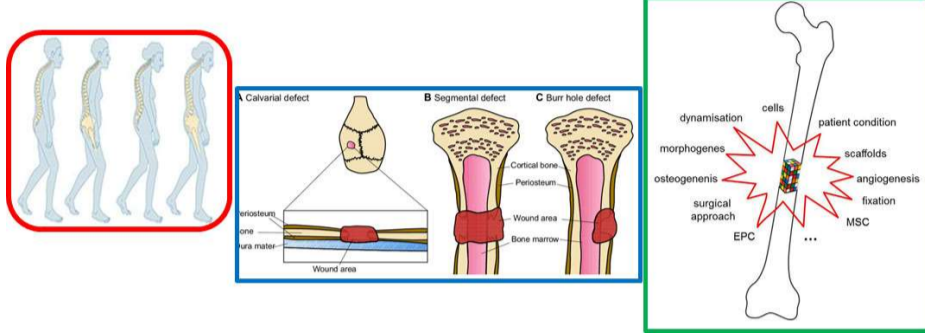


DeerA-OS BONE VOID FILLER

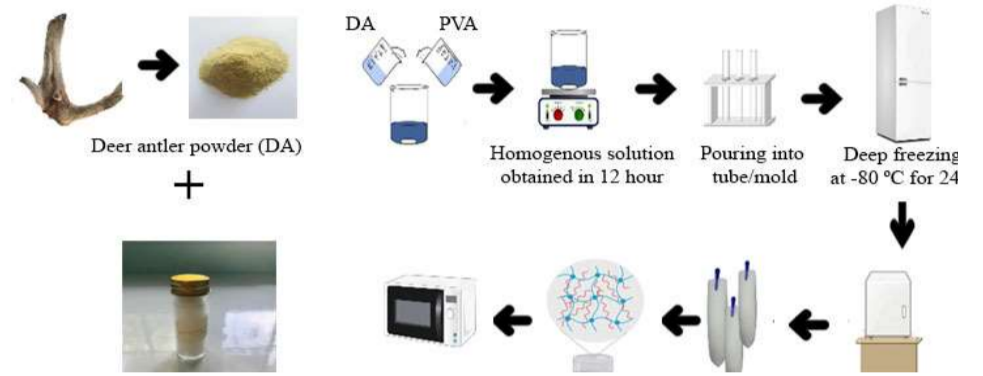
INVENTOR: PM DR HAZRULRIZAWATI BT ABD HAMID
FACULTY: FACULTY OF INDUSTRIAL SCIENCES & TECHNOLOGY
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CO-INVENTORS: DR FARAH HANANI ZULKIFLI,
MUHAMAD ZUBBAIR AMMAR BIN KHAIRUL ANUAR



Product Background



State of the Art/ Methods



Novelty/ Originality/ Inventiveness

Product Image and Product Characteristics/Results

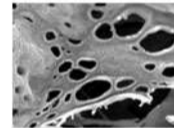
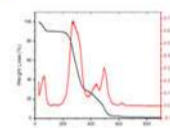
Deer antler contains trace elements such as calcium and phosphorus, promising material for bone substitution

Combination of bioactive elements (deer antler) with synthetic polymers (PVA)

Standardized pores are within the range of ideal bone growth and comparable compressive strength with trabecular bone ~0.1-16 MPa

Addition of the bioactive elements improves the crystallization properties and thermal stability

No	Parameter	Concentration (ppm)
1.	Sodium (Na)	5315.16
2.	Magnesium (Mg)	3251.63
3.	Potassium (K)	977.33
4.	Calcium (Ca)	154074.37
5.	Iron (Fe)	85.29
6.	Copper (Cu)	130.31
7.	Zinc (Zn)	68.06
8.	Selenium (Se)	106.29
9.	Phosphorus (P)	72038.40

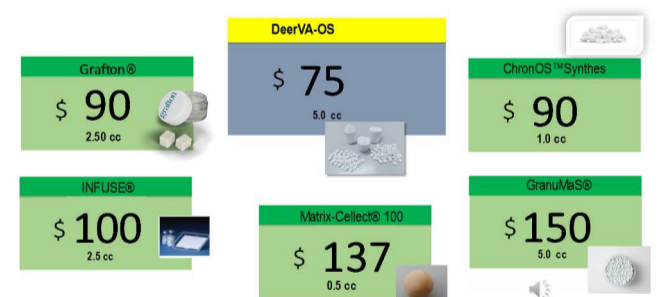


Marketability & Commercialisation

GLOBAL BONE GRAFT MARKET

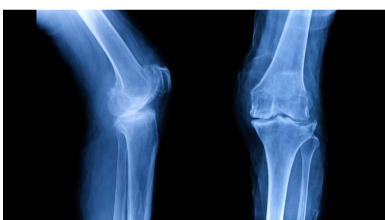


Cost Analysis



Benefits/Usefulness/ Applicability

Porous scaffolding implanted at the site of injury to encourage natural bone growth.



Environmental Impact

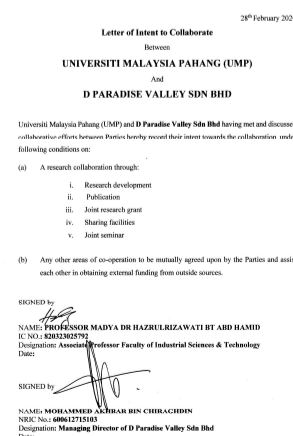
From waste to medical: Deer antler is a natural biomaterial and been considered a promising material for bone substitution

Non-toxic chemicals: 100 % using water as the only solvent. Reduce the water pollution.

Status of Innovation

- Functionality of Product

Achievement/Award



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Effect of Different Concentration of Cellulose Nanocrystals Comprising Hydroxyethyl Cellulose / Poly(Vinyl Alcohol) as a Bone Tissue Engineering Scaffold

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Keywords: lyophilization, cellulose nanocrystals, hydroxyethyl cellulose, poly (vinyl alcohol) and tissue engineering

Abstract. In this study, biodegradable scaffolds based on hydroxyethyl cellulose (HEC) (5 wt%) and poly (vinyl alcohol) (PVA) (15 wt%) with different percentages of cellulose nanocrystal (CNC) (1 and 7 wt%) were fabricated by lyophilization method to get highly porous scaffolds. These scaffolds were made water insoluble by cross-linking via heat treatment. The morphology and thermal properties of HEC/PVA/CNC scaffolds were characterized by using Scanning Electron Microscope (SEM) and Thermogravimetric Analysis (TGA). The morphological study showed that both prepared scaffold have highly porous structures with good pore interconnected structure. It

Collaboration/Industrial Partner

