

Poster

Effect of priming on the immunomodulatory response of mesenchymal stem cells (adMSC) with immunogenic synthetic peptides from *Leishmania braziliensis*



Flores Thomas, Ana Paula (1*), Tejado Huaman, Juan Rigoberto (1),
Cahuana Macedo, Gladys Margot (1)

(1) Department of Molecular Biology and Biochemical Engineering, Regeneration of Pancreatic Beta Cell Laboratory. University of Pablo de Olavide, Crta. Utrera Km1, 41013 Seville, Spain

Tutor académico: Tejado Huaman, Juan Rigoberto & Cahuana Macedo, Gladys Margot

Keywords: Mesenchymal stem cells; immunomodulatory potential; immunogenic peptides.

ABSTRACT

Leishmaniasis is a zoonotic disease that causes major public health problems, mainly in tropical or subtropical countries, causing approximately 70,000 deaths per year and currently there is no approved vaccine. Therefore, research into the development of effective therapies that help both the elimination of the parasite and the aesthetic recovery of wounds, through the search for synthetic antigenic systems with immunogenic activity, is nowadays a necessity. Recently, the immunotherapeutic potential of human mesenchymal stem cells (hMSCs) and the secretome and exocytic vesicles they produce when cultured in specific media have been described [1]. It has also been described that they have regenerative and antimicrobial potential and that these effects are enhanced when stimulated with different antigens. The present study aimed to characterize the secretome of hMSCs, treated with synthetic immunogenic peptides from *Leishmania braziliensis*, and to evaluate their immunomodulatory potential. Adipose tissue-derived hMSCs, which were characterized according to international standards [2], were used. For this work, cells at passage eight were exposed to two synthetic immunogenic peptides MSD1 and CBP, designed in silico, from *L. braziliensis* and lipopolysaccharide (LPS) as a positive control. The secretome was collected at 48 and 96h and characterized firstly by measuring the expression of Interleukin 6 (IL-6) by an ELISA method and the expression of cytokines and other proteins using an 80- antibodies targets in a chemiluminescence panel. The results have shown a proinflammatory profile at the level of cytokine expression for the treatments with MSD1, CPB and LPS [3,4]. These were characterized by an increase in the expression of proinflammatory cytokines such as INF- γ , IL-6, IL-16, TNF- α and TNF- β . In summary, the secretome of adipose tissue hMSC pre-treated with synthetic immunogenic peptides from *L. braziliensis* presents differences in the level of cytokine expression with a tendency towards a proinflammatory profile.

REFERENCES

- [1] Sanchez-Castro, E. *et al.* (2021) Mesenchymal Stromal Cell-Based Therapies as Promising Treatments for Muscle Regeneration After Snakebite Envenoming. *Front Immunol.* 11:609961. doi: 10.3389/fimmu.2020.609961.
- [2] Viswanathan, S. *et al.* (2019). Mesenchymal stem versus stromal cells: International Society for Cell & Gene Therapy (ISCT®) Mesenchymal Stromal Cell committee position statement on nomenclature. *Cytotherapy*, 21(10), 1019–1024. doi:10.1016/j.jcyt.2019.08.002

- [3]Khosrowpour, Z. *et al.* (2017) Pretreatment of Mesenchymal Stem Cells With Leishmania major Soluble Antigens Induce Anti-Inflammatory Properties in Mouse Peritoneal Macrophages. *Journal of Cellular Biochemistry*, 118(9), 2764–2779. doi:10.1002/jcb.25926
- [4] Kurte, M. *et al.* (2020) Time-dependent LPS exposure commands MSC immunoplasticity through TLR4 activation leading to opposite therapeutic outcome in EAE. *Stem Cell Research and Therapy*, 11(1). <https://doi.org/10.1186/s13287-020-01840-2>