

Nanoparticles offer a quick fix for decayed teeth

## Pearly whites

Chinese scientists have found a new route to the perfect smile: using nanoparticles to repair tooth enamel.

Ruikang Tang at Zhejiang University and his team found that nanoparticles made from hydroxyapatite (HAP), a mineral which is the major component of dental enamel, adsorb very strongly onto the surface of natural enamel – potentially enabling decayed teeth to be repaired and strengthened.

Tang explains that up to now dentists have found it hard to understand why synthetic hydroxyapatite has not been a good candidate for enamel repair, but they could now have the answer.

In contrast to previous studies, Tang's group have used much smaller particles, which they say are similar to the size of the building blocks of dental enamel. The features of these 20nm sized HAP nanoparticles may be closer to the



features of natural hydroxyapatite than those of the larger HAP particles that are usually used, he explains.

George Nancollas, professor of chemistry at the University of Buffalo in the US, says that the team's work with HAP nanoparticles has revealed some exciting possibilities for

the remineralisation of decayed enamel. 'The apparent restoration of enamel hardness using an in vitro method is particularly significant. The challenge will be to control the kinetics of the process and to achieve a degree of reproducibility.'

In order to confirm the effects seen with the HAP nanoparticles in vitro, Tang says they need to extend their work to in vivo studies. 'We are also interested in using these nanoparticles to repair other apatite hard tissue like bone,' he says.

Klaus Jandt, an expert in biomaterials research at Friedrich Schiller University of Jena in Germany, agrees. 'Enamel repair studies are important and of high relevance. In the future, it will be especially important to demonstrate the enamel repair potential in vivo and that the repaired enamel is mechanically stable'.

*Katherine Davies*

**The nanoparticles absorb strongly onto the surface of natural tooth enamel**

### Reference

L Li *et al*, *J. Mater. Chem.*, 2008, DOI: 10.1039/b806090h