

1. Title

Development of bio-ceramic composite coated implants for Bone cancer applications.

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2. Area of research and Domine of research

Material chemistry & Biomaterials

3. Objective of the proposal

- In our current work, we have developed a novel method for addressing bone cancer. Our approach involves the bio-composites, which effectively target and replace bone cancer cells within the affected tissues.
- These hydroxyapatite composite enhanced the biological properties.
- It facilitates tissue regeneration processes. It contributing to improved healing outcomes and long-term biocompatibility and hydroxyapatite can help prevent bacterial colonization and infection at the implantation site.
- Fabricated hybrid particles were used in hypothermia treatment for killing of site-specific bone cancer cells.

4. Background/short description

1. Our main objective of the work is to achieve highly corrosive resistant implants surfaces coated with bio-ceramic materials to improve the bio-regeneration process which enhances the speed of bone healing.
2. We planned to improve the service life of the implanted biomaterials which reduce the pain and complications faced by the patients.
3. We planned adopt an *in-situ* deposition process to deposit the bio-ceramic material on the metallic implant surface with higher adhesion strength.

4. This method is a simple one step new methodology process utilized to develop smart implants.

5. Expected results

Fabrication of a novel implant with multi-functional properties for bone tissue applications with extended service life with good mechanical support for the patients to restore the daily functions in normal ways.

6. References

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3. Ahmadabadi, H. Y., Yu, K. and Kizhakkedathu, J. N. (2020) 'Surface modification approaches for prevention of implant associated infections', *Colloids and Surfaces B: Biointerfaces* 193, 111116.
4. Arul Xavier Stango, S. and Vijayalakshmi, U. (2018) 'Electrochemically grown functionalized -Multi-walled carbon nanotubes/hydroxyapatite hybrids on surgical grade 316L SS with enhanced corrosion resistance and bioactivity', *Colloids and Surfaces B: Biointerfaces* 171, 186–196.