



Windtree Therapeutics Investor Presentation

July 2024

Nasdaq: WINT



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Windtree Investment Highlights



- ✓ Biopharmaceutical company focused on cardiovascular and oncology treatments intended to address markets with significant unmet need (NASDAQ: WINT)
- ✓ First in class, novel asset istaroxime has demonstrated positive efficacy and an attractive profile in three Phase 2 global studies, highlighted by improvements in cardiac function and increases in blood pressure with favorable renal function profile
- ✓ Istaroxime is in Phase 2b clinical development for cardiogenic shock (CS) and acute heart failure; cardiovascular platform also includes next generation oral, SERCA2a activators in preclinical development
- ✓ Expect top line results from istaroxime Phase 2b SEISMic Extension Study in CS to be presented at a major cardiovascular meeting in late Q3 '24
- ✓ Cardiogenic shock is an estimated \$1.25B global market where patients have high mortality, morbidity and costs. It represents a significant opportunity for istaroxime because currently available drugs have undesirable side effects and can result in poor outcomes and there is a lack of competition in development or active competition in the market
- ✓ Global and regional license deals are in place with Windtree in active discussions on potential additional global license for cardiovascular assets
- ✓ Newly acquired first in class, novel, protein kinase C iota inhibitor oncology platform with both topical and oral formulations creates significant opportunity that we plan to advance this year
- ✓ Lean, capital efficient operation led by a highly experienced management team

Multi-Asset / Indication Pipeline with Several Near-Term Milestones

Product Candidates	Indication	Phase	Development Status / Plans
Istaroxime (SERCA2a activator/ Na/K ATPase inhibitor)	Cardiogenic Shock	Phase 2b	<ul style="list-style-type: none"> • Positive Phase 2 study • Executing small follow-on studies intended to transition to Phase 3
Istaroxime	Acute Heart Failure	Phase 2b	<ul style="list-style-type: none"> • Positive Phase 2a and 2b data • Augment AHF data with cardiogenic shock data, if positive and adequate, for Phase 3 for AHF with partnership • Greater China regional license with Lee's Pharma who is advancing and paying for Phase 3 AHF program in territory
SERCA2a Activators (oral)	Chronic Heart Failure, including potentially HFpEF	Preclinical	<ul style="list-style-type: none"> • Chronic and Acute Heart Failure • Target for collaboration/partnership
aPKCi inhibitor (topical and oral)	Cutaneous and systemic treatment in broad and/or rare malignant diseases	Preclinical	<ul style="list-style-type: none"> • IND enabling studies
Rostafuroxin	Treatment Resistant Hypertension – Genotypically identified patients	Phase 2b	<ul style="list-style-type: none"> • Phase 2 data in hypertension • Company holding development to out-license and reposition for the attractive and large Resistant Hypertension market
KL4 Surfactant and AEROSURF	KL4 surfactant Drug/Device Tx for RDS and potential other applications	Phase 2b	<ul style="list-style-type: none"> • Global out-license in place • Partner responsible for all costs of development

Windtree Strategy for Value Creation – Deliver Data and Deals

1H 2024 Accomplishments

- ✓ FPI global Phase 2b Extension Study of istaroxime in Cardiogenic Shock
- ✓ \$138MM plus royalties' regional license secured for CV products
- ✓ Eliminated \$15MM in liabilities with Deerfield, added to shareholder equity
- ✓ Delivered positive data with istaroxime and the pure SERCA2a in arrhythmias
- ✓ Started concomitant therapy Stage C study in more severe shock patients
- ✓ Acquired a novel pre-clinical atypical Protein Kinase C iota platform

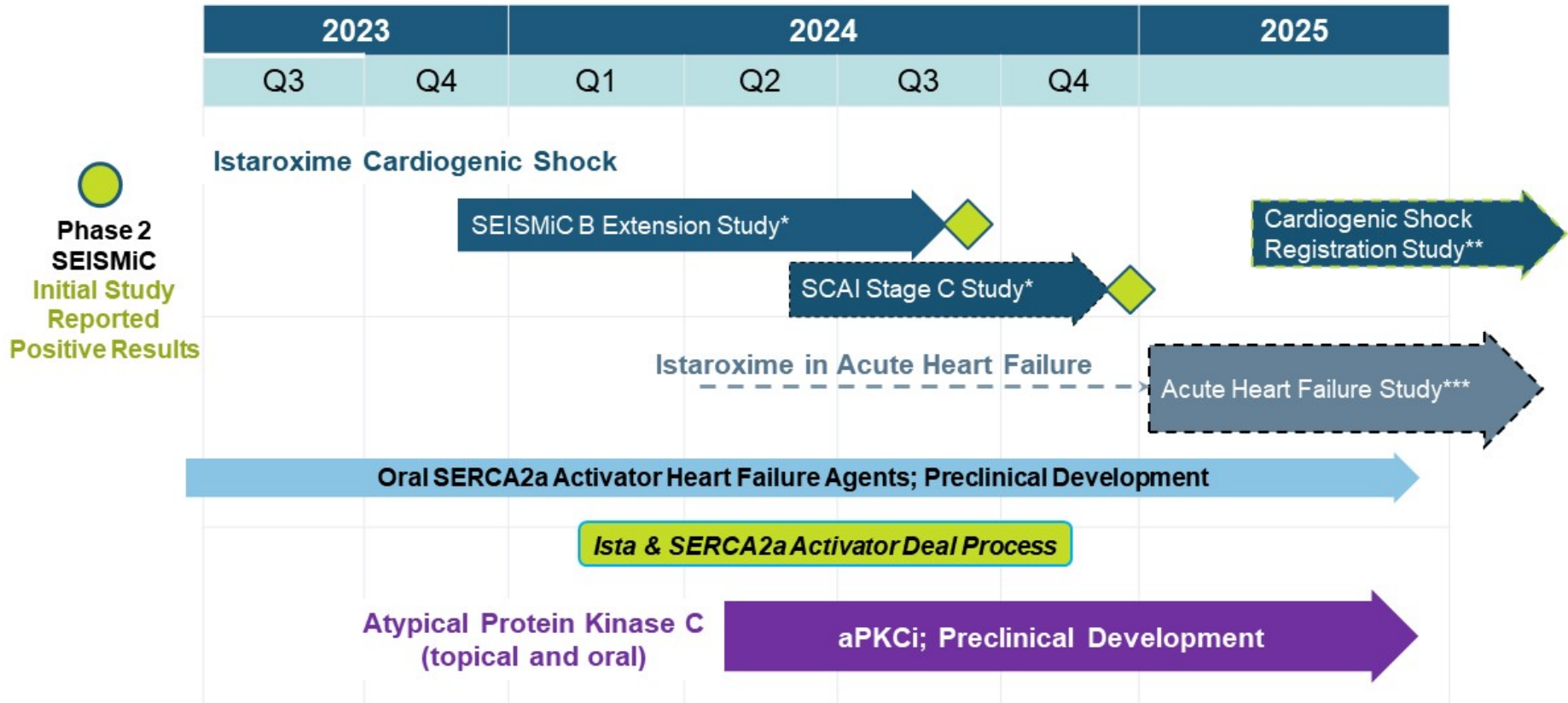
2H 2024 Focus and Planned Deliverables¹

- Final data from istaroxime Phase 2b SEISMiC Extension Study in Cardiogenic Shock (CS)
- Advance istaroxime in Stage C CS
- Support our license partner start up of Phase 3 Acute Heart Failure study in Asia/PAC
- Secure a global license for istaroxime and SERCA2a activators
- aPKCi inhibitor IND-enabling studies
- Explore additional acquisition and/or strategic transactions
- Drive capital efficacy with further material-level cash burn cuts and partnerships



1) Assumes additional resourcing

Milestone Strategy for Value Creation



Phase 2 SEISMic Initial Study Reported Positive Results



* Study and guidance depends upon adequate funding or partnership
 ** Study and guidance pending positive EOP2 meeting and adequate funding
 *** Study and guidance pending positive EOP2 meeting and adequate funding (via partnership)

◆ Represents planned data available



Istaroxime

Cardiogenic Shock

Potential to transform the standard of care for critical patients

Cardiogenic Shock - A Critical Condition Caused by a Failing Heart

A severe presentation of heart failure characterized by **low blood pressure and inadequate blood flow to vital organs (hypoperfusion)** accompanied by congestion and high filling pressures of the heart. It **requires very urgent treatment.**



- Most often requires pharmacological or mechanical intervention with key clinical objective to increase SBP to >90mmHg and improve tissue perfusion
- Cardiogenic shock patients typically require hospital intensive care and consume significant hospital resources
- High mortality (~20-30%) and substantial morbidity in survivors¹
- US + EU markets represent an ~\$1.0B market potential² with high unmet need
- Potential for relatively faster and less expensive developmental and regulatory pathway

1) Burgos, JSCAI (1) 2021Kotte D, American Heart Association; 2014 Jan 13; (rates associated with classic, stage C shock)

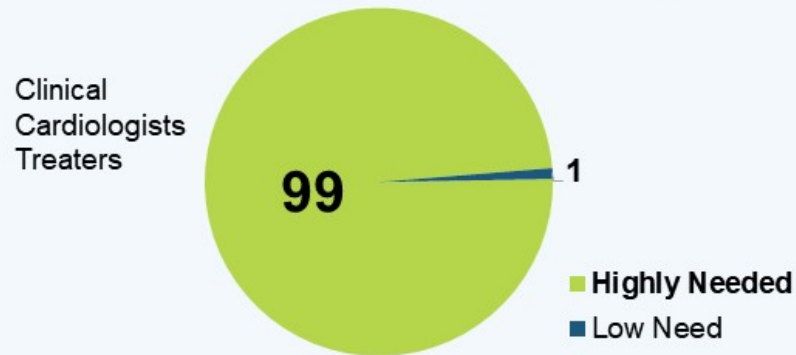
2) Estimates from claims data and epi data September 2021, multiplied by assumed various regional prices

Significant Unmet Need and Reported Desire for Istaroxime

- **No satisfactory pharmacological intervention to reverse the condition**
 - Available therapies have unwanted side effects such as risk for arrhythmias, decreasing blood pressure, renal dysfunction and even increases in mortality that limit their usefulness and position them as “rescue medicines”
- A therapy that can be used **earlier** to rapidly **improve blood pressure and cardiac function without unwanted side effects** is needed

Market research shows need and enthusiasm for istaroxime profile

100 U.S. Cardiologists questioned on degree of unmet need for new innovative pharmacologic treatments for ECS¹

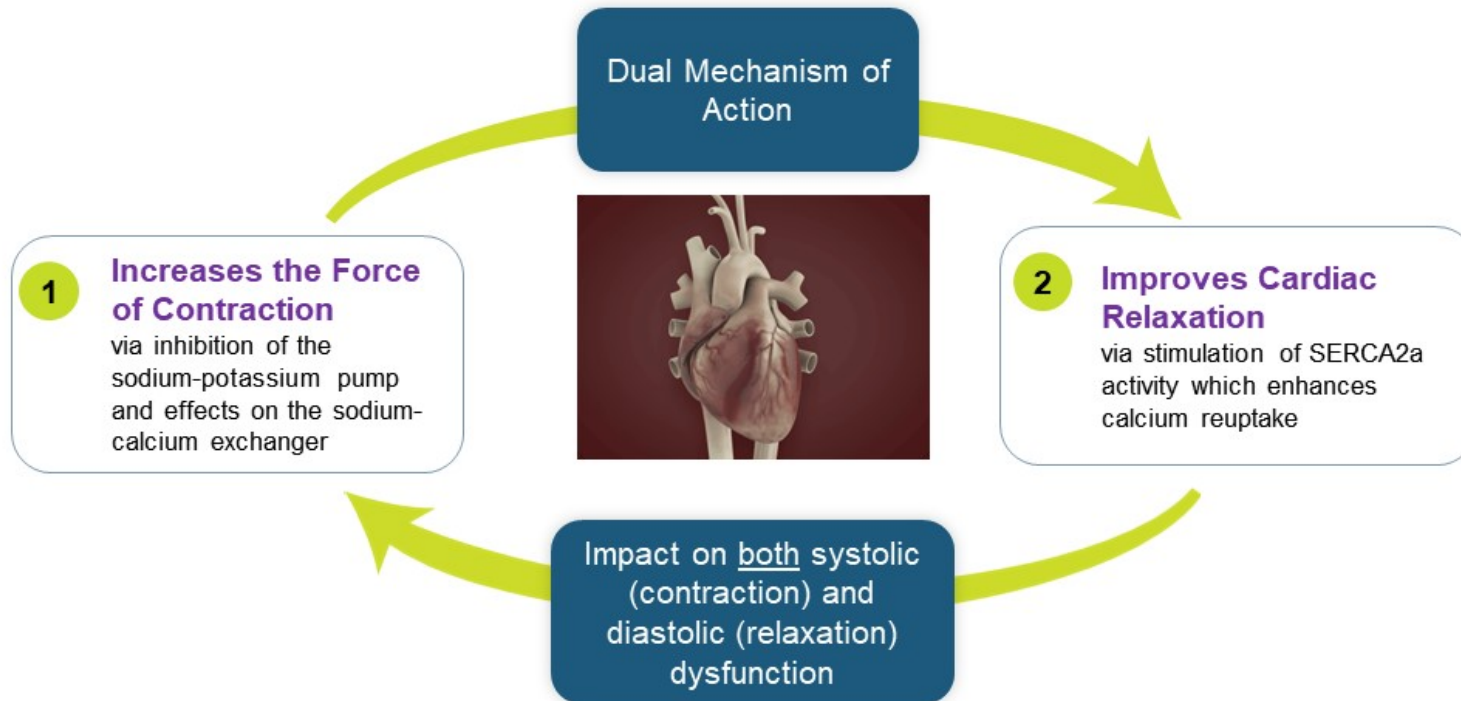


✓ 84% of the cardiologists responded they would be **likely to extremely likely to use** istaroxime for early cardiogenic shock patients

✓ Majority responded they would position utilization before use of other existing classes of therapies such as inotropes and vasopressors

Istaroxime – Novel First-in-Class Therapy

Novel intravenous agent designed to improve systolic contraction and diastolic relaxation of the heart



Istaroxime Cardiogenic Shock Program Came from AHF Phase 2 Trials and the Potential Attractive Regulatory Pathway

In Phase 2a and 2b data in AHF istaroxime demonstrated:



Cardiac Function Improved with Both Doses

- Significant increase in stroke volume (amount of blood expelled with each heartbeat)
- Lowered cardiac filling pressures



Increased in Systolic Blood Pressure



Increased Renal Function (eGFR)



Heart Rate Decreased

Favorable Heart Rhythm Profile Observed

- No increase in clinically significant arrhythmias or ventricular tachycardia

SEISMic Early Cardiogenic Shock Study

Clinical strategy: Start development with patients in early cardiogenic shock caused by severe heart failure



60 patients in early cardiogenic shock (SBP 75-90 mmHg) with AHF



Study drug was infused for 24 hours in a 1:1 randomization to placebo or istaroxime. Two istaroxime target doses were evaluated, 1.5 $\mu\text{g}/\text{kg}/\text{min}$ in the first group and 1.0 $\mu\text{g}/\text{kg}/\text{min}$ in the next group.



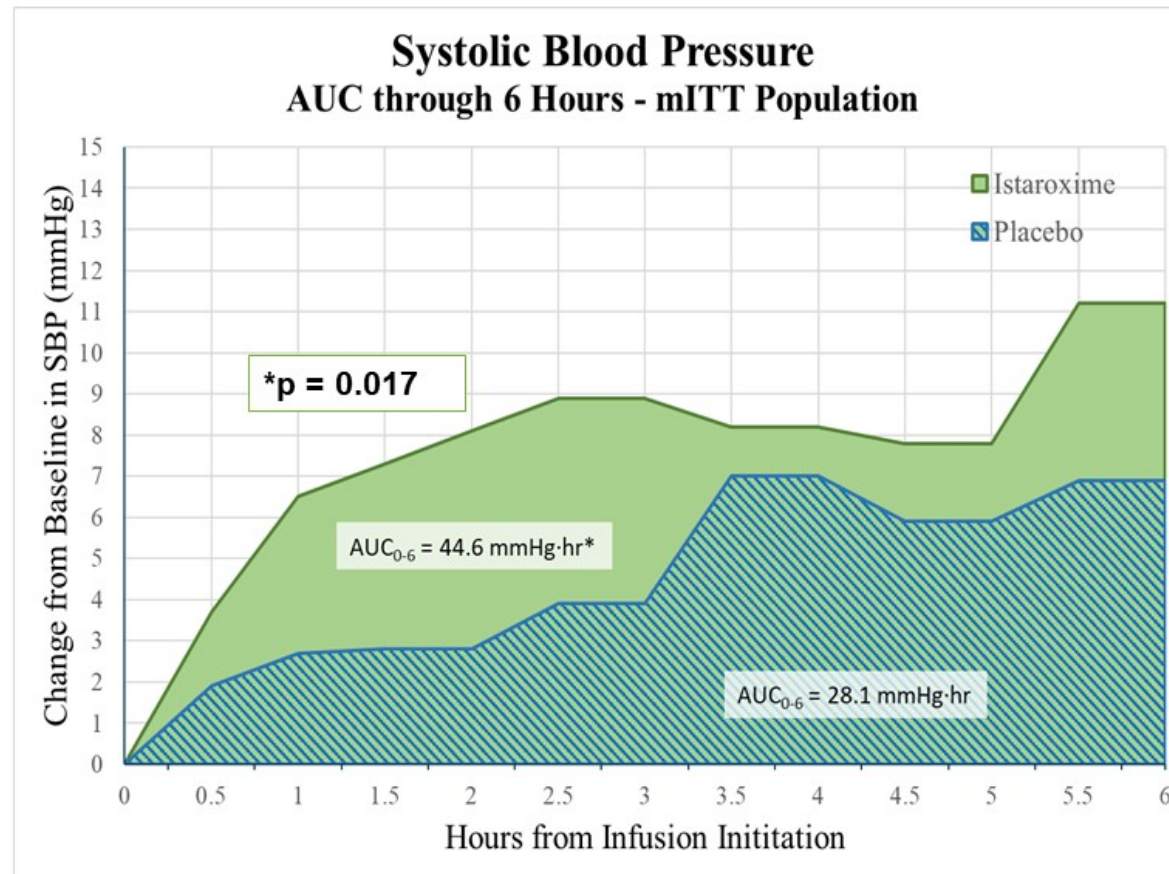
Primary endpoint was SBP AUC at 6 hours comparing istaroxime to placebo

Secondary measures included: SBP profile at 24 hours, echocardiology measures associated systolic and diastolic cardiac function, renal function, various safety and tolerability measures

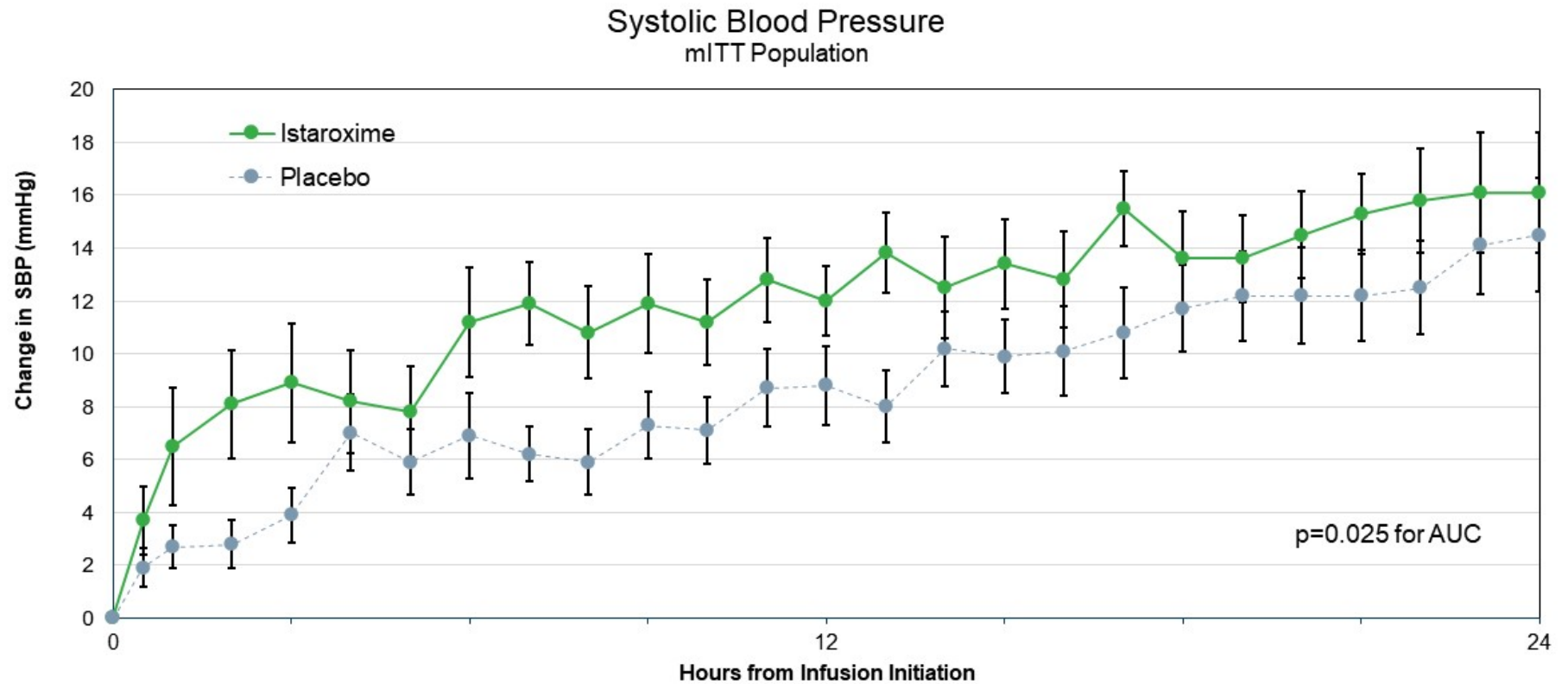


Positive Results in the Early Cardiogenic Shock Study

Istaroxime Achieved Positive Primary Endpoint



Systolic BP Improvements Persisted over 24 Hours



Cardiac Function Improvement

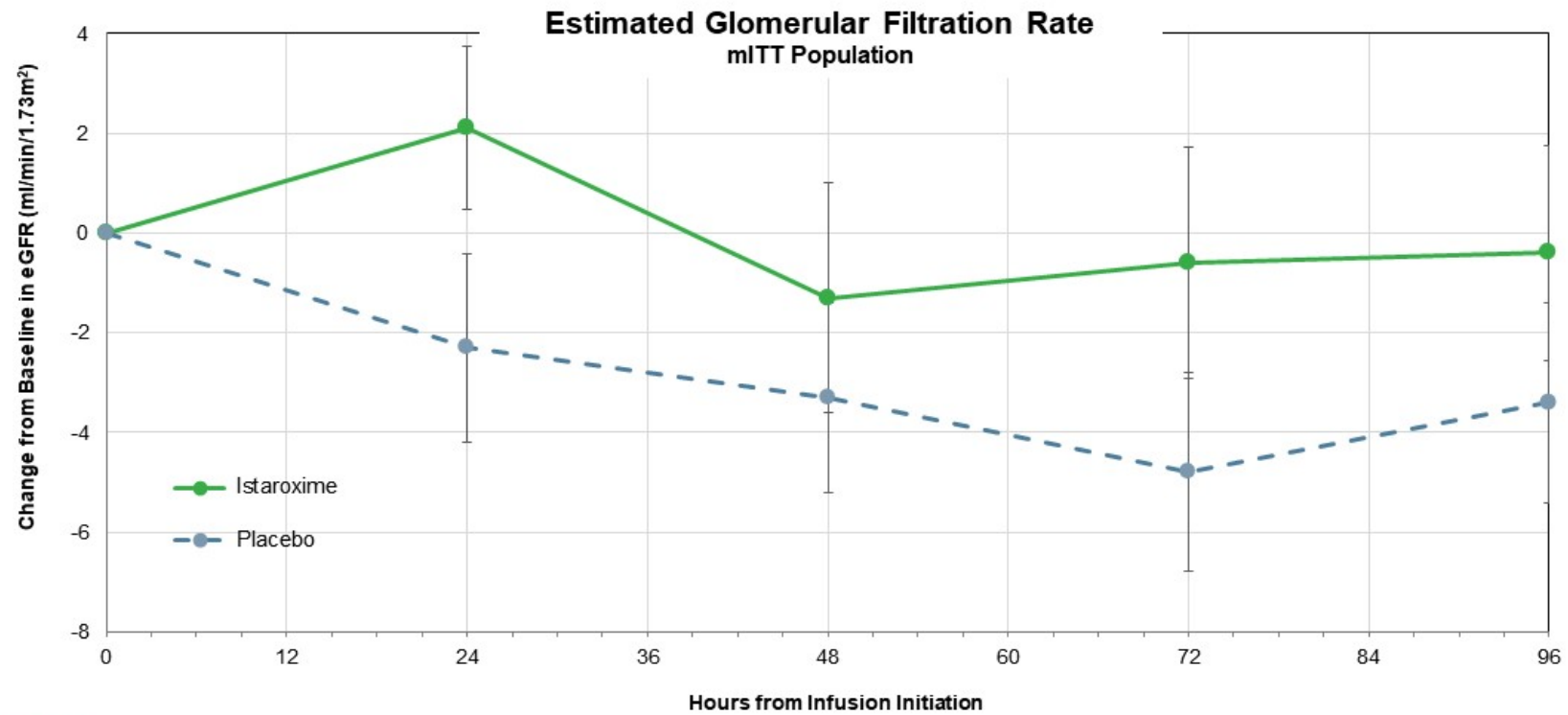
Echocardiography demonstrated improvements in key systolic and diastolic cardiac function measures including:

- ✓ **Cardiac index (amount of output from the heart over a minute) significantly increased**
- ✓ **Stroke volume (amount of blood from the heart with each heartbeat) substantially increased**
 - (4 mL/m²) approaching statistical significance
- ✓ **The strength and cardiac geometry of the heart improved including:**
 - Left atrial area was reduced
 - Left ventricular end systolic volume was reduced
 - Left ventricular end diastolic volume was reduced



Treatment was Associated with a Favorable Renal Profile

Renal function was not decreased in istaroxime treated patients

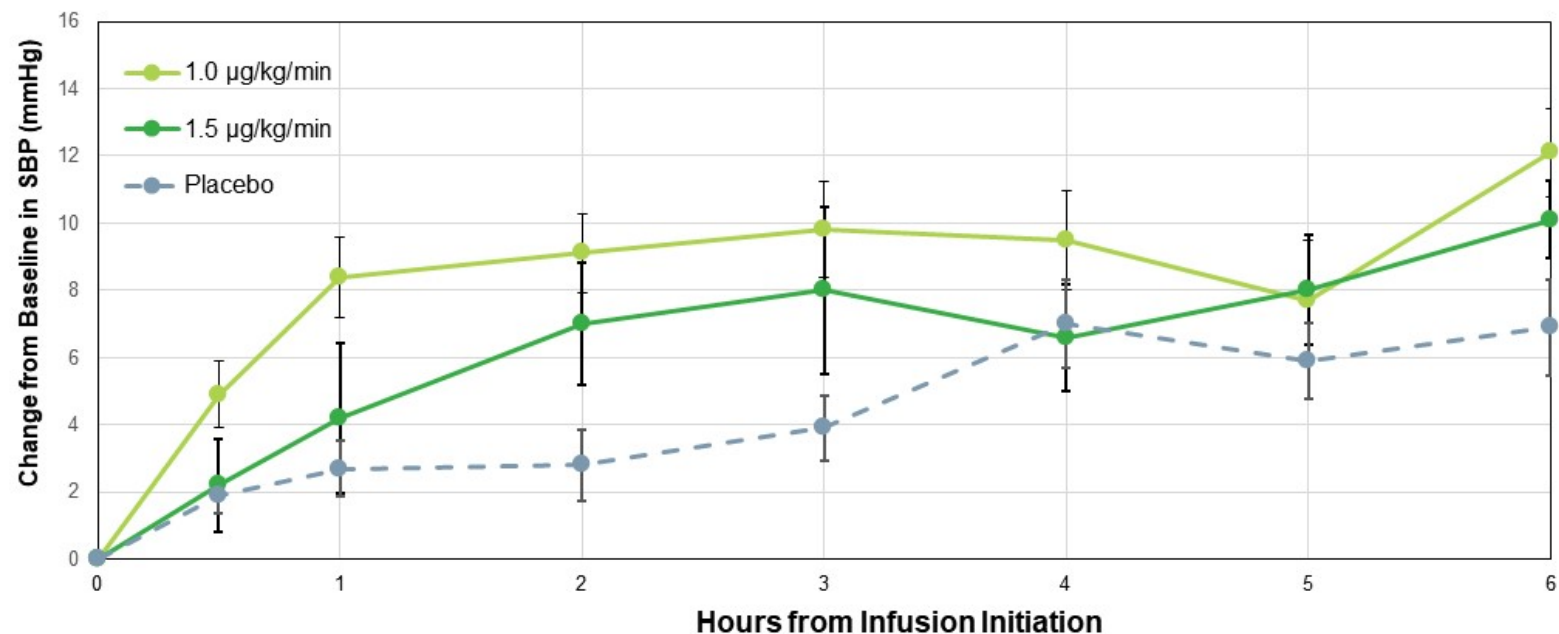


Data shown as means and standard errors

1.0 $\mu\text{g}/\text{kg}/\text{min}$ Produced a Favorable Effect on SBP

1.0 $\mu\text{g}/\text{kg}/\text{min}$ dosing was associated with:

- Early, rapid SBP increase and improvement in more echocardiographic assessments of cardiac function
- More favorable adverse event, serious adverse event and clinical event profile

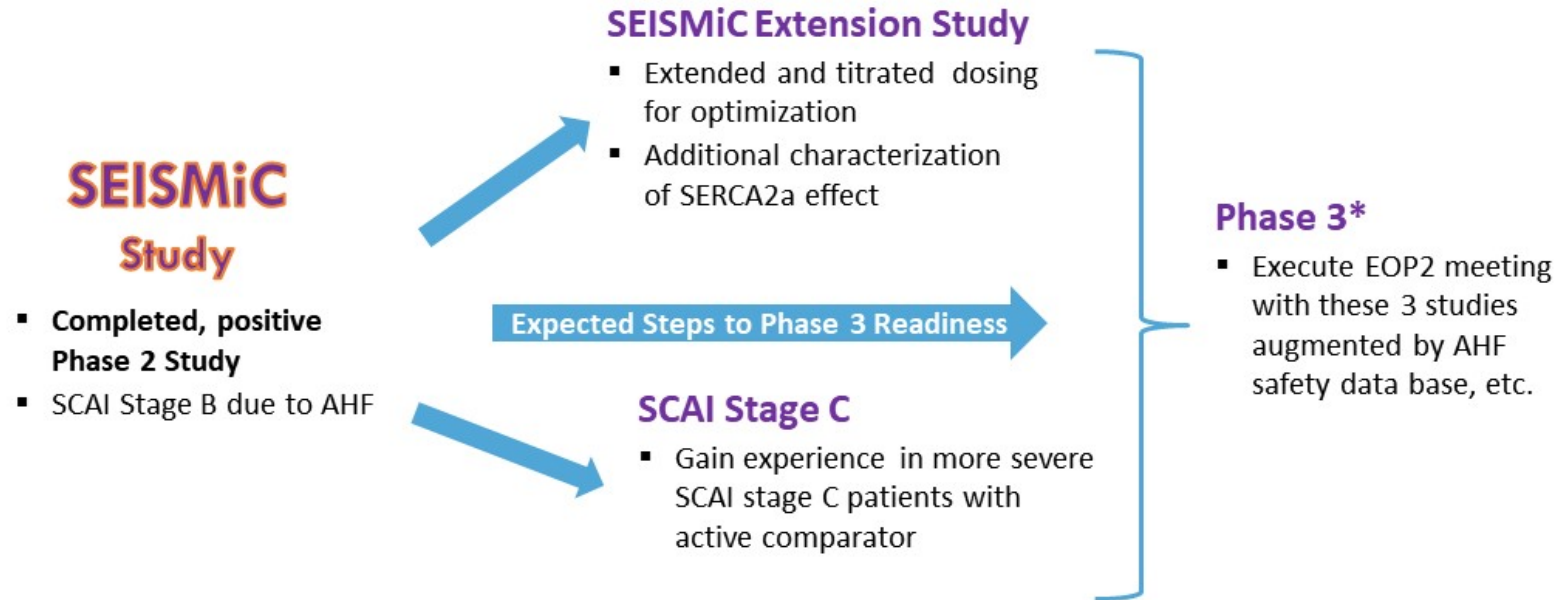


SEISMiC Study Results Summary

- ✓ Systolic blood pressure significantly increased within the first 6 hours of initiating the infusion ($p=0.017$) and the increase was maintained throughout the 24-hour infusion ($p=0.025$)
 - SBP increases were rapid within the first hour and sustained through the 96-hour post-infusion measure
- ✓ Key secondary endpoints of systolic and diastolic cardiac function and performance were improved
- ✓ Renal function was maintained
- ✓ SEISMiC provided valuable information for optimizing our dose moving forward
- ✓ These data substantiate and advance the rationale for istaroxime as a potential treatment for cardiogenic shock and align with the existing data from the program in AHF

Cardiogenic Shock Development Strategy

Focus on thoroughness, speed and relatively low cost of trials



* Study plans and progression to Phase 3 dependent upon regulatory alignment and resourcing

SEISMiC Extension Study Desired Results:

Good Efficacy and Safety Data Support an Optimized Dose for Phase 3 Planning

- ✓ SBP significantly increased versus control with a profile of rapid correction that is sustained through the 96-hour post-infusion measure
- ✓ Secondary endpoints of cardiac function and performance improved
- ✓ Heart rate not significantly increased during the infusion
- ✓ Renal function maintained
- ✓ Balanced safety profile (no clinically significant increase in arrhythmias, etc.)



Cardiogenic Shock Represents a Significant Opportunity for Istaroxime and Windtree

- ✓ Significant opportunity for Istaroxime to make a difference:
 - ~20-30% mortality in classic shock and high morbidity
 - Very long average length of hospital stay (~ 19.5 days¹) means high cost of hospital care (estimated >\$175k²) and creates opportunity for pharmacoeconomic benefits
- ✓ Currently available pharmacologic treatments have undesirable side effects and can result in poor outcomes
- ✓ Lack of competition in development or active competition in the market
- ✓ Attractive \$1.25B valuation of market potential versus time and cost of development supports potential deals



¹ US Hospital Claims Data, 2022

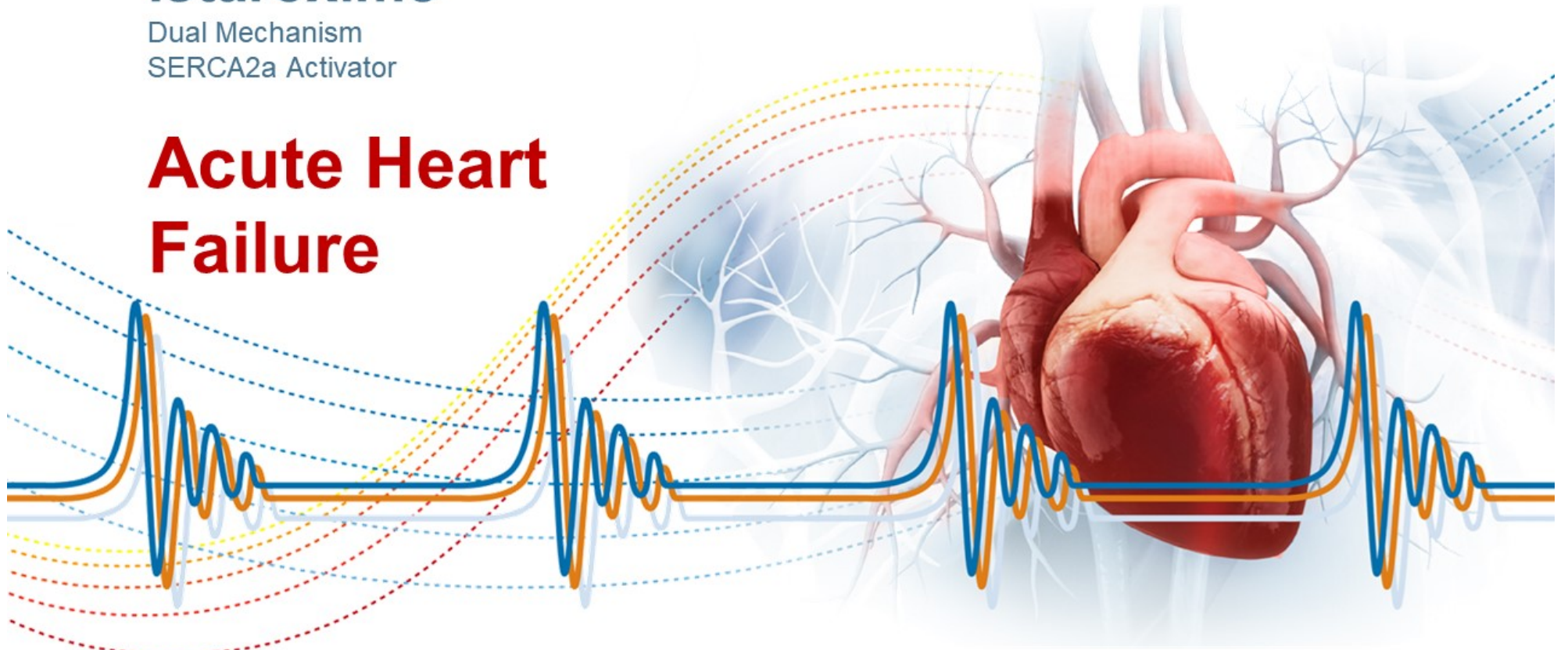
² Healthcare.gov, Department of Health & Human Services, estimated from average cost of hospital stay

³ Long et al, USC Cardiology Review, Describing and Classifying Shock: Recent Insights, Sept 2021

Istaroxime

Dual Mechanism
SERCA2a Activator

Acute Heart Failure



Heart Failure –

A Large and Growing Market with Significant Mortality and Unmet Need

#1 cause of U.S. hospitalization in patients > 65 years old

Annual Admissions

~1.3M U.S.



~1.5M E.U.

Patients

7M U.S.,



25M+ worldwide

~7%

In-patient mortality



30-day mortality can exceed 10%

>\$18B

annual U.S. hospital costs



Most expensive of the Medicare diagnoses

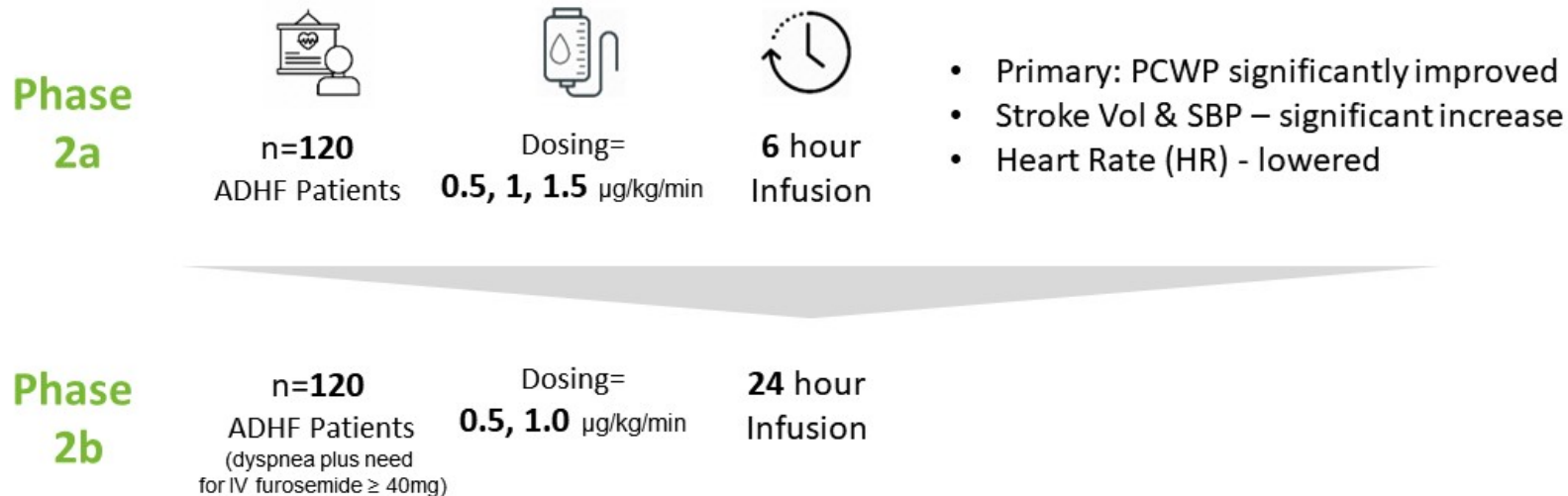
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New pharmacologic advancements in acute heart failure for decades



Lack of therapeutic advances led the FDA to issue new Heart Failure Guidance in July 2019 for greater development flexibility in acceptable endpoints, specifically acknowledging mortality is not required

Istaroxime AHF Phase 2a & 2b Studies



Results

Positive Phase 2 trial results demonstrated improved cardiac function without unwanted side effects of existing rescue therapies

Istaroxime – Acute Heart Failure

Development Strategy

Regional Strategy: Licensing Partner in Asia / Pac Intends to Start Phase 3 AHF Study

Global Phase 3 AHF Program Strategy



Augment our data from the positive phase 2a and phase 2b AHF studies with the efficacy, safety and dosing and characterization learnings from the extension and other studies in the severe AHF patients experiencing cardiogenic shock. If positive and adequate, move istaroxime into phase 3 for AHF.



Our strategy is to focus on treating heart failure patients with low blood pressure, who also tend to be diuretic resistant, as a patient population that we believe could particularly benefit from the unique profile and potential ability of istaroxime to increase cardiac function and increase blood pressure while maintaining or improving renal function.

Currently seeking partnership to finance global program

Next Generation, Oral SERCA2a Activators Platform has Potential for *both Major Types* of HF in *Acute and Chronic* Therapy

Today:

Istaroxime

- Dual Mechanism (SERCA2a & Na⁺/K⁺)
- IV only, Acute Heart Failure with Reduced Ejection Fraction (HFrEF) with normal / low blood pressure

Future:

Preclinical Dual Mechanism, (SERCA2a & Na⁺/K⁺) Activators

&

Preclinical Pure SERCA2a Activators

- Same mechanism as Istaroxime with potential for oral / chronic use
- Granted composition of matter IP (U.S. and EU)
- Strategy: Fast follow-on to Istaroxime in AHF; then add on hospital discharge / chronic use development
- Innovative pure SERCA2a activator (without the Na⁺/K⁺ mechanism) with newly granted composition of matter IP (EU)
- Develop for Heart Failure including Preserved Ejection Fraction (HFpEF) for chronic and acute use

Development Strategy:

AHF Hospital, i.v.
HFrEF

AHF Hospital, i.v.	CHF Home, oral
HFrEF	

AHF Hospital, i.v.	CHF Home, oral
HFrEF	HFpEF



Atypical Protein Kinase C iota (aPKCi) Inhibitors

Potential Multiple Tumor Types

Innovative topical and oral formulations

Oncology Assets: aPKCi Topical (VAR-101) and Oral (VAR-102)

Newly acquired, first in class atypical protein kinase C iota inhibitors (aPKCi)

✓ **Novel, emerging oncogenic target**

- Protein kinase inhibitors are a class of anti-cancer therapeutics that have made a significant impact on the treatment of cancers.
- aPKCi is a promising atypical PKC iota isozyme with defined oncogenic role in multiple signaling pathways, and in the initiation and development of multiple tumor types
- aPKCi inhibitors represent a next generation of Hedgehog (Hh) pathway inhibitors targeting the most downstream component of the pathway and are fundamental components of the Hh resistance pathway

✓ **Advanced preclinical studies with early promising signals**

- The active pharmaceutical ingredient has demonstrated dose responsive characteristics in murine and human basal cell carcinoma (BCC) cell lines, as well as non-small cell lung cancer (NSCLC) mice models
- Initial ADME studies (in rat dog, primate), kinase selectivity/potency, and protein binding studies have been done as have skin permeation studies of the active pharmaceutical ingredient

✓ **Multiple clinical development opportunities**- Specific, potent approach with a topical formulation for cutaneous cancers (i.e. BCC, Gorlin Syndrome, CTCL, etc.) and oral formulation to focus on broader tumor types as monotherapy or in combination

Oncology Assets: aPKCi inhibitor Topical and Oral

Next Steps

- ✓ Progress the IND-enabling activities including pre-IND meeting, toxicology (including topical)
- ✓ Create a comprehensive clinical and CMC development plan that leverages the assets' unique characteristics and mechanisms of action on the highest unmet disease needs

- Decide on **leading with rare disease** option such as Gorlin Syndrome **vs. more prevalent tumor type** such as Basal Cell Carcinoma
- Ensure differentiation and **maximizing benefit vs. risk / toxicity as a key evaluation element**. For example, focus on **topical formulation** as a potential way to optimize benefit, minimize toxicity, treat earlier and improve patient compliance compared to systemic treatment options
- Fully identify and **rigorously assess various opportunities across tumor types** with the Scientific Advisory Committee where the mechanism is important, there are preclinical data signals and clinically feasible pathway to registration and commercialization.

Matching Preclinical Data, Attributes, Scientific Rationale and Market Opportunities for Optimal Development Path

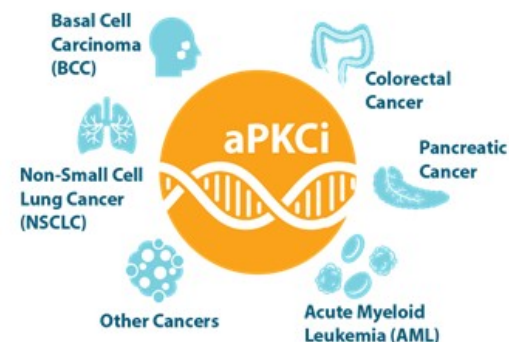
Early Observations of the Key Attributes of Active Pharmaceutical Agent	
Rational Design	✓ Molecules designed through med chem, SAR, and in vitro and in vivo testing
Selectivity	✓ High degree of kinome selectivity
Biomarker Activity	✓ There is potential for a biomarker-driven approach targeting aPKCi/Gli-1/K-RAS positive tumors
Potential for Less Resistance	✓ aPKCi is a potential GLI regulator; upregulation of GLI occurs in resistance
PK	✓ Preliminary PK and ADME characterization has been done in rodent, dog and primates. Tolerability has been good in these studies
Therapeutic Index	✓ Dose dependent potential and potential biomarker activity observed across <i>in vitro</i> murine and human BCC cells lines and in explanted human BCC cells from Moh's sections

Cutaneous Malignancies (lead)

- Assessment may include Basal Cell Carcinoma (BCC), Gorlin Syndrome, Cutaneous T-Cell Lymphoma (CTCL), etc.

Oral, Systemic Treatment Tumors

- Assessment may include Non-Small Cell Lung (NSCL), Pancreatic, Colorectal, Ovarian, Acute Myeloid Leukemia (AML)



Financial and Deal Summary

Cash

March 31, 2024	\$2.5M
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Common Stock Outstanding

June 30, 2024	591,909
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Driving Capital Efficiency to Program Investment

- In 2023, significantly reduced company expenses and cash burn (28%) via out-licensing KL4 platform, focusing resources on istaroxime lead priority program
- Plans for 2024 include further significant cash burn reductions to be achieved

Completed Deals- \$217MM in Potential Milestones Plus Royalties

- **Istaroxime, Dual-Mechanism SERCA2a Activators, Rosta**
 - Exclusive Greater China regional license to Lee's Pharm
 - Potential proceeds: Up to **\$138.1 million** in potential milestone payments, low double-digit % royalties; Partner pays for development, regulatory and commercial costs
- **AEROSURF / KL4 Platform –**
 - Exclusive global license to Lee's Pharm and Zhaoke
 - Potential proceeds: Up to **\$78.9 million** in potential milestone payments, low double-digit % royalties; Partner pays for all costs

Potential Next Deal

- **Highly engaged BD activity for global (ex-Greater China) license for Istaroxime, SERCA2a Activators**



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THERAPEUTICS™