

# Autologous preparations rich in growth factors promote proliferation and induce VEGF and HGF production by human tendon cells in culture

Eduardo Anitua<sup>a</sup>, Isabel Andía<sup>a,\*</sup>, Mikel Sanchez<sup>b</sup>, Juan Azofra<sup>b</sup>,  
M<sup>a</sup> del Mar Zalduendo<sup>a</sup>, María de la Fuente<sup>a</sup>, Paquita Nurden<sup>c</sup>, Alan T. Nurden<sup>c</sup>

<sup>a</sup> *Biotechnology Institute, cl San Antonio 15, 5º, 01005 Vitoria, Spain*

<sup>b</sup> *Unidad de Cirugía Artroscópica “Mikel Sanchez”, cl La Esperanza, Vitoria, Spain*

<sup>c</sup> *IFR4/FR21, Laboratoire d'Hématologie. Hôpital Cardiologique, 33604 Pessac, France*

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## Abstract

Blood platelets become activated and aggregate at the site of vessel injury. Upon activation by thrombin, platelets release storage pools of proteins and growth factors (GFs), including those involved in tissue repair. Our goal was to evaluate the potential beneficial effect of proteins released from platelet-rich clots on tendon healing. PDGF, TGF- $\beta$ -1, IGF-I, HGF, VEGF and EGF were measured in human platelet-poor plasma (PPP) and in the releasates collected from either platelet-poor or platelet-rich clots prepared *in vitro*. We then studied the effects of the releasates on human tendon cells in culture. Releasates from both platelet-rich and platelet-poor clots stimulated tendon cell proliferation, in contrast to un-clotted PPP. The mitogenic activity of the supernatants was not decreased by the thrombin inhibitor, hirudin. Cultured tendon cells synthesise VEGF and HGF in the presence of PPP-clots and PRP-clot releasates, thus the synthesised amount was significantly higher with supernatants from platelet-rich clots than supernatants from a platelet-poor clot ( $p < 0.05$ ). These results suggest that administering autologous platelet-rich clots may be beneficial to the treatment of tendon injuries by inducing cell proliferation and promoting the synthesis of angiogenic factors during the healing process.

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