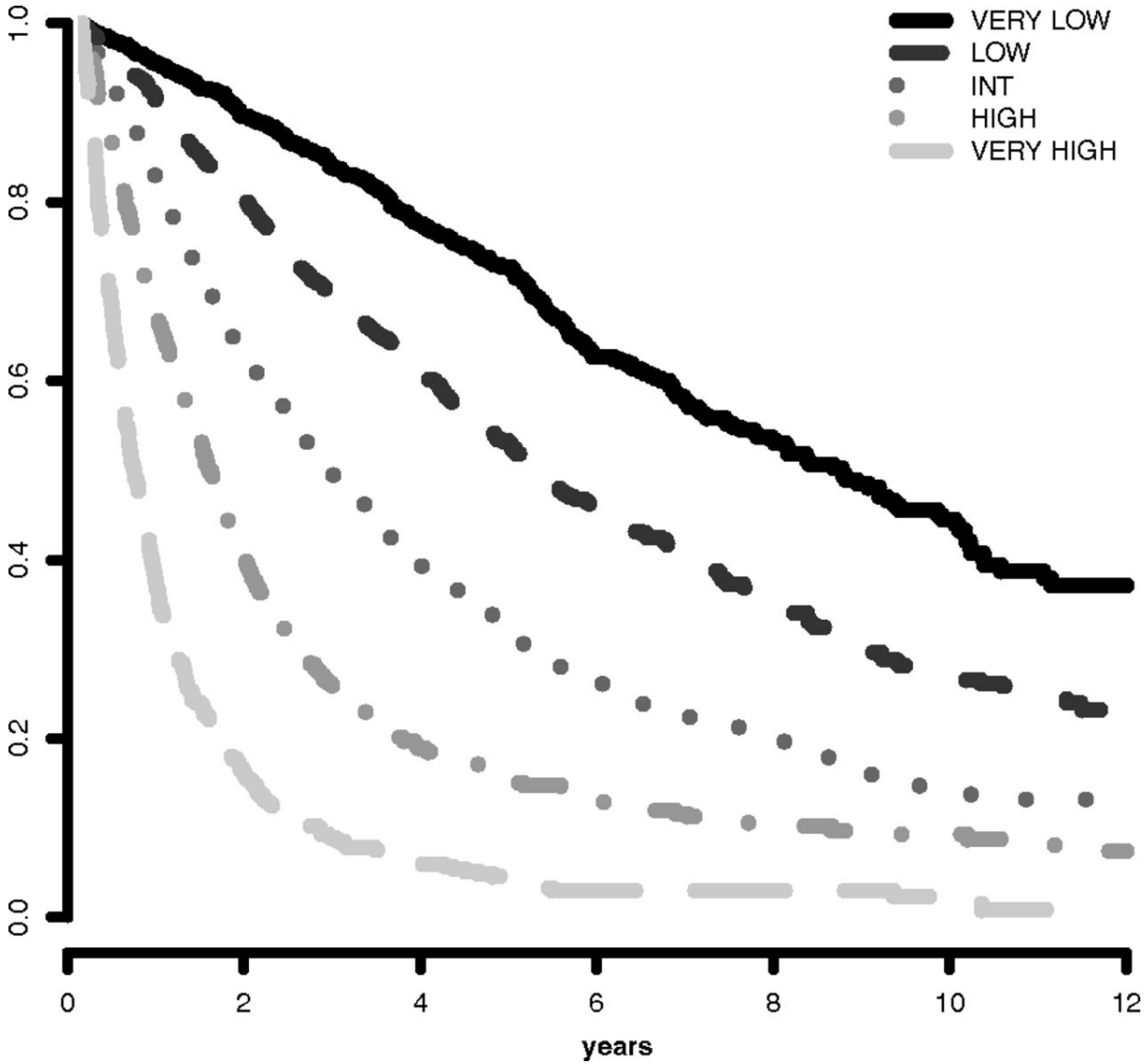
- **Maria R. Baer, MD - University of Maryland Greenebaum Cancer Center, Baltimore**
- Robert H. Collins, Jr., MD, FACP - University of Texas Southwestern Medical Center, Dallas
- **Guillermo Garcia-Manero, MD - University of Texas MD Anderson Cancer Center, Houston***
- **Lucy Godley, MD, PhD - University of Chicago Comprehensive Cancer Center, Chicago**
- **Aref Al-Kali, MD – Mayo Clinic Rochester, Minnesota**
- **Gail J. Roboz, MD - Weill Medical College of Cornell University New York Presbyterian Hospital, New York**
- **Bart Scott, MD – Fred Hutch Cancer Center, Seattle, Washington**
- Jamile Shammo, MD - Rush University Medical Center, Chicago
- **Lewis R. Silverman, MD - Icahn School of Medicine at Mount Sinai, New York****
- Selina Luger, MD - University of Pennsylvania Cancer Center, Philadelphia
- Rafael Bejar, MD, PhD - Moores Cancer Center at the University of California, San Diego
- Christopher R. Cogle, MD - University of Florida Shands Hospital, Gainesville
- Azra Raza, MD - Columbia University Medical Center, New York

***First* & senior** author in Lancet Oncology, 2016 paper on ONTIME results***

**Sites in Europe, Israel and Australia**

- **Pierre Fenaux, MD, PhD - Hôpital St Louis/ Université Paris, France**
- Norbert Vey, MD - Institut Paoli- Calmettes, Marseille, France
- Aristotle Giagounidis, MD, PhD - St. Johannes Hospital Heinrich-Heine Universität, Duisburg, Germany
- Detlef Haase, MD, PhD - Georg-August- Universität Göttingen, Göttingen, Germany
- **Uwe Platzbecker, MD - Universitätsklinikum Carl Gustav Carus, Dresden, Germany**
- Valeria Santini, MD - University of Florence Azienda OSP Careggi, Florence, Italy
- María Díez-Campelo, MD, PhD - Hospital Universitario de Salamanca, Salamanca, Spain
- Guillermo F. Sanz, MD - Hospital Universitario La Fe, Valencia, Spain
- Jaroslav Cermák, MD, PhD - Institute of Hematology and Blood Transfusion, Prague, Czech Republic
- Eva Hellstrom-Lindberg, MD, PhD - Karolinska Institutet, Karolinska, Sweden
- Ghulam J. Mufti, DM, FRCP, FRCPath - King's College London & King's College Hospital, London, UK
- Moshe Mittelman, MD - Tel-Aviv Sourasky Medical Center, Tel-Aviv, Israel
- Michael Pfeilstöcker, MD - Hanusch Hospital Medical Univ of Vienna, Vienna, Austria
- Jake Shortt, MD – Monash Health, Monash Medical Centre, Melbourne, Victoria, Australia
- Arjan A. van de Loosdrecht, MD, PhD - Vrije Universiteit Medical Center, Amsterdam, The Netherlands

# REVISED IPSS-R IN RELATION TO SURVIVAL




Greenberg et al. *Blood* 2012;120:2454-65

# IPSS-R RISK AND CLINICAL OUTCOME FOR FRONT-LINE PATIENTS

7012 patients, at diagnosis, on Best Supportive Care

| Parameter | Very Low | Low | Intermediate | High | Very High |
|---|---|---|---|---|---|
| IPSS-R score | <=1.5 | >1.5-3 | >3-4.5 | >4.5-6 | >6 |
| Patients^ (%) | 19 | 38 | 20 | 13 | 10 |
| Survival, years*** | 8.8 | 5.3 | 3.0 | 1.6 | 0.8 |
| Median months to 25% of patients in AML | NR | 10.8 | 3.2 | 1.4 | 0.7 |
| ONTIME Study (%) *15% were "unknown"* | 0 | 0 | 9 | 31 | 45 |

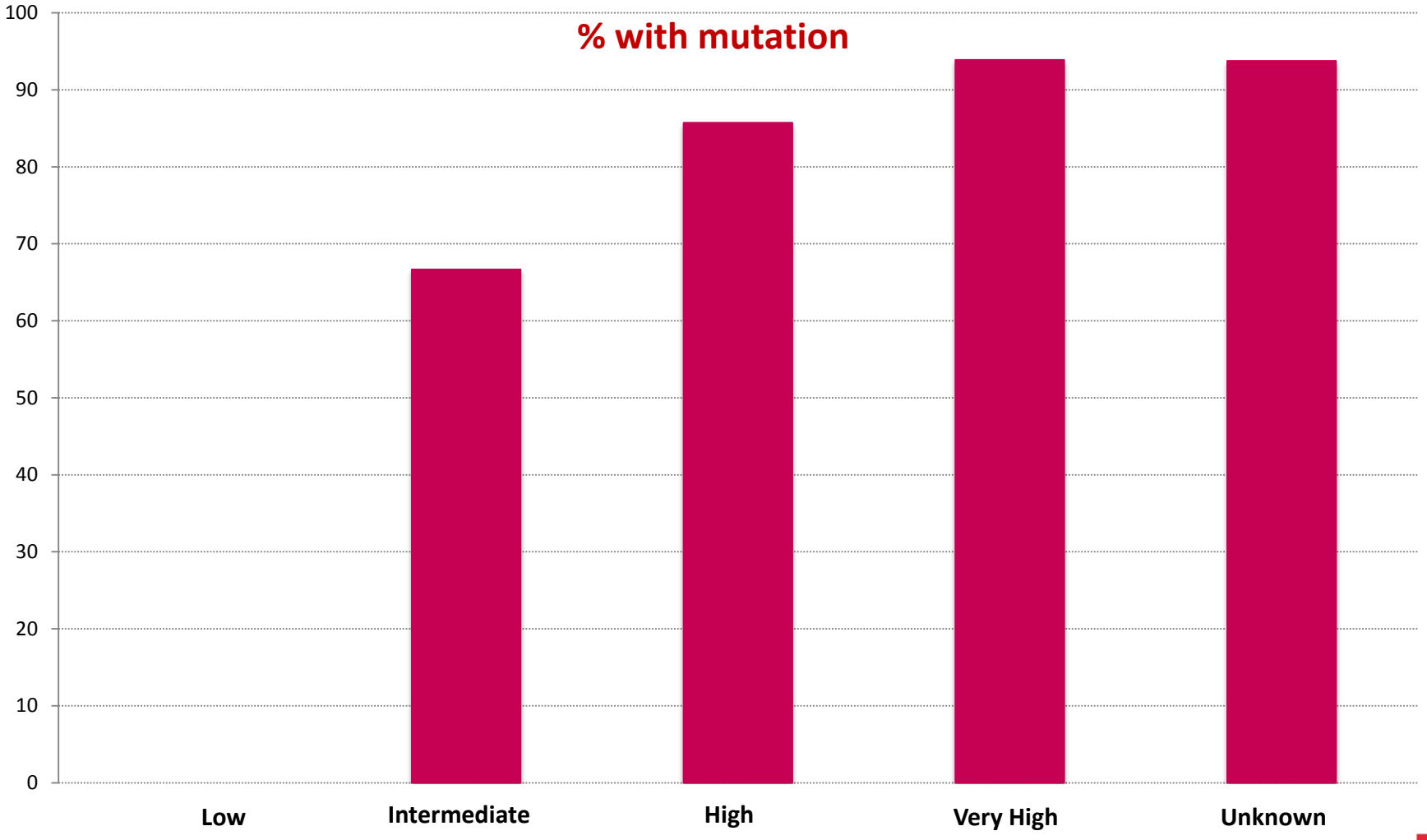
***Median survival of VHR patients on BSC arm in the ONTIME study was 3.2 months***

***Medians, years ^Median time to 25% AML evolution

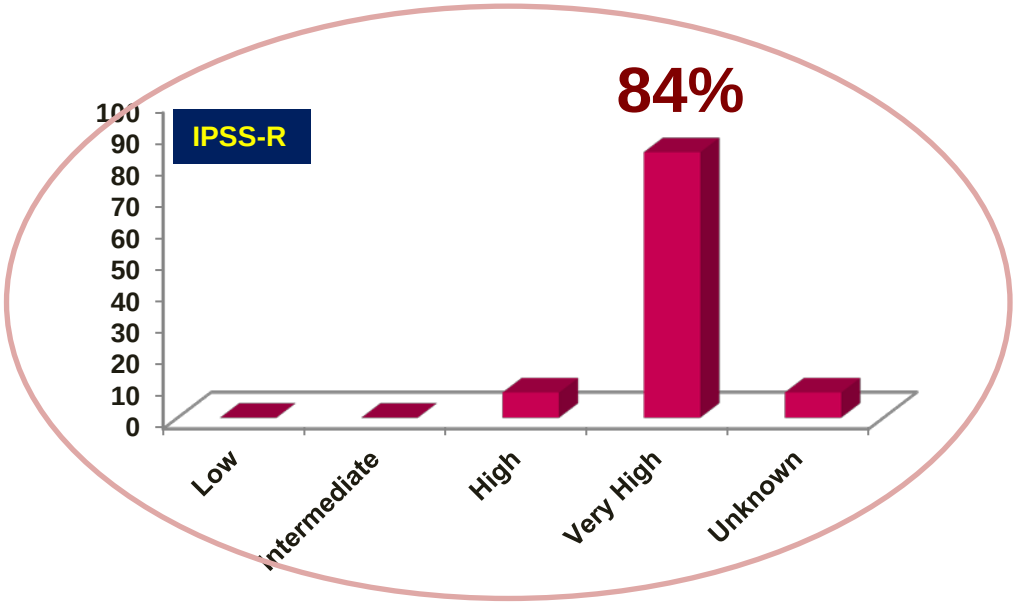
*Greenberg, Tuechler, Schanz et al, Revised International Prognostic Scoring System (IPSS-R) for Myelodysplastic Syndrome, Blood 120: 2454, 2012.

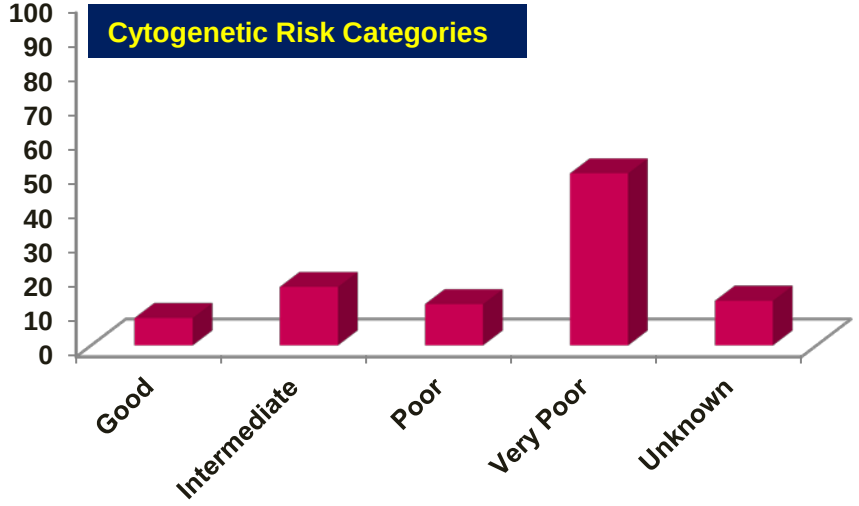
**Schanz J et al, J Clin Oncology 2012; 30:820

# ONTIME TRIAL: MUTATION FREQUENCY IN IPSS-R CLASSES



# DISTRIBUTION (%) OF TP53 MUTATIONS BY PROGNOSTIC RISK CLASSIFICATION




- 100% of Monosomy 7 and Trisomy 8 patients tested carried one or more myeloid mutations
- Older patients (>80 years) had fewer TP53 mutations
- Complex karyotype patients had more mutations