ELECTROSPINNING® COMPANY

Non-Woven Solutions in Dental Surgery

We visited the International Dental Show (IDS) show, Cologne in March 2023 to explore the use of electrospun membranes for bone tissue guide repair dental membranes.

This is what we learnt:

- Studies have shown that decellularized collagen outperforms synthetic fibrous non-woven membranes, and synthetics are only used if patients request for them, for example to avoid an animal-derived product.
- Degradable non-woven synthetic membranes have been observed to cause an inflammation response around dental tissue in some clinical settings.
- Decellularized collagen products are well established, approved by regulatory bodies and familiar to surgeons.

So, is there a space for electrospinning in dental applications? The answer was 'Yes'!

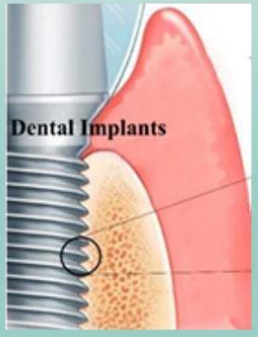

Figure 1: Dental implant and tissue interface

Coating of dental implants with fibrous synthetic membranes could promote bone growth and soft tissue healing. These coatings could be loaded with drugs and or biomolecules such as hydroxyapatite or collagen to prevent infection and promote tissue growth and integration.

Figure : Dental implants could be coated with electrospun material to promote cell/tissue integration between implant and tissue interface (a,), and a dental plug (b) that can be made with Mimetix Air (c).

One of the largest dental implant companies identified a need for better coating of dental bone plugs and blocks with different shapes (fig. 1b), which are difficult to coat with decellularised collagen matrix.

The Electrospinning Company has a wide experience in coating medical devices of different shapes and materials with electrospun fibres to promote cell and tissue integration. We have also wide experience in fabricating 3D porous structures with our Mimetix Air® proprietary materials (fig. 1c). Dental plugs could be cut from our 3D Mimetix Air sheets into various shapes and sizes.

Picture references

1. Surface Modified Techniques and Emerging Functional Coating of Dental Implants

by Heng Dong ,Hui Liu Na Zhou, Qiang Li, Guangwen Yang ,Li Chen 1, and Yongbin Mou

2. (a) Electrospun Bioresorbable Membrane Eluting Chlorhexidine for Dental Implants by Pierre Pouponneau, Ophélie Perrey,1 Céline Brunon, Carol Grossiord, Nicolas Courtois, Vincent Salles, and Antoine Alves

(b) Bone plugs from ZimVie

(c) Electrospun Mimetix Air from TECL

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