



Hard graft builds bone strength

We are living longer in the western world, some of us long enough for our joints to wear out and need replacing with artificial alternatives.

Occasionally these artificial joints, made from metal and plastic, come loose and surgeons have to graft bone into areas around them to stabilise the joint. This bone has to come either from the patient or a donor. Such bone is in short supply and can carry the risk of disease transmission.

Researchers have been looking for other materials that serve as well as natural bone and at Bath a team of engineers have risen to the challenge. Professor Tony Miles and Dr Irene Turner, of the Centre for Orthopaedic Biomechanics in the Department of Mechanical Engineering, have spent six years developing a new range of suitable materials.

They are working on developing bioceramics made from calcium phosphate powders, which have a similar chemical composition to the mineral found in natural bone and provide a scaffold around which natural bone can grow.

The team creates holes in the ceramic by coating a polymeric foam in a ceramic slurry and then burning out the foam. This leaves an interconnected network of pores in the material without compromising its strength. Existing natural bone can grow into these holes, strengthening the area. The new materials are stronger than other synthetic bone substitutes.

The materials are patented and will be on the market once a commercial partner is found. They can also be used for facial reconstruction and spinal fusion, as well as many other specialist areas of orthopaedic and dental surgery.

