



ASX/MEDIA RELEASE

5<sup>th</sup> June 2017

## **SIRveNIB Study Data Presented at ASCO Annual Meeting**

**Sydney, Australia; 5<sup>th</sup> June 2017** – Sirtex Medical Limited (ASX:SRX) announces the oral abstract of the SIRveNIB clinical study comparing SIR-Spheres<sup>®</sup> Y-90 resin microspheres versus sorafenib (Nexavar<sup>®</sup>, Bayer Healthcare Pharmaceuticals) in patients with non-resectable advanced hepatocellular carcinoma (HCC) was presented at the gastrointestinal (non-colorectal) cancer session at the American Society of Clinical Oncology (ASCO) Annual Meeting today<sup>1</sup>. The 360 patient SIRveNIB study was conducted in predominately Asian patients, across 11 Asian countries and New Zealand, with 27 centres participating.

Dr David N. Cade, Chief Medical Officer of Sirtex Medical said “We congratulate the SIRveNIB study investigators on their oral abstract presentation at ASCO. The SIRveNIB study data verifies the important role of SIR-Spheres as an alternative treatment to sorafenib for advanced HCC in an Asian population, given the significant safety and toxicity benefits conferred, with no significant difference in median overall survival outcomes.”

Professor Pierce Chow, Principal Investigator of the SIRveNIB study and Senior Consultant Surgeon at the National Cancer Centre Singapore and the Singapore General Hospital said “We found that the Asian patients with locally advanced HCC who were treated with Y-90 resin microspheres had a significantly better tumour response rate of 16.5% compared to 1.7% for sorafenib ( $p < 0.001$ ) in the intent to treat, or ITT analysis, and 23.1% for SIRT compared to 1.9% ( $p < 0.001$ ) in the treated population, which represents the patients who actually received their allocated treatment. They also experienced almost a two-fold decrease in severe adverse events (grade  $\geq 3$ ; 27.7% vs. 50.6%;  $p < 0.0001$ ) compared with those treated with sorafenib.”

“The comparative data on side effects reported in the SIRveNIB study unequivocally favoured Y-90 resin microspheres over sorafenib,” Prof. Chow said. “In addition to two-fold fewer severe AEs, we observed about one fourth as many adverse events (60.0% vs. 84.6%  $p < 0.0001$ ) as well as fewer serious AEs [SAEs] (20.8% vs. 35.2%;  $p = 0.009$ ). Specifically, patients treated with Y-90 resin microspheres reported substantially less fatigue (3.8% vs. 15.4%), diarrhoea (1.5% vs. 29.6%), hand-foot skin reaction (0.8% vs. 54.9%), alopecia (0% vs. 9.9%) as well as hypertension (0% vs. 14.8%) than those treated with sorafenib.”

Professor Bruno Sangro, Director of the Liver Unit at Clinica Universitaria de Navarra, Professor of Medicine at the University of Navarra School of Medicine, and senior researcher in the National Biomedical Research Network Center for Liver and Digestive Diseases commented “The SIRveNIB study results confirm those from the SARAH study, in terms of the good safety profile of SIRT using Y-90 resin microspheres, which was significantly better tolerated than sorafenib. We now have two large, prospective, randomised controlled trials that show that SIRT using Y-90 resin microspheres in HCC patients with cirrhosis, is a safe procedure. Since liver toxicity could have been a potential issue, the safety profile of SIRT with Y-90 resin microspheres is very reassuring. Although this is a negative primary endpoint, as SIRveNIB was designed to show superiority in overall survival, it shows that for centres that treat HCC, it is worth having SIRT as an alternative to sorafenib so that the multidisciplinary tumour boards can consider the most appropriate treatment option for their patients.”

The SIRveNIB study is the largest ever randomised controlled trial in a predominately Asian population to provide Level 1 evidence comparing a liver-directed therapy, namely SIR-Spheres Y-90 resin microspheres, against the standard of care chemotherapy agent sorafenib.

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A copy of Professor Chow's presentation is attached.

**- ENDS -**

### **About SIRveNIB**

SIRveNIB is a Phase III Multi-Centre Open-Label Randomised Controlled Trial of Selective Internal Radiation Therapy (SIRT) using SIR-Spheres Y-90 resin microspheres Versus Sorafenib (Nexavar®, Bayer HealthCare Pharmaceuticals, Germany) in Locally Advanced Hepatocellular Carcinoma. The primary objective of this study is to assess the efficacy of SIRT as compared with sorafenib in patients with locally advanced liver cancer in terms of overall survival (OS). ClinicalTrials.gov Identifier: NCT01135056. [www.sirvenib.com](http://www.sirvenib.com).

### **About Hepatocellular Carcinoma (HCC)**

Hepatocellular Carcinoma (HCC) is the most common form of primary liver cancer – cancer that starts in the liver. It is the sixth most common cancer in the world and the second most common cause of cancer-related death<sup>2</sup>.

### **About SIR-Spheres® Y-90 Resin Microspheres**

SIR-Spheres Y-90 resin microspheres are a medical device used in interventional oncology and delivered via Selective Internal Radiation Therapy (SIRT), also known as radioembolisation, directly to liver tumours. SIR-Spheres Y-90 resin microspheres are approved for supply in key markets, such as the United States, European Union and Australia.

### **About Sirtex Medical**

Sirtex Medical Limited (ASX:SRX) is an Australian-based global healthcare business working to improve outcomes in people with cancer. Our current lead product is a targeted radiation therapy for liver cancer. Over 73,000 doses have been supplied to treat patients with liver cancer at 1,060 medical centres in over 40 countries. For more information please visit [www.sirtex.com](http://www.sirtex.com).

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<sup>1</sup> Chow PKH *et al.* Phase III multi-centre open-label randomized controlled trial of selective internal radiation therapy (SIRT) versus sorafenib in locally advanced hepatocellular carcinoma: The SIRveNIB study. *2017 ASCO Annual Meeting; J Clin Oncol* 2017; **35** (Suppl): Abs 4002.

<sup>2</sup> GLOBOCAN 2012. Estimated cancer mortality, incidence and prevalence worldwide. <http://globocan.iarc.fr/Default.aspx>



# Sirtex Medical Limited

**SIRveNIB Clinical Study**  
**ASCO Oral Abstract Presentation**

5 June 2017





# Phase III multi-centre open-label randomized controlled trial of selective internal radiation therapy (SIRT) versus sorafenib in locally advanced hepatocellular carcinoma: The SIRveNIB study.

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On behalf of

**The Asia-Pacific Hepatocellular Carcinoma Trials Group**

(<http://www.scri.edu.sg/cm/asia-pacific-hepatocellular-carcinoma-ahcc-trials-group/about-ahcc/>)

ClinicalTrials.gov: NCT01135056

**Asia-Pacific  
Hepatocellular Carcinoma  
Trials Group**





## Disclosure

Pierce K.H Chow

- **Advisory Role:**
  - Sirtex Medical, Ltd
  - Ipsen
  - BMS
  - Oncosil
- **Research Support:**
  - Sirtex Medical, Ltd
  - National Medical Research Council, Singapore
  - Ipsen
  - Quintiles-IMS Health

Presented by: Prof. Pierce K. H. Chow

04-Jun-2017

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## Background

The majority of patients with Hepatocellular Carcinoma (HCC) have **locally advanced disease** (+/- PVT) at diagnosis.

Both **SIRT** and **sorafenib** have demonstrated efficacy in this group of patients but have different mechanisms of actions.

A definitive RCT comparing these 2 promising therapies in locally advanced HCC will impact on outcomes in a large number of patients and potentially change clinical practice.

<sup>1</sup> Llovet JM et al. *N Engl J Med*. 2008; 359: 378-90. <sup>2</sup> Llovet JM et al. *Lancet* 2002; 359: 1734-9. <sup>3</sup> Lo CM et al. *Hepatology* 2002; 35: 1164-71. <sup>4</sup> Llovet JM et al. *Hepatology* 2003; 37: 429-42. <sup>5</sup> Oliveri RS et al. *Cochrane Database Syst Rev* 2011;(3):CD004787. <sup>6</sup> Sangro B et al. *Hepatology* 2011; 54: 868-78. <sup>7</sup> Salem R et al. *Gastroenterology* 2010; 138: 52-64. Khor et al. *Hepatology International* 2014; 8:395-404

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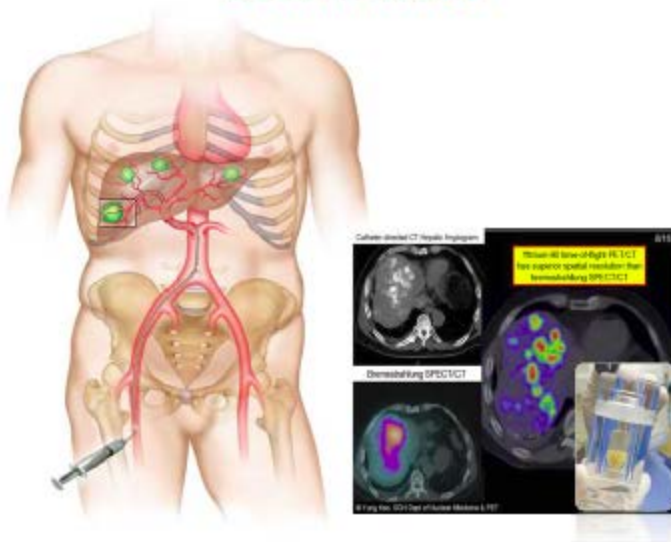
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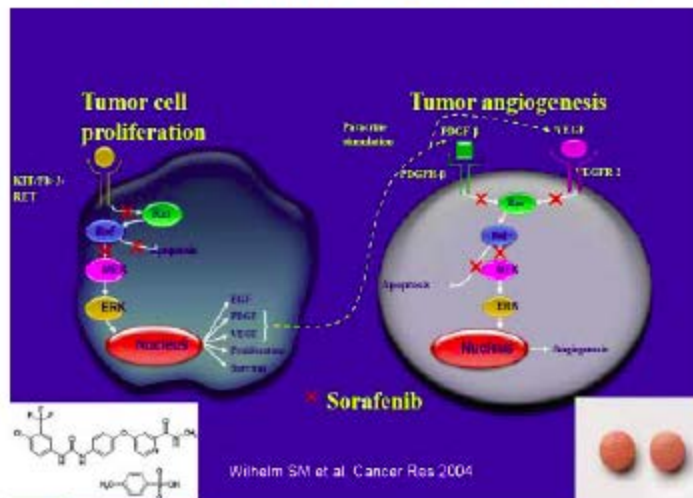


## Different Therapeutic Classes

### SIRT: Brachytherapy



### Sorafenib: Oral molecular targeted therapy



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## Objectives

### Primary objective

To assess the efficacy of **SIRT** with Y90 resin microspheres compared with **sorafenib** in patients with locally advanced liver cancer not amenable to curative therapies, with respect to overall survival (OS).

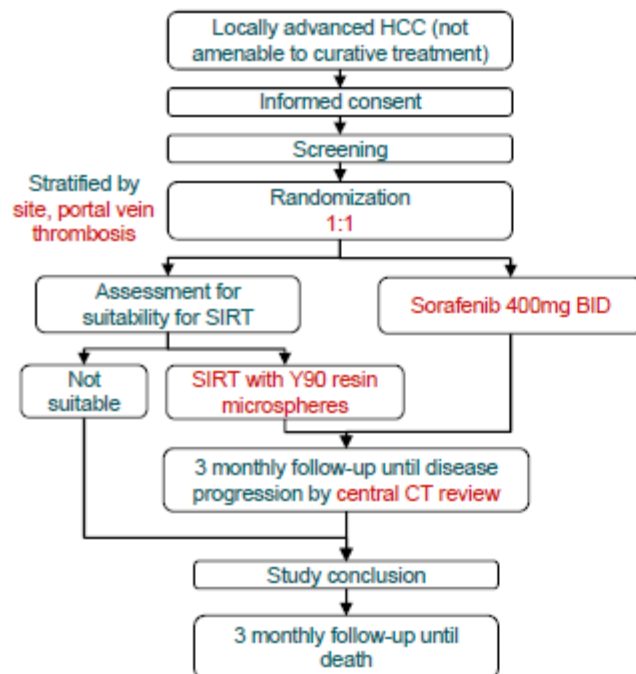
### Secondary objectives

To compare SIRT with sorafenib for:

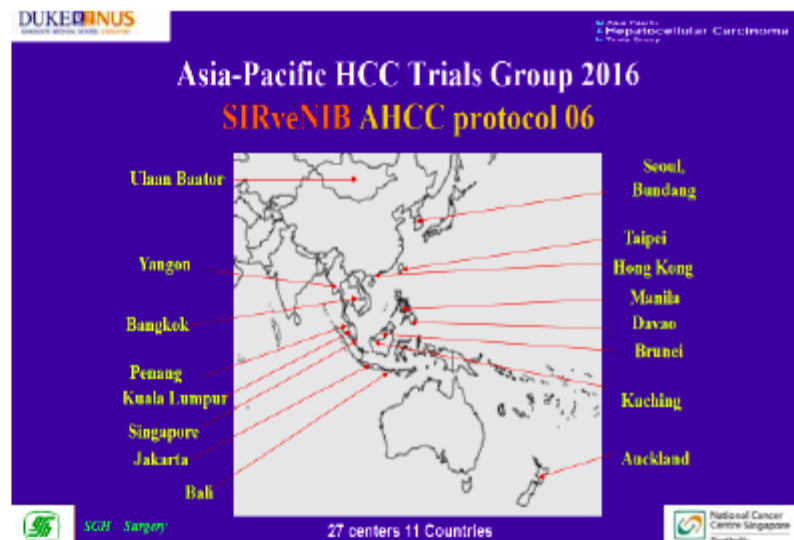
- Tumour response rate (RECIST 1.1)
- Disease control rate
- Time to disease progression (overall and in liver)
- Progression free survival (overall and in liver)
- Toxicity and safety (CTCAE 4.02)



## Study Design and Assessments



An **investigator-initiated** open-label, phase III multi-center, RCT in locally advanced HCC with or without portal vein thrombosis (PVT)



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## Eligibility Criteria

- Unequivocal diagnosis of HCC (AASLD Criteria or histology) that is locally advanced but without extra-hepatic metastases
  - With or without portal vein thrombosis
  - BCLC B and BCLC C without distant metastases
- At least one lesion with dimension  $\geq 10$  mm
- Age 18 years and above
- ECOG performance status 0 – 1
- Child-Pugh A-B (up to 7 points)
- Adequate hematological, renal and hepatic function
- Life expectancy of at least 3 months
- Not having > 2 prior administrations of hepatic artery directed therapy
- No prior hepatic artery directed therapy within past 4 weeks



## Sample size

- **Assumptions**

Median OS for SIRT = 14 months [Sangro *et al. Hepatology*. 2011;54(3):868–78]

Median OS for sorafenib = 9.35 months [Kang *et al. Ann Oncol*. 2008;19(Supplement 8):177]

Hazard ratio = 0.67

Type I error (two-sided) = 5%

Power = 90%

Built-in drop-out rate = 20%

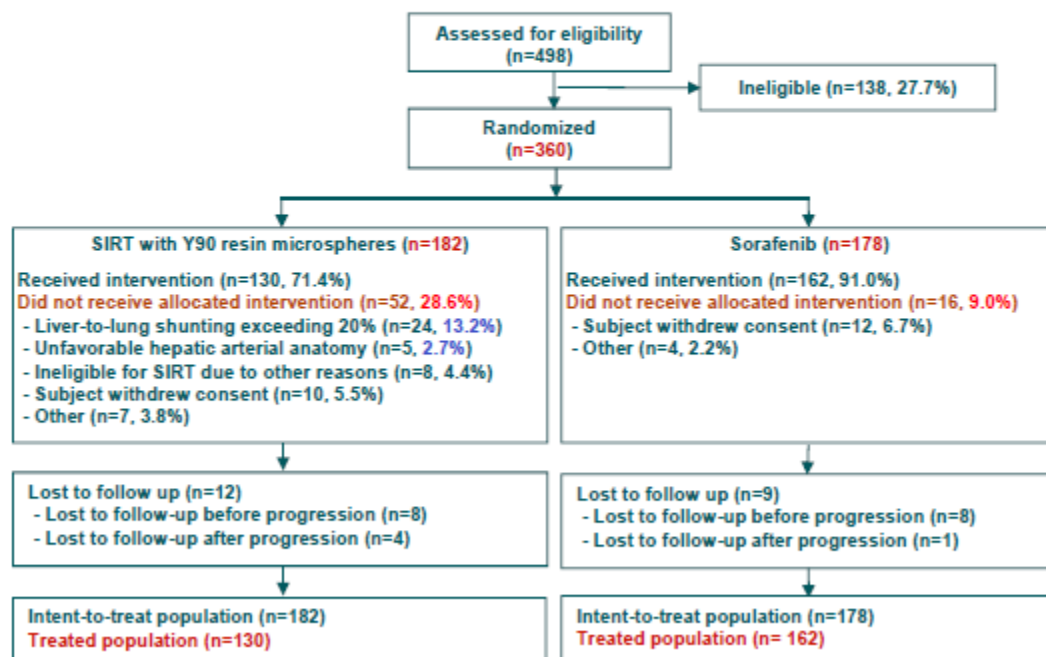
Accrual period = 3 years

Follow-up period = 2 years

- **Sample size (Using the Log-rank test)**

$180 + 180 = 360$  subjects (Final analysis at 266 deaths)

## CONSORT Diagram



## 11 Asia-Pacific countries (27 sites)

Country	n (%)
Singapore	78 ( 21.7)
Myanmar	74 ( 20.6)
Philippines	57 ( 15.8)
Mongolia	39 ( 10.8)
Thailand	32 ( 8.9)
Indonesia	22 ( 6.1)
Malaysia	19 ( 5.3)
South Korea	17 ( 4.7)
Taiwan	13 ( 3.6)
New Zealand	8 ( 2.2)
Brunei	1 ( 0.3)



## Baseline Characteristics

Characteristics	Intent-to-treat population			Treated population		
	SIRT ( N = 182 )	Sorafenib ( N = 178 )	P	SIRT ( N = 130 )	Sorafenib ( N = 162 )	P
Age (years), Mean (SD)	59.5 (12.9)	57.7 (10.6)	0.154	60.9 (11.5)	57.5 (10.6)	0.009
Male, n (%)	147 ( 80.8)	151 ( 84.8)	0.331	107 ( 82.3)	138 ( 85.2)	0.525
Body mass index (kg/m <sup>2</sup> ), Mean (SD)	23.2 (4.2)	24.0 (4.6)	0.089	23.2 (4.3)	24.1 (4.7)	0.089
Portal vein thrombosis, n (%)	56 ( 30.8)	54 ( 30.3)	1.000	30 ( 23.1)	48 ( 29.6)	0.232
ECOG status, n (%)			0.265			0.559
0	135 ( 74.2)	141 ( 79.2)		106 ( 81.5)	127 ( 78.4)	
1	47 ( 25.8)	37 ( 20.8)		24 ( 18.5)	35 ( 21.6)	
Child-Pugh stage, n (%)			0.613			0.455
A	163 ( 89.6)	156 ( 87.6)		117 ( 90.0)	142 ( 87.7)	
B	18 ( 9.9)	21 ( 11.8)		12 ( 9.2)	20 ( 12.3)	
BCLC stage, n (%)			0.239			0.427
A		0 1 ( 0.6)			0 1 ( 0.6)	
B	100 ( 54.9)	109 ( 61.2)		83 ( 63.8)	95 ( 58.6)	
C	81 ( 44.5)	68 ( 38.2)		46 ( 35.4)	66 ( 40.7)	
Tumor size >50% of liver, n (%)	43 ( 23.6)	43 ( 24.2)	1.000	23 ( 17.7)	35 ( 21.6)	0.462
Hepatitis, n (%)			0.484			0.653
B	93 ( 51.1)	104 ( 58.4)		68 ( 52.3)	94 ( 58.0)	
C	26 ( 14.3)	19 ( 10.7)		20 ( 15.4)	19 ( 11.7)	
B and C	4 ( 2.2)	5 ( 2.8)		3 ( 2.3)	2 ( 1.2)	

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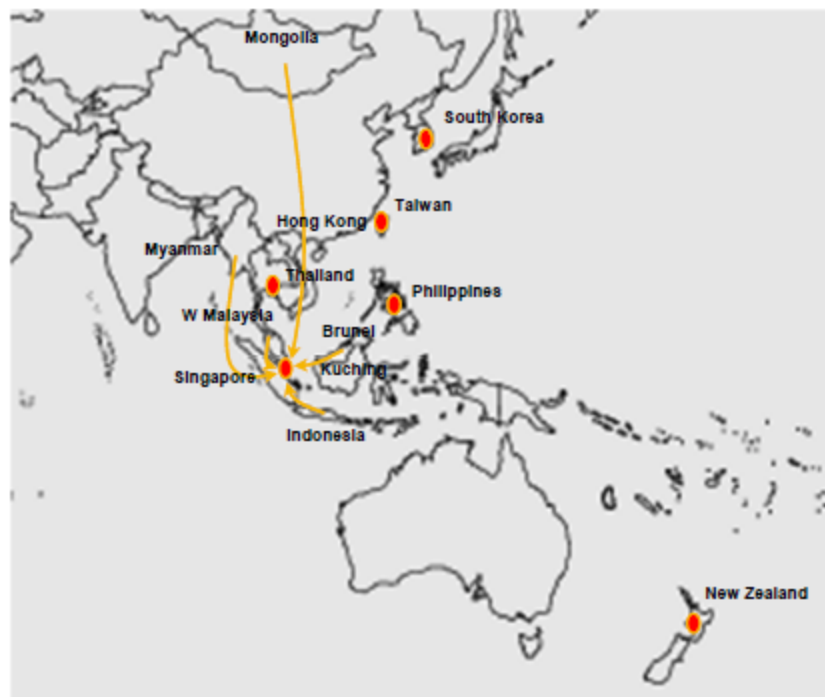
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## Study Treatments Exposure

- **SIRT (n = 130)**
  - Median time from randomization to treatment: **21.0 days**
  - **n=52 (28.6%)** did not receive allocated SIRT
  - All subjects received single dose
  - Mean activity administered: **1.8 GBq**
- **Sorafenib (n = 162)**
  - Median time from randomization to treatment start: **3.0 days**
  - **n=16 (9%)** did not receive allocated sorafenib
  - Mean daily dose per subject: **644.5 mg**
  - Median treatment duration: 13.8 weeks
  - Subjects with  $\geq 80\%$  adherence to planned doses: **88.9%**

## SIRT Treatment Centers



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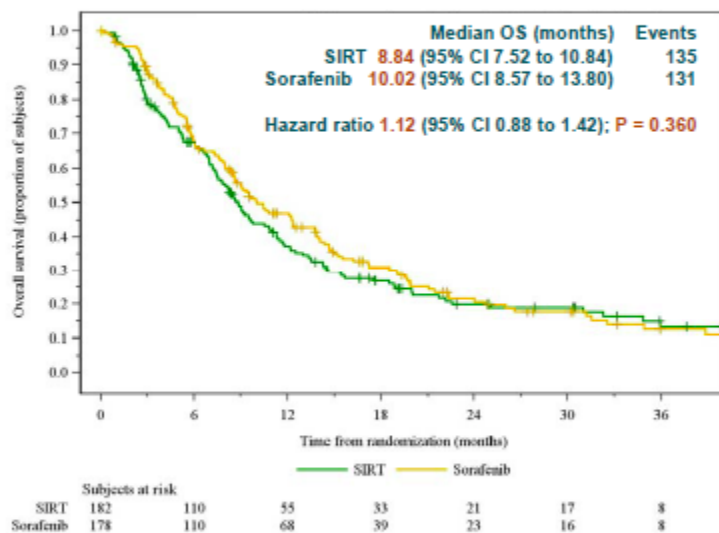
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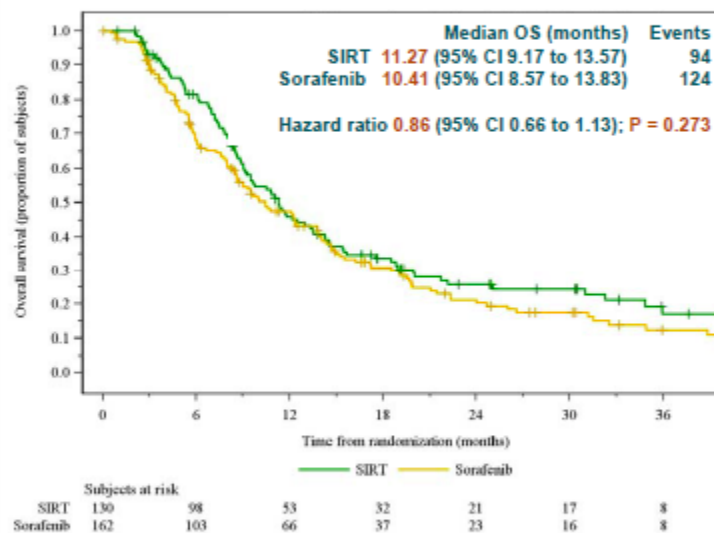


## Efficacy: Overall Survival

- Intent-to-treat population



- Treated population



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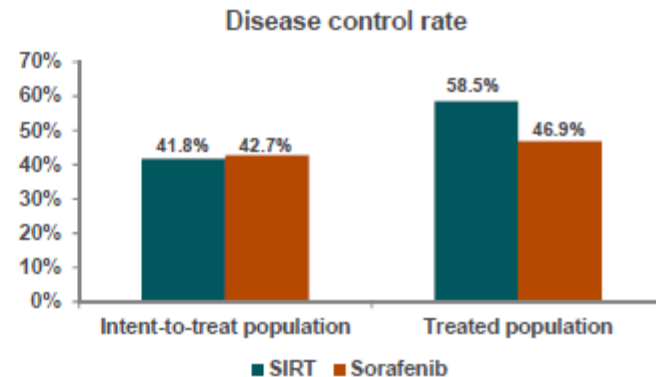
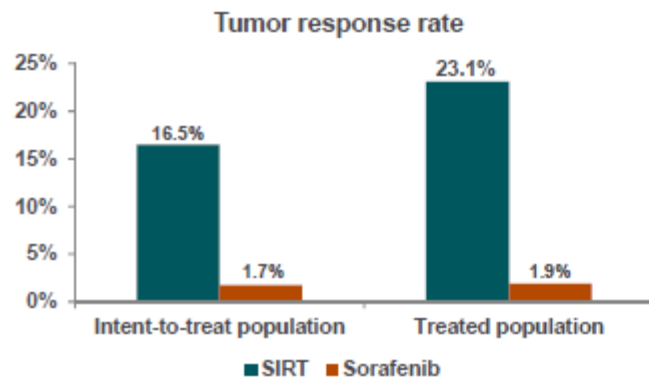
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## Efficacy: Tumor Response Rate and Disease Control Rate

	Intent-to-treat population			Treated population		
	SIRT ( N = 182 )	Sorafenib ( N = 178 )	P-value	SIRT ( N = 130 )	Sorafenib ( N = 162 )	P-value
Tumor response rate (CR + PR), n (%)	30 ( 16.5 )	3 ( 1.7 )	<.001	30 ( 23.1 )	3 ( 1.9 )	<.001
Disease control rate (CR + PR + SD), n (%)	76 ( 41.8 )	76 ( 42.7 )	0.915	76 ( 58.5 )	76 ( 46.9 )	0.059

CR: Complete response; PR: Partial response; SD: Stable disease



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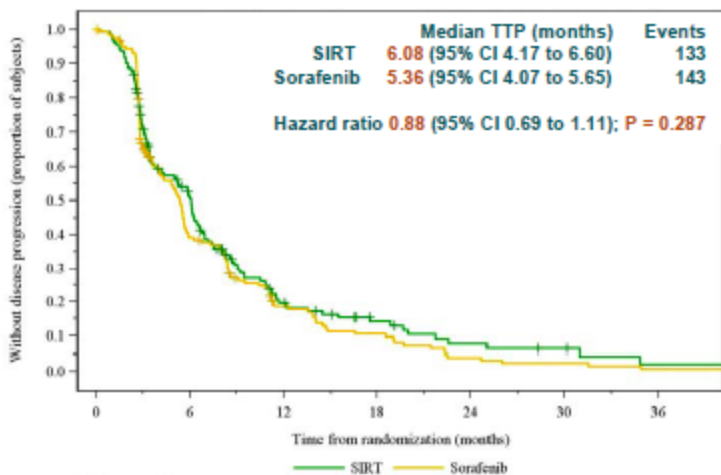
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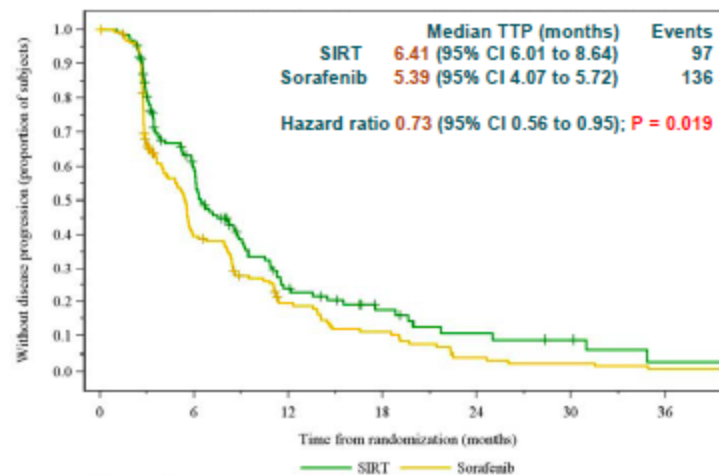
## Efficacy: Time to Progression

### • Intent-to-treat population



Subjects at risk						
SIRT	182	73	24	12	6	4
Sorafenib	178	56	23	13	5	3

### • Treated population



Subjects at risk						
SIRT	130	65	22	11	6	4
Sorafenib	162	54	23	13	5	3

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## Efficacy: Secondary Outcomes

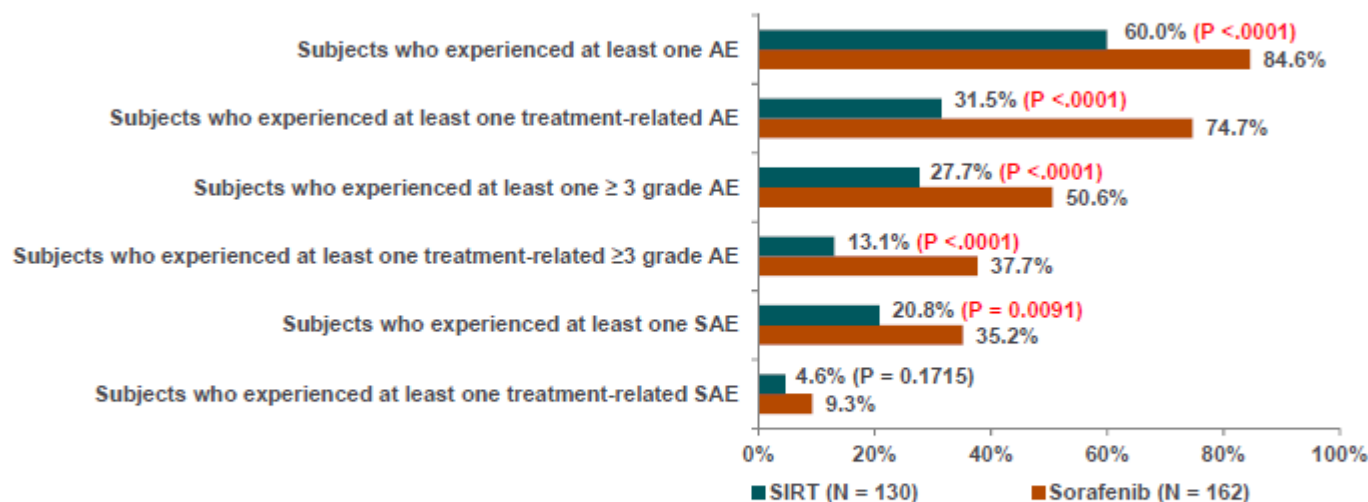
	Intent-to-treat population			Treated population		
	SIRT ( N = 182 )	Sorafenib ( N = 178 )	P-value	SIRT ( N = 130 )	Sorafenib ( N = 162 )	P-value
Time-to-tumor progression (months)						
Median	6.08	5.36		6.41	5.39	
Hazard ratio (95% confidence interval)	0.88	(0.69, 1.11)	0.287	0.73	(0.56, 0.95)	0.019
Time-to-tumor progression in liver (months)						
Median	6.11	5.39		6.77	5.45	
Hazard ratio (95% confidence interval)	0.87	(0.68, 1.10)	0.241	0.72	(0.55, 0.93)	0.013
Progression-free survival (months)						
Median	5.85	5.06		6.28	5.22	
Hazard ratio (95% confidence interval)	0.89	(0.71, 1.12)	0.306	0.73	(0.56, 0.93)	0.013
Progression-free survival in liver (months)						
Median	6.01	5.06		6.67	5.22	
Hazard ratio (95% confidence interval)	0.88	(0.70, 1.10)	0.259	0.71	(0.55, 0.92)	0.009

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## Overall Safety



Includes adverse events (AEs) and serious adverse events (SAEs) with onset date on or after study treatment start date. Treatment-related AE or SAE defined as those with certain, probable, possible, or missing relationship to study treatment. P values were computed for comparison between treatment arms using the Fisher's exact test.

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## Selected Adverse Events Graded with CTCAE 4.02

System Organ Class Preferred term, Number of subjects (%)	SIRT (N = 130)		Sorafenib (N = 162)		P	
	Grade 1 - 2	Grade ≥ 3	Grade 1 - 2	Grade ≥ 3	Grade 1 - 2	Grade ≥ 3
<b>Blood and lymphatic system disorders</b>						
Anaemia	4 (3.1)	0	5 (3.1)	4 (2.5)	1.0000	0.1315
<b>Gastrointestinal disorders</b>						
Abdominal pain	11 (8.5)	3 (2.3)	9 (5.6)	2 (1.2)	0.3585	0.6588
Ascites	5 (3.8)	5 (3.8)	14 (8.6)	4 (2.5)	0.1505	0.5179
Constipation	0	0	9 (5.6)	0	0.0051	-
Diarrhoea	2 (1.5)	0	42 (25.9)	6 (3.7)	<0.001	0.0353
Nausea	10 (7.7)	1 (0.8)	10 (6.2)	0	0.6466	0.4452
<b>General disorders and administration site conditions</b>						
Fatigue	5 (3.8)	0	19 (11.7)	6 (3.7)	0.0175	0.0353
Oedema peripheral	10 (7.7)	0	5 (3.1)	1 (0.6)	0.1082	1.0000
Pyrexia	6 (4.6)	0	17 (10.5)	1 (0.6)	0.0804	1.0000
<b>Metabolism and nutrition and disorders</b>						
Decreased appetite	11 (8.5)	0	20 (12.3)	1 (0.6)	0.3412	1.0000
Hypoalbuminaemia	6 (4.6)	1 (0.8)	7 (4.3)	1 (0.6)	1.0000	1.0000

Includes adverse events which were experienced by at least 5% of treated subjects in either arm and have onset date on or after study treatment start date. P values were computed for comparison between treatment arms using the Fisher's exact test.

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## Selected Adverse Events Graded with CTCAE 4.02

System Organ Class Preferred term, Number of subjects (%)	SIRT (N = 130)		Sorafenib (N = 162)		P	
	Grade 1 - 2	Grade ≥ 3	Grade 1 - 2	Grade ≥ 3	Grade 1 - 2	Grade ≥ 3
<b>Respiratory, thoracic and mediastinal disorders</b>						
Cough	8 (6.2)	0	8 (4.9)	0	0.7969	-
<b>Skin and subcutaneous tissue disorders</b>						
Alopecia	0	0	16 (9.9)	0	<.0001	-
Palmar-plantar erythrodysesthesia syndrome	1 (0.8)	0	62 (38.3)	27 (16.7)	<.0001	<.0001
Rash	0	0	18 (11.1)	0	<.0001	-
<b>Vascular disorders</b>						
Hypertension	0	0	22 (13.6)	2 (1.2)	<.0001	0.5043
<b>AEs typically associated with SIRT</b>						
Gastric ulcer	0	1 (0.8)	0	0	-	0.4452
Upper gastrointestinal haemorrhage	1 (0.8)	1 (0.8)	0	3 (1.9)	0.4452	0.6315
Jaundice	1 (0.8)	1 (0.8)	1 (0.6)	2 (1.2)	1.0000	1.0000
Hepatic cirrhosis	0	0	1 (0.6)	1 (0.6)	1.0000	1.0000
Portal hypertension	0	0	0	1 (0.6)	-	1.0000
Radiation hepatitis	0	2 (1.5)	0	0	-	0.1974

Includes adverse events which were experienced by at least 5% of treated subjects in either arm, or known to be associated with SIRT and have onset date on or after study treatment start date. P values were computed for comparison between treatment arms using the Fisher's exact test.

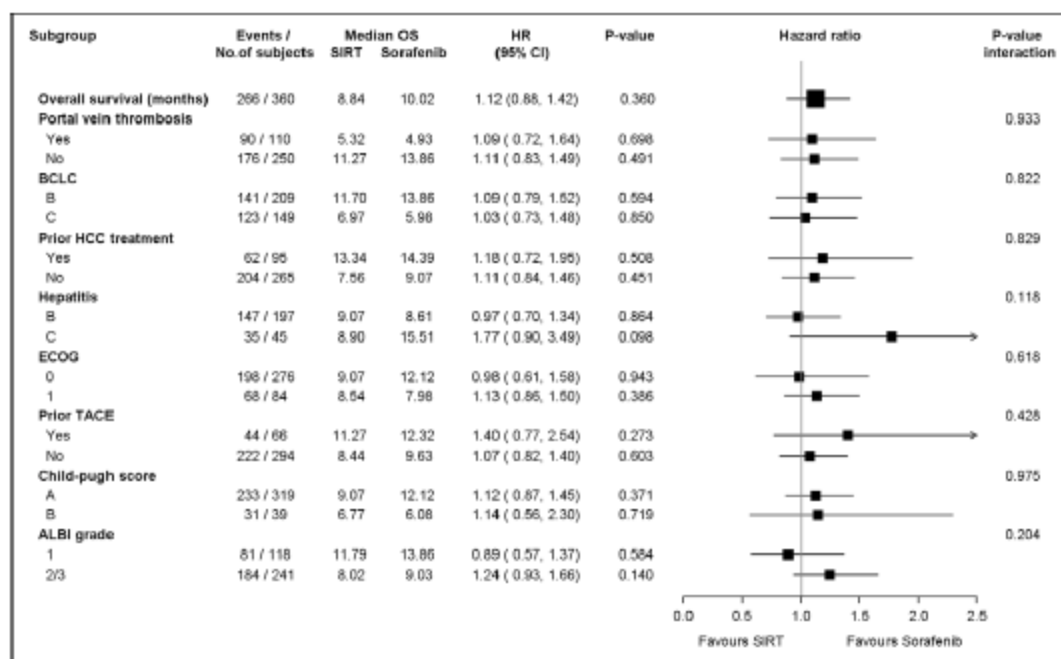
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## Subgroup Analysis (Intent-to-treat Population)



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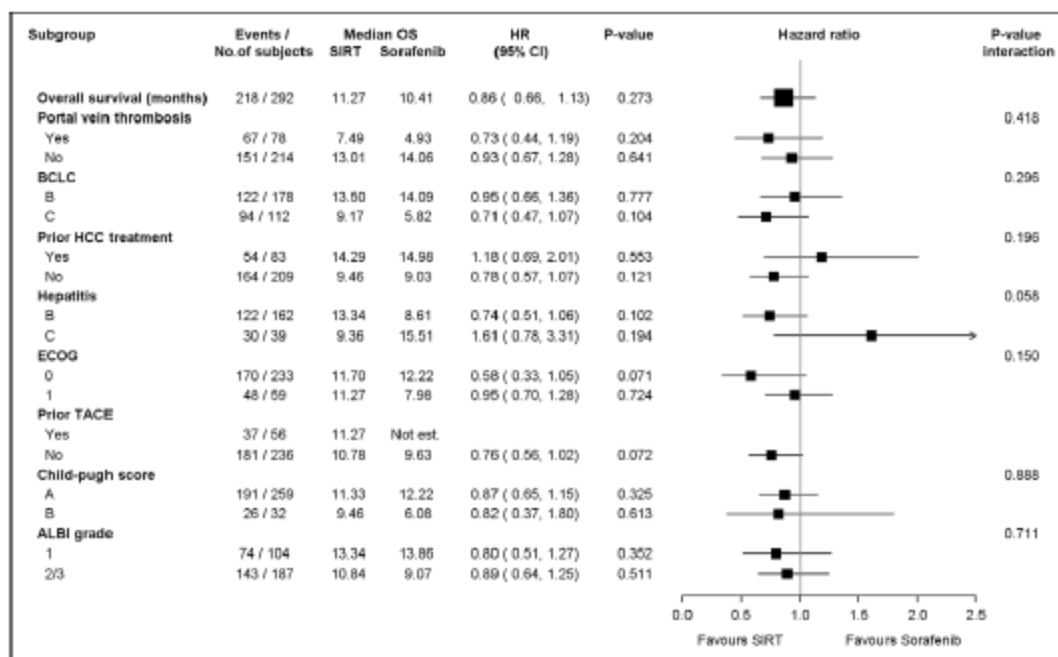
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## Subgroup Analysis (Treated Population)



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## Conclusions

- The primary end point of the study was not met.
  - In this study SIRT was not shown to be superior to sorafenib with respect to **overall survival**
  - No statistically significant difference was demonstrated between SIRT and sorafenib
- However, patients treated with SIRT have
  - a significantly better **tumor-response rate**
  - significantly fewer total number of **adverse events** and **severe adverse events**when compared with those treated with sorafenib.



## Acknowledgement

- Patients and colleagues from 27 centers in 11 countries of the

### **Asia-Pacific Hepatocellular Carcinoma Trials Group:**

**Singapore** SP Choo (NCC), PC Cheow (SGH), BL Lim (NUHS), CJ Simon (KTPH); **Myanmar**(Khin MW; **Philippines** J Ong (TMC), Cua I (St Luke), R Lobo (Davao), C Teh (Makati); **Mongolia** (K Ariunna); **Thailand** (C Chotipanich); **Indonesia** (L Lesmana (UOI), T Manuaba (Sanglah); **Malaysia** (BK Yoong (UMM), CS Law (SarawakGen), T Raj (Adventist)); **South Korea** (YH Kim (Anam), JY Won (Yonsei), HS Han (Bundang), SH Bae (StMary), HK Yoon (Asan); **Taiwan** (RC Lee (Veterans), CF Hung (ChangGung), CY Peng (ChinaMed), PC Liang (National)); **New Zealand** (Bartlett A); **Brunei** (Kok K)

- Singapore Clinical Research Institute
- National Medical Research Council Singapore
- Sirtex Medical Ltd



**Thank you**