Claims

1. A bone cement composition comprising:
   - a powder component comprising at least one acrylic polymer;
   - a liquid component comprising a monomer;
   - an amine-containing antibiotic; and
   - an acid-functionalised diblock copolymer comprising a carboxylic acid-functionalised polycarbonate (PAC) homopolymer subunit,

wherein reaction of the powder component and the liquid component results in formation of a bone cement.

~~2. The bone cement composition according to claim 1, wherein the acid-functionalised diblock copolymer comprises a polycarbonate (PAC) homopolymer subunit.~~

~~3.~~2. The bone cement composition according to claim 1 or 2, wherein the acid-functionalised diblock copolymer is: polyethylene glycol-polycarbonate (PEG-PAC), polycarbonate-poly(L-lactide) (PAC-PLLA), polycarbonate-poly(D-lactide) (PAC-PDLA), PAC-PLLA/PDLA, ~~copolymers thereof~~ or a combination thereof.

~~4.~~3. The bone cement composition according to any preceding claim, wherein the composition comprises 0.5-15 wt. % of acid-functionalised diblock copolymer, based on total weight of the composition.

~~5. The bone cement composition according to any preceding claim, wherein the antibiotic is an amine-containing antibiotic.~~

~~6.~~4. The bone cement composition according to any preceding claim, wherein the antibiotic is an aminoglycoside antibiotic.

~~7.~~5. The bone cement composition according to claim ~~6~~4, wherein the aminoglycoside antibiotic is: amikacin, apramycin, geneticin, gentamicin, kanamycin, netilmicin, neomycin, paromomycin, spectinomycin, streptomycin, tobramycin, polymyxins, or a combination thereof.

~~8.~~6. A bone cement formed from the bone cement composition of any of the preceding claims.

~~9.~~7. The bone cement according to claim ~~8~~6, wherein amine group comprised in the antibiotic and carboxylic group comprised in the acid-functionalised diblock copolymer form a non-covalent bond.

~~10.~~8. The bone cement according to claim ~~8~~6 or ~~9~~7, wherein the bone cement exhibits antibacterial activity for ≥ 100 days.

~~11.~~9. The bone cement according to any of claims ~~8~~6 to ~~10~~8, wherein the bone cement exhibits an area of inhibition zone for bacteria of ≥ 1 cm^2 after 100 days.

~~12.~~10. The bone cement according to any of claims ~~8~~6 to ~~11~~9, wherein the bone cement has a compressive modulus of ≥ 875 MPa.

~~13.~~11. A kit for forming a bone cement, the kit comprising;

- a powder component comprising at least one acrylic polymer**;**
- a liquid component comprising a monomer;
- an amine-containing antibiotic; and
- an acid-functionalised diblock copolymer comprising a carboxylic acid-functionalised polycarbonate (PAC) homopolymer subunit.

~~14.~~12. The kit according to claim ~~13~~11, wherein the powder component further comprises a polymerization initiator.

~~15.~~13. The kit according to claim ~~13~~11 or ~~14~~12, wherein the liquid component further comprises a polymerization activator.