

Armour for teeth

Biomin is the first and only toothpaste to receive accreditation from the Oral Health Foundation's expert panel for its effectiveness at both sensitivity reduction and remineralisation. Clinicians agree that it lives up to its slogan, 'armour for teeth', says **Moira Crawford**

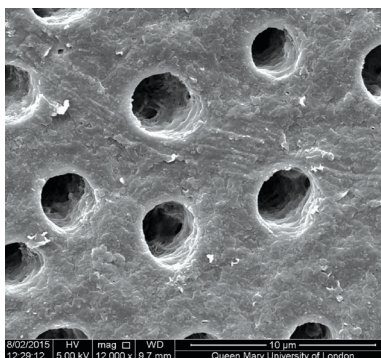


Figure 1: Scanning electron micrograph image showing dentine tubules before brushing with Biomin

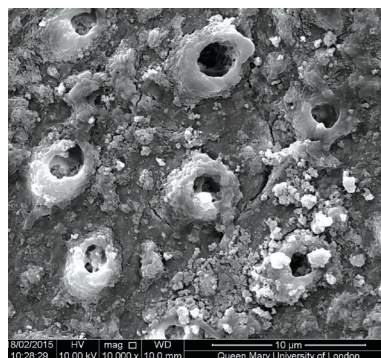


Figure 2: Tubule occlusion after brushing with Biomin F

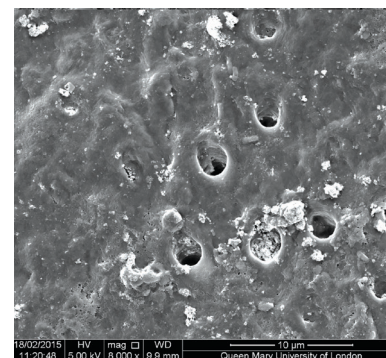


Figure 3: Tubule occlusion continues after acid challenge

B iomin F toothpaste has been available in the UK for just over two years and the evidence base is growing that it is highly effective both at remineralising dental enamel and providing relief from dentine hypersensitivity. Earlier this year, the prestigious Oral Health Foundation's expert panel reviewed the studies relating to Biomin, and found that it did indeed live up to its claims. What's more, dental professionals are finding Biomin to be effective in a range of situations.

How does Biomin work?

Biomin has an impressive scientific pedigree. It was developed in the laboratories of Queen Mary University, London, where materials expert Professor Robert Hill and his team have been studying the properties of bioactive glasses. These were originally developed for bone grafting, but had been found to be surprisingly effective in treating sensitivity. The Queen Mary team, however, developed a new generation of bioactive glass – Biomin – containing an optimum combination of calcium, phosphate and fluoride ions, designed to dissolve slowly in the mouth, releasing the ions to precipitate fluorapatite, the fluoride analogue of natural tooth mineral.

Fluorapatite is more stable and resistant to acid attack than hydroxyapatite, formed

by previous generations of bioactive glass (eg, Novamin), and studies in artificial saliva have shown that it begins to form within an hour of brushing with Biomin F.

Unlike the soluble fluoride contained in conventional toothpastes, which are rapidly rinsed away by saliva, the fluoride is contained within the particles of Biomin F. These adhere to the tooth surface and dissolve slowly over up to 12 hours, entering the dentine tubules, laying down fluorapatite and gradually occluding the tubules. This effect is enhanced by the presence of the increased concentration of phosphate ions in the glass structure.

The process has the dual effect of remineralising both the surface and penetrating deeper into the subsurface lesions, as well as forming a plug within the tubules that prevents fluid flow, the cause of dentine hypersensitivity. In the presence of acid in the mouth, Biomin F acts to raise the pH, neutralising the acid and promoting remineralisation. In fact, a further 'smart' effect is that Biomin F begins to act faster in the presence of acid in the mouth.

The three claims the Oral Health Foundation has verified and upheld are:

1. By brushing at least twice daily, morning and night, the regular use of Biomin F toothpaste provides relief from dentine hypersensitivity and long-lasting protection against acid attack
2. The unique patented technology

within Biomin F slowly releases calcium, phosphate and fluoride ions, forming a protective fluorapatite layer on the tooth surface and replacing lost tooth mineral

3. Biomin F toothpaste will help reinforce and protect your teeth, leaving your mouth feeling clean and fresh.

1. Providing relief from dentine hypersensitivity

Dentine hypersensitivity has long been a conundrum to dental professionals, affecting about a third of the population at some time – and for around 10% of them it can be extremely debilitating. As there are several possible causes, there's no single solution, and Dr David Gillam, an internationally respected specialist in this area, has been frustrated at the lack of an effective treatment for the problem. A chance meeting brought him together with Professor Robert Hill, and they have worked together on the development of Biomin F as a treatment for dentine hypersensitivity.

And clinicians are finding that it works in a number of situations. Several have trialled the product on themselves and their families before recommending it to patients suffering from sensitivity. Patients are coming back reporting improvement in their symptoms and requesting the product. Dr Don Gibson, a dentist in Yeovil, Somerset, believes that it has helped almost



Moira Crawford

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all the patients who have used it. 'It's been better than I dared hope. 90% of them are passionate about it and come back for more,' he said. 'The "overwhelming majority" – over 90% – got benefit from using BioMin,' agreed London dentist Dr Rash Patel.

Dental hygienists and therapists are also now using Biomin F routinely within the surgery to prevent sensitivity arising after certain procedures:

Post scaling

Irish hygienist Donna Paton and her colleague, dentist Dr Anne O'Donnell, apply Biomin F to patients after treatment and give them the product to take home. They have seen a great improvement in the incidence of sensitivity, as was also found in a clinical trial last year (Ashwini et al, 2018).

Post whitening

An effect of whitening treatment is to expose the surface of the teeth, risking the development both of sensitivity and of staining in the initial stages. American hygienist and oral health educator Theresa McCarter is amazed by Biomin's effectiveness at preventing this from occurring. She has been recommending the product to patients with extreme sensitivity from overuse of whitening products, and also routinely applies and recommends Biomin following in-surgery whitening treatments. Others with sensitivity arising from bruxism, reflux and poor dental hygiene have also seen huge improvement. 'I see Biomin as becoming an everyday toothpaste benefiting 80-90% of our patients,' she said. 'It will be a gamechanger.'



Figure 4: White spots following removal of orthodontic brackets

Following guided biofilm therapy (GBT)

Sam Davidson, a hygienist working in several practices across the south east of England, has been using Biomin following GBT. This procedure not only removes biofilm but in the short term also the pellicle which protects the tooth surface. 'I apply a smear layer of Biomin F after GBT and any scaling that I may need to do to remove tartar, and this provides a protective barrier, remineralising the tooth surface and preventing sensitivity and staining, until the pellicle is restored,' she said.

2. Formation of protective fluorapatite

Demineralisation matters, because it is because it is considered to be the precursor to frank enamel caries. Studies over recent months have proven

Biomin F to be effective at precipitating fluorapatite to remineralise not only the surface of the teeth, but also penetrating deeper into the sub-surface (Bakry et al, 2018; Sivarajani et al, 2018).

White spot lesions

A common problem arising after orthodontic treatment, the area around the brackets can become demineralised due

to poor oral hygiene. Trials have shown that Biomin F is effective at reversing the white spots by remineralising the enamel. Early enamel defects have also been reported to be reversed by Biomin F.

Deep remineralisation

A trial last year proved that Biomin penetrates deeper below the surface enamel than had previously been realised. Comparing the effect of Biomin with fluoride gel on artificially demineralised teeth, the researchers found that Biomin group showed significantly better remineralisation values. They concluded that 'Biomin was capable of remineralising the sub-surface enamel lesions efficiently.'

They hypothesise that this was due to the continuous, low fluoride release from Biomin, taking place slowly over several hours, which allowed the penetration of the calcium and phosphate ions through the porous enamel sub-surface, effecting the successful remineralisation of the demineralised enamel lesion, rather than simply remineralising the surface layer, as was observed with the fluoride gel.

It's actually visible. London hygienist Bhavana Dower has used the product on herself and her son, who was suffering from fluorosis. His teeth are visibly whiter, and the enamel on her patients' teeth 'actually looks thicker,' she said. US hygienist Theresa McCarter agreed. 'Teeth which were almost translucent are noticeably denser,' she said.

3. Reinforcing and protecting teeth

It seems that clinically Biomin F is living up to the expectations from scientific research, and even exceeding them, as dental clinicians continue to find new ways to use the product to help patients strengthen, remineralise and protect their dentition. It really is 'armour for teeth'. [OH](#)

References

For the references that accompany this article, email hello@oralhealthmagazine.com.



Biomin C: fluoride free

For those who do not wish to use a fluoride toothpaste, but need an effective desensitising and remineralising toothpaste, Biomin C is available, containing phosphate and calcium but no fluoride.