Medical Dental Device: Biogeneric Implant Prototype

Ibeth Erazo  
*CUNY New York City College of Technology*

Aneeza Hussain  
*CUNY New York City College of Technology*

Renata Budny  
*CUNY New York City College of Technology*

Gaffar Gailani  
*CUNY New York City College of Technology*

Follow this and additional works at: https://academicworks.cuny.edu/ny_pubs

Part of the Biomedical Engineering and Bioengineering Commons, Dentistry Commons, Mechanical Engineering Commons, and the Medical Biotechnology Commons

**How does access to this work benefit you? Let us know!**

**Recommended Citation**

Erazo, Ibeth; Hussain, Aneeza; Budny, Renata; and Gailani, Gaffar, "Medical Dental Device: Biogeneric Implant Prototype" (2019). *CUNY Academic Works*.  
https://academicworks.cuny.edu/ny_pubs/500

This Poster is brought to you for free and open access by the New York City College of Technology at CUNY Academic Works. It has been accepted for inclusion in Publications and Research by an authorized administrator of CUNY Academic Works. For more information, please contact AcademicWorks@cuny.edu.
A dental implant is typically a titanium post surgically positioned in the bone beneath the gingiva. It serves as an anchor to retain and retain restoration. The multiple stages of case planning often require 6-12 months to complete. Stability and material biocompatibility are essential in achieving successful osseointegration. The proposed material for a new implant designed by RD&B is titanium porous oxide which bonds the trabecular structure of the implant with the bone.

**OBJECTIVES**
- Create one piece custom designed and printed immediate loading implant to eliminate micro-leakage and reduce implant failures.
- Reduce trauma and shorten the implant osseointegration timeline for the patient.
- Decrease treatment planning timeline for dental professionals.

**METHOD**
- Utilize CT Scans of a patient’s dental alveolus prior to surgery to create custom fit implants.
- Use CAD/CAM methods to design and print a single component titanium implant.
- Decrease chance of infections by eliminating the opportunity for micro-movements and micro-leakage between multiple parts.
- Eliminate trauma from drilling with a minimally invasive lap in implant placed at the time of extraction.
- Improve osseointegration by incorporating trabecular structure.
- Provide stability and anchorage by incorporating the 7 fin implant design.

**OSSEINTEGRATION**
New developments aided with improved osseointegration of the implant at the extraction site. Ossimics added autogenous bone or a synthetic material into the osteotomy site to induce bone formation at the most apical portion. Materials used for osseointegration are divided into natural transplants (osteografts, allografts, and xenografts) and synthetic materials (allografts and xenografts). These graft materials are used for reconstruction or preservation of bone and the hypothesis that they are osteogenic, osteoconductive, osteoinductive or a combination of these properties. The use of allografts, xenografts, and xenografts has all generated remarkable results.

**CONCLUSION**
Today, dental implants extend the range of care to a variety of patients undergoing necessary prosthodontic rehabilitation. If the benefits of such treatments are to be maximized, the implants must be selected on logical bases and placed within the context of the full range of treatment modalities. However, modern dental implant systems are based on multiple components often leading to micro-movements and micro-leakage which cause stress on the bone and bacterial infections, both of which compromise the success of osseointegration and consequently jeopardize the whole implant adaptation. Thus, a new idea of patient-specific one-piece immediate loading implant emerged to reduce the micro-movement, shorten healing time and number of visits, and contribute to lesser implant failures. The prototypes of the seven-fin trabecular structure implant will be customizable for individual patient using the design software and 3D printing technology. The osseointegration phase will rely on the best materials and techniques to induce bone formation at the osteotomy site. The final components will include the titanium implant and coronal substructure to later cement the final restoration.