

SmartPR_eP[®]

THE OPTIMAL PLATELET RICH PLASMA COMPOSITION

HARVEST[®]

Developing technologies for **accelerating healing, naturally[®]**

SmartPReP 2: The Gold Standard

Harvest Technologies is the leader in developing point-of-care cellular platforms to isolate and concentrate autologous growth factors, stem cells, and accessory cells that may help optimize conditions for healing. A decade ago, we introduced the SmartPReP® Platelet Concentrate System, making the use of autologous growth factors practical in the hospital and clinic setting for the first time.

The SmartPReP System (and former Symphony® system) has been used in over 1,000,000 procedures to date and counting.

Today, the SmartPReP platform is the gold standard in PRP technology.

- ∴ Delivers the optimal composition of a concentrated platelet product¹
- ∴ Recovers the highest percentage of platelets and corresponding growth factors – up to 80% of available platelets
- ∴ Contains increased concentration of stem cells
- ∴ Generates the greatest level of reproducibility – only a 5% coefficient of variance
- ∴ In the shortest amount of time – 15 minutes or less from start to finish
- ∴ Considered the simplest and easiest system to use



Harvest's mission is to further expand and enhance the use of autologous bioactive cells to help optimize the conditions for healing and improved patient outcomes.

Harvest Technologies

Developing Cellular platforms that may help optimize conditions for healing

Unlocking the Biologic Potential



What is the Optimal Composition of a Concentrated Platelet Product (CPP)?

It has been documented in the literature that effective cellular therapy requires a scaffold for cell migration, progenitor cells which can be converted into bone or soft tissue, and signal proteins to modulate the repair and regeneration process. These key biologic cells are located in the “buffy coat” layer.

The buffy coat is a rich source of cells and proteins that may optimize the conditions for healing, including:

Platelets

- ∴ Mediate cell-to-cell adhesion through the release of various adhesion molecules and growth factors

Growth Factors

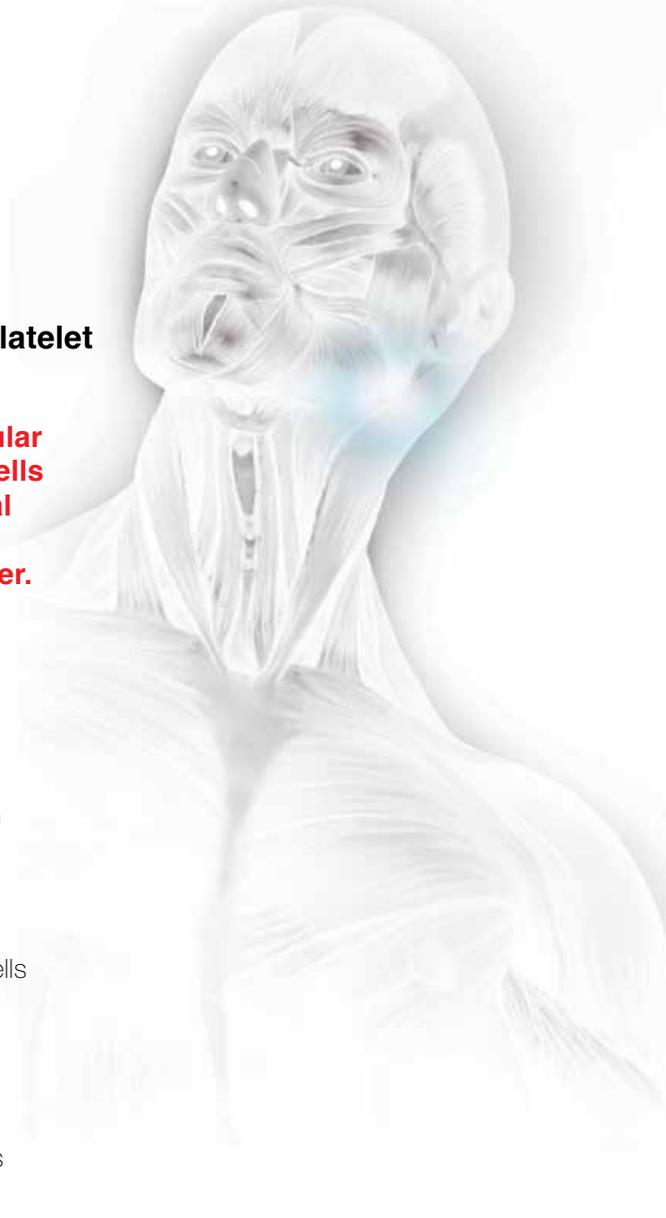
- ∴ Platelet Derived Growth Factors (PDGF): Chemoattractive for stem cells and endothelial cells
- ∴ Transforming Growth Factor Beta (TGF- β): Promotes cell mitosis and differentiation for connective tissue and bone
- ∴ Vascular Endothelial Growth Factors (VEGF): Stimulates angiogenesis and chemoattractive for osteoblasts

White Blood Cells (WBC's)

- ∴ The WBC composition of the Harvest CPP is primarily mononuclear as compared to whole blood which contains primarily granulocytes.¹
- ∴ **CD34⁺** cells as a stem cell marker have been identified in the Harvest concentrated platelet product (CPP)¹

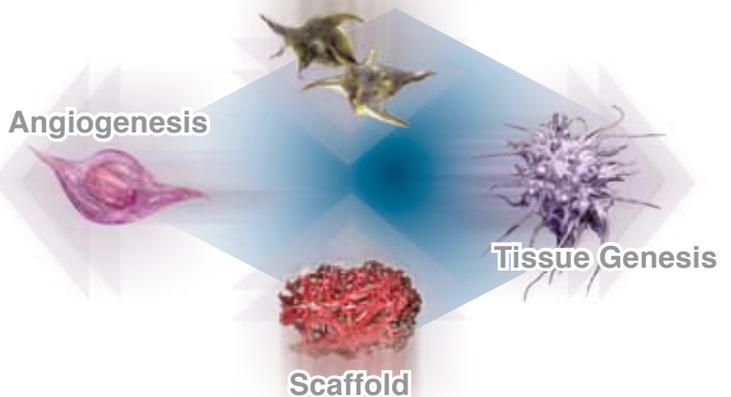
Cytokines and Adhesion Molecules

- ∴ Stromal Derived Factor-1 Alpha (SDF-1 α): Actively modulates migration and homing of stem cells to the wound site



Essential Healing Factors

Signal Proteins





What is the Optimal Platelet Concentration?

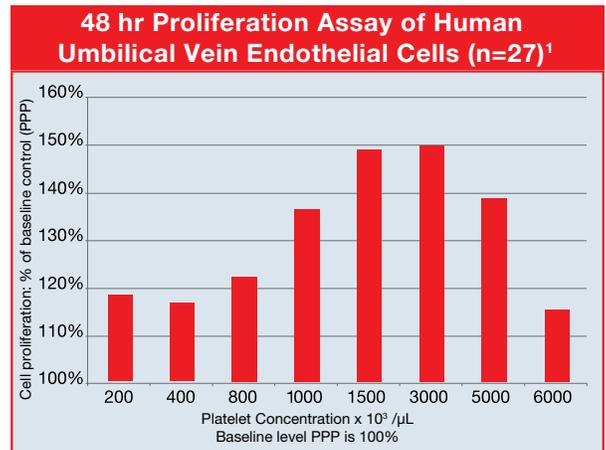
A concentrated platelet product not only accelerates migration of stem cells to the wound site but also stimulates proliferation in the microenvironment.

Physicians recognize that re-establishing blood flow is critical for healing.² Platelets, WBC's, and accessory cells contain critical cytokines such as VEGF which is well known to stimulate angiogenesis and SDF-1 α which actively mobilizes and navigates stem cells to the site of injury.

Recent studies indicate the optimal platelet concentration to stimulate angiogenesis ranged from 1.5 to 3.0 x 10⁶ platelets/ μ L (1.5 million to 3.0 million platelets per microliter).^{1,3}

Furthermore, proliferative assays showed:

- ❖ No PRP device can achieve platelet concentrations that inhibits angiogenesis¹
- ❖ WBC's do not inhibit cell proliferation¹
- ❖ Platelet concentrations less than 500 x 10³/ μ L support proliferation no better than platelet poor plasma (PPP)¹



What is the Value of White Blood Cells?

Some contend that concentrated WBC's may produce an unintended inflammatory response or inhibit cell proliferation. Not true. What most fail to recognize is the importance of the composition of the WBC fraction in the concentrated platelet product.

Unlike other systems, The SmartPRReP's patented separation process produces a WBC composition that contains 50% more mononuclear (lymphocytes and monocytes) cells while reducing the granulocyte cells by 60%.

- ❖ This composition may help optimize conditions for healing.
- ❖ Lower than baseline granulocyte levels limits inflammation while delivering a proportionately greater number of stem cells.
- ❖ More importantly, **CD34⁺** cells are markers for stem cells and these cells reside in the mononuclear fraction.
- ❖ The predominance of mononuclear and CD34⁺ cells found in the SmartPRReP's concentrated platelet product indicates the presence as well as the concentration of stem cells.

In addition to the significant reduction of granulocytes, CPP's have also been shown to significantly suppress inflammation by generating endogenous anti-inflammatory compounds such as lipoxins.^{4,5,6}

SmartPRReP Performance ¹		
	Whole Blood	SmartPRReP PRP
Platelets	250 x 10 ³ μ L	1,500 x 10 ³ μ L
SDF-1 α pg/ml	1,000	2,663
PDGF-AB ng/ml	30	398
TGF- β 1 ng/ml	43	319
VEGF pg/ml	55	600
WBC Count	5.7 x 10 ³ μ L	20.1 x 10 ³ μ L
Mononuclear	37.5%	75.1%
Granulocyte	62.5%	24.5%
CD34 ⁺ (Total Cells Delivered)		171,571 (64% Yld.)



How do Stem Cells find the Wound Site?

Clinically effective concentrated platelet products contain both stem cells and their homing agent.

Migration of stem cells throughout the body requires active navigation, a process called homing. Homing is a multistep process modulated by SDF-1 α .⁷



What about “Closed Systems” and Product Sterility?

Biologic Closed System – “A chemical or biological system that exchanges no matter or energy with the outside environment”⁸

AABB and FDA/CBER Guidelines For Transfusion Therapy

While no system is completely closed, the SmartPReP system was designed to follow AABB guidelines for cell separation.

Instead of using luer connectors that can be easily contaminated and cannot be disinfected, SmartPReP disposables incorporate re-sealable injection ports that can be aseptically disinfected with alcohol prior to needle entry. The SmartPReP 2 is the closest system, to a closed system on the market today.

Sterility Testing

Harvest Technologies went beyond FDA requirements for sterility testing. Prepared with the SmartPReP system, PRP aliquots were incubated, cultured and sub-cultured over 18 days aerobically and anaerobically. All cultures were negative. Harvest Technologies has documented sterility of the concentrated platelet product when following the manufacturer's instructions for use.⁹

All PRP Is Not Created Equal

The technique used for isolating and concentrating platelets has a direct impact on growth factor availability and functionality.¹⁰

Test tube systems, Lab centrifuges and many other so called “PRP” systems fail to achieve the threshold of platelet concentration and white blood cell composition required.

The SmartPReP 2 system consistently and reproducibly generates the optimal platelet concentration that may help optimize the conditions for healing. While no system is fully automated, **SmartPReP is as simple as 1,2,3.**



Draw blood



Concentrate



Deliver

Delivery Options



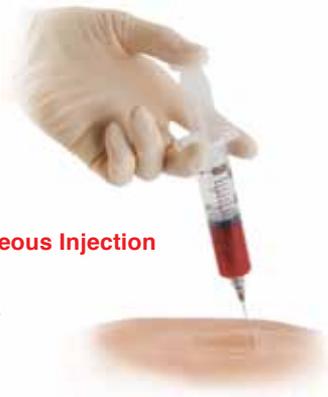
Topical Spray
(SK/S Shown)



Liquid Application
(LK/2 Shown)



Enriched Bone Grafts



Percutaneous Injection



In less than **15 minutes**, 60 mL of peripheral blood provides **10 mL of a concentrated platelet product with the optimal cellular composition and concentration.**

SmartPReP 2: A System You Can Trust to Consistently Deliver

SmartPReP 2

- :: Bullet proof multifunction, point-of-care platform for concentrating autologous cells
- :: More than a decade of proven reliability
- :: One-button operation
- :: 15-minute automated process



APC+® Procedure Packs:

- :: All inclusive procedure packs based on clinical need (APC-60 kit shown above)
- :: Patented floating shelf technology ensures consistency and highest level of reproducibility
- :: Delivers the optimal concentrated platelet product and WBC composition

SmartPReP2 Ordering Information

SMP-2	SmartPReP 2 Platelet Concentrate System 110V-50/60 Hz
WS-2	SmartPReP 2 Workstation
RC-2	SmartPReP 2 Rolling Transport Case
APC-20	APC+ Procedure Pack for SmartPReP 2 Generates 3ml APC+. 6/case.
APC-60	APC+ Procedure Pack for SmartPReP 2 Generates 5-10ml APC+. 3/case.
APC-120	APC+ Procedure Pack for SmartPReP 2 Generates 10-20ml APC+. 2/case.
LK/2	SmartJet® Liquid Applicator Kit Liquid delivery system. 6/case.
SK/S	SmartJet® Spray Applicator Kit Spray delivery system. 6/case.

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- (8) Perry, R., Green, D., *Perry's Chemical Engineers' Handbook*, 7th edition, 1997, 4-3, McGraw-Hill
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- (10) Keyv, et al, Comparison of Methods for Point of Care Preparation of Autologous Platelet Gel, *JECT*, 2004; 36:28-35

**To arrange an evaluation or for more information, call 877.8.HARVEST (toll free)
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