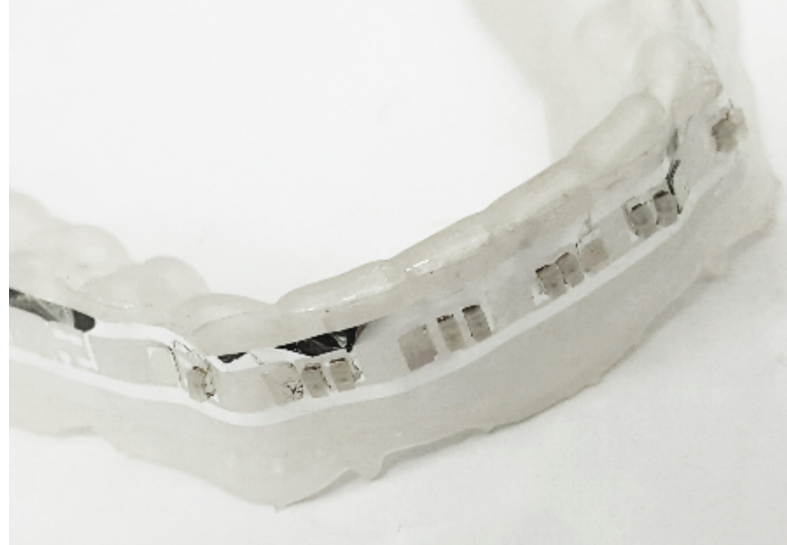


TECHNOLOGY OPPORTUNITY



Smart Dental Brace

A personalized self-powered optoelectronic platform that minimizes braces-wearing time

Today for orthodontic treatment, metallic one-size-fits-all dental braces are used for bone regeneration which costs thousands of dollars. Smartization of braces with near-infrared intra-oral system can be advantageous for low-cost and fast treatment time.

KAUST material and electrical engineering scientists have developed a thin, soft optoelectronic system with seamless integration using 3D printed materials for a low-cost personalized smart dental brace which expedites the regeneration of bone structures to help straighten teeth.

This technology presents a faster alternative to widespread orthodontic treatments with increased functionality through development of miniaturized and affordable near-infrared intraoral platforms which is powered and controlled wirelessly via a smart phone.



Benefits

- ▲ Personalized
- ▲ Wearable and flexible
- ▲ Multi-functionality platform
- ▲ In-vivo device
- ▲ Comfortable
- ▲ Easy to use
- ▲ Pain-reduced brace

Applications

- ▲ Monitoring of orthodontic treatment
- ▲ Sensory biomedical platforms
- ▲ Smart phone based remote (wireless) powering
- ▲ In-vivo wearable medical device

Opportunity

This technology is part of KAUST's technology commercialization program that seeks to stimulate development and commercial use of KAUST-developed technologies.

Opportunities exist for joint development, patent licensing, or other mutually beneficial relationships.

For More Information

ip@kaust.edu.sa

innovation.kaust.edu.sa

Technology Details

With the advances in panoramic x-ray technology, we are now capable to personalize and digitize the fabrication of dental braces using additive manufacturing. Smart dental brace relies on two main functionalities: first, a customizable, personalized and semitransparent brace, which provides required external loading to stimulate healthy rebuilding of bone structures. Secondly, a miniaturized, soft, biocompatible optoelectronic system for an intraoral (conformable on the mouth) near-infrared light therapy which allows rapid, temporally specific control of osteogenic cell activity via targeted exposure and light-sensitive proteins present in bone cells. The combination of both strategies in one single platform provides affordable, multi-functionality dental braces. Such capability enhances the bone regeneration significantly and reduces the overall cost and discomfort.

How It Works

The optoelectronic system is based on an array of light emitting diodes (LED). We have introduced non-toxic micro-scale flexible batteries to be used as on-demand power supply. Near-infrared light can be absorbed by bone cells to stimulate the bone regeneration for faster orthodontic treatment.

Why It Is Better

It is one of the first in-vivo wearable, low cost self-powered devices that integrates multi-therapeutic functionalities in one platform. This technology is targeted at making advanced healthcare systems accessible, affordable and personalized for patients who need faster orthodontic treatment.

IP Protection

KAUST has a patent pending for this technology.



جامعة الملك عبدالله
للعلوم والتقنية
King Abdullah University of
Science and Technology

INNOVATION
AND ECONOMIC
DEVELOPMENT