



# Developing a Novel Approach to Treat Metastatic Solid Tumors

James Nathanielsz, Chief Executive Officer



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# Novel Approach to Treating Metastatic Cancer

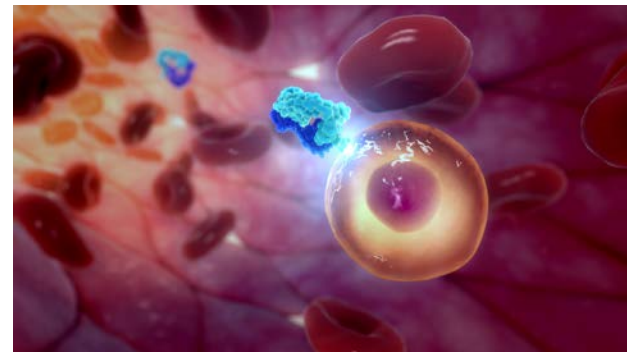


- **Global Metastatic Cancer Treatment Market estimated predicted to reach \$111B by 2027.<sup>1</sup>**
- Strong pipeline with more than 60 products in clinical development.<sup>2</sup>
- Cancer stem cells resistant to standard treatments, can remain dormant, migrate to other organs and trigger explosive tumor growth, causing patient relapse.
- Our approach addresses a global, unmet medical need of tumor recurrence and metastasis from solid tumors.
- Proenzyme treatment targets and eradicates cancer stem cells not killed by radiation or chemotherapy.

1. Emergen Research  
2. Research and Markets

# Company Overview

- Clinical stage biopharma company developing novel cancer treatments for patients suffering from pancreatic, ovarian and colorectal cancers.
- Publicly traded on OTC Pink: PPCB, Fully Reporting.
- Proenzyme therapy approach based on 100 yrs. of enzyme use.
- US FDA Orphan drug designation status for treatment of pancreatic cancer.
- Key figures:
  - \$23M raised since company inception.
  - 40 years combined pharma/biotech experience.
  - 80 years combined scientific research expertise.
  - 76 patents either in force or pending.





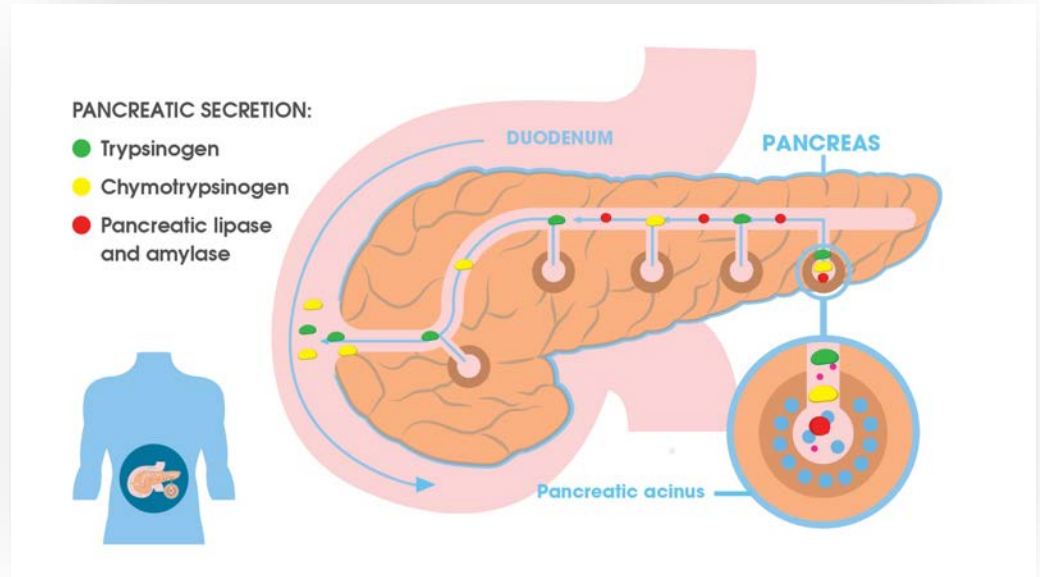
# PRP

Trypsinogen / Chymotrypsinogen I.V. Injection

# Pancreatic Enzyme Therapy

Enzymes stimulate biological reactions in the body, especially enzymes secreted by the pancreas.

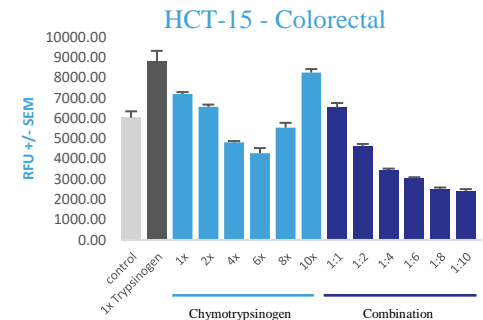
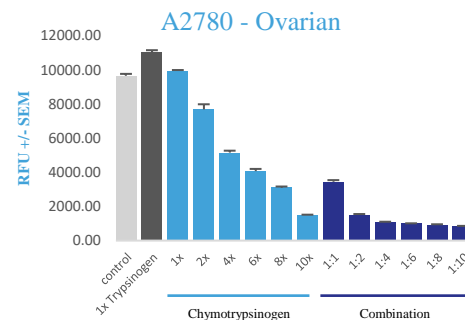
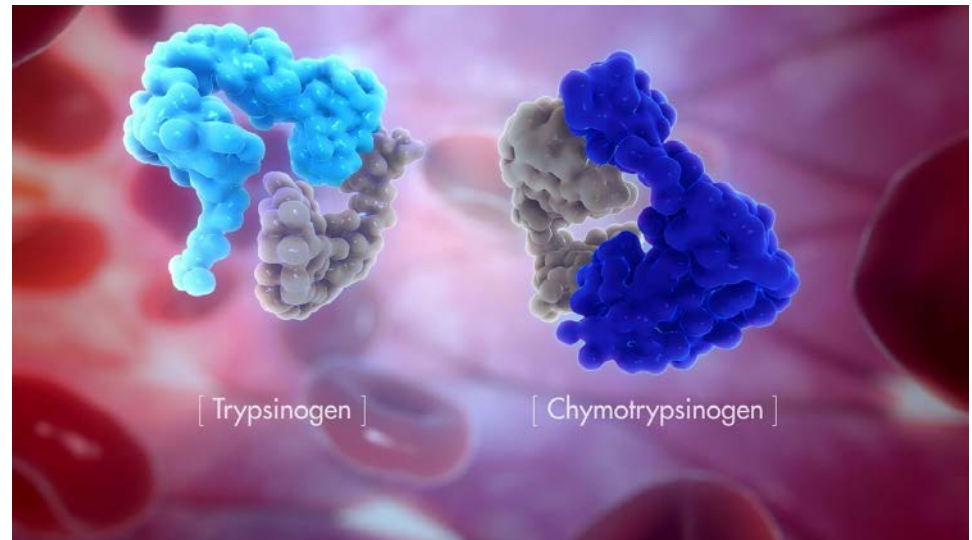
- Over 100 years ago, Professor John Beard proposed that pancreatic enzymes represents the body's primary defence against cancer.
- Scientific experts have endorsed Beard's hypothesis with encouraging data from patient treatment.



# PRP

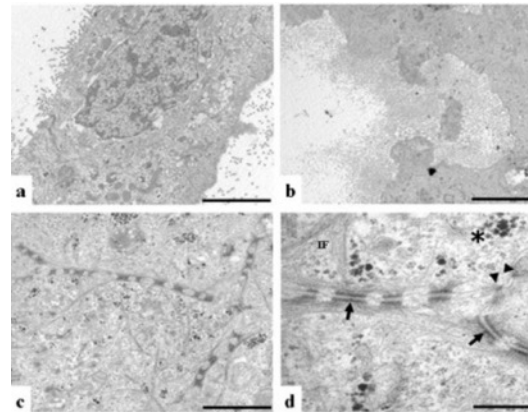
## Trypsinogen/Chymotrypsinogen

- Mixture of 2 proenzymes from bovine pancreas.
- Synergistic ratio of 1:6 inhibits growth of most tumor cells, *in vitro*.
- Examples include ovarian and colorectal cancers.
- Efficacy also shown in pancreatic, kidney, breast, brain, prostate, lung, liver, uterine and skin cancers.

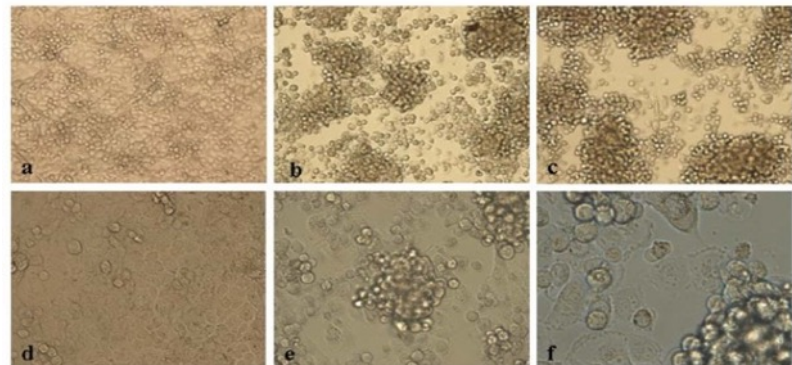


# PRP Induces Cell Differentiation

- PRP has the potential to convert cancerous cells back into normal cells.
- Tumor cells return to the normal pathways of a differentiated cell.
- Post treatment evidence shows that colorectal and pancreatic cancer cells return to normal cell behavior.



Caco2 cells untreated (a) and treated (b-d). In (b) numerous microvilli can be seen. Panels (c) and (d) show tight junction (arrow heads), desmosomes (arrows) and increase in glycogen deposits (asterisk)



Proenzyme treatment induces aggregation of Panc1 cells. (a and d) are evenly distributed in a monolayer culture, whereas treated cells (b, c, e and f) cluster and form aggregates)



# PRP Compassionate Patient Treatment Results

- 46 terminal patients administered suppository formulation containing trypsinogen & chymotrypsinogen.
- No severe, or even serious adverse events observed from treatment.
- 19 from 46 patients significantly exceeded life expectancy (41.3%).
- Mean survival (9.0 Mo.) significantly higher than mean life expectancy (5.6 Mo.), one way ANOVA ( $\alpha = 0.05$ ,  $P < 0.05$ ).
- Although incidence is low, endocrine tumors and cancers of GI tract appear to benefit from treatment.

Cancer Type	Responders Vs Patients*
<b>Ovarian Cancer</b>	<b>4/6</b>
<b>Pancreatic cancer</b>	<b>3/4</b>
<b>Gastric cancer</b>	<b>2/2</b>
<b>Prostate cancer</b>	<b>2/8</b>
Non-Hodgkin Lymphoma	1/1
Mesothelioma	1/1
Neuro-endocrine tumor	1/1
NSCLC	1/2
Melanoma	1/2
<b>Bowel</b>	<b>1/2</b>
<b>Colon cancer</b>	<b>1/5</b>
Breast cancer	1/6
Small cell carcinoma	0/1
Renal cancer	0/1
Abdomen (unknown primary)	0/1
Bladder cancer	0/2
<b>Total:</b>	<b>19/46</b>

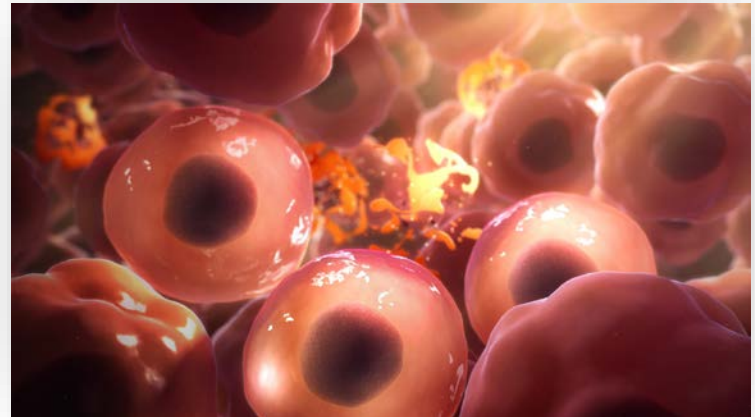
\*All patients either met or exceeded life expectancy based on initial prognosis

# A New Frontier

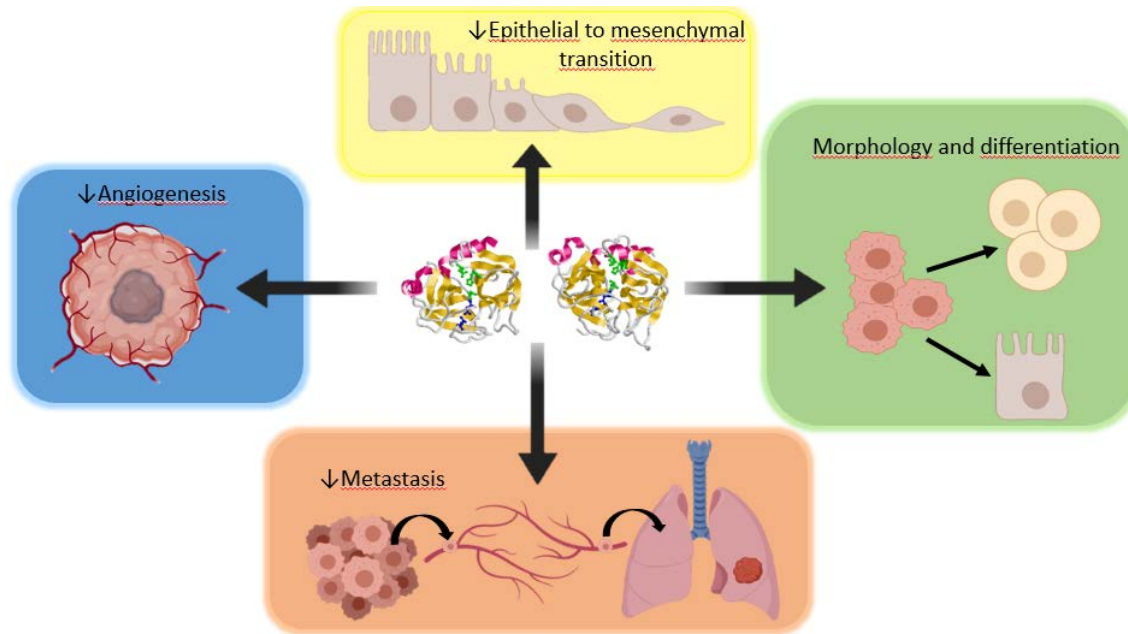
PRP is an Anti-Cancer Stem Cell Therapy

# Conventional Therapies

- Kill replicating cancer cells, but deep inside tumors are cells that develop resistance, called cancer stem cells.
- Can remain dormant for long periods.
- Migrate to other organs spreading the cancer.



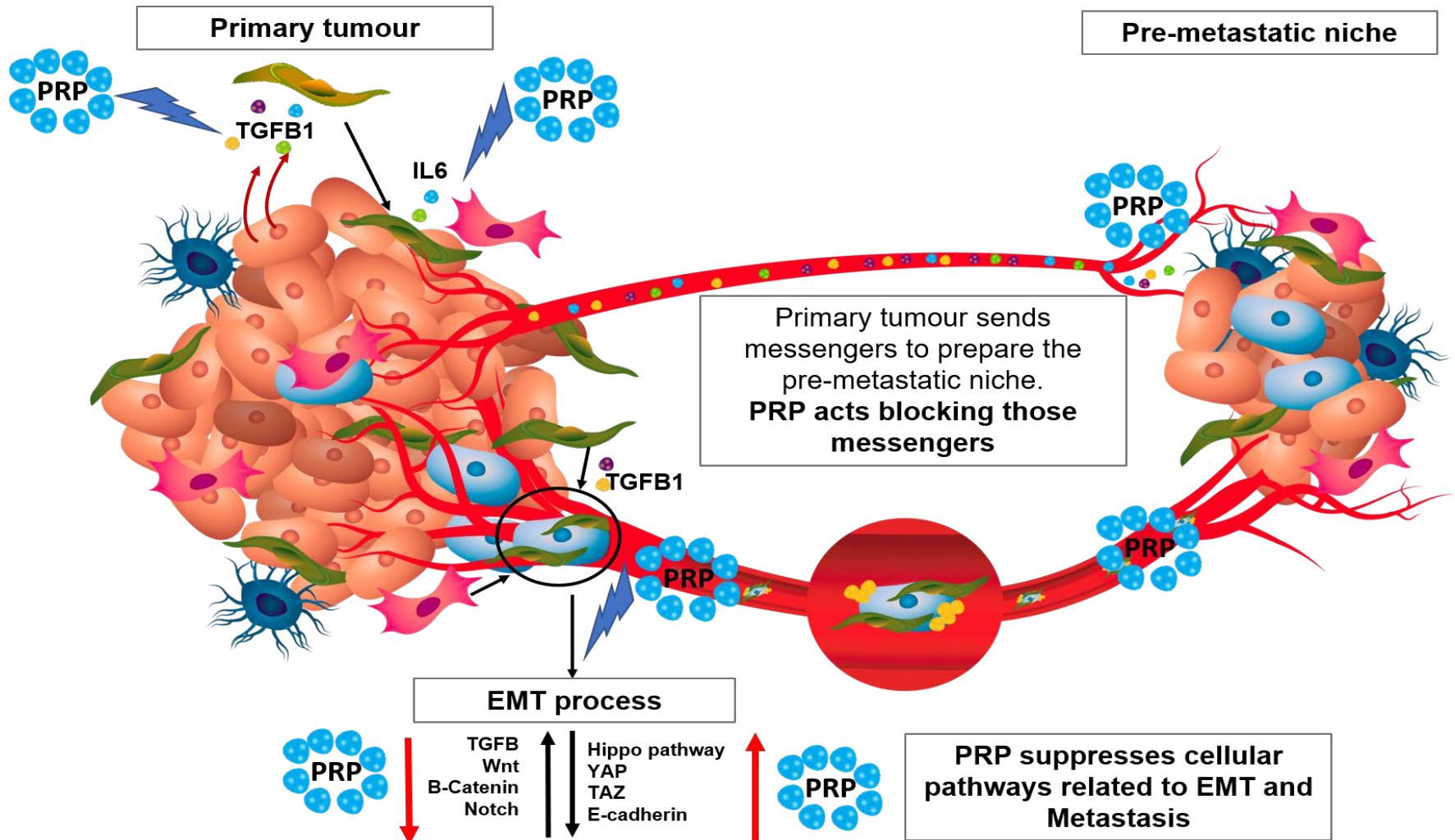
# PRP Exerts Multiple Anti-Cancer Effects



- PRP represents a new advancement in the treatment of cancer by inducing cell differentiation, impairing angiogenesis, inhibiting cancer stem cell formation and blocking the EMT process, known as *differentiation therapy*.

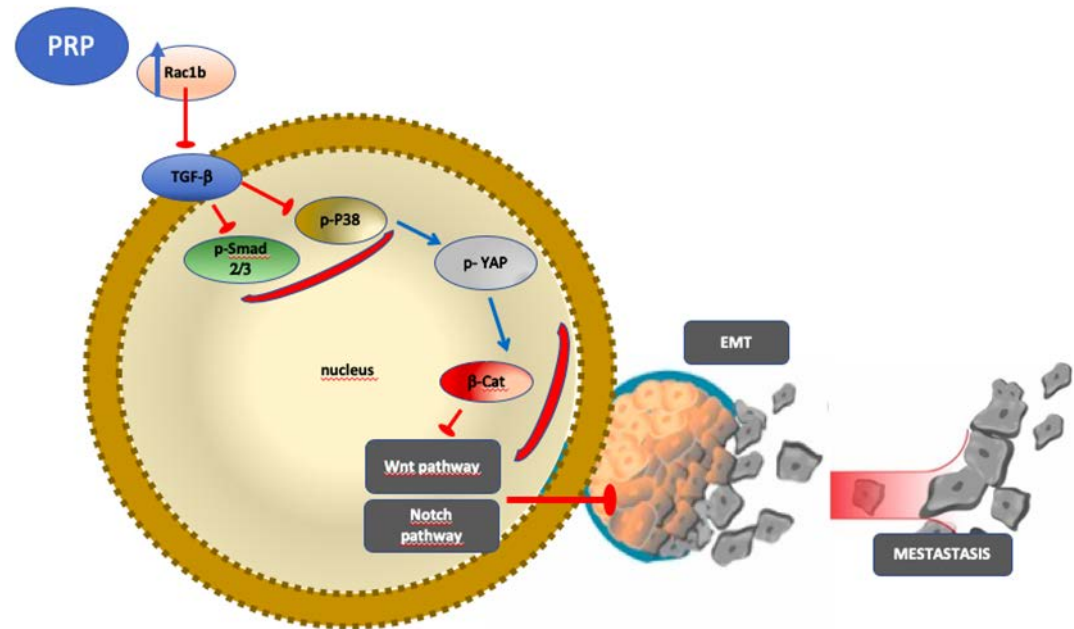


# PRP Suppresses Epithelial to Mesenchymal Transition (EMT) & Metastasis



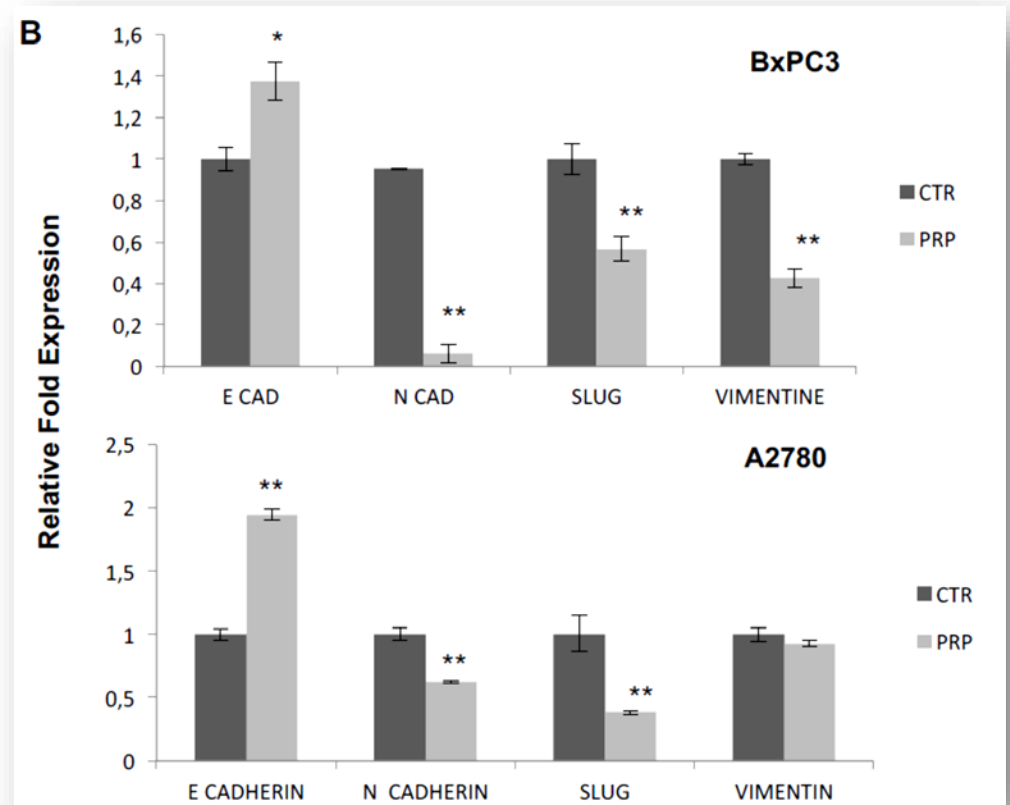
# PRP Has A Novel Mechanism of Action

- Promotes up-regulation of RAC1 $\beta$  which prevents hyper-activation of the TGF- $\beta$  pathway.
- These events inhibit the EMT process that leads to metastatic cancer.



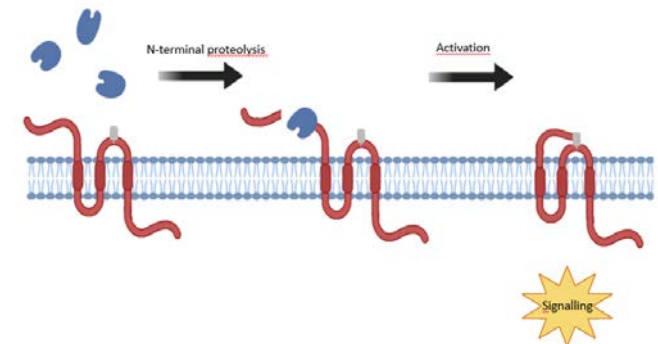
# PRP Alters EMT Signalling Pathways

- Cancer stem cells die naturally by reprogramming the cancer stem cell to reduce malignancy and invasiveness.
- PRP promotes the expression of E-cadherin and decreases expression of N-cadherin & vimentin mesenchymal markers.
- Strongly inhibits Slug, a transcription factor associated with tumor metastasis and angiogenesis.



# PRP *Selectively* Targets Extracellular Matrix of Tumor Cells

- Proenzymes activated by proteases in the extracellular matrix of tumor cells.
- Once activated, enzymes cleave extracellular molecules which triggers intracellular signalling.
- Trypsin has maximum affinity for PAR-2 receptors, but can also cleave PAR-1, whereas chymotrypsin cleaves PAR-1.
- PAR-1 and PAR-2 receptors are frequently overexpressed in many types of malignancies and plays a key role with transactivation of EGF receptor leading to alternative splicing of RAC1.



Activation of PAR receptors by Chymotrypsinogen / Trypsinogen



# PRP Offers Paradigm Shift in Standard of Care

- No adverse events observed from compassionate patient treatment.
- Since PRP does not target replicating cells, it is unlikely to affect healthy cells and will suppress undesirable effects from cancer.
- PRP regulates expression of genes that triggers dominant pathways that are turned on in cancer stem cells, but turned off in healthy cells.
- PRP has the potential to force cancer stem cells to become benign!








# Corporate Strategy

Future Landscape

# Future Benchmark Analysis

Company Name	Ticker	Market Cap. \$\$M*	Overview	Status
	MREO	\$113.1	Therapeutic candidates <b>targeting cancer stem cell pathways and immuno-oncology.</b>	2 x clinical development
	VSTM	\$64.3	Small molecule inhibitors designed to <b>modulate the tumor micro environment.</b> Clinical programs target RAS and FAK pathways.	3 x clinical development
	IPSC	\$574.1	Allogeneic iNK and iT cell therapy product candidates across solid tumor and hematologic malignancies.	5 x preclinical development

\*As of Oct 20, 2022

# Executive Leadership with Significant Scientific, Clinical and Operational Experience



**Mr James Nathanielsz**  
Chief Executive Officer

- Director & C.E.O, Oct '07.
- 20 yrs. experience in R&D, Manufacturing & Distribution, including 15 yrs. in oncology pharmaceutical drug development.
- Bachelor of Applied Science (Biochemistry/ Applied Chemistry) & Master of Entrepreneurship & Innovation, Swinburne University, Melbourne, AUS.



**Dr Julian Kenyon**  
Chief Scientific Officer

- Co-Founder & Director, Feb '08.
- Medical Director of the Dove Clinic for Integrated Medicine, UK, since 2000.
- Bachelor of Medicine & Surgery & Doctor of Medicine, University of Liverpool, UK.
- Primary Fellow of the Royal College of Surgeons, Edinburgh for over 40 years.



**Prof. Klaus Kutz**  
Chief Medical Officer

- 20 yrs. experience as consultant in Clinical Pharmacology & Safety in oncology.
- 12 yrs. experience Head of Clinical Pharmacology in 2 multinational pharma companies.
- Specialist for Internal Medicine, Gastroenterology & Clinical Pharmacology.
- Professor of Medicine, University of Bonn, Germany.



**Mr. Josef Zelinger**  
Non-Executive Director

- 45 yrs. Experience in tax auditing, finance, investment and management consulting.
- Director of several private investment companies in commercial real estate, import/export businesses and financial investments.
- Bachelor of Business (Accounting), RMIT University, Fellow of RMIT University (Business).
- Certified Practicing Accountant since 1984



# Medical and Scientific Advisory Board

## **Prof Macarena Perán**

Univ. of Jaén

Reader in Anatomy, collaborating with the Institute for Regenerative Medicine and Pathobiology (IBIMER).

## **Prof Juan Marchal Corrales**

Univ. of Granada

Professor of Anatomy and Embryology at the Faculty of Medicine, member of the standing committee of the Scientific council and coordinator of Area Research in the Biosanitary Institute of Granada (IBS.Granada), Board member of IBIMER.

## **Dr Maria Garcia**

University Hospital

Leads the competitive research contract from the National Health System to lead translational cancer research in the University Hospital Complex of Granada.

## **Dr Ralf Brandt**

vivoPharm

Co-Founder of vivoPharm. Formerly led the Tumor Biology program at Novartis Pharma AG. More than 15 years of experience in leading research programs in experimental oncology.

# International R&D Partnerships



Joint IP ownership and Commercialization Agreement.



Universidad de Jaén



Universidad de Granada



**FIBAO**

FUNDACIÓN PÚBLICA ANDALUZA PARA LA  
INVESTIGACIÓN BIOSANITARIA DE ANDALUCÍA ORIENTAL

Joint research collaboration:

- Drug discovery oncology program
- New compound screening
- Translational research
- Clinical development



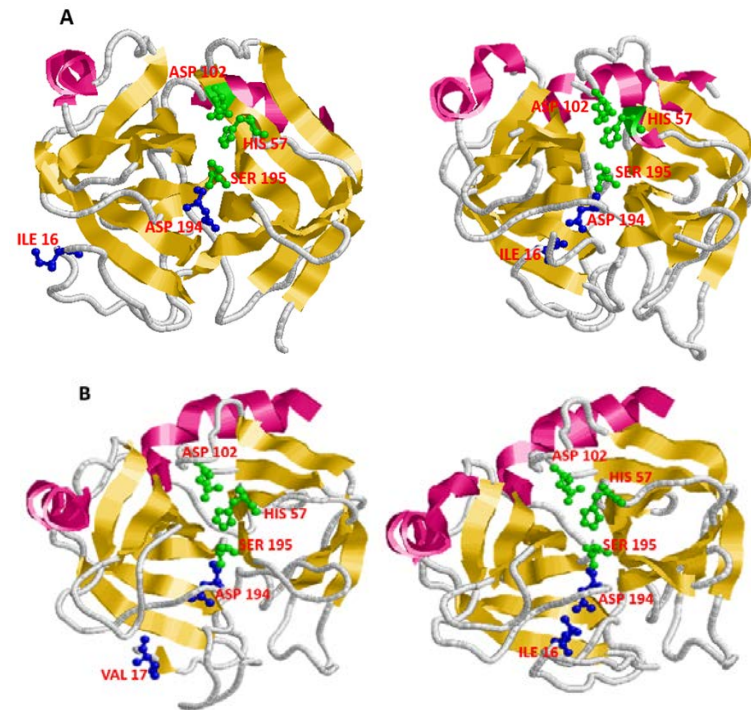
**eurofins**

CDMO

Process development, purification of active drug substances, analytical method development and GMP manufacturing.

# POP1 Joint Discovery & Research Program

- Our research has produced synthetic versions of the two proenzymes using a novel expression system to achieve high titers of recombinant trypsinogen and chymotrypsinogen.
- Anti-cancer effects to be tested against naturally derived proenzymes of bovine origin.
- Goal to produce crystallized proteins with better stability and a longer shelf life for global distribution.



General structure of Chymotrypsinogen / Chymotrypsin and Trypsinogen / Trypsin represented in ribbon and in color. **A** The structure of Chymotrypsinogen (zymogen) is shown on the left and the structure of Chymotrypsin (active form) on the right. **B** The structure of Trypsinogen (zymogen) is shown on the left and the structure of Trypsin (active form) on the right. The amino acids that make up the active site are shown in green. In the case of the active structures in blue, the interaction between the amino acids Ile-16 and Asp-194 is shown, which are involved in the formation of a salt bridge necessary for the activation of proteins.

# Propanc Innovation & Intellectual Property

- Portfolio consists of 76 patents covering important discoveries regarding proenzymes and their anti-cancer effects.
- Another 2 – 3 patent applications in preparation covering composition of matter & method of use.

Title	Countries	Case Status	Date Filed
A pharmaceutical composition for treating cancer comprising trypsinogen and/or chymotrypsinogen and an active agent...	USA, Canada, Europe, China, Australia, Japan, Indonesia, Malaysia, Israel, New Zealand, Singapore, South Africa, Mexico, Hong Kong, South Korea, India & Brazil	Granted	Oct-22-2010
	USA	Divisional application granted	
Proenzyme composition	Australia, Indonesia, New Zealand & Singapore	Granted	Nov-11-2016
	Europe, Israel,	Allowed	
	Canada, China, India, Japan, Malaysia, South Africa & USA	Under examination	
Cancer Treatment	USA, Singapore, Australia, Japan	Granted	Jan-27-2017
	Canada, China, Europe, Israel, Malaysia, New Zealand & Republic of Korea	Under examination	
Composition of proenzymes for cancer treatment	Japan	Granted	Apr-12-2016
	Australia, China, Europe, Hong Kong & USA	Under examination	

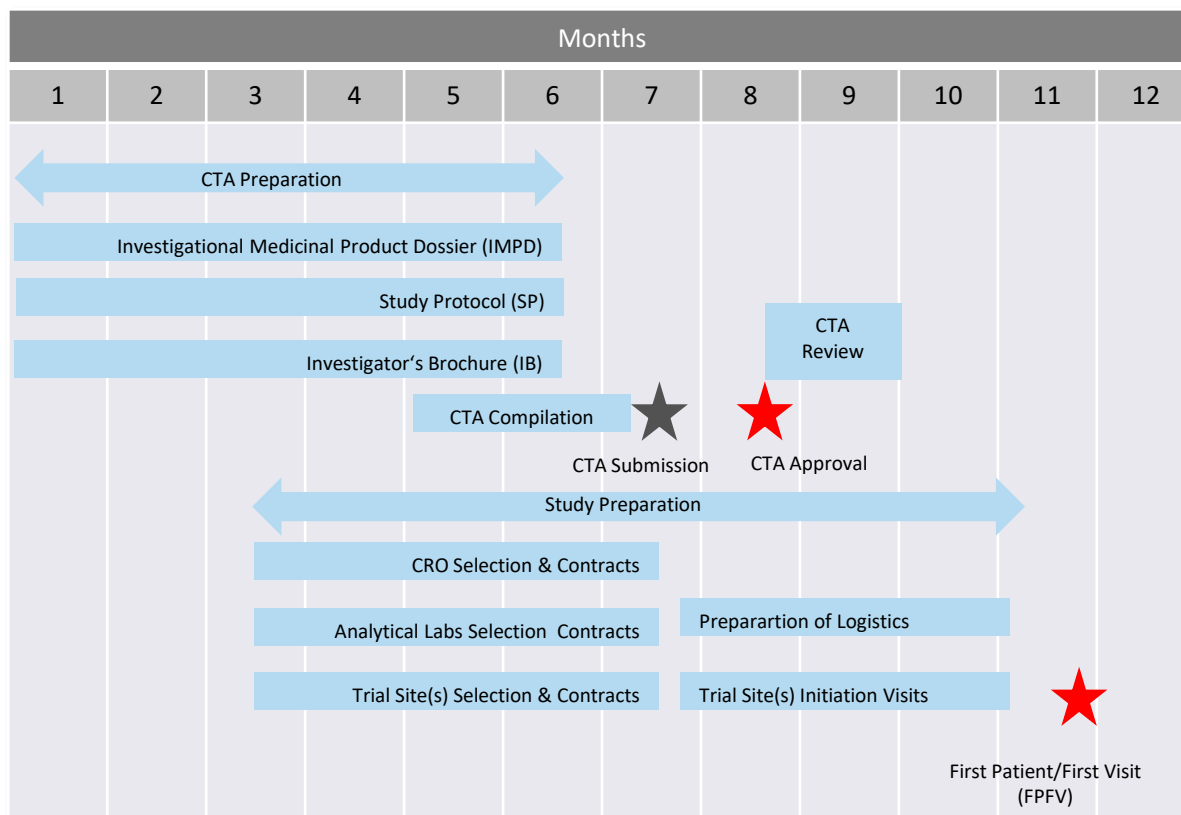


# PRP Well-Positioned to Start First-In Human Study for Solid Tumors

- Scientific advice meetings with MHRA (UK) completed.
- Preclinical pharmacology and safety toxicology studies completed.
- Orphan Drug Designation Status received from the FDA for treatment of pancreatic cancer.
- Planned activities:
  - Preparation for Ph IB, FIH study in advanced cancer patients, solid tumors.
  - Investigational Medicinal Product (IMP) manufacture.
  - Development of bio-analytical assays to quantify PRP in human serum.
  - Follow on discussion with FIH study investigator at **Australia's biggest cancer hospital, Peter Mac Cancer Center.**



# PRP Timelines



# Investment Opportunity

- Seeking \$15M for finished product manufacture & completion of clinical trial Ph I, FIH study, for PRP, ready for Ph II.
- Initiating preclinical testing of Rec-PRP from POP1 drug discovery program.
- Activities associated with Phase I & II clinical trials in AUS to receive 43% R&D tax incentive benefit, incl. OS expenses, if <50% of overall project costs



*CEO & Cofounder, Mr James Nathanielsz, and Lead Scientific Researcher, Professor Macarena Perán*

# Clinical Development Timelines/Costs

- Yr. 1: Phase I, FIH study, 30 – 40 advanced cancer patients, solid tumors
- Yrs. 2 & 3: 2 x Phase II, MTD studies, ~100 patients, pancreatic & ovarian cancers
- **Milestone: Achieve Proof of Concept & poss. Market Authorization in 3 – 4 yrs.**

Duration	Phase I	Phase II	Total
Years:	1.0	2.0	3.0

Cost (US\$M)	Phase I	Phase II	Total
CMC:	4.0*	5.0	9.0
Clinical:	2.5	12.0	14.5
Non Clinical:	-	1.5	1.5
<b>Total:</b>	<b>\$6.5M</b>	<b>\$18.5M</b>	<b>\$25.0</b>

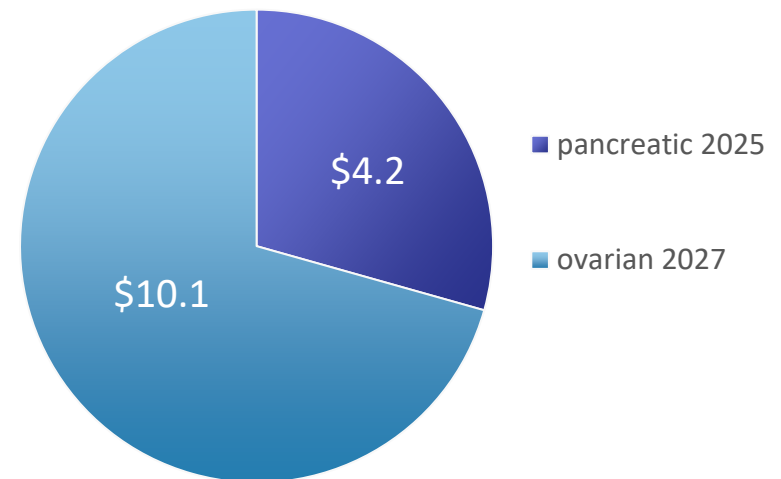
*Required over 3 – 4 yrs. for poss. market approval & licensing in 2 indications.*

\*One off investment of \$3M (max \$6M) for GMP manufacturing of API in exchange for exclusive supply/profit sharing arrangement of raw materials.

# Market Opportunity

- **80% of ALL cancers are solid tumors:**
  - Initially target pancreatic & ovarian tumors.
  - 673,255 global deaths, combined, in 2020 (WHO).
  - Combined market prediction is \$4.2B for pancreatic cancer in 2025 and \$10.1B for ovarian cancer in 2027\*.
  - With a high mortality rate, substantial need for new, clinically proven treatments exists.
  - Seek orphan drug designation protection for niche indications.

Combined Target Markets (\$\$Billions)



Global Market to reach \$111B in 2027 “Emergen Research”

\*Pancreatic and ovarian cancer markets predicted by Grandview Research and iHealthcareAnalyst, respectively



# IP Assets – Pricing Only

## Indications

➤ Pancreatic	➤ Ovarian	➤ Colorectal	➤ Prostate
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## Commercialization

➤ Pancreatic	➤ Ovarian	➤ Colorectal	➤ Prostate
2025	2025	2027	2027

## Risk Adjusted Forecast Revenue (first 5 years of commercialization) – US\$

	➤ Pancreatic	➤ Ovarian	➤ Colorectal	➤ Prostate
Revenue <sup>1</sup>	\$17.0 billion	\$5.0 billion	\$27.0 billion	\$12.0 billion
Risk Adjustment <sup>2</sup>	5.1%			
Risk Adjusted Revenue	\$885.0 million	\$266.0 million	\$1.3 billion	\$595.0 million

## Potential Market Value of IP Assets - US\$ million<sup>3</sup>

	➤ Pancreatic	➤ Ovarian	➤ Colorectal	➤ Prostate
Post-Money <sup>4</sup>	\$33.0 – \$37.0	\$10.0 – \$11.0	\$21.0 - \$24.0	\$9.0 - \$11.0
Financing Required	\$52.0 million			
Pre-Money Valuation of IP Assets Portfolio	<b>\$21.0 - \$31.0 million</b>			

<sup>1</sup> Management forecast.

<sup>2</sup> Represents risk associated with transitioning from Phase I to commercialization. Industry average probability of achieving commercialization.

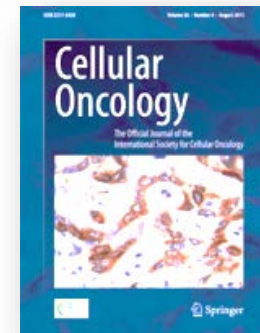
<sup>3</sup> Value indications were independently developed by Evans & Evans, Inc. and are subject to terms, conditions and assumptions outlined in the Report.

<sup>4</sup> Present values at discount rates of 23.0% and 24.0%.

# Joint Scientific Publications

1. *"Antitumor efficacy of chymotrypsinogen and trypsinogen,"* P. Hernández, E. López-Ruiz, M. A. García, J. A. Marchal, J. Kenyon, M. Perán.
2. *"In vitro treatment of carcinoma cell lines with pancreatic (pro)enzymes suppresses the EMT programme and promotes cell differentiation",* M. Perán, J.A. Marchal, M.A. García, J. Kenyon & D. Tosh.
3. *"A formulation of pancreatic proenzymes provides potent anti-tumour efficacy: a pilot study focused on pancreatic and ovarian cancer",* M. Perán, E. López-Ruiz, M. A. García, S. Nadaraia-Hoke, R. Brandt, J. A. Marchal & J. Kenyon.
4. *"Pancreatic proenzymes treatment suppresses BXP-3 pancreatic Cancer Stem Cell subpopulation and impairs tumour engrafting,"* P. Hernández-Camarero, E. López-Ruiz, C. Griñán-Lisón, M.A. García, C. Chocarro-Wrona, J.A. Marchal, J. Kenyon & M. Perán.
5. *"Trypsinogen and Chymotrypsinogen: Potent Anti-Tumour Agents,"* A. González-Titos, P. Hernández-Camarero, S. Barungi, J.A. Marchal, J. Kenyon & M. Perán.
6. *"Blocking Tumor Support from Cancer-Associated Fibroblasts in Tumor Microenvironment,"* M. Belén Toledo Cutillas, J.A. Marchal, M. Perán.

SCIENTIFIC REPORTS





# Thank You!

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