

**[421] Platelet-Rich Plasma Promotes Cell Proliferation**

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Platelet-rich plasma an concentration of platelets in a small volume of plasma which is considered to be a rich source of autologous growth factors and can be rapidly and easily obtained by centrifugal separation from whole blood. Recently, there has been a great interest in the use of PRP for the treatment of orthopedics-related injuries. PRP contains numerous growth factors and bioactive proteins in the alpha-granules of blood platelet. The multiple growth factors are concentrated in PRP at high levels after centrifugation, hence, PRP obtained from patients can be used as an autologous source of growth factors for various tissue repairs. In the current study, we hypothesized that PRP could be a promising candidate for the ex vivo expansion of myoblasts and fibroblasts and we investigated the effect that PRP had on cell proliferation. Two different protocols were used to prepare PRP. The first protocol produced high platelet and white blood cell concentration (PRPh) and the second method produced a high platelet concentration but was white blood cell free (PRPEHS). C2C12 mouse adherent myoblasts and NIH were cultured in a flat-bottomed 6 well at a cell density of  $2 \times 10^5$  cells/well. The DMEM was supplemented with 0.5, 2 or 10% of FBS. Half and two percent FBS (FBS low) served as the negative control, as this provides enough nourishment to support cell viability but not to stimulate proliferation, and 10% FBS (FBS high) was the positive control because it is known to stimulate cellular proliferation (28). Both PRP preparations were added in 3 different concentration: 0.5, 5 and 50  $\mu$ l. Cells were exposed to each treatment for 48 hours. Growth factors were quantified by ELISA and to determine cell viability the colorimetric MTT metabolic activity assay was used. Application of PRP in NIH and C2C12 culture significantly ( $P \leq 0.05$ ) increased growth factor concentrations compared with controls (cells with 0.5%, 2% or 10% SFB + DMEM) for both cell types and for the following growth factors: TGF $\beta$ 1, EGF, PDGF, HGF, VEGF and IGF. On the other hand no significant difference between the groups with control DMEM + PRP. In C2C12 cells, PRP(h) promotes more proliferation than PRP(EHS) when 0.5 and 2% FBS was used; however, when 10% of FBS was used no difference between PRP preparations was observed. Both PRP preparations promote more proliferation than the CTL groups. In NIH 3T3 cells, no difference between PRP preparations were observed, however, both preparations promote more proliferation than controls with 0.5 and HASP Run-time 2% of FBS. When 10% of FBS was used PRP(h) preparation promoted more proliferation than the control group. Both cells lineages present better proliferation when PRP was added in the culture medium, these results prove the effect the PRP in cell proliferation.

**Keywords:** Cell Therapy - muscle; Cell Processing; Other-[Acute]platelet Rich Plasm

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