# PREPARATION OF "THIOL-ENE" UV CURED BIODEGRADABLE POLYCARBONATE COATING ON BIOABSORBABLE MG ALLOYS

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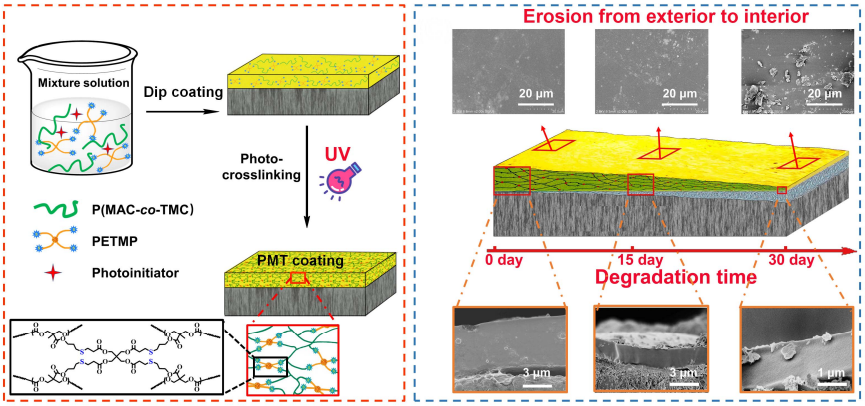
Medical magnesium and its alloy, as revolutionary biomaterials, have been widely applied in fabricating bioabsorbable implants. However, their rapid corrosion rate and potential local toxicity remain a challenge. [1] UV cured "thiol-ene" biodegradable coating provide a flexible and effective tool to provides excellent corrosion resistance to the Mg substrate, since its uniform network improves the barrier performance and meanwhile, maintains degradation property [2]. Herein, "thiol-ene" UV cured coatings with excellent mechanical properties, unique surface erosion mechanism and suitable biocompatibility for enhancement of corrosion control and cytocompatibility of Mg substrate was exploited (Scheme 1). The biodegradable polycarbonate, [P(MAC-*co*-TMC), PMT], was first synthesized. The PMT copolymer, PETMP and Irgacure 2959 were then applied on AZ31 Mg alloy. After 365 nm UV light irradiation, the coating networks were obtained. The electrochemical test, *in vitro* degradation test and the *in vitro* cell experiment were conducted to assess the coating performance. The results indicated that Mg substrates modified by UV cured coatings showed uniform degradation, better *in vitro* corrosion resistance, and much lower cytotoxicity, than those of bare Mg alloy. In conclusion, the biodegradable UV cured PMT coatings might be promising to improve the safety and success rate of Mg-based devices and implants.




Scheme 1. Schematic illustration of the preparation of UV cured PMT coating on Mg alloy.

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[1] Kiani. F.; Wen C.; Li Y. *Acta Biomaterialia*, **2020**, *103*, 1-23.

[2] Bertlein, S.; Brown, G.; Lim, K. S.; Jungst, T.; Boeck, T.; Blunk, T.; Tessmar, J.; Hooper, G. J.; Woodfield, T. B. F.; Groll, J. *Adv Mater*. **2017**, *29* (44), 1703404.