

5th International Conference on

Tissue Engineering & Regenerative Medicine

September 12-14, 2016 Berlin, Germany

PreImplantation Factor (PIF): Comprehensive neurorepair regimen from newborn to adult

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PIF Premise: Endogenously secreted only by viable embryos, PIF has determining immune-modulatory and transplant acceptance functions throughout pregnancy—a “perfect” regulatory scenario. Synthetic PIF replicates native peptide functions in representative preclinical/clinical non-pregnant setting. Specifically, PIF comprehensively addresses neuro-repair locally and systemically.

PIF Effects: PIF exerts autotrophic effects on native stem cells. In newborn/early pregnancy PIF has neurotrophic/protective effects; the notochord initiates embryogenesis. In prematurity and multi-injury-induced brain damage (HIE), PIF reverses corpus striatum and cortex damage. In adult multiple sclerosis, (EAE) PIF promotes re-myelination while reversing chronic paralysis up-to-total resolution.

PIF Mechanism of Action: Mechanistically, PIF crosses intact BBB targeting brain and spinal cord microglia, neurons and blood vessels. In HIE PIF reduces let-7 microRNA, PKC/PKA phosphorylation while increasing IL10. In adult EAE, PIF regulates brain phosphoproteins and spinal cord proteome to reduce oxidative stress and protein misfolding while promoting Na⁺/K⁺/Ca⁺⁺, glucose and amino acid transport. Thus PIF promotes neuron assembly and synaptic transmission while reducing systemic inflammation. PIF promotes endogenous brain stem cells proliferation and differentiation. The effect of PIF is superior to and potentiates intra-cranially injected stem cells.

Conclusion: PIF is in Fast-Track FDA Phase Ib clinical trial (NCT#02239562). Collectively, PIF high-safety and comprehensive effect on CNS and peripheral nervous system coupled with intimate interaction with endogenous stem cells support PIF's planned phase II clinical trial for neuro-repair.

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