

# The FIBRINET® Wound Matrix



The Fibrinet® Wound Matrix represents an easy and efficient method to harness and concentrate the patient's own platelets and associated growth factors into a Platelet-Rich Fibrin Membrane (PRFM) graft.



◆ Patient  
Centric  
Medicine

◆ Extended  
Release  
Growth  
Factors

◆ Platelet  
Rich  
Fibrin  
Membrane

**The Peak of Innovation in Biologics**

# The FIBRINET® Wound Matrix



## Key Features of the Fibrinet® Wound Matrix:

- The only system that provides intact, concentrated platelets in a platelet-rich fibrin membrane graft without thrombin. *8,9*
- Sustained availability of platelets and associated growth factors out to seven days; ability to proliferate cells in vitro. *8,9,12*
- Easy-to-use, closed system with the highest platelet capture efficiency and reproducibility of all commercially available systems tested. *13*

## EASY, REPRODUCIBLE, AND EFFICIENT PROCESS

The Fibrinet Wound Matrix was designed for safe and rapid preparation of Platelet-Rich Fibrin Membrane (PRFM) and Platelet-Rich Fibrin Gel (PRFG) from a small sample of blood at the patient point of care.

### Separate and Concentrate the Platelets

Step

1

Draw patient's blood into the blood collection tubes and spin in a centrifuge for six minutes. After centrifugation, the concentrated platelets and plasma are separated from the other blood components.

### Produce the Platelet-Rich Fibrin Membrane Graft

Step

2

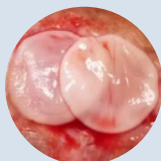
Resuspend the platelets into the plasma; the transfer required volume into the membrane vial and spin in the centrifuge for twenty-five minutes. After centrifugation, the membranes are ready to be delivered to the sterile field.

## Potential Applications

Spine



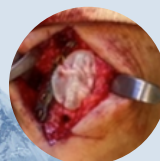
Wound Care



Plastic Surgery



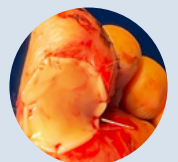
Orthopedics



Tendon Repair



Foot & Ankle



# The FIBRINET® Wound Matrix

## THE FIBRINET® WOUND MATRIX Optimizing Scaffolds, Signals, and Cells

### SCAFFOLD:

Unlike other commercially available systems, the Fibrinet® Wound Matrixes patented process concentrates platelets into a robust fibrin scaffold, allowing Physicians to deliver the platelets and associated growth factors into a defect site without excess exogenous activators (i.e. bovine thrombin). The resulting Platelet-Rich Fibrin Membrane (PRFM) has enhanced mechanical properties with respect to all other similar systems described in the literature.<sup>8</sup> Studies have shown that the modulus and tensile strength of PRFM was 600x the stiffness of conventional fibrin clots, it had comparable mechanical properties to arterial tissue, and was approximately 50% the stiffness of human skin.<sup>8</sup>

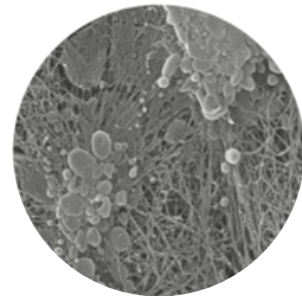
### SIGNALS:

Scanning electron microscopy images showed intact platelets on the fibrin construct and 99.1% of the platelets were present.<sup>8</sup> Other authors have evaluated the percent of viable platelets in the same PRFM structure and demonstrated greater than 50% viability out to seven days.<sup>9</sup> Autologous platelets contain a variety of associated growth factors (signals) that play different roles in the healing process. As these growth factors have a short half-life, the sustained availability of platelets during the healing phase is very important.<sup>11</sup> In three separate characterization studies, associated growth factors from platelets contained in the PRFM were analyzed in culture.<sup>8,9,10</sup> Sen et al. evaluated PDGF-AB, VEGF and TGF-B from the PRFM and the results showed increased concentrations out to seven days. Below is a list of known qualities from the literature of the growth factors tested.

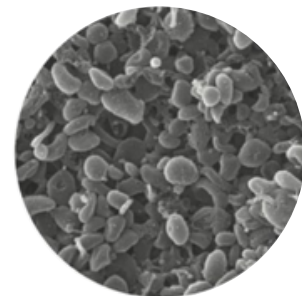
PDGF-A,B	Promotes cell migration (chemotaxis) and growth of mesenchymal stem cells (MSC) and smooth muscle cells to repair site Promotes new blood vessel formation, growth factor release and new matrix formation
VEGF	Stimulates endothelial cell growth, angiogenesis and new blood vessel formation
TGF-B	Promotes cell differentiation, activation and growth inhibition Promotes collagen synthesis

### CELLS:

The sustained availability of concentrated platelets and their associated growth factors in the PRFM is well documented. <sup>9</sup> In vitro studies have also demonstrated the PRFM's ability to proliferate cells in culture. <sup>8,9,12</sup>

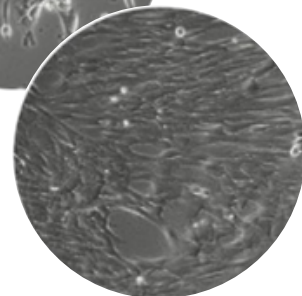
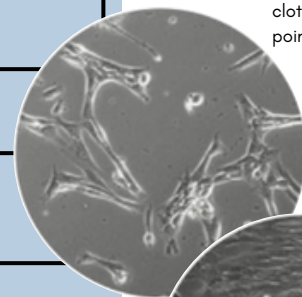


Scanning Electron Micrograph SEM image



SEM image shows clusters of intact viable platelets in the PRFM (HD)

In-vitro, eluent from the membrane consistently induced a significant increase in cell proliferation compared to a standard blood clot at each time point (SA)



## SELECTED BIBLIOGRAPHY

1. Sengupta DK, Truumees E, Patel CK. Outcome of Local Bone Versus Autogenous Iliac Crest Bone Graft in the Instrumented Posterolateral Fusion of the Lumbar Spine. *Spine* 2006; Vol. 31; 9:985-991.
2. Niu CC, Tsai TT, Fu TS. A Comparison of Posterolateral Lumbar Fusion Comparing Autograft, Autogenous Laminectomy Bone With Bone Marrow Aspirate, and Calcium Sulphate With Bone Marrow Aspirate. *Spine* 2009; Vol. 34; 25:2715-2719.
3. Brenner R, Zhang K, Abjornson C, Cammisa FP. Platelet Rich Fibrin Matrix in Posterolateral Lumbar Fusion. *AAOS* 2012.
4. Breceovich A.T., Kiely P., Abjornson C, Cammisa FP. A Retrospective Analysis of Platelet Rich Fibrin Matrix Use in Posterolateral Spine Arthrodesis. *ISASS* 2014.
5. Park JJ, Hershman SH, Kim YH. Updates in the Use of Bone Grafts in the Lumbar Spine. *Bull Hosp Jt Dis.* 2013; 71(1):39-48
6. Han B, Woodell-May J, Ponticello M, Yang Z, Nimni M. The effect of thrombin activation of platelet-rich plasma on demineralized bone matrix osteoconductivity. *J Bone Joint Surg.* 2009; 91:1459-70.
7. DePaula CA, Truncala KG, Gertzman AA, Sunwoo MH, Dunn MG. Effects of hydrogen peroxide cleaning procedures on bone graft osteoinductivity and mechanical properties. *Cell Tissue Bank.* 2005;6:287-298.
8. Lucarelli E, et al. A recently developed bifacial platelet-rich fibrin matrix. *Eur Cells Materials* 2010; 20:13-23.
9. Roy S, Sen CK, et al. Platelet-rich fibrin matrix improves wound angiogenesis via inducing endothelial cell proliferation. *Wound Rep Regen.* 2011;19(6):753-766.
10. Socket Healing Following the Use of Autologous Platelet-Rich Fibrin Matrix (PRFM) to Ridge Preservation Procedures Employing Demineralized Freeze Dried Bone Allograft Material and Membrane, *The Open Dentistry Journal* 2009; Simon BI, Zatzoff AL, Kong JJW and O'Connell SM; Clinical and Histologic Comparison of Extraction.
11. Marx RE: Platelet-rich plasma (PRP): What is PRP and What is not PRP? *Implants Dental* 10:225-228, 2001.
12. Visser LC, Arnoczky SP, Caballero O, et al. Platelet-rich fibrin constructs elute higher concentrations of TGF- $\beta$ 1 and increase tendon cell proliferation over time when compared to blood clots of similar volume: A comparative in vitro analysis. *Vet Surg.* 2010c; 39(7):811-817.
13. Castillo TN, Pouliot MA, Kim HJ, Dragoo JL. Comparison of growth factor and platelet concentration from commercial PRP separation systems. *Am J Sports Med.* ePub Nov 4, 2010.

## ORDERING INFORMATION

Description	Cat. No.
The FIBRINET System Kit	510359
The FIBRINET System Kit – Mini	510358
General Purpose Centrifuge	755VES

401 Hackensack Avenue #604  
Hackensack, NJ 07601

tel: 201.488.1549  
support@royalbiologics.com

[www.royalbiologics.com](http://www.royalbiologics.com)

