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Engineering Sciences, 1 Pesek Road, Jurong Island, Singapore 627833 (SG).

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(74) Agent: YU SARN AUDREY &amp; PARTNERS; 24 Raffles Place, #27-01, Clifford Centre, Singapore 048621 (SG).

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(71) Applicant (for all designated States except US): AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH [SG/SG]; 1 Fusionopolis Way, #20-10, Connexis, Singapore 138632 (SG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): SHEN, Shou-Cang [SG/SG]; c/o Institute of Chemical and Engineering Sciences, 1 Pesek Road, Jurong Island, Singapore 627833 (SG). NG, Wai, Kiong [SG/SG]; c/o Institute of Chemical and Engineering Sciences, 1 Pesek Road, Jurong Island, Singapore 627833 (SG). CHIA, Leonard [SG/SG]; c/o Institute of Chemical and Engineering Sciences, 1 Pesek Road, Jurong Island, Singapore 627833 (SG). TAN, Reginald, B., H. [SG/SG]; c/o Institute of Chemical and

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## Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

[Continued on next page]

(54) Title: NANOSTRUCTURED MATERIAL FORMULATED WITH BONE CEMENT FOR EFFECTIVE ANTIBIOTIC DELIVERY

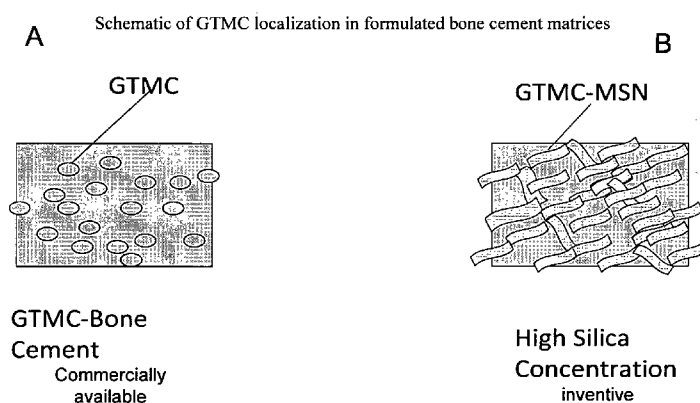


FIG. 3

(57) Abstract: This invention uses mesoporous silica nanoparticles and other nanostructured materials to formulate polyacrylate-based bone cement for achieving an enhanced and controlled elution of active ingredients such as antibiotics. This invention overcomes the limitation of low antibiotic release from commercial polyacrylate-based bone cements using for example, PMMA. In certain aspects, the formulation enables a sustained release of antibiotics from the bone cement over a period of 80 days and achieves 70% of total drug release, whereas the commercial antibiotic bone cement (e.g., SmartSet GHV) only releases about 5% of the antibiotics on the first day and subsequently an almost negligible amount. In addition, the mechanical properties of our formulated bone cements are well retained. The inventive bone cement exhibits good antibacterial properties and has very low cytotoxicity to mouse fibroblast cells.



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- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*
- *of inventorship (Rule 4.17(iv))*
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