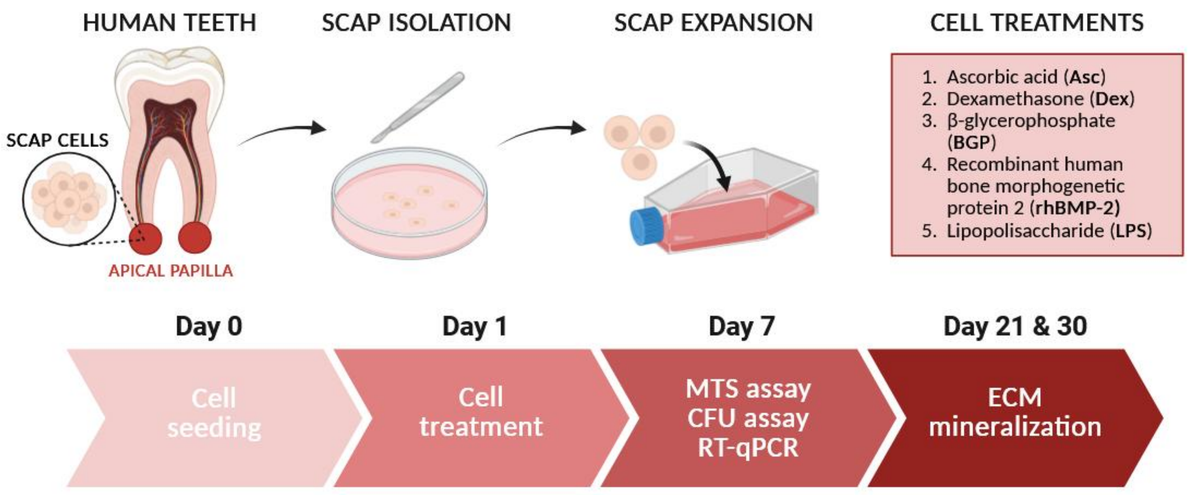
UNVEILING THE IMPACT OF BMP-2 ON SCAPS IN AN LPS-DRIVEN INFLAMMATORY CONTEXT

Lukasz Tytula[1,3], Malgorzata Jamka-Kasprzyk[2], Andrzej Kiencalo[2], Anna M. Osyczka[1]
[1]Jagiellonian University in Kraków, Faculty of Biology, Institute of Zoology and Biomedical Research, Department of Cell Biology and Imaging, Gronostajowa 9, 30-387 Kraków, Poland
[2]Department of Developmental Age Dentistry, Institute of Dentistry Jagiellonian University Medical College, 31-155 Krakow, Poland.
[3]Doctoral School of Exact and Natural Sciences, Jagiellonian University in Kraków, Poland

INTRODUCTION

Stem cells from the apical papilla (SCAPs) are promising cell source in dental tissue engineering due to their high proliferative capacity and potential for osteo-/odontogenic differentiation. Bone morphogenetic protein type 2 (BMP-2) is known to enhance their osteo-/odontogenic differentiation, whereas lipopolysaccharide (LPS), a bacterial endotoxin commonly present in infected root canals, may affect SCAPs proper functioning. Despite growing interest in SCAPs-based tissue regeneration, the impact of LPS-induced inflammatory conditions on their proliferation and differentiation, especially upon BMP-2 stimulation - remains unclear, which this study aims to address.

MATERIALS & METHODS



RESULTS

Cell viability & CFU

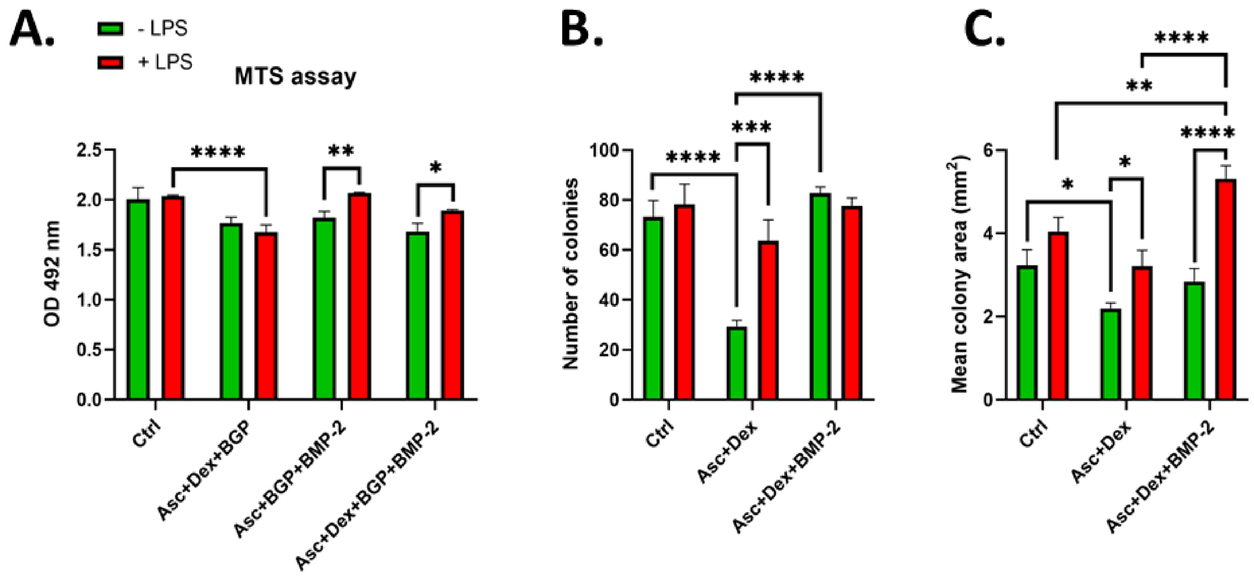


Fig. 1. General characteristics of SCAP culture (A) Viability of cells (MTS assay) after 7-day culture; Number of colonies (B) and their mean area (C) at day 10 culture; SCAPs were cultured in standard cell culture medium ± LPS. Cells were treated with Asc, Dex, BGP and/or rhBMP-2. Results are shown as mean values ± SD. Two-way ANOVA, *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001 relative to selected groups.

Gene expression

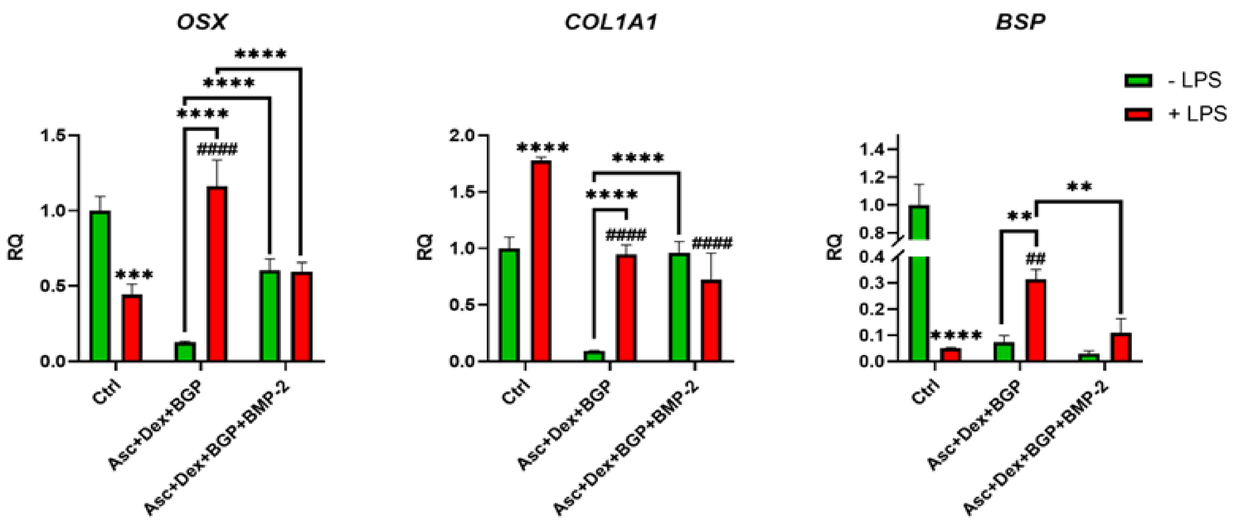


Fig. 2. Gene expression in SCAPs after 7-days culture. (A) Relative mRNA levels of the osteoblast-related genes: osterix *(OSX)*, collagen type I *(COL1A1)* and bone sialoprotein *(BSP)*. SCAPs were cultured in standard cell culture medium ± LPS. Cells were treated with Asc, Dex, BGP and/or rhBMP-2. with and without LPS. Results are shown as mean values ± SD. Two-way ANOVA, *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001 relative to control group without LPS (Ctrl -LPS) or between selected groups and #p<0.05, ##p<0.01, ###p<0.001, ####p<0.0001 relative to control group with LPS (Ctrl +LPS.

ECM mineralization

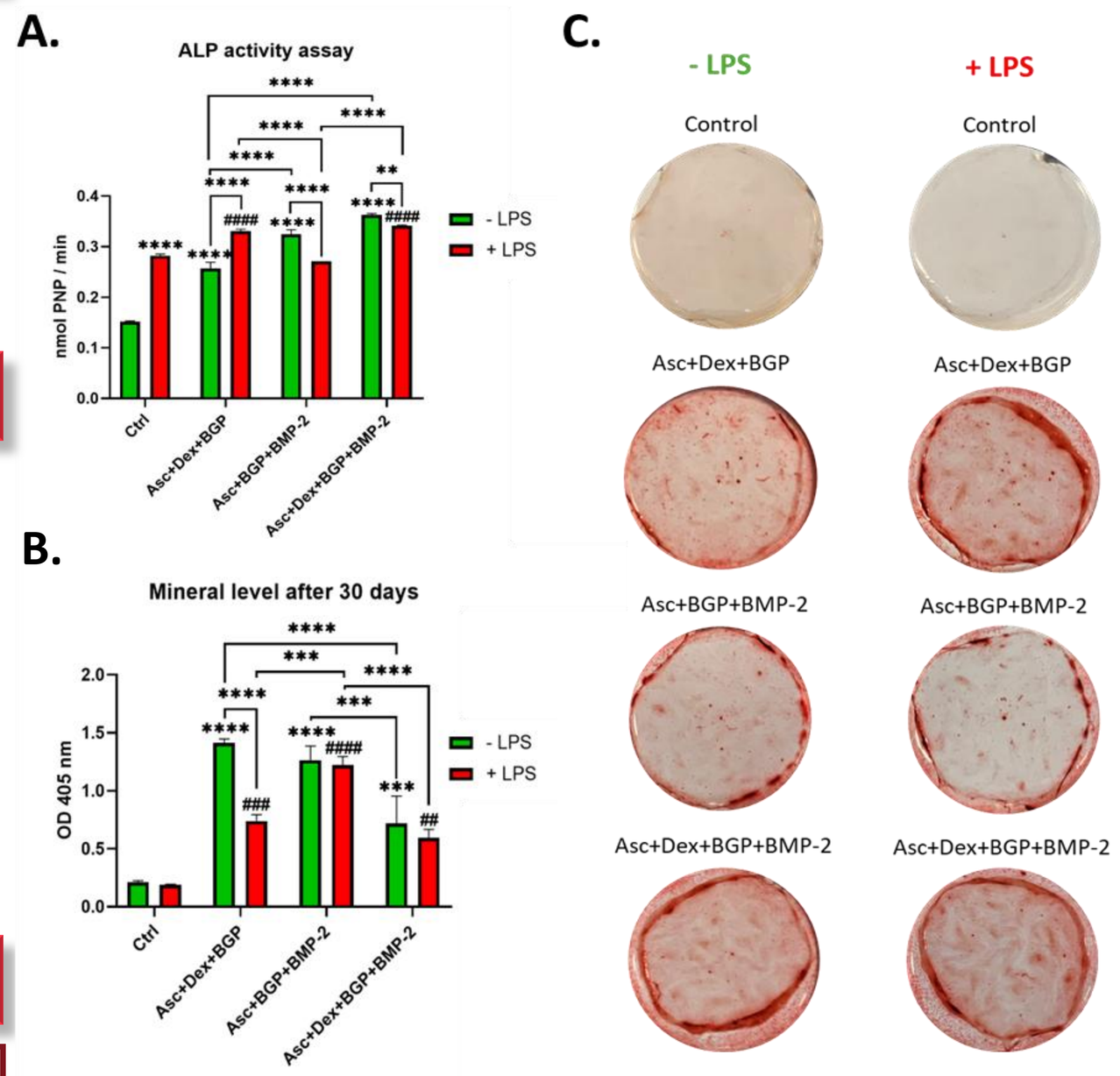
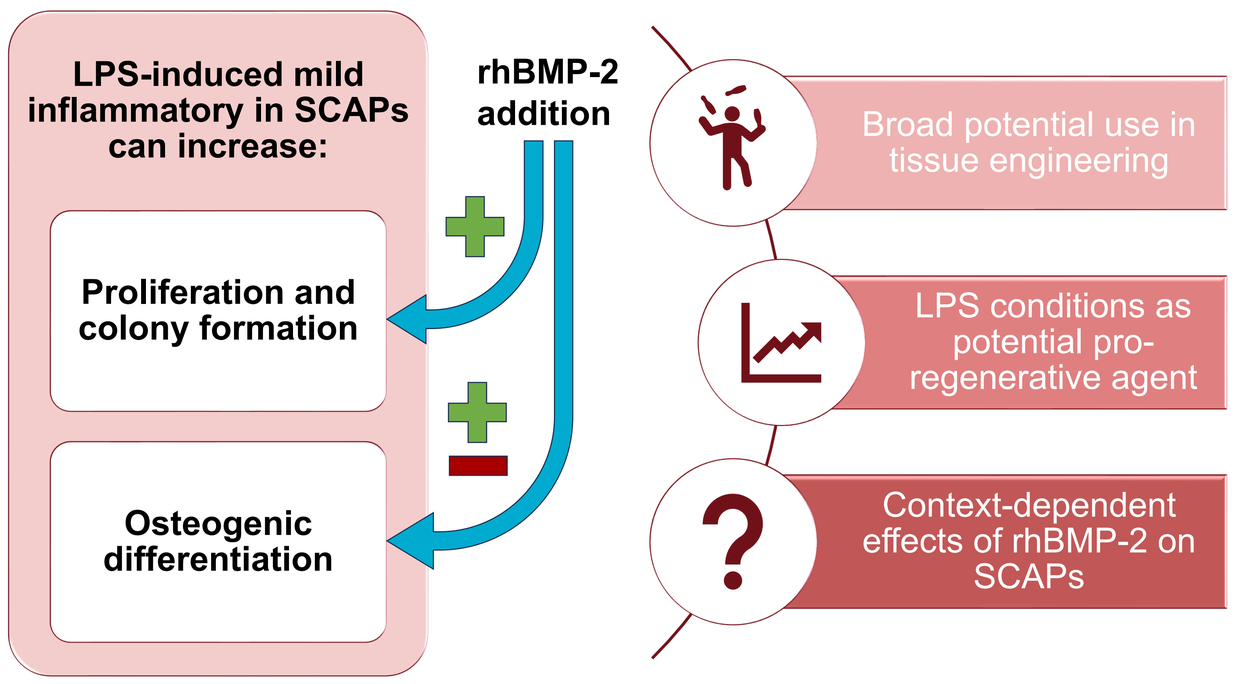


Fig. 3. SCAPs capacity to mineralize extracellular matrix *in vitro*. (A) Alkaline phosphatase (ALP) activity after 7 days of SCAP cell culture. (B) Quantification of extracted Alizarin Red S dye from cells after 30 days. (C) Images after 30 days of whole wells in 6-wells plate. Control SCAP cells cultured in standard cell culture medium ± LPS. Cells were treated with Asc, Dex, BGP and/or rhBMP-2 under standard culture conditions or under inflammatory conditions induced by LPS. Results are shown as mean values ± SD. Two-way ANOVA, *p<0.05, **p<0.01, ***p<0.001, ****p<0.0001 relative to control group without LPS (Ctrl -LPS) or between selected groups and #p<0.05, ##p<0.01, ###p<0.001, ####p<0.0001 relative to control group with LPS (Ctrl +LPS.

CONCLUSIONS & PERSPECTIVES



ACKNOWLEDGEMENTS

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Selected schematics in this poster were created using BioRender.com for academic and conference purposes.