IMMUNOLOGY AT THE CONFLUENCE OF MULTIDISCIPLINARY APPROACHES

ABSTRACT BOOK

Institute for Biological Research "Siniša Stanković" National Institute of Republic of Serbia
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Immunological Society of Serbia

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Poster presentation

MODULATION OF FUNCTIONAL ACTIVITY OF GRANULOCYTES THROUGH PERIODONTAL LIGAMENT MESENCHYMAL STEM CELLS PRIMED WITH PROINFLAMMATORY FACTORS

Tamara Kukolj[1], Ivana Okić Đorđević[1], Mila Pešić[1], Slavko Mojsilović[1], Diana Bugarski[1], Aleksandra Jauković[1]

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Immunomodulatory functions of periodontal ligament stem cells (PD-SCs) in the context of granulocytes (GRA) activity regulation have not been examined so far. Therefore, the aim of this study was to investigate how proinflammatory factors, significant for periodontal disease progression, modulate interactions between PD-SCs and GRA.

As bacterial agents strongly activate innate immunity at the beginning of inflammatory reaction, first we analyzed potential ability of PD-SCs treated with lipopolysaccharide (LPS, *E. Coli*) to attract GRA through endothelial barrier. After 2h of incubation, by using transwell co-culture system, PD-SCs significantly reduced transendothelial migration (TEM) of GRA *in vitro*, while 72h pre-treatment with LPS (1000 ng/ml) did not affect this property of PD-SCs. Along with TEM, we examined the effect of PD-SCs and their conditioned medium (CM) on GRA respiratory burst *in vitro* based on NBT reduction test. We showed that PD-SCs have potential to inhibit respiratory burst of GRA (both stimulated and unstimulated) after direct co-culture, while the effect of proinflammatory factors varied. Namely, no changes of PD-SCs action were detected after LPS (1000 ng/ml) and IL-17 (50 or 100 ng/ml) treatment, while TNF-α (1, 10 or 20 ng/ml) amplified inhibitory functions of PD-SCs. Unlike direct co-culture tests, results related to the effects of CM on GRA (both stimulated and unstimulated) respiratory burst point out the inhibitory action of CM of PD-SCs pre-treated with TNF-α (10 or 20 ng/ml). On the other hand, CM derived from control PD-SCs and PD-SCs treated with IL-17 or LPS did not change GRA activity.

Considering the differences observed in direct co-culture and CM effects, these results indicate the existence of complex mechanisms in PD-SCs/GRA crosstalk. Moreover, the importance of the soluble factors present in microenvironment should be highlighted regarding their contribution in shaping the functional activity of PD-SCs as local regulators in inflammatory process.

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