



Competitive Biologics Comparison

	Autograft	Cyclone/Promote	Orthofix Trinity	Orthovita Vitoss	Apatech Actifuse	DePuy Healos	Medtronic rhBMP-2
Graft Type	Autogenic Cells and Autogenic Bone	Autogenic Cells and Allograft Bone	Allograft Cells and Allograft Bone	Synthetic β -TCP	Synthetic β -TCP	Synthetic HA Coated Cross-Linked Collagen	Genetically Engineered Recombinant BMP-2
Live Cells	+	+	+*				
Osteoconductive	+	+	+	+	+	+	
Osteoinductive	+	+	+	\pm **			+
Osteogenic	+	+	+				
Bone Marrow Aspirate		+		+ ***	+ ***	+ ***	
Bone Marrow Aspirate Concentrate		+ ψ					

Notes:

* Cells are harvested and cultured in lab from allogenic sources. This graft is shipped and stored at -70 – 80° C. Additional processing steps to reconstitute cells and graft required prior to implantation. While allogenic MSCs are believed to bypass the T-cell activation of the immune response, they are not autogenic in source.

** Vitoss suggests osteoinductivity through the release of Si, Na, and Ca₂ ions. However, osteoinduction is most commonly associated with extracellular protein cascades (such as bone morphogenic proteins) and the addition of necessary growth factors that directly recruit MSCs to the implantation site.

*** This scaffold can be used with bone marrow aspirate. However, the system does not include concentration of the bone marrow.

ψ The Cyclone and Promote system utilizes concentration of the bone marrow, which literature shows increases the nucleated cell count, which contains the MSCs, by up to 70% while maintaining 90% cell viability (Connolly, 1989). Additionally, concentration of bone marrow aspirate can increase the progenitor cells up to 4-fold higher than that seen in unconcentrated bone marrow (Hernigou, 2005). The Cyclone/Promote system utilizes both *allogenic bone with autogenic cells* and *bone marrow concentrate* to promote healing through the patient's own cells, replacing the need for autograft, which can lead to donor site morbidity and/or necrosis.

