



# Liver Cirrhosis

## Overview and Top-line Results

January 5, 2016



# Forward-looking Statements

This presentation contains forward-looking statements. All statements other than statements of historical facts contained in this presentation, including statements regarding our future results of operations and financial position, business strategy, prospective products, product approvals, research and development costs, timing and likelihood of success, plans and objectives of management for future operations, and future results of current and anticipated products are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. These known risks and uncertainties are described in detail in our filings made with the Securities and Exchange Commission from time to time. Because forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified and some of which are beyond our control, you should not rely on these forward-looking statements as predictions of future events. The events and circumstances reflected in our forward-looking statements may not be achieved or occur and actual results could differ materially from those projected in the forward-looking statements.

All forward-looking statements are qualified in their entirety by this cautionary statement, which is made under the safe harbor provisions of the Private Securities Litigation Reform Act of 1995 and we undertake no obligation to revise or update this presentation to reflect events or circumstances after the date hereof.



# Cirrhosis of the Liver

- Cirrhosis is scarring of the liver in response to a variety of insults (viral infection, alcohol, obesity, etc.)
- There are no approved drugs that improve both portal hypertension and liver function in patients with cirrhosis if the insult persists
- Liver cirrhosis kills 32,000 Americans each year
  - The only “cure” is a transplant
  - Linked to recently reported increase in mid-life all-cause mortality in white non-Hispanic US men and women



# Why Conatus? Why Now?

**Conatus is advancing  
an initial emricasan registration  
strategy with a focus on cirrhosis**



# Emricasan: Potential to Modify Disease Outcome

- First-in-class, orally active, pan-caspase inhibitor
  - Suppresses apoptosis and inflammation
  - Addresses all etiologies of cirrhosis
- Efficacy
  - Potent mechanism with multiple disease intervention points
  - Demonstrated activity across broad spectrum of chronic liver disease
  - Clinically meaningful reductions in validated surrogate cirrhosis endpoints
    - Rapidly improves both portal hypertension and key measures of liver function
- Safety
  - 650+ subjects exposed (450+ with liver disease)
    - Up to 50mg BID for 12 weeks – currently testing 25mg BID for 2 years
  - Serious adverse event and adverse event profiles similar in placebo and emricasan treated patients
  - Cleared for dosing to efficacy





**Conatus**   
Pharmaceuticals

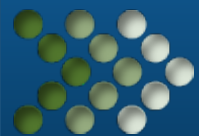
**Liver Cirrhosis  
Top-line Trial Results**



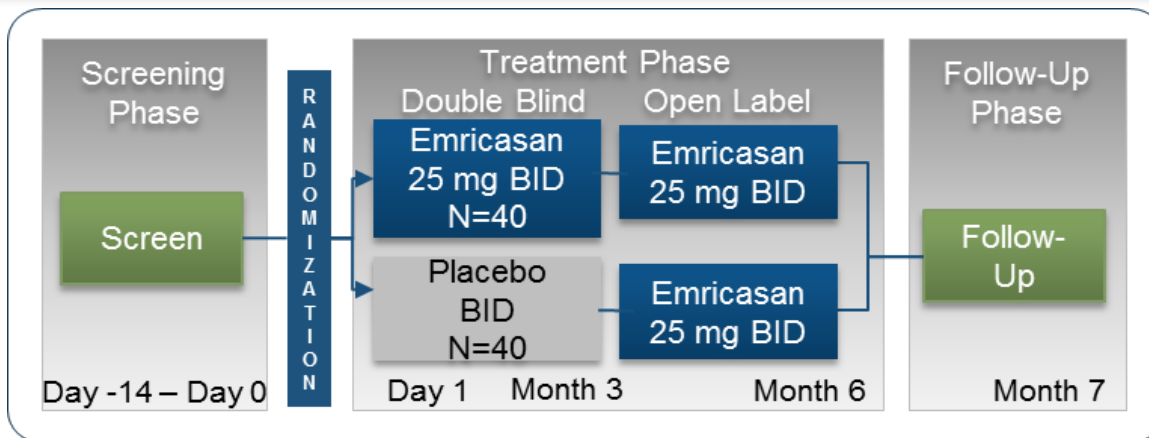
# Endpoints for Measuring Liver Function Improvement in Liver Cirrhosis Clinical Trial

- Manuscript from AASLD/FDA Joint Workshop provided comments on potential surrogate endpoints for cirrhosis trials\*
- Model for End-Stage Liver Disease (MELD)
  - Objective measure, validated
  - 2 point change in MELD score or lack of progression to MELD score of 15 as potential surrogate endpoints (disease state dependent)
  - **MELD components: Total bilirubin, creatinine, INR; values under 1.0 rounded to 1.0 in MELD calculation;  $\geq 15$  is transplant eligible**
- Child-Pugh score
  - Objective-subjective measure, validated
  - 2 point change in Child-Pugh score or lack of progression from CP-A to CP-B as potential surrogate endpoints (disease state dependent)
  - **Child-Pugh components: Total bilirubin, albumin, INR, encephalopathy, ascites; A = 5-6; B = 7-9; C = 10-15**

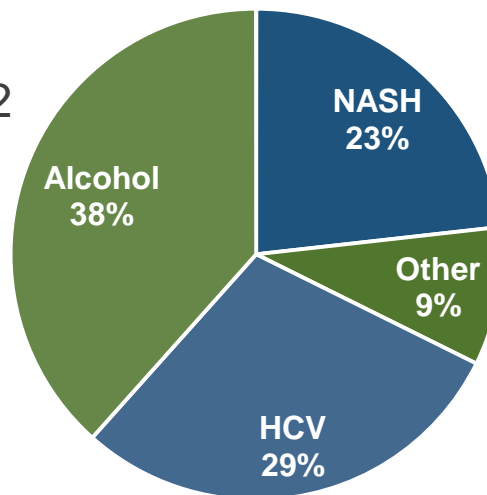
\*Sanyal, AJ, et al. *Hepatology* 2015;61:1392-1405.



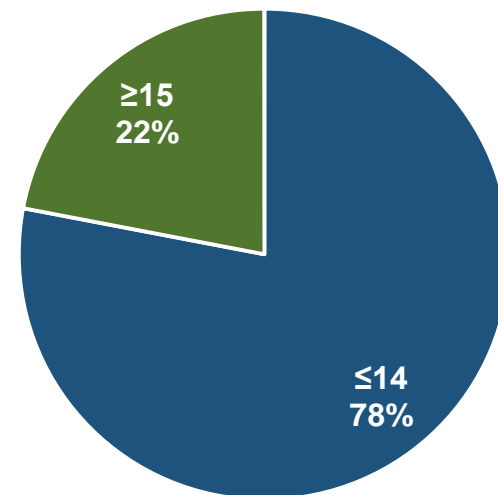
# Liver Cirrhosis Trial: 3-Month Initial Analysis



- Double-blind, placebo controlled, multicenter (26 U.S. sites) Phase 2
  - 86 patients enrolled and dosed
  - Multiple etiologies of cirrhosis
- Baseline MELD 11 to 18
  - Mean of 12.8 at baseline
- Child-Pugh
  - 43% Child-Pugh A
  - 56% Child-Pugh B
  - Mean of 6.9 at baseline



Etiology



Baseline MELD Score





# Consistent Treatment Effect across Mechanism-Specific and Mechanism-Independent Biomarkers

Emricasan effective in mixed etiology patients over a broad range of MELD scores

Overall Patient Population	Placebo (N=42)		Emricasan (N=44)		p-value*
	Baseline	Change at Month 3 <sup>†</sup>	Baseline	Change at Month 3 <sup>†</sup>	
cCK18 (U/L)	296	+9.3%	289	-4.6%	0.04
Caspase 3/7 (RLU)	2503	+8.8%	2656	-45.5%	<0.0001
fICK18 (U/L)	582	-3%	714	-18%	0.005
ALT (U/L)	25.5	-1.0	27.5	-3.0	0.03
AST (U/L)	41.5	-1.5	50.0	-5.0	0.08

\*p-values for treatment effect at Month 3, adjusting for baseline, MELD, etiology; not adjusted for multiple testing.

<sup>†</sup>Based on last observation carried forward. Data presented are geometric mean for baseline cCK18, caspase 3/7, fICK18, and median/median change for ALT and AST.



# Emricasan 3-month Dosing Shows Trend Toward Improving Parameters of Liver Function

Trends in overall population driven by significant improvement in MELD  $\geq 15$  subgroup

Overall Patient Population	Placebo (N=42)		Emricasan (N=44)		p-value*
	Baseline	Change at Month 3 <sup>†</sup>	Baseline	Change at Month 3 <sup>†</sup>	
MELD score	12.9	+0.1	12.8	-0.1	0.50
Child-Pugh score	6.9	+0.1	6.9	-0.2	0.10
Total bilirubin (mg/dL)	2.59	+0.07	2.25	-0.05	0.19
INR	1.31	+0.02	1.33	-0.02	0.12
Albumin (g/dL)	3.48	+0.06	3.46	+0.02	0.38

\*p-values for treatment effect at Month 3, adjusting for baseline, MELD, etiology; not adjusted for multiple testing.

<sup>†</sup>Based on last observation carried forward.



# Emricasan Improves Key Liver Function Parameters in Patients with MELD $\geq 15$ (Eligible for Transplant Listing)

Consistent with PH trial, greatest improvement observed in patients with highest medical need

Baseline MELD Score $\geq 15$ Patient Population	Placebo (N=10)		Emricasan (N=9)		p-value*
	Baseline	Change at Month 3 <sup>†</sup>	Baseline	Change at Month 3 <sup>†</sup>	
MELD score	16.3	+0.6	16.0	-1.6	0.003
Child-Pugh score	8.2	+0.6	7.8	-0.6	0.003
Total bilirubin (mg/dL)	4.30	-0.06	3.17	-0.55	0.03
INR	1.45	+0.06	1.54	-0.14	0.0004
Albumin (g/dL)	3.19	+0.05	3.41	+0.07	0.78

\*p-values for treatment effect at Month 3, adjusting for baseline, MELD, etiology; not adjusted for multiple testing.

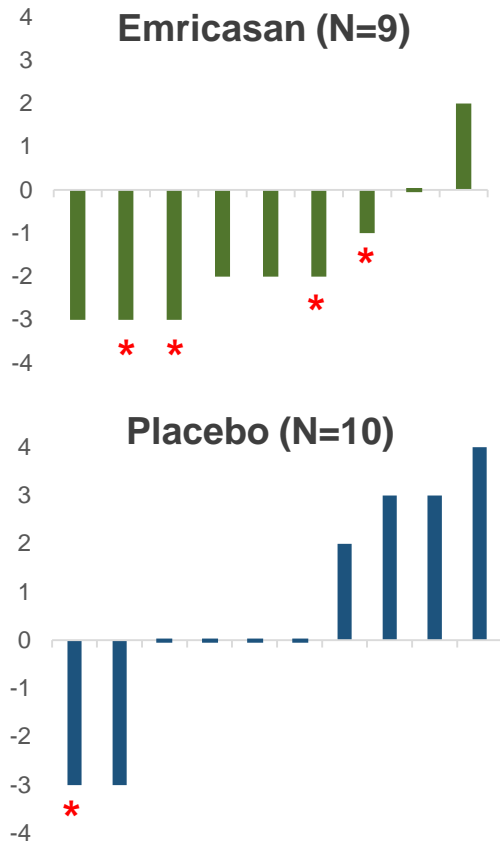
<sup>†</sup>Based on last observation carried forward.



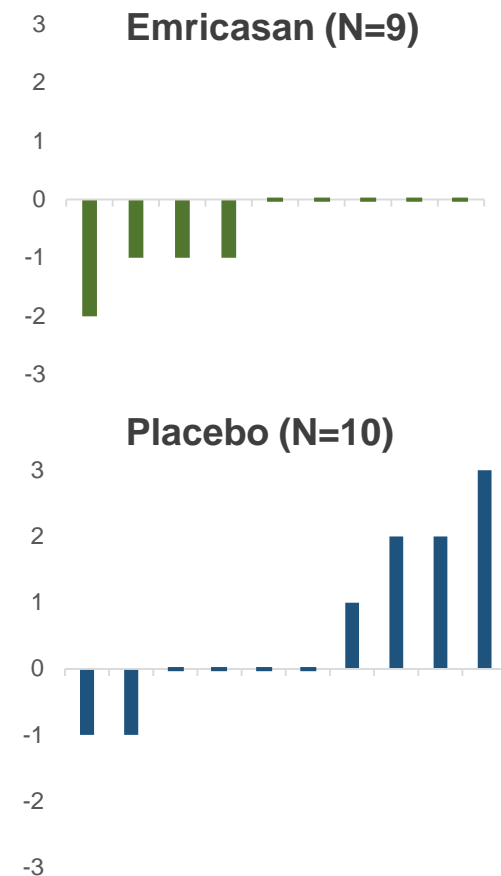
# Clinically Meaningful Improvement in Liver Function in Patients with Baseline MELD of $\geq 15$

Responses driven by improvement in INR and bilirubin

## Change in MELD at 3 months



## Change in Child-Pugh at 3 months



\* Also reached MELD  $\leq 14$  at Month 3

■ Emricasan 25 mg BID  
■ Placebo BID

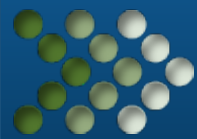




# Key Conclusions From 3-month Top-line Analysis in Liver Cirrhosis Clinical Trial

Emricasan improves measures of liver function in patients with baseline MELD  $\geq 15$

- Consistent treatment effect across mechanism-specific and mechanism-independent biomarkers in overall patient group
  - Statistically significant reduction in cCK18 ( $p=0.04$ ), adjusting for differences between groups in baseline MELD and disease etiology
- Clinically meaningful improvement in liver function measures
  - Observed in patients with MELD of  $\geq 15$  at baseline
  - Responses driven by improvements in INR and bilirubin
- Reassuring safety profile
  - Consistent with prior experience
- Await 6-month data to:
  - Determine if responses in MELD  $\geq 15$  subgroup are sustained or improved
  - Determine if responses in MELD  $\leq 14$  subgroup are improved
  - Compare 3-month responses in placebo patients switching to emricasan



# Emricasan Has Unique Potential to Improve Both Portal Hypertension and Liver Function in Patients with Cirrhosis

Clinical trial results in 2015-16 support emricasan development as a treatment for cirrhosis

- Organ impairment PK/PD clinical trials
  - Permits dosing to efficacy in patients with mild, moderate, or severe liver function impairment
- NAFLD/NASH Phase 2 clinical trial
  - Confirmed that emricasan is as effective in NAFLD/NASH patients as previously shown in patients with other (i.e. HCV) etiologies of liver disease
- Portal Hypertension Phase 2 clinical trial
  - Clinically meaningful reductions in a validated surrogate endpoint of portal hypertension (HVPG) in patients with cirrhosis and severe portal hypertension after only one month of dosing with emricasan
- Liver Cirrhosis Phase 2 clinical trial
  - Clinically meaningful reductions in validated surrogate endpoints of liver function (MELD and Child-Pugh) in patients with cirrhosis and moderate liver function impairment after only three months of dosing with emricasan



# Emricasan Has Multiple Opportunities to Improve Liver Damage in Patients with Cirrhosis

Liver Function impairment results from progressive damage in the liver from a combination of **excessive hepatocyte cell death and excessive inflammation**

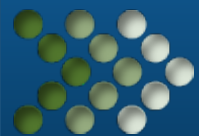
✓ LC Trial

Severe Portal Hypertension results from a combination of **hepatic vasoconstriction and GI vasodilation**

✓ PH Trial



Emricasan has the potential to reduce portal hypertension AND improve liver function. We believe that the longer patients take the drug the better they will get.



# Emricasan: Current Clinical Milestones

Goals: Define dosing, broaden safety database, show activity against validated endpoints

Target Population	Preclinical	Phase 1	Phase 2	Importance	Next Milestone
<b>Portal Hypertension (PH)</b>				Validated surrogate endpoint	Phase 2 top-line data reported 3Q15; detailed data reported 4Q15
<b>Liver Cirrhosis (LC)</b>				Validated surrogate endpoint	Phase 2 first stage top-line data reported 1Q16
<b>Liver Cirrhosis (LC)</b>				Validated surrogate endpoint	Phase 2 second stage top-line data to be reported 2Q16
<b>Liver Cirrhosis (LC)</b>				Validated surrogate endpoint	Phase 2 subgroup and ad hoc analyses to be reported 2016 + 2017
<b>Post Liver Transplant HCV Clearance with Unresolved Fibrosis/Cirrhosis (POLT-HCV-SVR)</b>				Established histology endpoint	Phase 2b top-line data expected 1H18





# Liver Cirrhosis Q&A Session January 5, 2016