

# THE ROLE OF MESENCHYMAL STROMAL CELL DERIVED SECRETOME IN REGULATING MACROPHAGE PHENOTYPE DURING INFLAMMATION

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## INTRODUCTION:

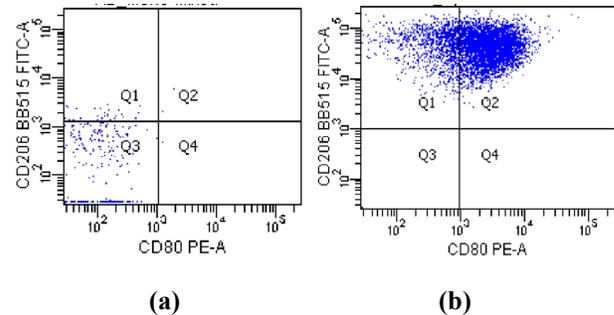
Pro-inflammatory macrophages (M1) are key drivers of chronic inflammation. Such aggravated environment suppresses the function of anti-inflammatory macrophages (M2). Studies have shown mesenchymal stromal cells (MSCs) are able to modulate the M1 macrophages in inflammation into M2 wound healing phenotype<sup>1</sup>. However, whether MSCs derived secretome (MSCs-S), has similar properties to MSCs is yet to be explored. Thus, the MSCs-S can be considered as a cell free therapy to subside inflammation via switching M1 macrophages into M2 phenotype.

## MATERIALS & METHODS:

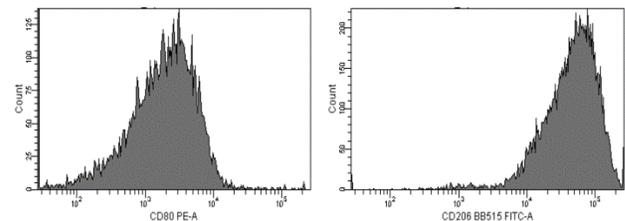
Human bone marrow derived MSCs (N=10) were cultured and its secretome were harvested. MSCs-S were pooled and profiled for its protein content using LCMS/MS QTOF. The MSCs-S was used to treat peripheral blood monocyte derived macrophages. The treated macrophages were harvested upon 24 hours and run through FACs analysis to study the ratio of surface marker present (M1: CD80-PE; M2: CD206-BB515). The ratio of specific gene expression as for TNF $\alpha$ , IFN- $\gamma$ , TGF $\beta$ , IL-4, IL-6 and IL-10 were studied on treated macrophages using qPCR.

## RESULTS & DISCUSSIONS:

The finding shows that addition of anti-inflammatory factor, IL-4 activates monocytes and expresses higher CD206 than CD80, reflecting a M2 macrophage phenotype.



**Figure 1: Surface markers expression in, (a) monocyte before activation and (b) macrophage after activation with IL-4.**



**Figure 2: Median fluorescence intensity (MFI) of CD80 and CD206 on activated macrophage.**

## CONCLUSION:

Thus, MSCs-S which contains the cocktail of immune regulatory factors would be able to switch the monocytes and macrophages in chronic inflammatory microenvironment into anti-inflammatory or wound healing phenotypes. This, aids in alleviating inflammation and restoring tissue homeostasis in inflammatory tissues such synovium in osteoarthritis and many more.

## REFERENCE(S):

1. Driscoll, J., & Patel, T. (2019). The mesenchymal stem cell secretome as an acellular regenerative therapy for liver disease. *J Gastroenterol*, 54(9), 763-773. doi:10.1007/s00535-019-01599-1.