

Tech Highlight

Material to smile about

Those of us who have sat in a dentist's chair and had moulds of our teeth done so that retainers, or crowns, or dentures could be made for us, would know how uncomfortable that can be.

Thanks to a couple of innovative scientists from IMRE, led by Dr Wang FuKe, dental patients can look forward to a fuss-free way of getting dentures, crowns and retainers that are durable and of a perfect fit, minus the discomfort.

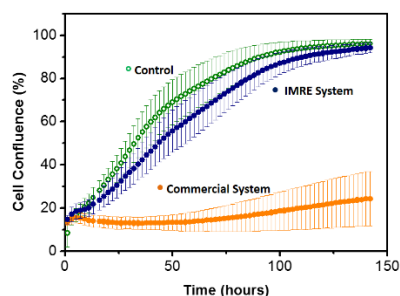
The 'secret'? Simply a clever use of digital technology, 3-D printing and high-tech composite materials that are of high strength, yet of high impact resistance.

By using a scanned 3-D image, patients need not go through a sometimes uncomfortable process of obtaining a dental impression (e.g. biting into the impression material). Instead, 3-D images of the patients' teeth can be scanned and the subsequent printed dental prosthetics produced accurately without discomfort to the patients. The prosthetics produced this way, using IMRE's proprietary composite material, are stronger and smoother and provide a better fit. To top it off, the team came up with a technique for easy and precise shade matching that best mimics the patient's native teeth.

When asked of his future plans for the project, Dr Wang shared that he would like to engage partners from the industry to further develop this functional material and extend its capabilities to other biomedical applications. Already, companies from the industry have shown interest in this cost-effective innovation. A dental company based overseas is keen on licensing the technology and establishing a start-up in Singapore. Looks like Dr Wang is well on his way to realising his plans!



Prototype of the IMRE 3-D printed denture demonstrating the shade matching technique that helps to mimic a patient's native teeth.



Biocompatibility evaluation of the resins developed in IMRE (●) in comparison to the HeLa cells (a cell line commonly used in biomedical research) extracted from the commercial system (●). The higher the percentage of cell confluence, the better the biocompatibility. Control (●) indicates the standard for the best condition for cell culture.

Published in ACS Applied Materials and Interfaces, entitled "High-Performance Nano-Photoinitiators with Improved Safety for 3-D Printing".

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