



PostSurgical Therapeutics, Inc.

Enabling Combination Targeted Therapies for
Safer and More Effective Cancer Treatment

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Agenda

Safer and More Effective Cancer Treatment

- 01 Company Overview
- 02 Cancer Treatment Overview
- 03 Toxicity Problem
- 04 PST Solution
- 05 Market Opportunity
- 06 Intellectual Property Position
- 07 Regulatory Strategy
- 08 Partnering Strategy
- 09 Exit Strategy

About PST

Enabling safer and more effective cancer treatment

Postsurgical Therapeutics, Inc (“PST”) is a privately held, California based pharmaceutical company founded in 2014. The company conducts Research & Development repurposing targeted drugs to make them safer and more effective for cancer patients.





Opportunity at a Glance

Advantage of PST's technology and strategy

Multiple Cancers
Same Formulation

\$19.4B
Total Potential Market

FDA
505(b)(2) & Fast Track Potential

5-6 yrs
From 10+ Typical

Rescue or Augment
Existing Programs

Platform

Large & Urgent

Potential For

Reduced Costs

Attractive Value

Technology & Large Pipeline Potential

Unmet Medical Need & Large Market Potential

Shorter Regulatory Paths Faster Drug Approvals

Faster Time Market

Proposition For Partner & M&A Candidates

PST Leadership

PST is lead by Dr. Hahn, a seasoned scientist, inventor, and entrepreneur



Soonkap Hahn, Ph.D.

CEO, CSO & Founder

Ph.D. Organic Chemistry, Ohio State University

**Postdoctoral Research at Stanford University
Under late professor Carl Djerassi**

Founded 6 Biotech Companies:

- Novatrix in 1993 (\$21 M investment from 3 VCs in the US)
- Biocept in 1997 (>\$300 M investment, IPO in 2014)
- Avicule and JCSS Biomedical in 2004
- Curexo USA in 2006
- Postsurgical Therapeutics in 2014

Experience & Deals

- Asset transfer agreements with two public companies in Korea; Curexo in 2006 and Kossen in 2019
- License-in agreement with UCSD in 2004
- Two acquisitions: Integrated Surgical Systems in 2006 and Proxy Diagnostics in 2008
- Research agreements with Medtronic in 2007, Roche in 2011 and Visionary Therapeutics in 2007
- Extensive experience in financing, M & A, technology development and licensing
- 16 issued US patents

Promise of Targeted Therapies



Personalized Medicine

- Targeted therapies heralded the era of personalized cancer treatment.
- Targeted therapies zero in on genomic alterations of a patient's cancer. Most types of targeted therapy help treat cancer by interfering with **specific** proteins that help tumors grow and spread throughout the body.
- Most targeted therapies are either small-molecule drugs or monoclonal antibodies. Small-molecule drugs are small enough to enter cells easily, so they are used for targets that are inside cells.

More Precise Than Chemo

- This is different from chemotherapy, which often kills all cells that grow and divide quickly including normal cells and tissues.

Reality of Targeted Therapies



Resistance

Cancer cells can become resistant to targeted therapy. Resistance can happen when the target itself changes and the targeted therapy is not able to interact with it. Or it can happen when cancer cells find new ways (new pathways) to grow that do not depend on the target.

Toxicity

When targeted therapy was first developed, scientists thought that it would be less toxic than chemotherapy. But they have learned that targeted therapy can also cause serious side effects.

Combination Therapies



Overcoming Resistance

A proven way to overcome resistance is to use more than one targeted therapy in order to cut off cancer's escape routes (alternate pathways).

Cumulative Toxicity

Most combination therapies are taken systemically; orally or intravenously. When combining multiple targeted drugs, their toxicities can build up throughout the body and prevent use of these potential life saving treatments.

2023 Study of Combinations

A study evaluating three precision medicine drugs as combinations, each targeting unique pathway among the most often seen in oncology. The authors concluded that two of the drugs Everolimus and Trametinib should **not be used in combination** even at reduced doses due to serious side effects.

Full Body Drug Exposure



Toxicity threshold limits drug concentration at tumor



Combinatorial Local & Oral Targeted Therapy

A Proprietary Technology Platform

Enabling Combination Targeted Therapies for
Safer and More Effective Cancer Treatment

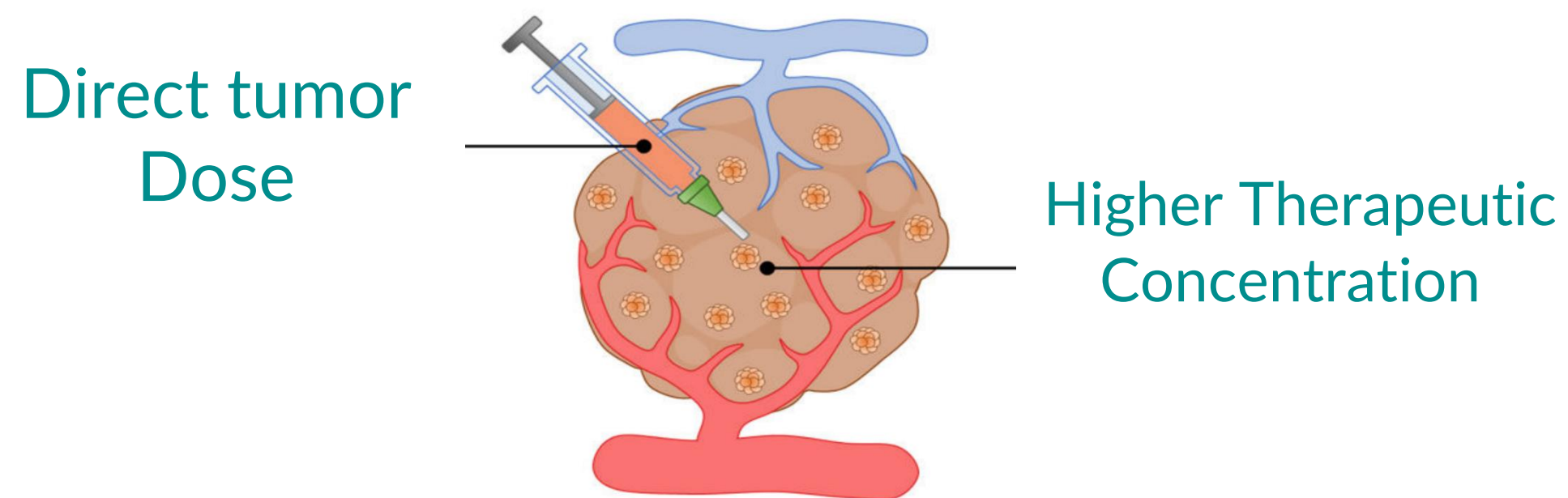
Solution To Combination Therapy Toxicity



Combinatorial Local & Oral Targeted Therapy (CLOTT)
PST's CLOTT technology address the core cause of cumulative toxicity resulting from combined targeted drug therapy.

Intra-tumor Dosing

Intra-tumor dosing localizes the drugs at high therapeutic concentrations while avoiding whole body systemic distribution.



Full Body



Localized



Solution To Combination Therapy Toxicity



Microsphere AND In Situ Gels

PST develops both microsphere (MS) and in situ gelling (ISG) PLGA (polylactic glycolic acid) formulations for sustained release and better tumor retention

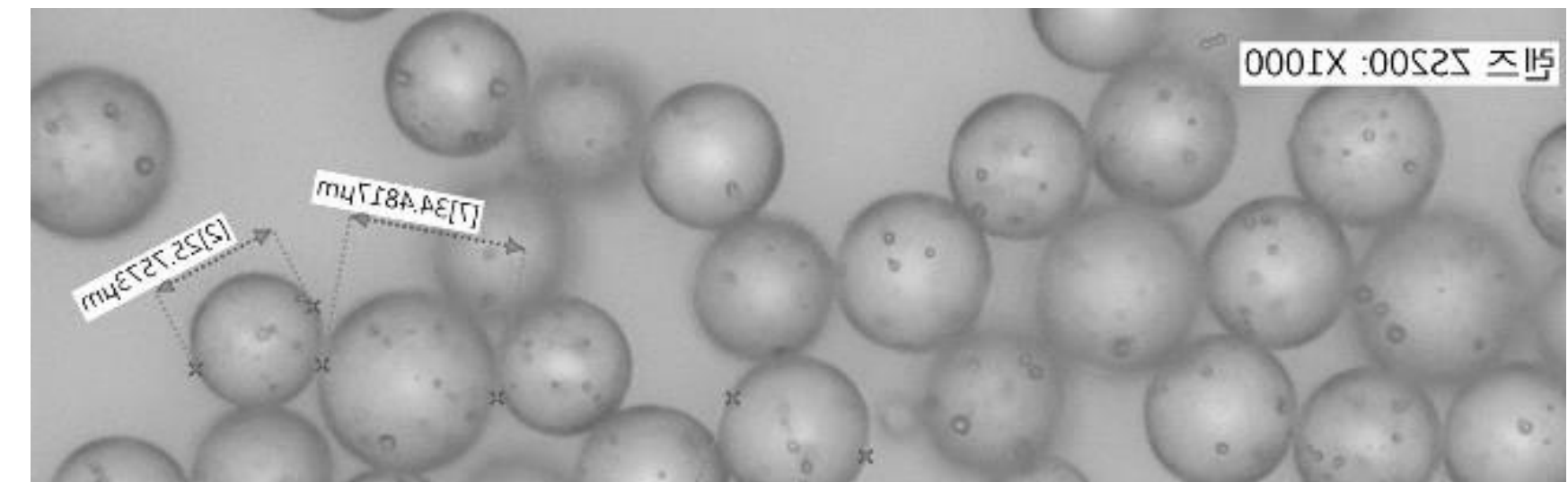
Sustained Release

PST sustained release formulations ensure continuous exposure of cancer to the drugs over a 30 – 90 day periods, utilizing FDA friendly PLGA excipient formulations

Tumor Retention

PST's formulations are engineered to be retained within the cancer while also delivering treatment to the periphery of lesion

PST's PLGA Microspheres



SPG membrane equipment (McTech) for preparing MS which produces uniform size of MS with easy quality control

Two Novel Formulations



IN COMMON FORMULATION & CLINICAL ADVANTAGES

- Many prior FDA-approved long-acting drug formulations
- Established FDA guidelines & dedicated FDA PLGA research group
- Biodegradable polymers and biocompatible carriers,
- Do not require removal after dose/implant
- Tunable bio-absorption and release rates
- Accommodate wide variety of drugs: simple small molecules to proteins and peptides

MICROSPHERES

- Micron to submicron and nano-sized spheroid particles (red blood cells, 6-8 micron diameter)
- 15 FDA-approved PLA/PLGA Microsphere-based products
- Myriad of formulation options
- Well-established manufacturing methods and standards

IN SITU GELS

- In situ gelling matrix (so-called "Atrigel")
- Handled and injected as a liquid
- Post injection undergoes a phase change to an in situ formed implant
- Solidifies at body injection site for local retention
- Easy to prepare at lab scale and commercial scale



Acute Chemical Ablation To Complement CLOTT's Sub-Chronic Targeted Therapy

PST is evaluating combining its Microsphere and In Situ Gel formulations with Ethanol as an acute chemical ablative agent

Advantages/Benefits of Ethanol Ablation

- Established clinical use against localized tumors such as HCC
- Immediate, highly toxic, short-lived effect on tumor
- Causes coagulative necrosis upon contact with tissue
- Results in microthrombi occlusion of tumor blood vessels
- May disrupt the tumor microenvironment (TME)
- TME disruption may improve CLOTT's API diffusion and penetration
- May stimulate immune response by liberating tumor antigens



THE PST SOLUTION

Ultrasound Image-Guided Delivery

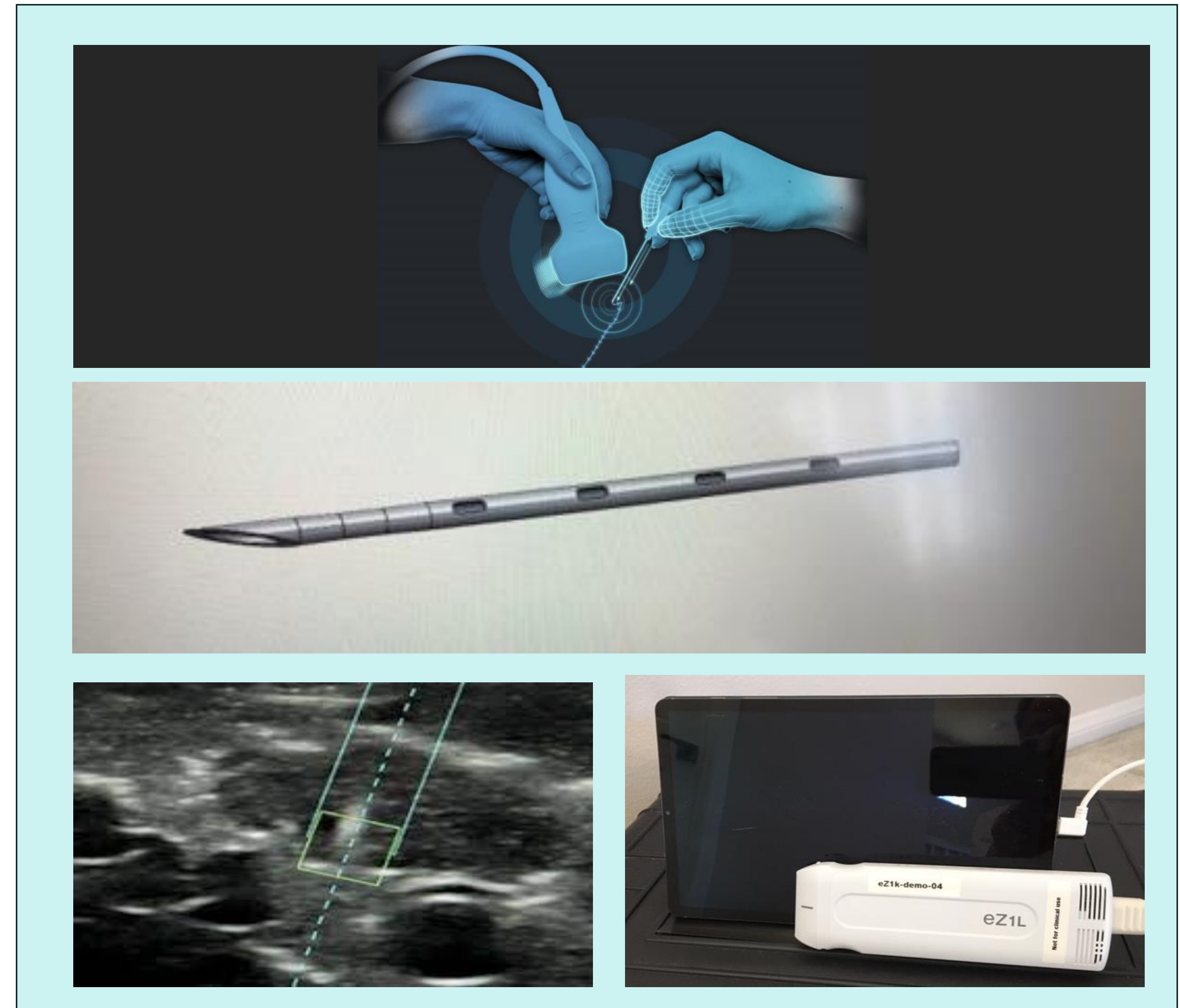
Precision dosing and improved tumor

Improved Precision

PST is concurrently developing an ultra-sound guided proprietary needle delivery system for precise dose localization (Collaboration with EZONO, Germany)

Higher Tumor Distribution

PST's proprietary multi-side multi-hole needle is engineered to improve distribution of drugs across the tumor. (Collaboration with Lighteum, USA)



Applications For CLOTT Platform



CLOTT is a technology platform

- Multiple drug combinations possible
- Various cancer indications can be sought
- Multiple products planned utilizing the same CLOTT technology

Lead Product Application

- 2 Drug combinations which block both PI3K and MAPK pathway
- PST Combination 1 = Sorafenib (RAF inhibitor) + Everolimus (mTOR inhibitor)
- PST Combination 2 = Trametinib (MEK inhibitor) + Everolimus (mTOR inhibitor)
- All 3 drugs are FDA approved and marketed worldwide



PST's Lead Products Target KRAS Mutations

- > 20% of all solid tumors caused by KRAS mutations
- Pancreatic cancer (>80%), colorectal cancer (40%) and lung cancer (35%)
- Attempts to develop inhibitors against mutated KRAS in past 30 years unsuccessful until 2021
- Currently two inhibitors approved by the FDA
- Sotorasib in 2021 by Amgen and Adagrasib in 2022 by Mirati Therapeutics

Shortcoming of Sotorasib and Adagrasib

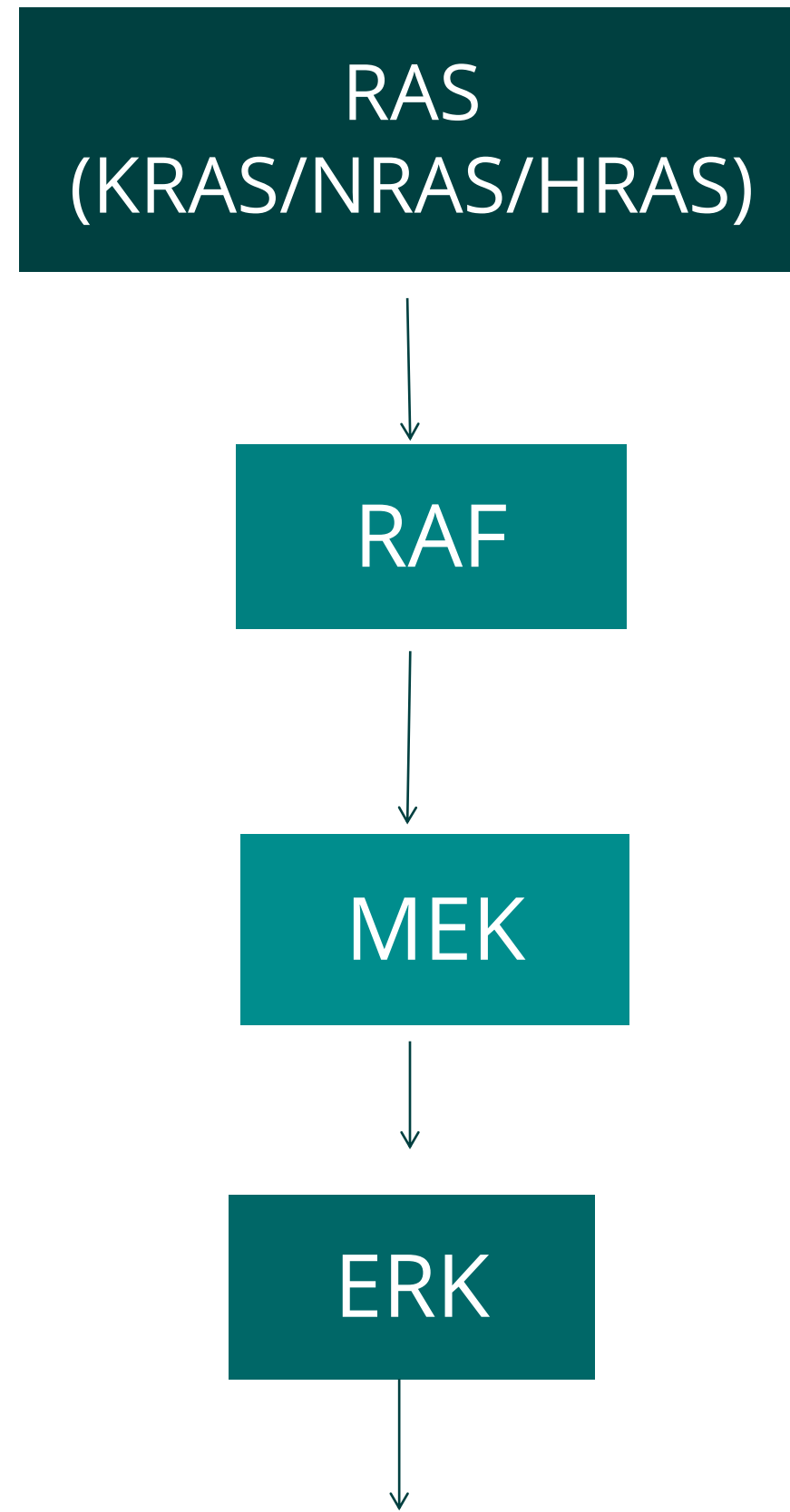
- KRAS mutations have more than 10 subtypes
- Subtype depends on the location of the gene mutation (G12C, G12D, G12V, etc.)
- Sotorasib and Adagrasib only active against G12C
- Only about 15% of lung cancer are caused by G12C KRAS mutations

PST's drug combinations may be effective against tumors with **all three KRAS** sub-mutations (KRAS: G12C, G12D, G12V)

Two Cancer Pathways

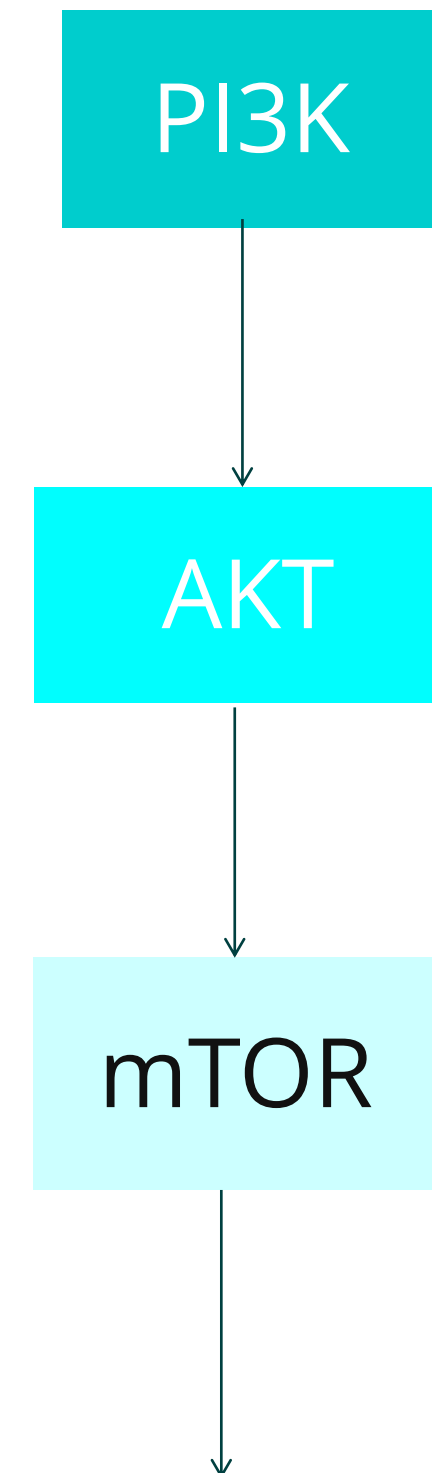


MAPK Pathway



Cancer cells grow

PI3K Pathway



Cancer cells grow

Both Pathways Blocked



MAPK Pathway

RAS
(KRAS/NRAS/HRAS)

RAF

MEK

ERK

Cancer growth blocked

Sorafenib
is a RAF inhibitor

Trametinib
is a MEK inhibitor

PI3K Pathway

PI3K

AKT

mTOR

Cancer growth blocked

Everolimus
is an mTOR inhibitor

PST Combination-1
Blocks RAF + mTOR

PST Combination-2
Blocks MEK & mTOR

Combination Therapy Development



(In vitro and in vivo studies)

Combination 1

Preliminary in vivo study with Combination 1

Sorafenib and Everolimus PLGA Microspheres

Efficacy evaluation of oral dose vs intratumor injection

Objective was to show that some targeted drugs taken orally may not reach at tumor site well

(Positive outcome shown in figure 1)

Sorafenib has low potency which may require a large amount injection for treatment

- PTI decided to develop Combination 2
- Trametinib is about 100-fold more potent than sorafenib

Systemic vs Intratumor Response

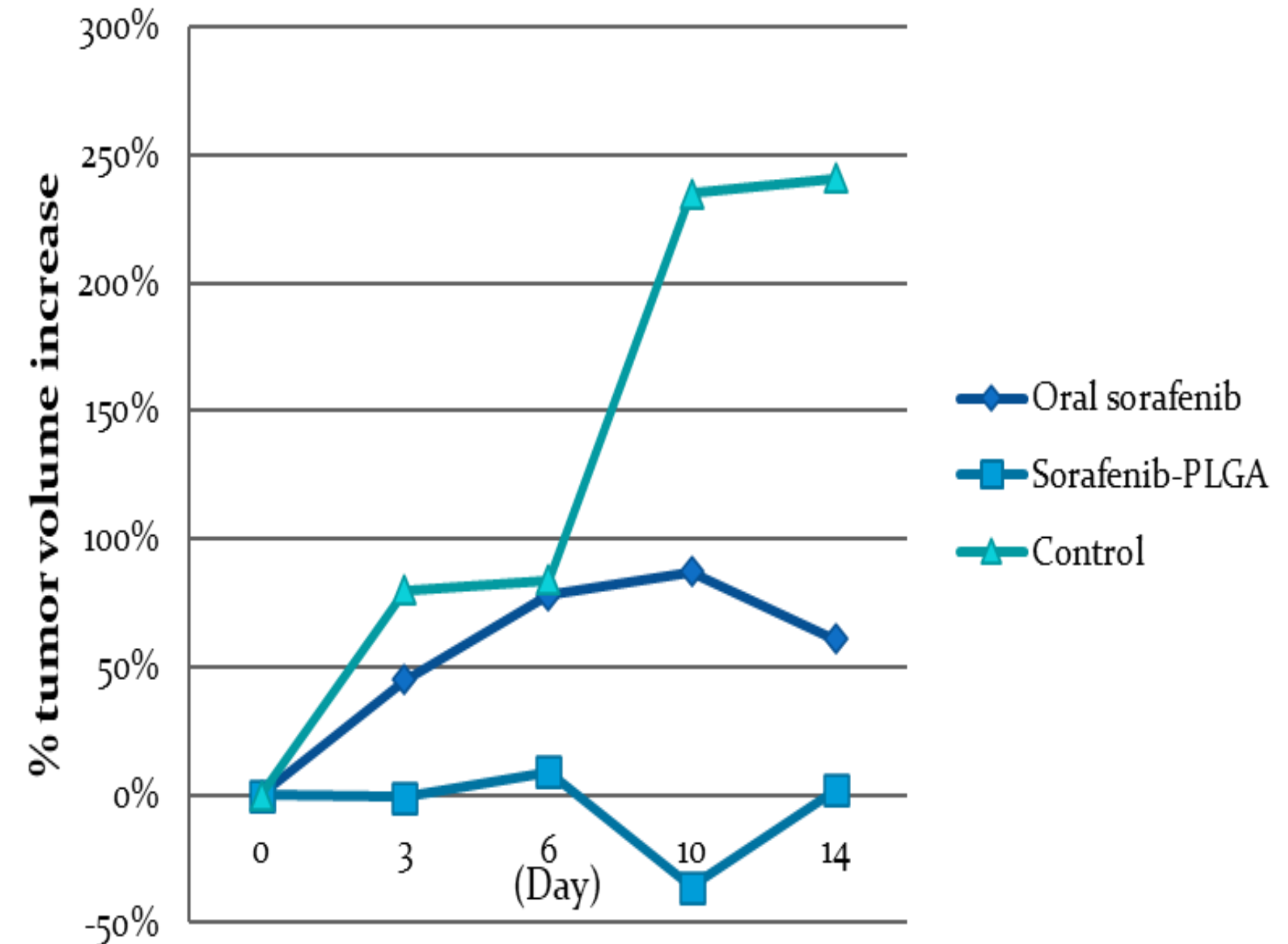


This preliminary study in **Colorectal Cancer tumor (C26 cell line)** shows that intratumor injection of Sorafenib PLGA Microspheres is more effective than oral administration.

An indication that orally administered sorafenib may not reach tumor site as effectively as the intratumor dose

Theranostics, 2017; 7(2): 400-412

Figure 1. Tumor Growth: IT Injection vs Oral Administration



Combination Therapy Development



Combination 2

- Everolimus + Trametinib PLGA In Situ Gel

Aims:

- Evaluate effectiveness against the three prevalent KRAS mutations (G12C, G12D, and G12V)
- Evaluate effectiveness against three different tumor types (gastric, lung and pancreatic)
- Determine if combinations are more effective than single agent treatments

Human Tumor Lines Tested

- AGS gastric cancer cell line with G12D KRAS mutation (data shown in figure 2)
- Mia PaCa-2 pancreatic cancer cell line with G12C KRAS mutation (figure 3)
- NCI H-441 lung cancer cell line with G12V KRAS mutation (figure 4)
- SW403 colorectal cancer cell line with G12V KRAS mutation is in progress

In vivo mouse model studies are in progress and will be completed in November, 2023



In Vitro Cytotoxicity Study for Combination 2

CTL = No treatment

Vehicle = PLGA Gel without drugs

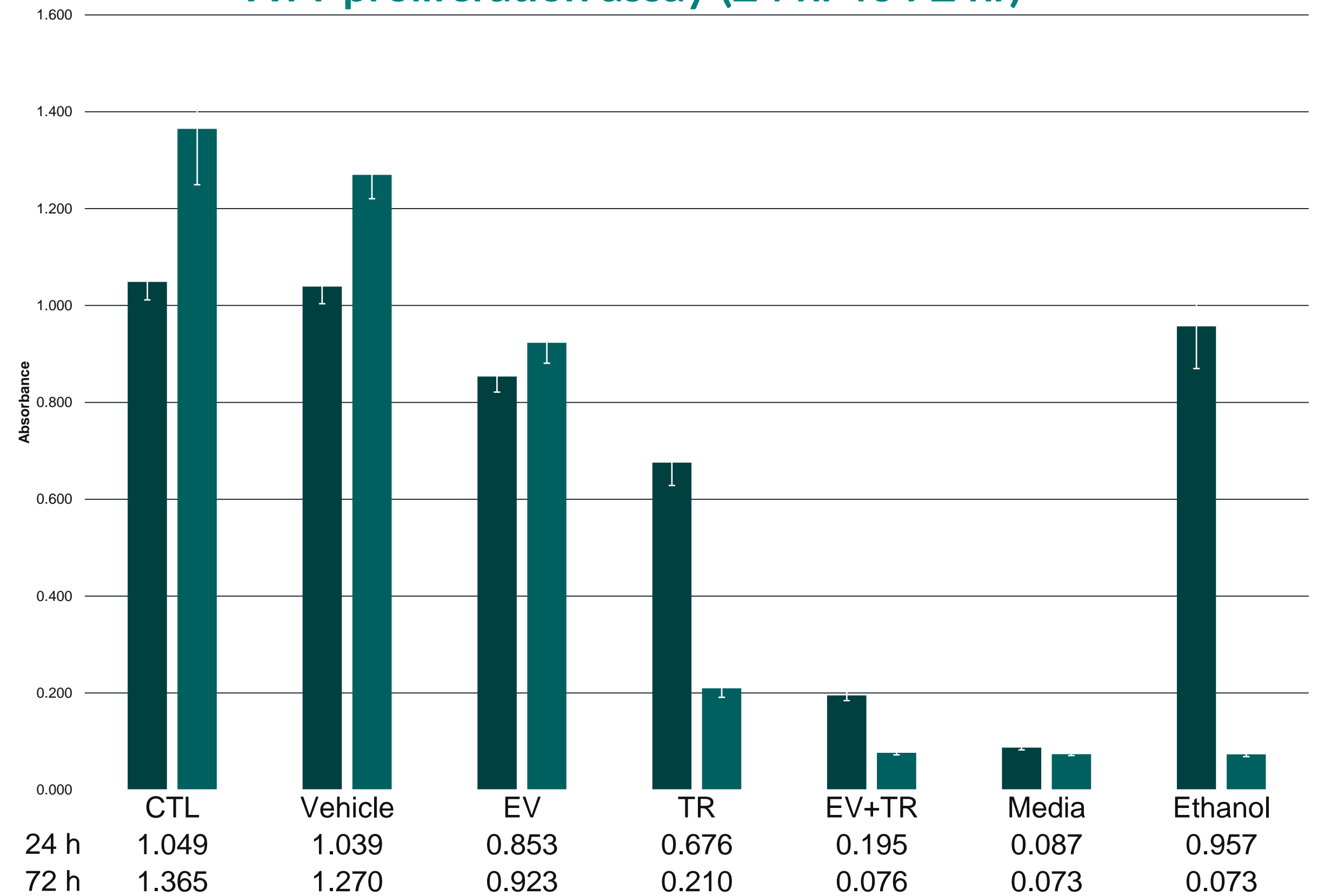
EV = Everolimus

TR = Trametinib

Media = Media without cells

Ethanol = Cells in media treated with ethanol

Figure 2. AGS Human Gastric Tumor Line XTT proliferation assay (24 hr vs 72 hr)



Human Pancreatic and Lung Tumor Cells



Figure 3.

Mia PaCa-2 Human Pancreatic Tumor Line
XTT proliferation assay
(100K cells, 24hr v 72hr)

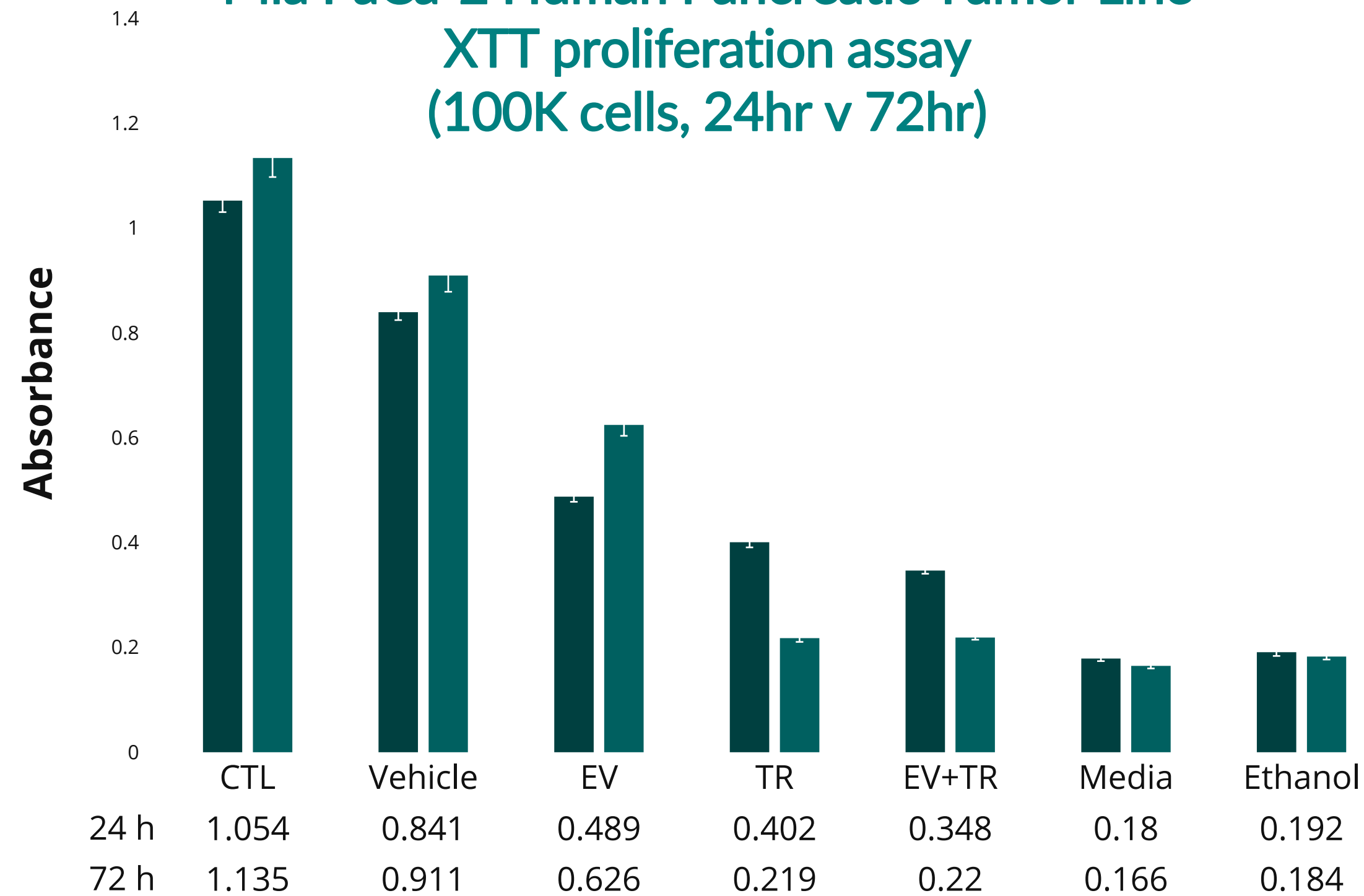
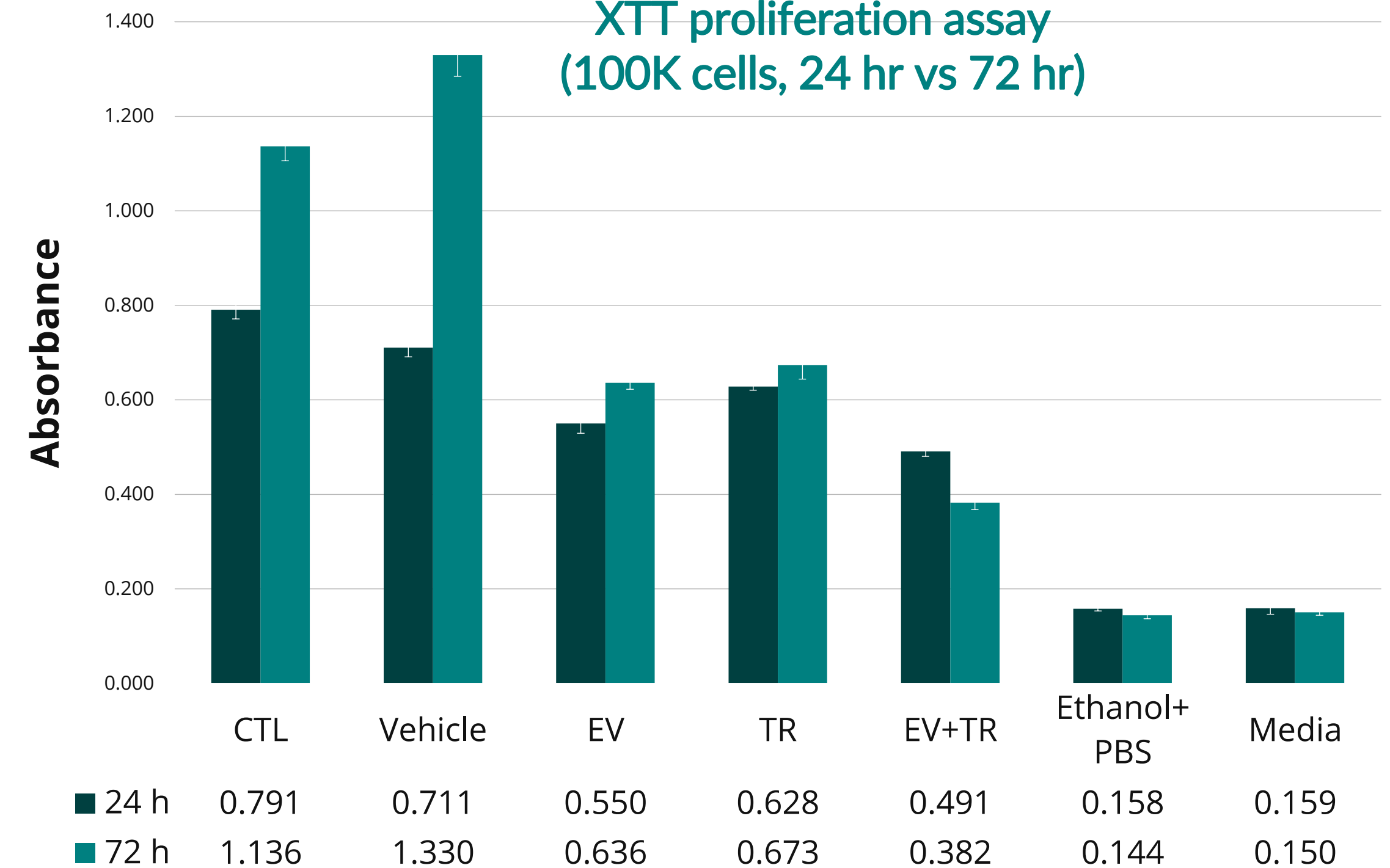


Figure 4.

NCI H441 Human Lung Tumor Line
XTT proliferation assay
(100K cells, 24 hr vs 72 hr)



Combination 2 - Take Aways



Combination 2 (COM2)

- Everolimus + Trametinib PLGA Gel

In vitro cytotoxicity studies take aways:

- COM2 is effective against the three prevalent KRAS mutations (G12C, G12D, and G12V)
- COM2 is effective against three different tumor types (gastric, lung and pancreatic)
- COM2 is more effective than single drug treatments
- COM2 may be more broadly effective compared to sotorasib and adagrasib
- Observed 24h and 72h efficacy was consistent with the COM2 formulation design

Human Tumor Lines Tested

- AGS stomach cancer cell line with G12D KRAS mutation (data shown in figure 2)
- Mia PaCa-2 pancreatic cancer cell line with G12C KRAS mutation (figure 3)
- NCI H-441 lung cancer cell line with G12V KRAS mutation (figure 4)
- SW403 colorectal cancer cell line with G12V KRAS mutation is in progress

In vivo mouse model studies are in progress and will be completed in November, 2023

Targeted Drug Market



Available Targeted Drugs

There are now over 100 FDA approved anticancer targeted therapies on the market and many more in development.

Market for Targeted Drugs

Worldwide market size: \$70 – 80 billion in 2022 and is expected to grow to \$100 – 120 billion by 2027

Patent Cliff

Dozens of oncology targeted drugs will be losing patent protection representing 10's of billions in revenue. A growing opportunity for off patent combinations.

Pipeline Opportunity

PST CLOTT platform technology poised to exploit market opportunity by delivering safer more effective combination therapies



Market Potential for Combination 1 & 2

Current market size for cancers caused by KRAS mutations

Cancer type	Current market	% Patients with KRAS mutations	Potential market for Combination 1 & 2
Lung cancer ¹	\$29.5 B (2022)	35%	\$10.3 B
Colorectal cancer ²	\$18.6 B (2022)	40%	\$7.4 B
Pancreatic cancer ³	\$2.1 B (2022)	80%	\$1.7 B
Total potential market			\$19.4 B

¹ Global Market Insight

² The Insight Partners

³ Yahoo Finance

Intellectual Property



Repurposed Drug Patents

Patents can be secured for out of patent drugs for new and novel formulations, routes or indications.

US & EU Applications

Patent application filed in US and Europe April, 2021 (US 17/227,992)

- Novel method and composition claims
- New formulations, routes and indications
- For treating solid tumors
- Claims for combined blocking of PI3K pathway and MAPK pathway

Continuation In Part

CIP in preparation to include new matter and methods to strengthen original application:

- Add more examples to support the original claims
- Novel ISG PLGA formulations with ethanol
- Novel needle configuration
- Plan to file in November as soon as PST completes its final animal tests

Expedited Regulatory Path



Repurposed Drug Approval Path

- Sorafenib, everolimus and trametinib API's in PST combinations are FDA approved and marketed world wide
- Approach allows for a “repurposed drug” 505(b)(2) regulatory pathway
- Repurposed drug submission avg approvals in 5 – 7 yrs
- Regular 505(b)(1) submissions > 10 yrs
- Shorter development time equals reduce development cost and faster market entry

Fast Track & Breakthrough Designations

CLOTT platform aims to treat patients with little treatment option, there is a possibility of receiving “Fast Track” and “Breakthrough Therapy” designation by the FDA

Therapies with Fast Track will have an accelerated approval



3 Tier Business Development Approach

1st Tier Blue Chip Pharma Companies

- Global big pharma companies like Novartis, AstraZeneca, Bristol Myers Squibb (BMS), Merck, etc
- Companies with failed clinical trials due to systemic toxicity
- CLOTT provides drug program rescue

2nd Tier CA Companies With Failed Clinical Program & Cash On Hand

- California-based pharmaceutical companies
- Mid-size company with a strong cash position (>\$100 million)
- Clinical drug failure due to systemic side effects
- CLOTT provides drug program rescue

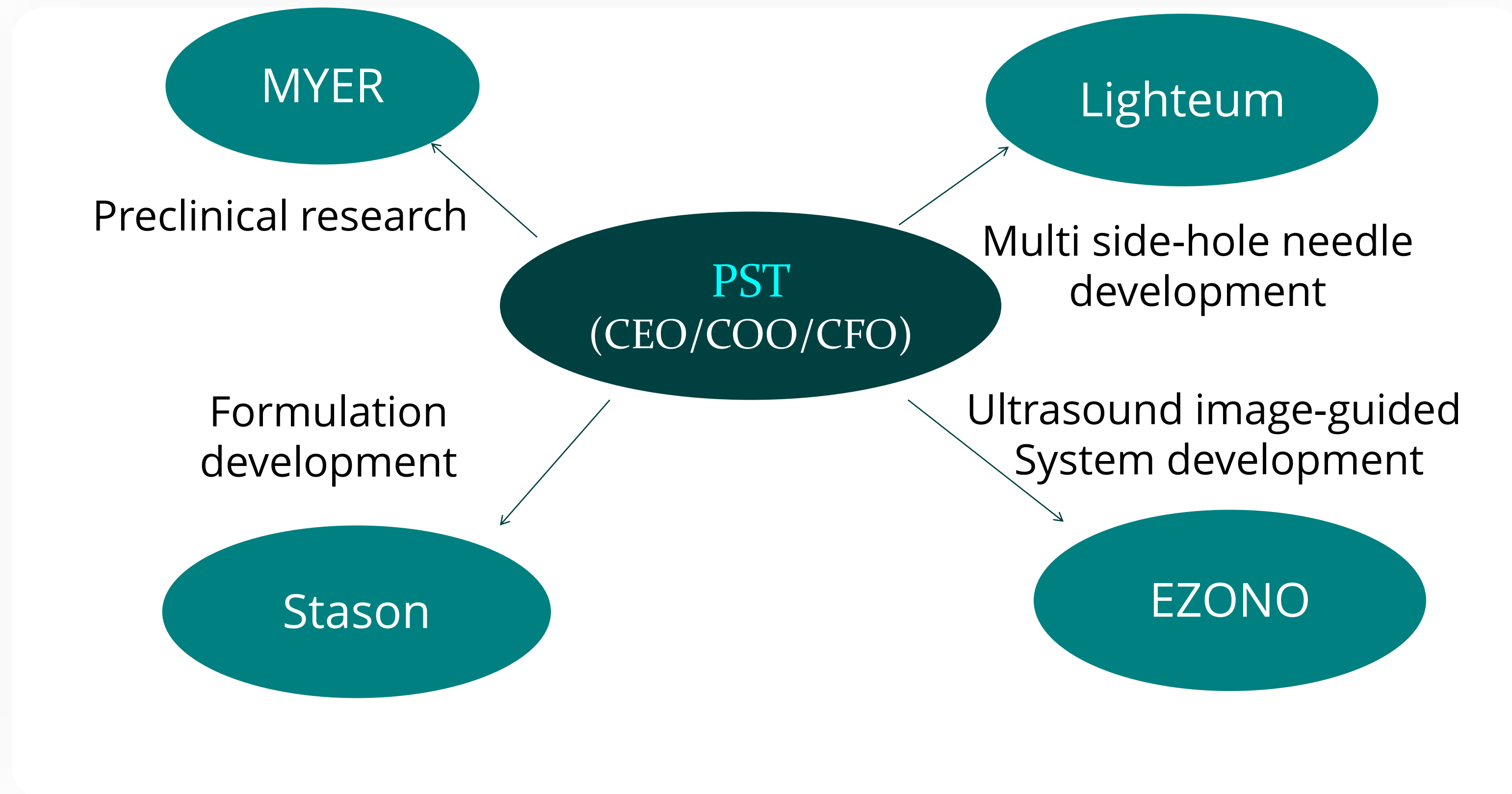
3rd Tier Public Companies with Low Market Cap and Failed Clinical Program

- Low market cap (and a failed drug) Companies
- M & A candidate & investments from Korea



Semi-Virtual Operations

Development with minimum expense and maximum efficiency. PST compensates collaborators with a combination of equity and cash. No one takes a regular salary.



Exit Strategy



MERGER: Exit strategy 1

- With a public, 3rd-tier biotech company
- Nasdaq valuations are extremely low in 2023. M & A opportunity.
- Biotech market expected to rebound in late 2024

Acquisition: Exit strategy 2

- Selling PST to other pharmaceutical company --- PST will be open to this option if the price is right.

IPO: Exit strategy 3

- If PST starts establishing corporate partnership(s) beginning late this year and brings in more than \$20 M every year, PST may offer profit sharing to shareholders and may not sell PST. In this case PST may consider developing combination 2 further by itself and look for IPO in 2026.