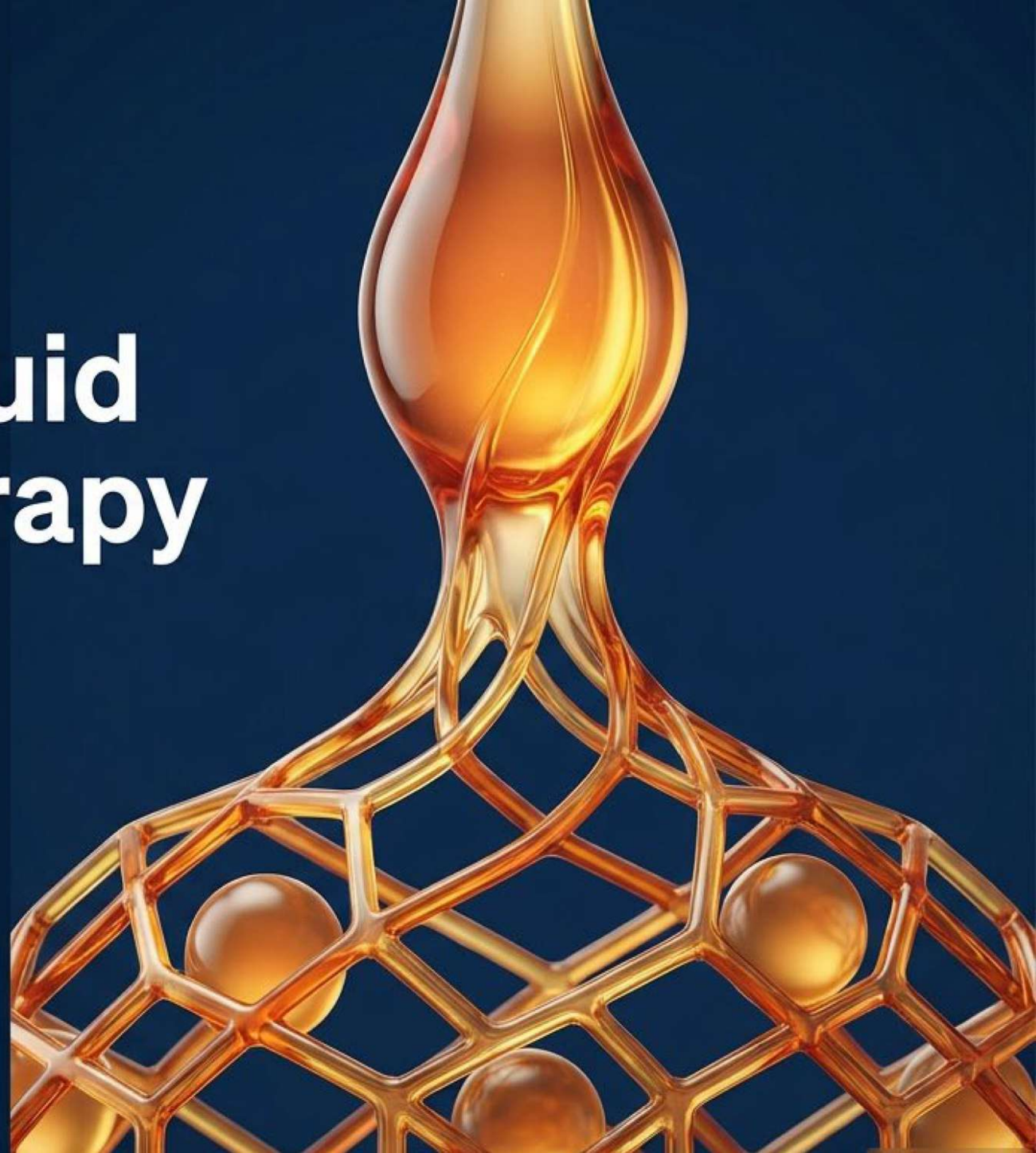
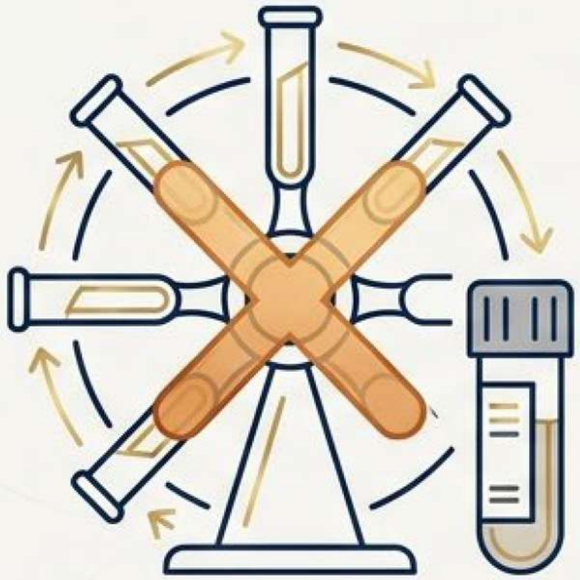
The Next Generation of Fluid Autologous Therapy

Unlocking Sustained Regeneration with Injectable Platelet-Rich Fibrin (i-PRF)



The Evolution

Moving beyond conventional PRP by removing anticoagulants and reducing centrifuge speeds to capture a broader biological profile.

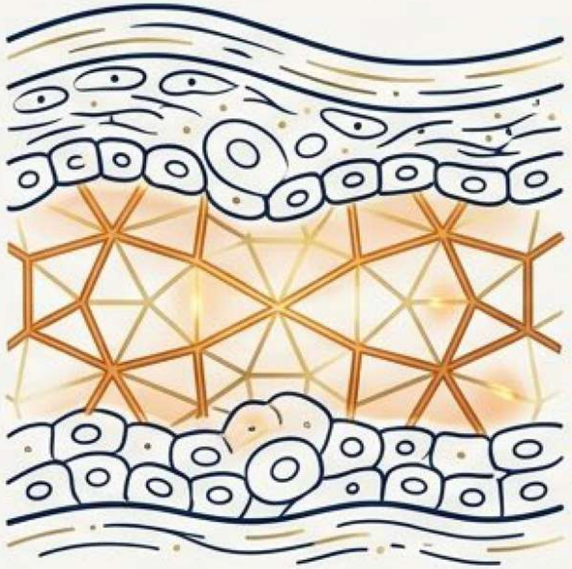


The Advantage

Delivering an in situ 3-in-1 biological scaffold capable of sustained growth factor release for up to 14 days.

The Evidence

Proven tissue repair and marker reduction in recent periodontal regeneration and Acute Kidney Injury (AKI) models

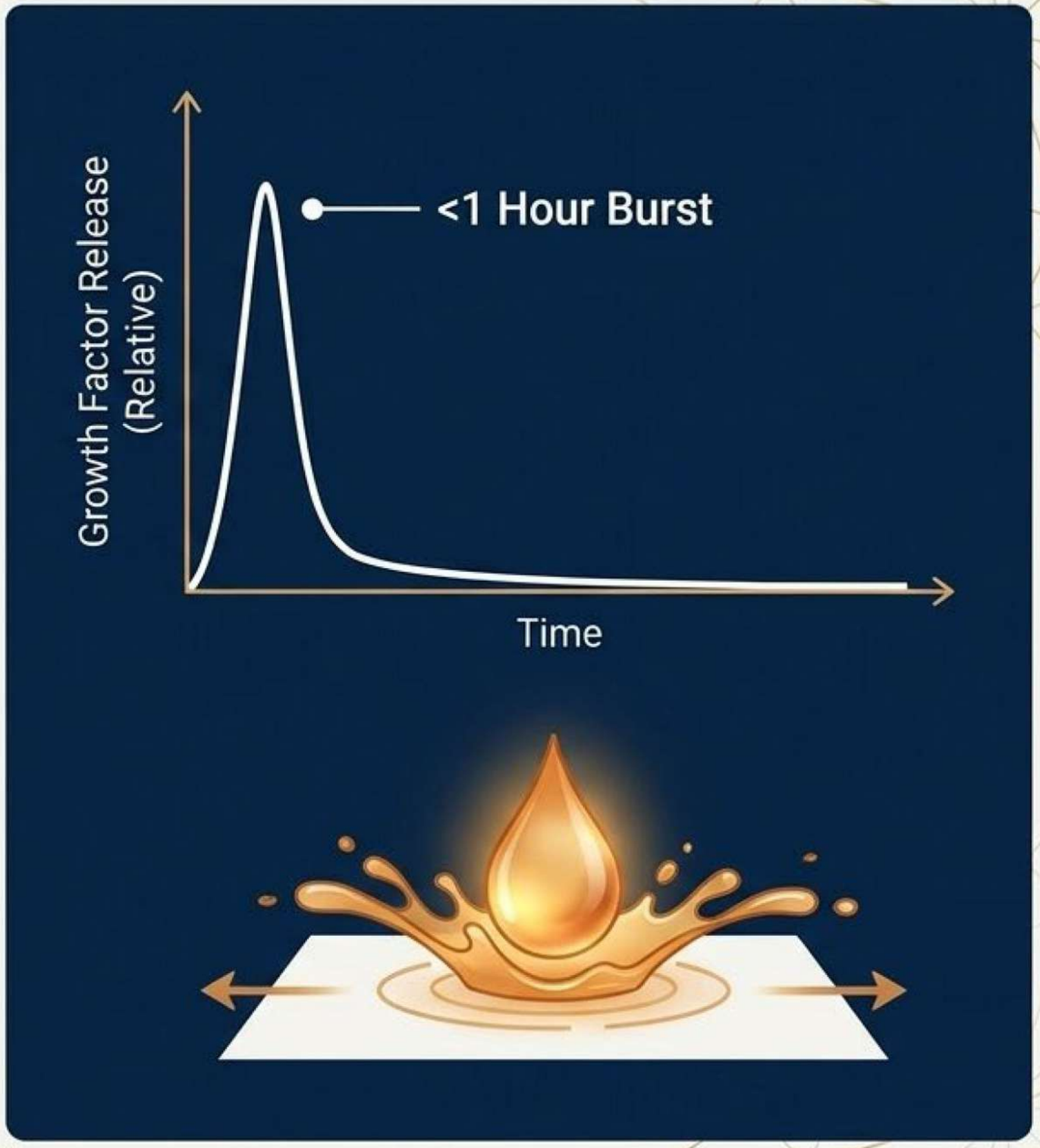


The Status Quo: Structural Limits of Conventional PRP

- **Limit 1: The Burst Release.**
  Because PRP cells break down rapidly, they release their payload of growth factors almost instantly, failing to provide long-term healing signals.

- **Limit 2: Liquid Displacement.**
  As a pure liquid with no scaffold effect, injected PRP easily migrates away from the target tissue site, reducing localized efficacy.

- **Limit 3: Variable Yields.**
  Processing heavily relies on the patient's individual blood state, leading to inconsistent clinical outcomes.



Redefining the Spin: The i-PRF Protocol

Low-Speed Spin
(60G for 3-4 mins)

Whole Blood Draw

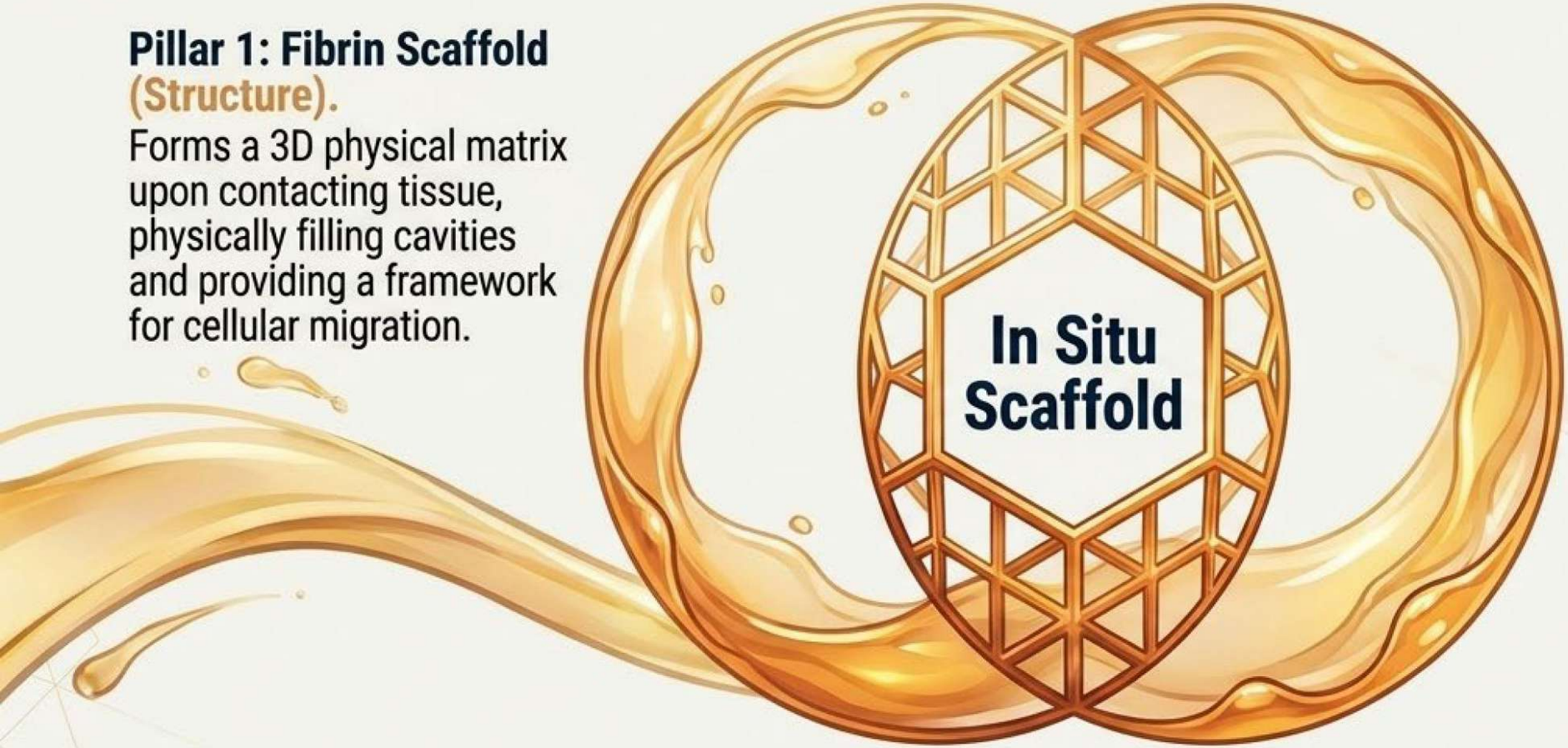
⚠ **Strictly NO Anticoagulants**

i-PRF

By utilizing a specific low-speed concept without chemical anticoagulants, i-PRF captures a significantly wider array of leukocytes and platelets while retaining its natural ability to coagulate after injection.

The 3-in-1 Biomaterial Matrix

Pillar 1: Fibrin Scaffold (Structure).
Forms a 3D physical matrix upon contacting tissue, physically filling cavities and providing a framework for cellular migration.



Pillar 2: Leukocytes & Platelets (Cells).
A dense concentration of autologous cells captured intact due to low-speed centrifugation.

Pillar 3: Growth Factors (Signals).
Trapped within the matrix to orchestrate continuous tissue repair and stem cell recruitment.

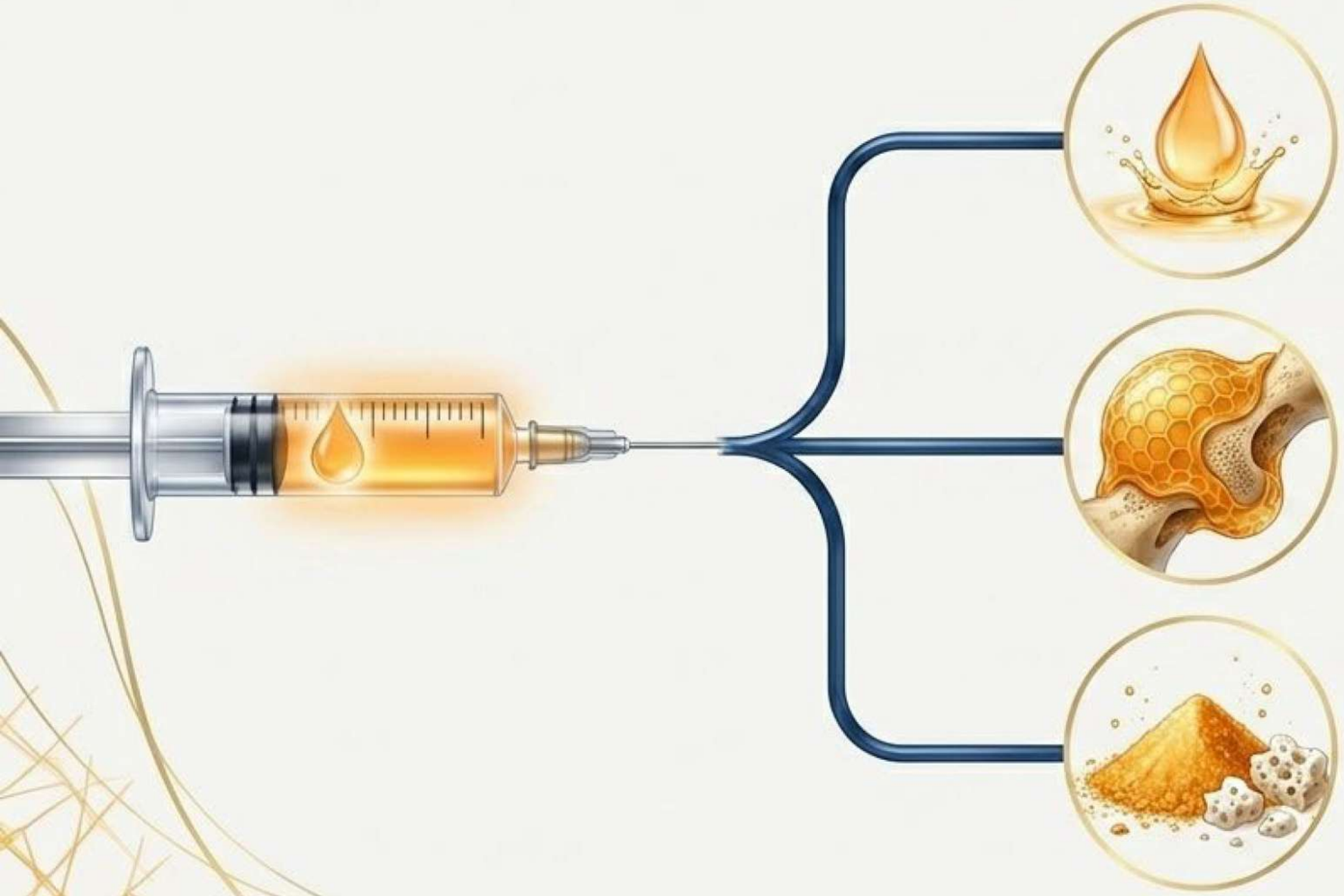
The Generational Shift: PRP vs. i-PRF

	Conventional PRP	i-PRF
Anticoagulant Use	Required	None used
Centrifuge Speed	High-speed (max yield focus)	Low-speed (60G / 3-4 mins)
Physical State Post-Injection	Liquid (migrates)	In situ Scaffold Gel
Release Profile	Burst Release (<1 hour)	Sustained Release (Up to 14 days)
Clinical Handling Window	Highly flexible timeframe	Strict 15-20 min window

Overcoming Burst Release: A 14-Day Signal Plateau

The fibrin mesh acts as a natural time-release capsule. Because low-speed spinning captures more growth factors without immediately destroying the cells, the matrix slowly releases these repair signals as it biodegrades, providing continuous support for tissue remodeling.

Adaptable Form Factors for Complex Surgical Cavities

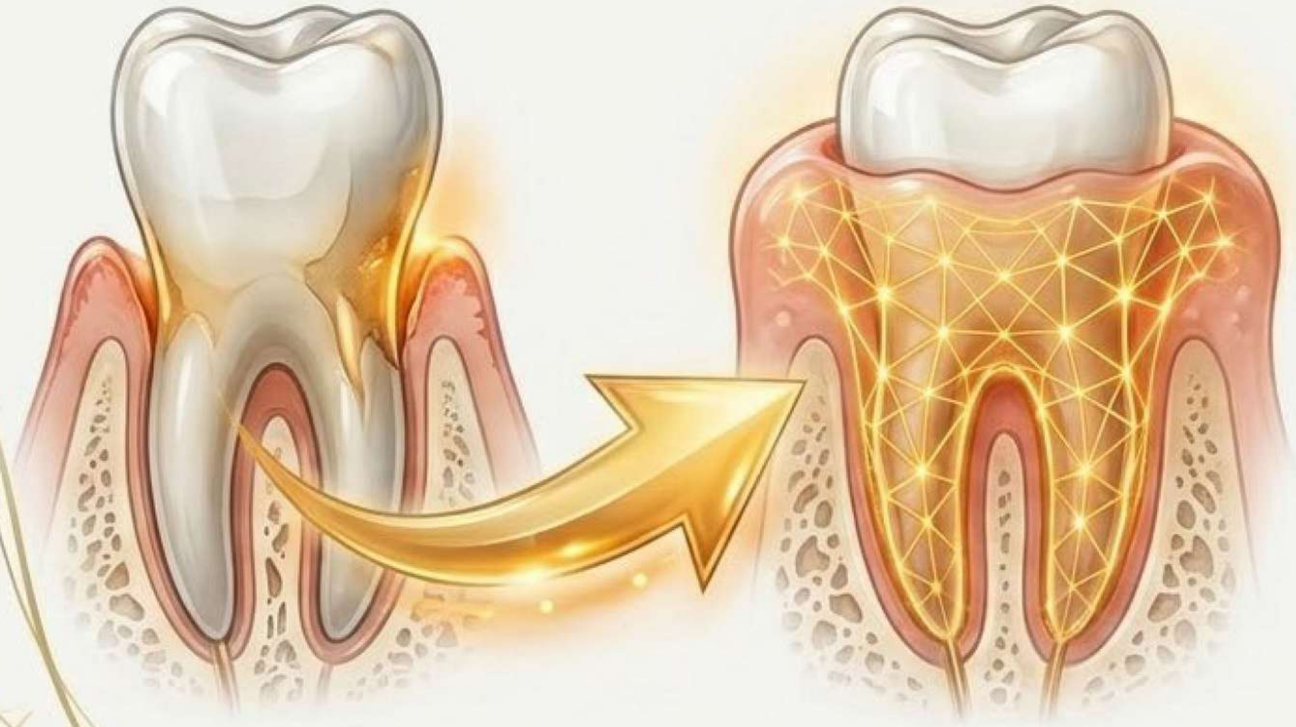


Liquid Injectable: For direct tissue infiltration (e.g., gums, joints).

In Situ Gel: Conforms perfectly to irregular tissue geometries upon coagulation.

Freeze-Dried Powder: The matrix can be lyophilized, ground into a powder, and re-suspended or mixed with bone grafts to create an autologous regenerative putty.

Clinical Evidence I: Periodontal Tissue Regeneration



Before

After

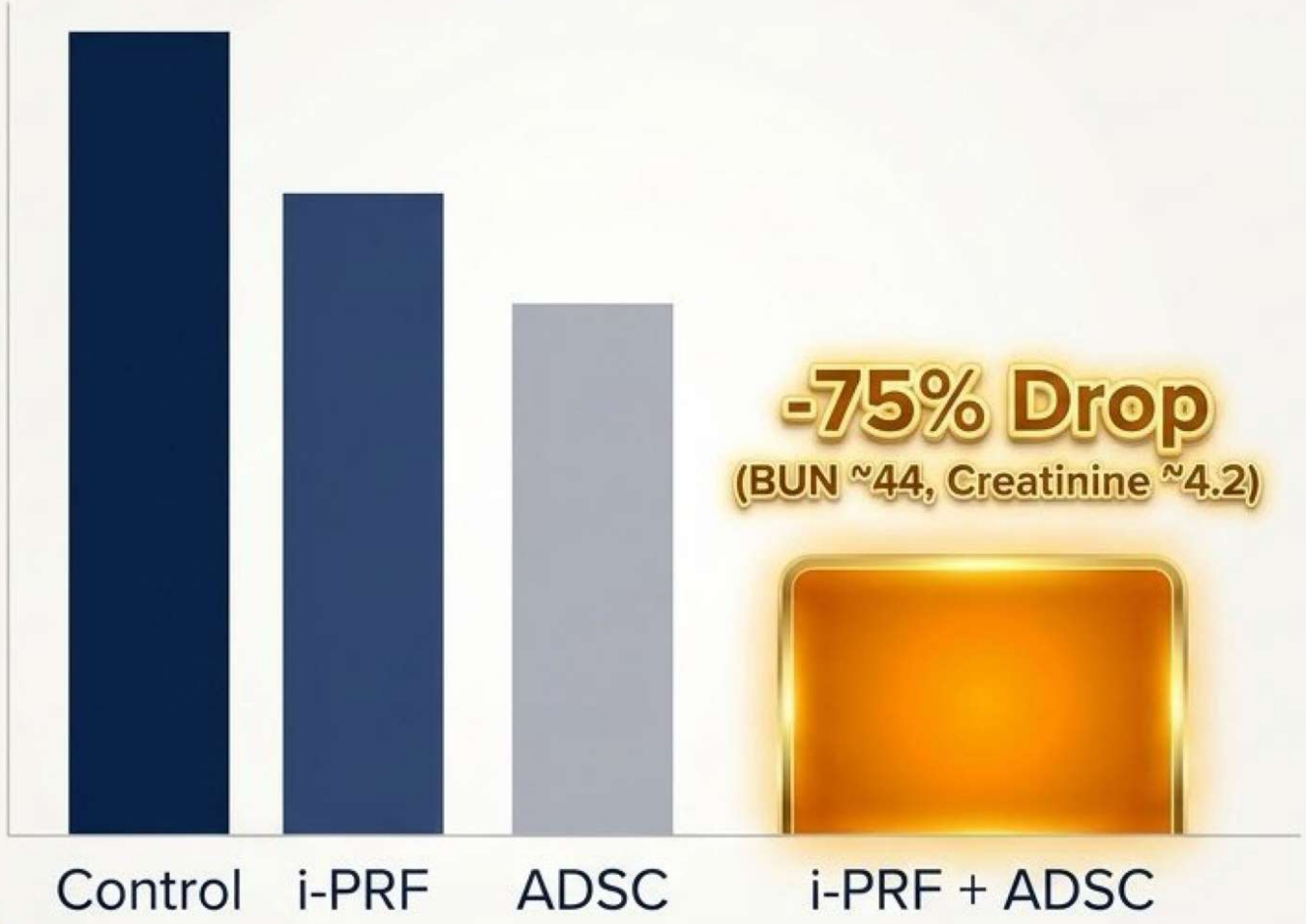
Cohort: 30+ patients.

Protocol: 4 injection sessions, 10 days apart (10-20cc whole blood per draw).

Outcome: Statistically significant increases in gingival thickness observed at both 3 and 6 months.

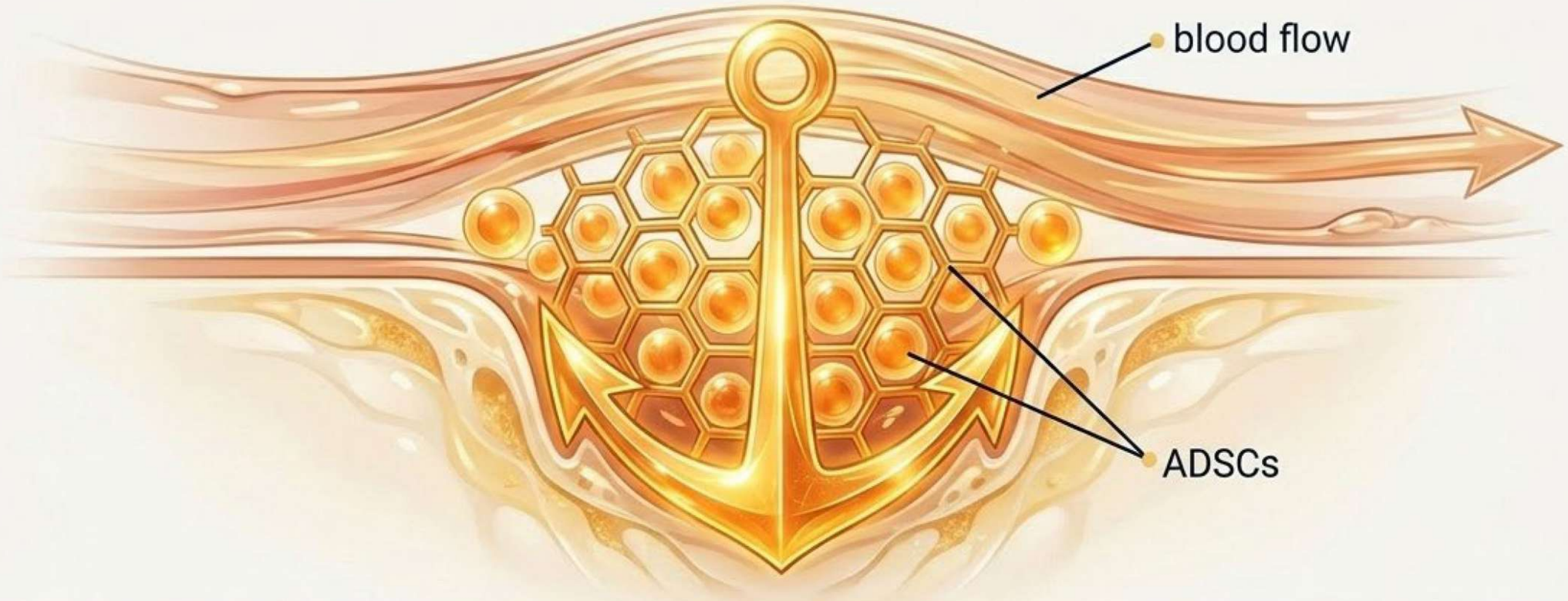
Mechanism: Directly stimulates human gingival fibroblast proliferation and migration.

Pre-Clinical Synergy: Reversing Acute Kidney Injury (AKI)



Timeline Note: Treatments were administered once weekly for 4 weeks. The 75% suppression of injury markers persisted completely through Week 7, proving long-term reparative changes rather than temporary suppression.

The Matrix as a Biological Anchor

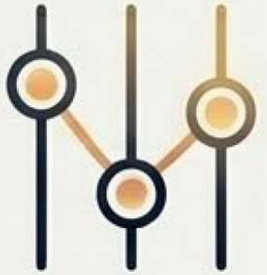


In highly vascularized environments like the kidney, standalone stem cells or liquid PRP are quickly washed away from the injury site. **i-PRF** acts as a localized **biological glue**. By locking ADSCs and regenerative factors exactly where they are injected, it prevents cellular migration and enforces sustained, localized healing.

Operational Realities: The Choreography of i-PRF

The 15-Minute Window

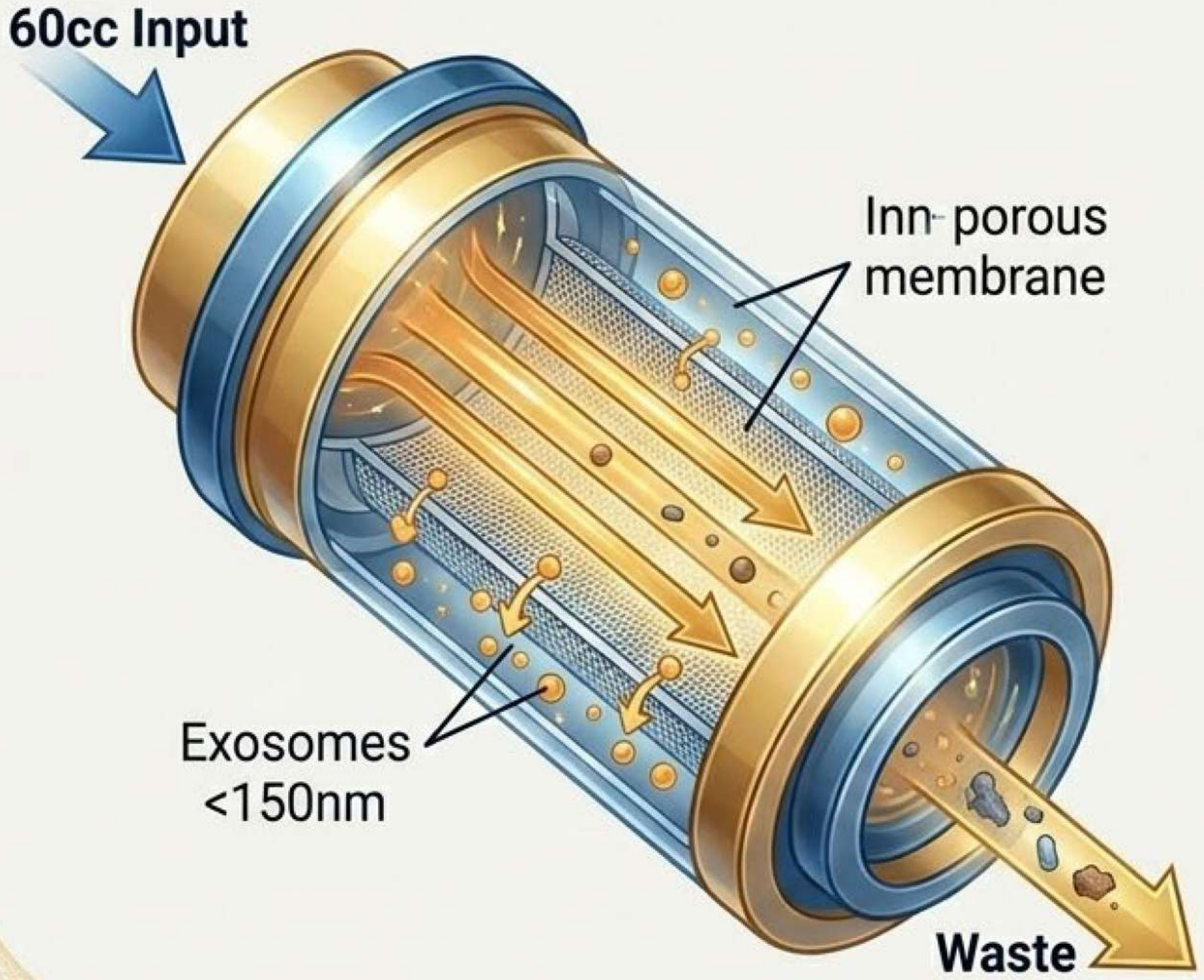
Because the protocol intentionally omits anticoagulants, the biological clock is ticking instantly. Clinicians have a strict 15-20 minute window from the blood draw to the final injection before the i-PRF coagulates inside the preparation tube.



Biological Variability

This is a highly personalized therapy. The quality of the final matrix is heavily influenced by the patient's real-time health, room temperature, and exact centrifuge calibration. It demands tight clinical choreography, not automated administration.

Pipeline Spotlight: Exosome Concentration via Tangential Flow Filtration (TFF)



System: Exosmart TFF Kit

- **Input:** 60cc (Plasma or Whole Blood).
- **Output:** Concentrated down to 25-30cc, then a final yield of 5-7cc.
- **Isolation:** A 15kDa membrane cutoff precisely isolates small therapeutic particles (exosomes <150nm) while washing out unwanted small-molecule waste.


From Ingredients
to Environments.
i-PRF represents a fundamental maturity in regenerative medicine. We are no longer simply flooding an injury with liquid ingredients hoping they stay in place. By utilizing autologous fibrin, we are delivering a complete, personalized biological environment structured for sustained repair.