

# Preparation and characterization of poly(2-methoxyethyl acrylate)/Nano-hydroxyapatite/ZnO nanocomposite coating for reducing bio-leaching and bio-film formation in SS316L orthopaedic implants



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## Name of the Funding Agency

Indian Council of Medical Research  
(ICMR)

## Name of the Scheme

Ad-hoc

## Sanctioned Amount (in Rupees)

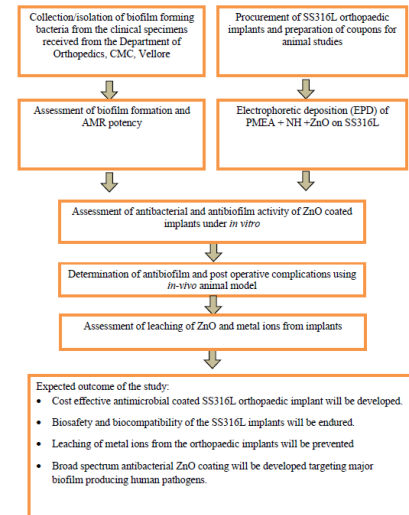
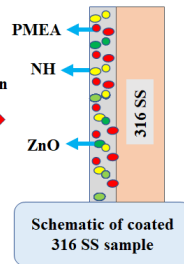
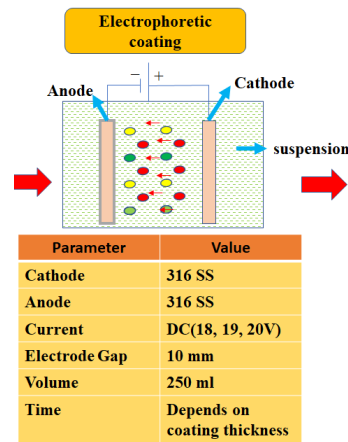
Rs. 61,46,546

## Duration of the Project (years)

3

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## Graphic Abstract / Layout



## Project Description

Microbial infections and biofilm formation are major complications in the orthopaedic implants. This remains the main reason for failure of treatment in implant-related infections. Another issue is leaching of metal ions from the implants, which leads to the adverse effect in patients. The implants act as the substrate for bacterial attachment and biofilm formation, which allows development of anti-biotic resistance among the infectious bacteria. To overcome these drawbacks, we need to choose a proper nanocomposite material that could save the material from leaching and prevent biofilm formation. Hence, we intended to prepare the zinc oxide integrated Nano-hydroxyapatite/poly(2-methoxyethyl acrylate) (PMEA) coating on SS316L orthopaedic implants. The antimicrobial Multi implant, ZnO is integrated with Nano-hydroxyapatite/poly(2-methoxyethyl acrylate) (PMEA) coating could be capable of producing a low wettability (Contact angle  $> 150^\circ$ ), which will reduce the adherence of bacteria and biomolecules on the surface of the implants.