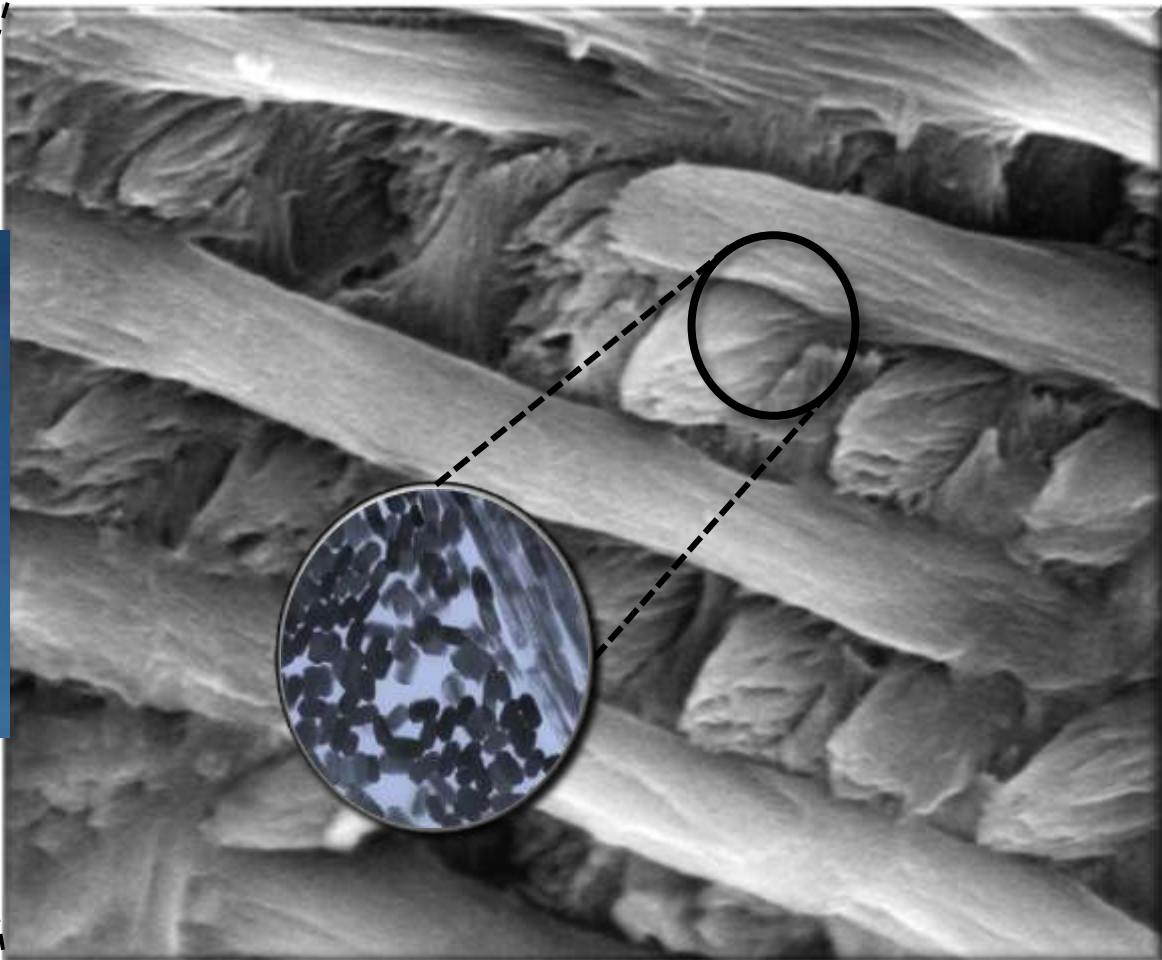
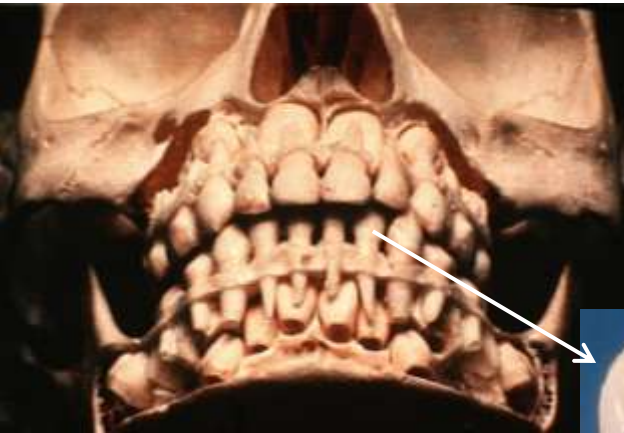


Molecules, Mice & Men: Biomineralisation research for patient benefit.

Jennifer Kirkham, Steven Brookes, Alan Mighel,
Julie Burke, Neil Thomson
Biomineralisation Group, Department of Oral
Biology, Leeds Dental Institute

Dental enamel is the most extreme example of biomineralisation.....



Tissue function depends on crystal size, orientation and arrangement in to prismatic structure

A self-assembled protein scaffold controls enamel Biomineralisation

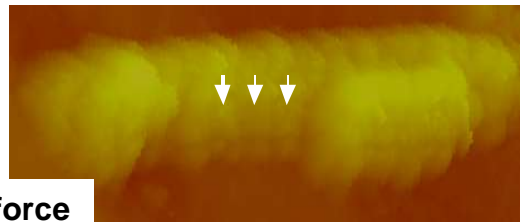
Chemical force microscopy:
Negatively charged AFM tip
moved across crystal surface



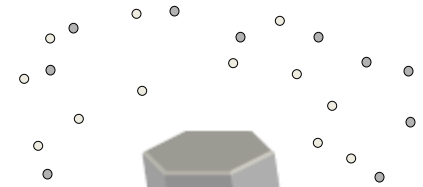
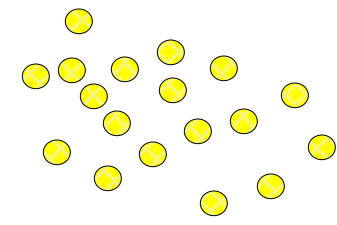
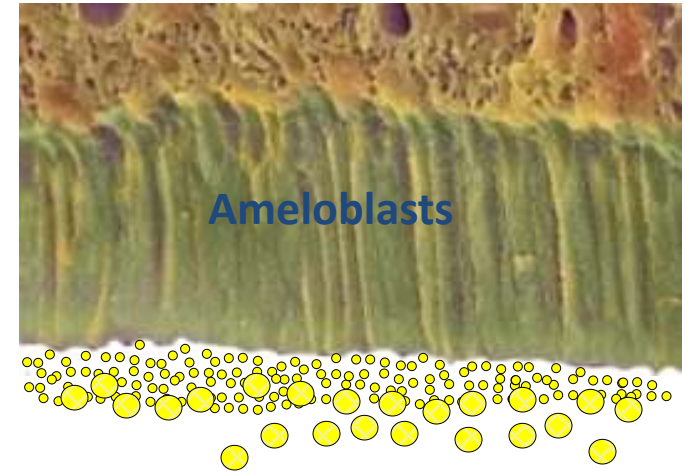
Chemical force
image of naked
enamel crystal



Chemical force
image of naked
enamel crystal
+ amelogenin



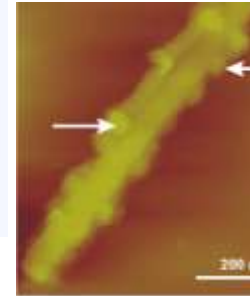
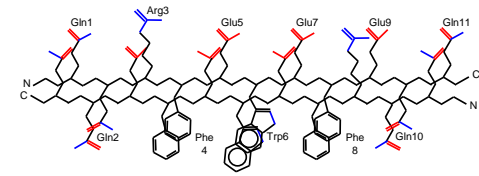
Amelogenin self-assembles to form nanospheres which bind to charge domains on crystal surfaces. These are then dismantled by enzymes, permitting secondary crystal growth.



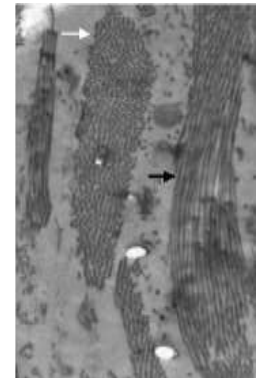
Dentine

Interdisciplinary Biomineralisation research for patient benefit:

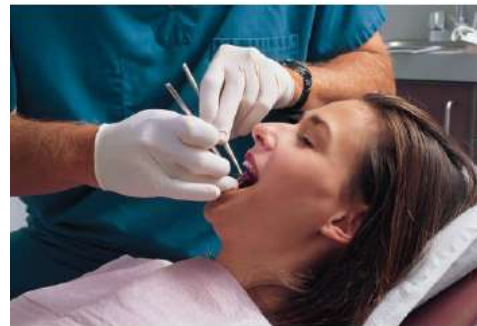
** With A Aggeli, Chemistry*



***Rational design of self assembling molecular biomimetic scaffolds**



Mouse models; recombinant proteins, structure function relationships, control of mineral growth

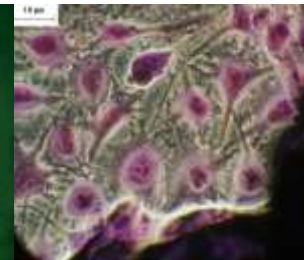


Clinical trials at Leeds

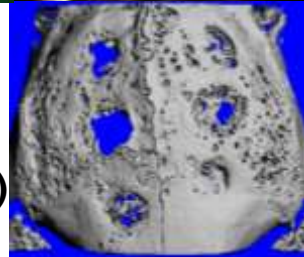
“Filling without Drilling”



Product in international clinical use



**Cytotoxicity testing
In situ testing (teeth)
Animal testing (bone)**





Thank
you