श्री चित्रा तिरुनाल आयुर्विज्ञान और प्रौद्योगिकी संस्थान, त्रिवेंद्रम, तिरुवनन्तपुरम - 695 011, केरल, भारत
SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY, TRIVANDRUM
THIRUVANANTHAPURAM - 695 011, KERALA, INDIA
(एक राष्ट्रीय महत्व का संस्थान, विज्ञान और प्रौद्योगिकी विभाग, भारत सरकार)
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PROJECT COMPLETION REPORT

1. **Project Number** : **8196**

2. **Title of the Project** : Development of Modified Glass-Ionomer Cement to Improve Mechanical Properties

3. **Funding Agency Name** : Start-up Research grant, SERB

4. **Project Reference Number provided by the Funding Agency**:

   SRG/2020/001600; dated 04-12-2020

5. **Principal Investigator (Name & Address) :**

   Dr. Manju S., Scientist E, Division of Dental Products, Department of Biomaterial Science and Technology, Biomedical Technology Wing, SCTIMST

6. **Co-Investigators (Name & Address): Nil**

7. **Implementing Institution** : Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum

8. **Collaborating Institutions** : Nil

9. **Date of Commencement** : 22-12-2020

10. **Duration** : 2 years 3 months

11. **Date of Completion** : 21-03-2023

12. **Objectives as approved:**

- Development of modified glass-ionomer cements using nanogel additives to improved mechanical properties.

  1. Design and development of nanogel modified glass ionomer cements (GICs)
  2. Physiochemical characterization of nanogel modified GICs
  3. Biocompatibility evaluation of GICs
  4. Initiate technology transfer activities

13. Deviation made from original objectives if any, while implementing the project and reasons thereof :

Nil

14. Field/Experimental work giving full details of summary of methods adopted, data collected supported by necessary tables, charts, diagrams and photographs :

15. Detailed analysis of results :

16. Summary sheet of not more than 2 pages under following heads:
(Title, Introduction, Rationale, Objectives, Methodology, Results, Translational Potential)

17. Contributions made towards increasing the state of knowledge in the subject :

18. Conclusions summarising the achievements and indication of scope for future work :

Nanogel modified Glass ionomer cement (GIC), a biocompatible dental restorative material was developed via in house optimized polyacid (polyalkenoic acid) and fluoroalumino silicate glass powder. As part of the study completed short term objectives, Optimized polyalkenoic acids formulations, Different nanogels were synthesized and characterized, Prepared different batches of fluoroalumino silicate glass powder and optimized the formulation of nanogel modified GIC, Physiochemical characterization of both conventional GIC and nanogel modified GIC were prepared and characterized for its working time, setting time and mechanical properties, and radiopacity etc., Biocompatibility evaluations were confirmed for nanogel modified GIC based on ISO-9917:2007 . Initiated Industrial collaboration for the nanogel modified GIC technology. Prime Dental Products Pvt. Ltd., Maharashtra, India is interested in the technology. We had email communications and conducted two online meetings with Technology Business Division (TBD), SCTIMST and Prime Dental management. Prevest Denpro Pvt. Ltd, Jammu, India is interested in GIC liquid (Polyalkenoicacid). Optimized polyalkenoic acid for company specific glass powder.

19. Science and Technology benefits accrued :

a. List of research publications with complete details :

Srejith S.L and Manju S.*, Chemistry of Dental Materials; Swadesh Vigyan Patrika; 3 (1), 32-36

Srejith S.L and Manju S.*, Polyalkenoic acid modifications to improve mechanical properties of glass Ionomer Cement; Materials Advances (under revision)

b. Manpower trained on the project :

i. Research Scientists or Research Fellows	**:**	1
ii. No. of PhD's produced	**:**	nil
iii. Other Technical Personnel trained	**:**	Two M.Sc. Students for 1 month each (as part of Scientific Social Responsibility)
c. Patents taken, if any	**:**	Manju Saraswathy, S.L. Sreejith, Suresh Babu; Nanogel Modified Glass Ionomer Cement; Indian patent application # 202341003519 (Filed on 01/01/2023)
d. Products developed, if any	**:**	1. Prime Dental Products Pvt Ltd., Maharashtra, India Email communications and conducted two online meetings with Technology Bussiness Division (TBD), SCTIMST, and Prime Dental management. 2. Prevest Denpro Limited, Jammu, India Interested in GIC liquid (Polyalkenoic acid). Initiated Industry collaboration for optimizing polyalkenoic acid formulations for the company-specific glass powder.

20. Abstract: (In 300 words for possible publication in ..... Bulletin)

a. Background:

b. Materials:

c. Results:

d. Conclusion:

21. Procurement/Usage of Equipment:

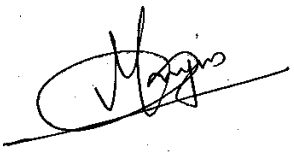
a. Details of Equipment:

Sl. No.	Name of Equipment	Make/ Model	Cost (Rs.)	Date of Installation	Utilisation	Remarks regarding maintenance breakdown

1	Vortex Mixture	Neuation, ISWIX VT	12,065	15 May, 2021	100%	
2	Microcentrifuge	Neuation, IFUGEM08VT	9,760	28 June, 2021	100%	
3	Magnetic stirrer and hot plate	IKA, C-MAG HS10	83,051	22 July, 2021	100%	
4	Microbalance	Kern Analytical Balance, ABT 120-4NM	1,58,477	22 July, 2021	100%	
5	Rotary Evaporator	IKA, RV 8V	2,56,981	22 July, 2021	100%	
6	Pipette	IKA pette vario100-1000 microlitre	10,185	22 July, 2021	100%	

b. Suggestions for disposal of equipment(s):

Dr. Manju S.



(Name and Signature of PIs with date)

Routing: *Signed copy of "Project completion Report" by PI →* root@sctimst.ac.in, rpc@sctimst.ac.in