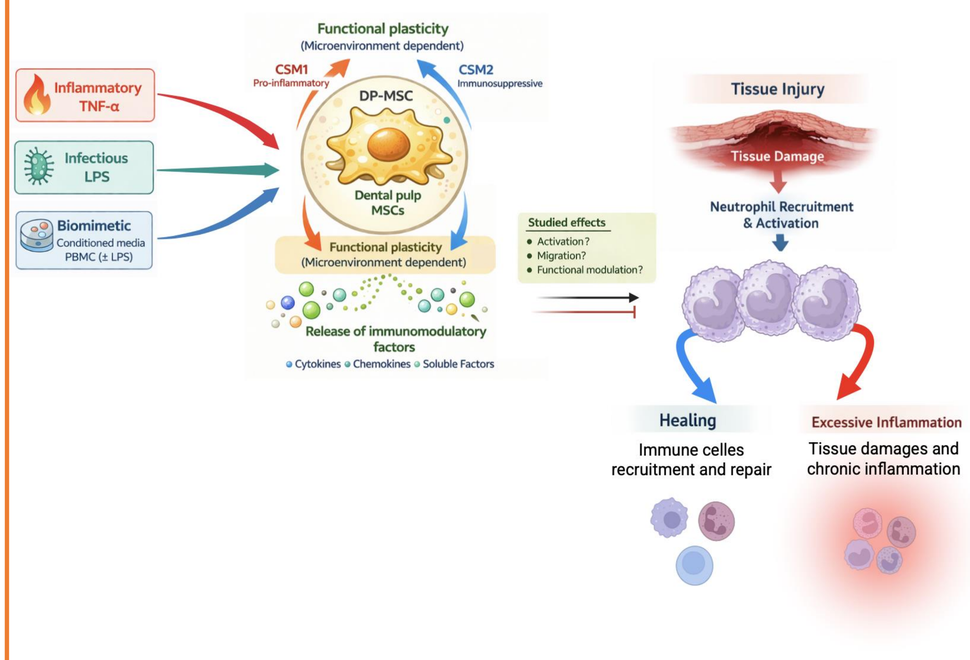
EVALUATION OF THE IMMUNOMODULATORY EFFECTS OF DENTAL PULP MESENCHYMATOUS STEM CELLS ON NEUTROPHILOUS POLYMORPHONUCLEAR CELLS

Flora Lemaire[1,2], Marie Dubus[1], Cédric Mauprivez[1,2,3], Sandra Audonnet[4], Halima Kerdjoudj[1,2]

[1] Université de Reims Champagne Ardenne, EA 4691 Biomatériaux et Inflammation en Site Osseux (BIOS), Reims, France, [2] UFR d'Odontologie, Université de Reims Champagne Ardenne, Reims, France, [3] Pôle Médecine Bucco-Dentaire, Hôpital Maison Blanche, CHU Reims, Reims, France, [4] Université de Reims Champagne-Ardenne, URCACyt, Reims, France.

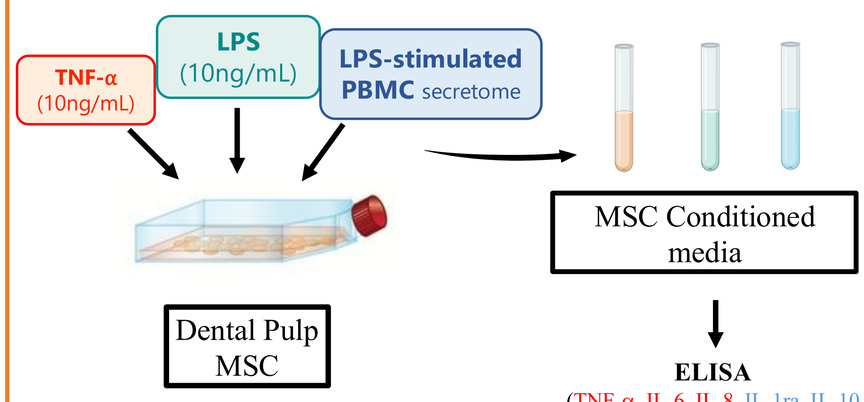
1.Introduction

Study of paracrine activity of MSCs under inflammatory, infectious, and biomimetic conditions, and to assess their effects on neutrophil functions

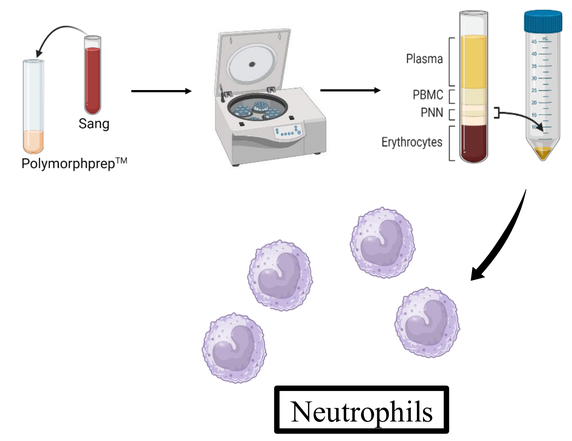


2.Materials et Methods

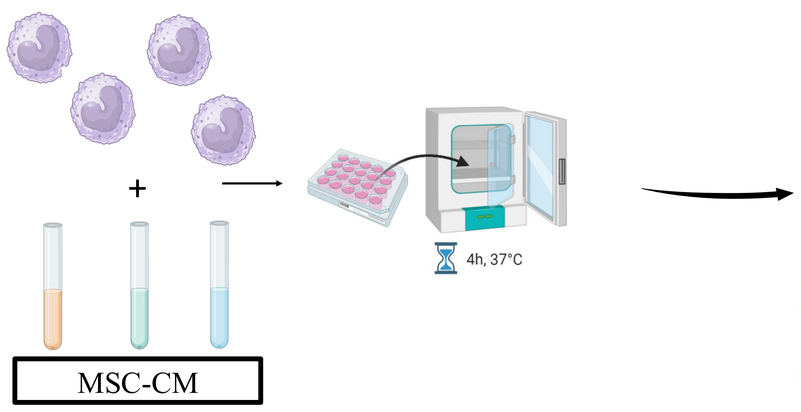
1- Conditioned media production (CM)



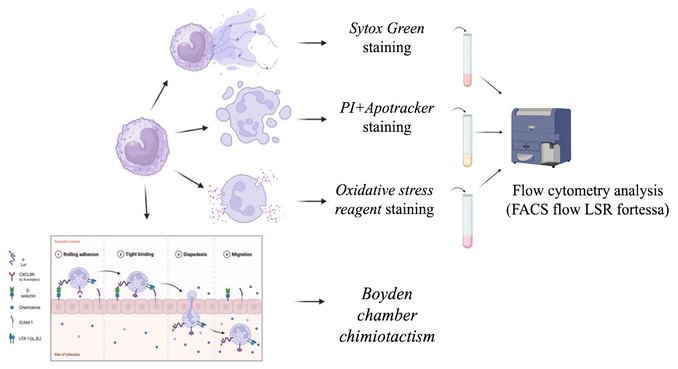
2- Peripheral blood neutrophils isolation



3- Neutrophils activation



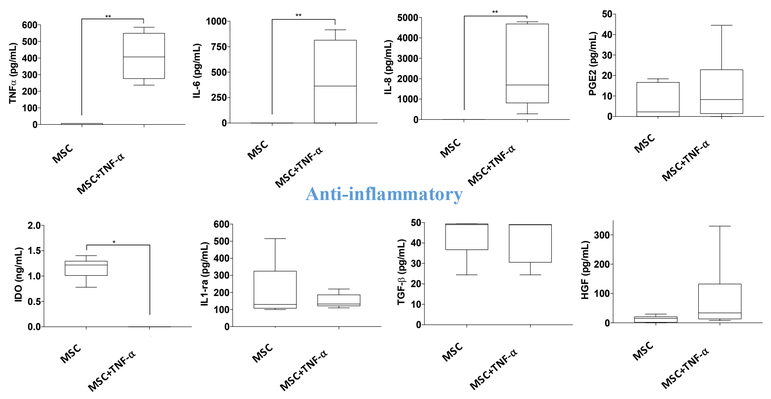
4-DP-MSC immunomodulatory effects evaluation on neutrophils



3. Résultats

Inflammatory context (TNF-α)

a- TNF-α stimulated DP-MSCs paracrine activity (n=6)

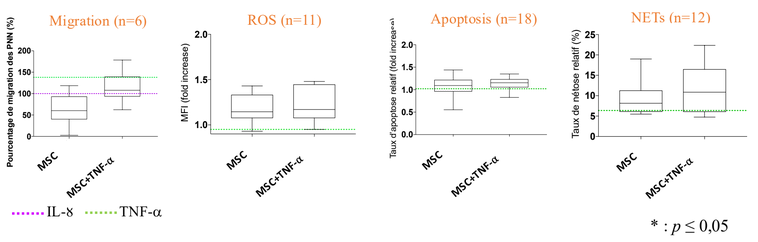


IL-10 was not detected under these conditions

* : $p \leq 0,05$

=> TNF-α-stimulated DP-MSCs adopt a pro-inflammatory MSC-1 profile

b- DP-MSCs secretome effects on neutrophils

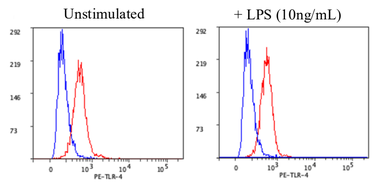


* : $p \leq 0,05$

=> Absence of a paracrine effect of TNF-α-stimulated DP-MSCs on neutrophils migration and activity

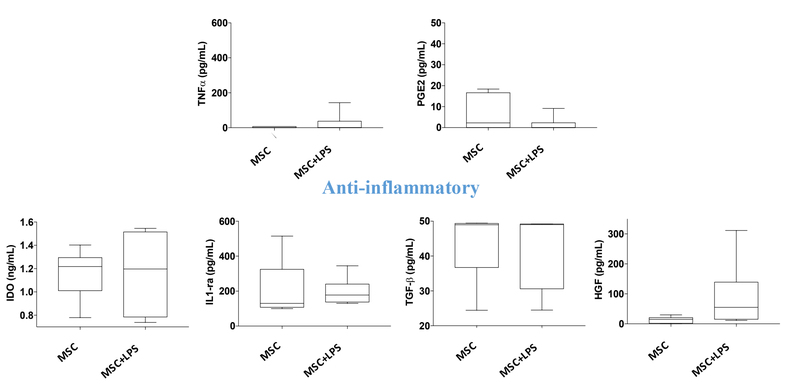
Infectious context (LPS)

a- TLR-4 expression at DP-MSCs surface (n=2)



=> DP-MSCs are not sensible to LPS

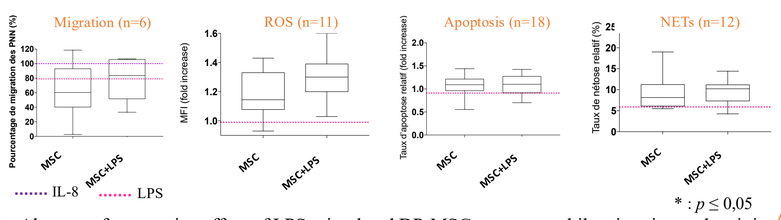
b- LPS- stimulated DP-MSCs paracrine activity (n=6)



=> L'IL-6, l'IL-8 et l'IL-10 were not detected under these conditions * : $p \leq 0,05$

=> No effect of LPS on DP-MSCs polarization

c- DP-MSCs secretome effects on neutrophils

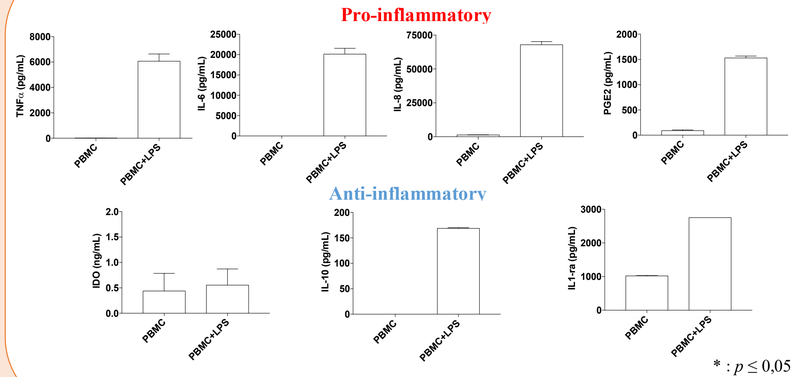


* : $p \leq 0,05$

=> Absence of a paracrine effect of LPS-stimulated DP-MSCs on neutrophils migration and activity

Biomimetic context (CM PBMC+LPS)

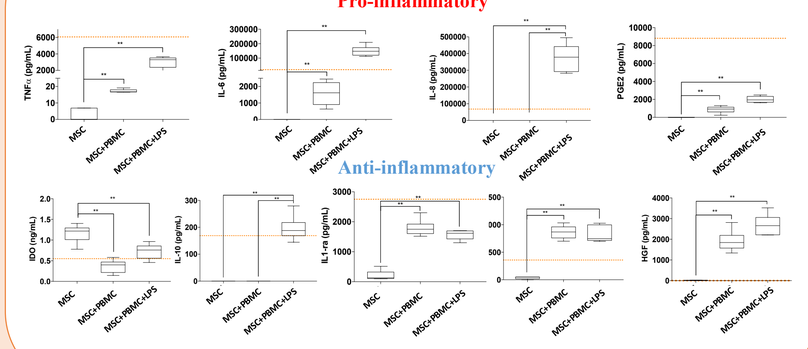
a- Biomimetic medium validation (n=2)



* : $p \leq 0,05$

=> Inflammatory PBMC profile

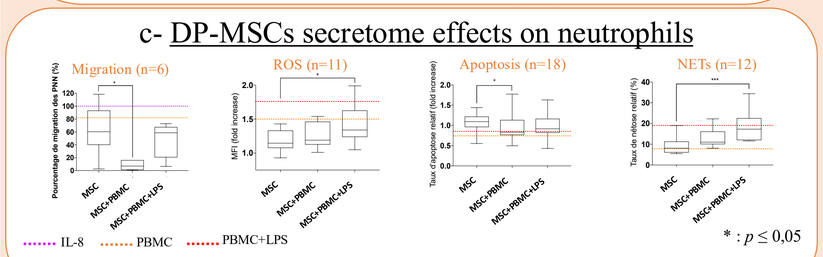
b- PBMC secretome-stimulated DP-MSCs paracrine activity (n=6)



* : $p \leq 0,05$

=> LPS-stimulated PBMC induces DP-MSCs hybrid profile (MSC1/2)

c- DP-MSCs secretome effects on neutrophils



* : $p \leq 0,05$

⇒ Biomimetic medium-stimulated DP-MSCs increase neutrophils ROS production and NETs release

Conclusion

PD-MSCs display context-dependent phenotypes that modulate neutrophil activity, highlighting paracrine effects to investigate in co-cultures and tissue models.