Genetic techniques have role in future of dental care

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A visit to the dentist could one day require a detailed look at how genes in a patient's body are being switched on or off, as well as examining their pearly whites, according to researchers at the University of Adelaide.

In a new paper published in the Australian Dental Journal, researchers from the University of Adelaide's School of Dentistry have written about the current and future use of the field of epigenetics as it relates to oral

health.

Speaking on Dentist's Day (Thursday 6 March), co-author Associate Professor Toby Hughes says epigenetics has much to offer in the future treatment and prevention of dental disease.

"Our genetic code, or DNA, is like an orchestra - it contains all of the elements we need to function - but the epigenetic code is essentially the conductor, telling which instruments to play or stay silent, or how to respond at any given moment," Associate Professor Hughes says.

"This is important because, in the case of oral health, epigenetic factors may help to orchestrate healthy and unhealthy states in our mouths. They respond to the current local environment, such as the type and level of our oral microbes, regulating which of our genes are active. This means we could use them to determine an individual's state of health, or even influence how their genes behave. We can't change the underlying genetic code, but we may be able to change when genes are switched on and off," he says.

Associate Professor Hughes is part of a team of researchers at the University of Adelaide that has been studying the underlying genetic and environmental influences on dental development and oral health.

He says that since the completion of the Human Genome Project in 2007, epigenetics has had an increasing role in biological and medical research.

"Dentistry can also greatly benefit from new research in this area," he says. "It could open up a range of opportunities for diagnosis, treatment and prevention.

"We know that our genome plays a key role in our dental development,

and in a range of oral diseases; we know that the oral microbiota also play a key role in the state of our oral health; we now have the potential to develop an epigenetic profile of a patient, and use all three of these factors to provide a more personalised level of care.

"Other potential oral health targets for the study of epigenetics include the inflammation and immune responses that lead to periodontitis, which can cause tooth loss; and the development and progression of oral cancers.

"What's most exciting is the possibility of screening for many of these potential oral health problems from an early age so that we can prevent them or reduce their impact."

The full paper can be found at the *Australian Dental Journal*'s website.

More information: Williams, S., Hughes, T., Adler, C., Brook, A. and Townsend, G. (2014), "Epigenetics: a new frontier in dentistry." *Australian Dental Journal*. doi: 10.1111/adj.12155

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