

# A comparative study of the biofunctionality and intercalation capacity of two metal phosphates phases intercalated with antimicrobials.

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**Keywords:** Titanium phosphate, Silver, Zinc, Bactericidal, Cytotoxicity

Nano-layered or platy-like metal phosphates are materials that were investigated since 1950s and led to many established industrial and prospective biotechnological applications owing to their capability of being exfoliated and intercalated with different ions and functional chemical groups [1]. Among these layered metal phosphates are three phases of the titanium phosphate: titanium bis(monohydrogen phosphate) monohydrate,  $\alpha$ -Ti(HPO<sub>4</sub>)<sub>2</sub>·H<sub>2</sub>O ( $\alpha$ -TiP);  $\gamma$ -titanium phosphate,  $\gamma$ -Ti(HPO<sub>4</sub>)<sub>2</sub>·2H<sub>2</sub>O ( $\gamma$ -TiP) and its dehydrated form  $\beta$ -Ti(PO<sub>4</sub>)(H<sub>2</sub>PO<sub>4</sub>).  $\gamma$ -TiP is considered as an analogue to  $\alpha$ -TiP, with larger interlayer spacing since it comprises two interlayer water molecules instead of the one of  $\alpha$ -TiP. Recently we showed the competence of  $\alpha$ -TiP compared to its zirconium counterpart ( $\alpha$ -ZrP) and how it encountered higher intercalation capacity combined with a better cytocompatibility when intercalated with silver ions [2]. In this communication we report another study in which we compare the capabilities of  $\alpha$ -TiP to  $\gamma$ -TiP in terms of their intercalation capacity to silver and zinc as two well established ions in the context of their antimicrobial effects [3]. The communication includes the structural aspects together with the microbiological assays required to define the intercalation capacity, the cytocompatibility and antimicrobial activities, respectively.

[1] Amghouz, Z., Garcia, J. R., & Adawy, A. (2022). *Eng*, **3**, 161.

[2] Garcia, I., Trobajo, C., Amghouz, Z., & Adawy, A. (2021). *Materials*, **14**, 1481.

[3] Adawy, A. & Diaz, R. (2022). *ACS Appl. Bio Materials*, **5**, 1648.