Supplementary Information for:

3D printed bioactive calcium silicate ceramics as antibacterial scaffolds for hard tissue engineering

Joelle El Hayek[a,b], Habib Belaid[a], Louis Cornette de Saint Cyr[a], Ghenwa El Chawich[a,b], Emerson Coy[c], Igor Iatsunskyi[c], Christel Gervais[d], Jeevithan Elango[e], Camilo Zamora Ledezma[f], Mikhael Bechelany[a,g], Michel Nakhl[b], Damien Voiry[a], Philippe Miele[a], Mirvat Zakhour[b], Laurence Soussan[a], Chrystelle Salameh[a*]

Affiliations :

[a]*Institut Européen des Membranes, IEM, UMR 5635, University Montpellier, ENSCM, CNRS, 34095 Montpellier, Cedex 5, France*

[b]*Laboratoire de Chimie Physique des Matériaux/Plateforme de Recherche en Nanomatériaux et Nanotechnologies (LCPM/PR2N), Lebanese University, Beirut 90656, Lebanon*

[c]*NanoBioMedical Centre, Adam Mickiewicz University, Wszechnicy Piastowksiej str. 3, 61-614 Poznan, Poland*

[d]*Sorbonne Université, UMR 7574 CNRS, Laboratoire de Chimie de la Matière Condensée de Paris, LCMCP, F-75005 Paris, France*

[e]*Department of Biomaterials Engineering, Faculty of Health Sciences, UCAM-Universidad Católica San Antonio de Murcia, Campus de los Jerónimos 135, Guadalupe, 30107 Murcia, Spain*

[f]*Green and Innovative Technologies for Food, Environment and Bioengineering Research Group (FEnBeT), Faculty of Pharmacy and Nutrition, UCAM-Universidad Católica San Antonio de Murcia, Campus de los Jerónimos 135, Guadalupe, 30107 Murcia, Spain*

[g]*Gulf University for Science and Technology, GUST, Kuwait*

Corresponding author: chrystelle.salameh@umontpellier.fr

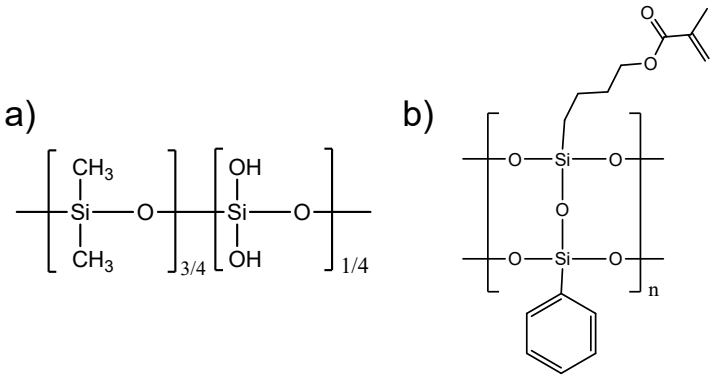

Fig. S1: Chemical formulas of the two preceramic polysilsesquioxane polymers used in this work. a) Commercial resin (SILRES MK) and b) **"**customized**"** ladder-like (phenyl-co-methacryl) silsesquioxane resin.

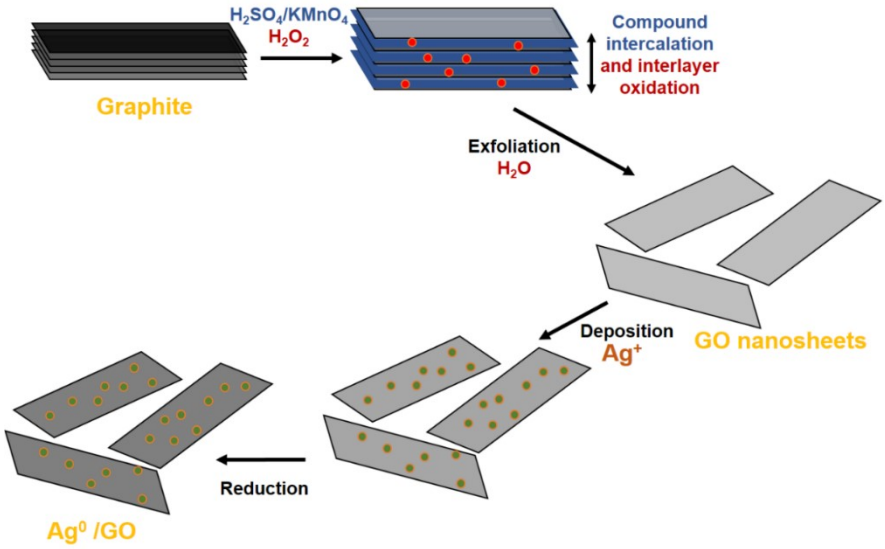

Fig. S2: The different steps involved in depositing silver nanoparticles on graphene oxide nanosheets.

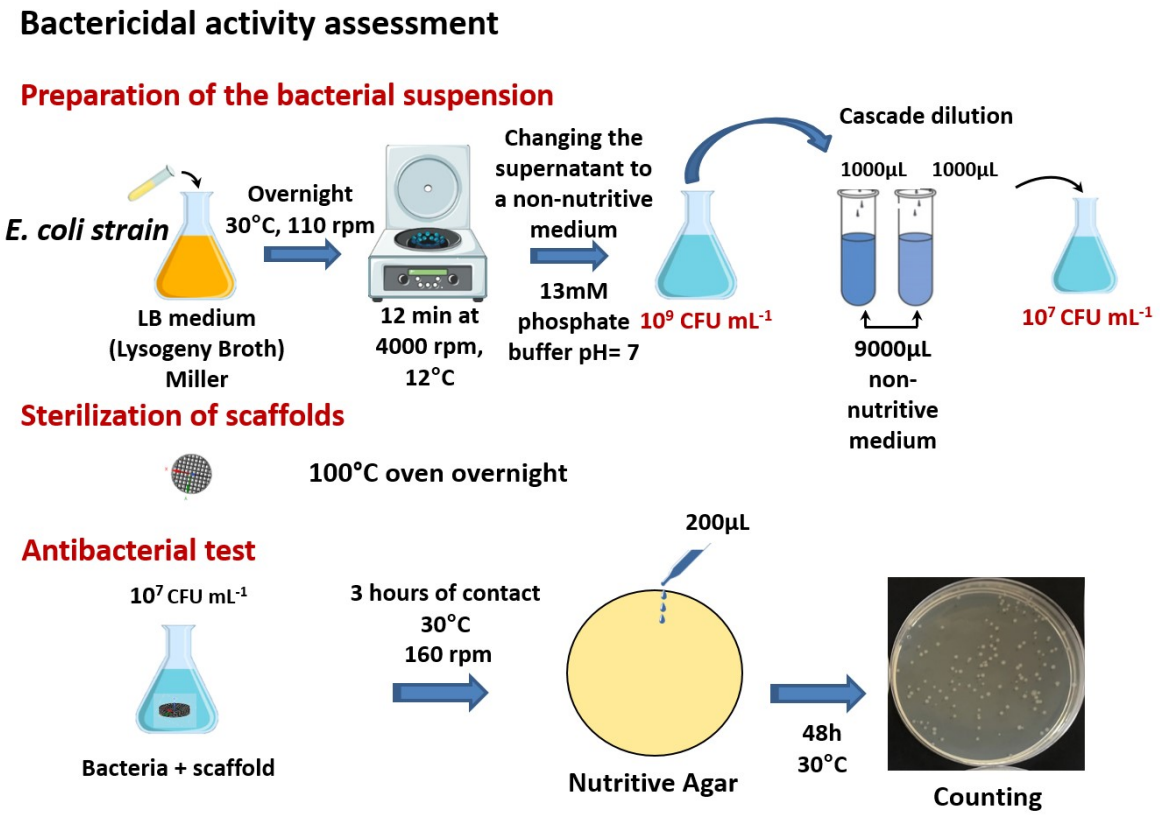

Fig. S3: Schematic protocol used to assess the bactericidal activity of the scaffolds.

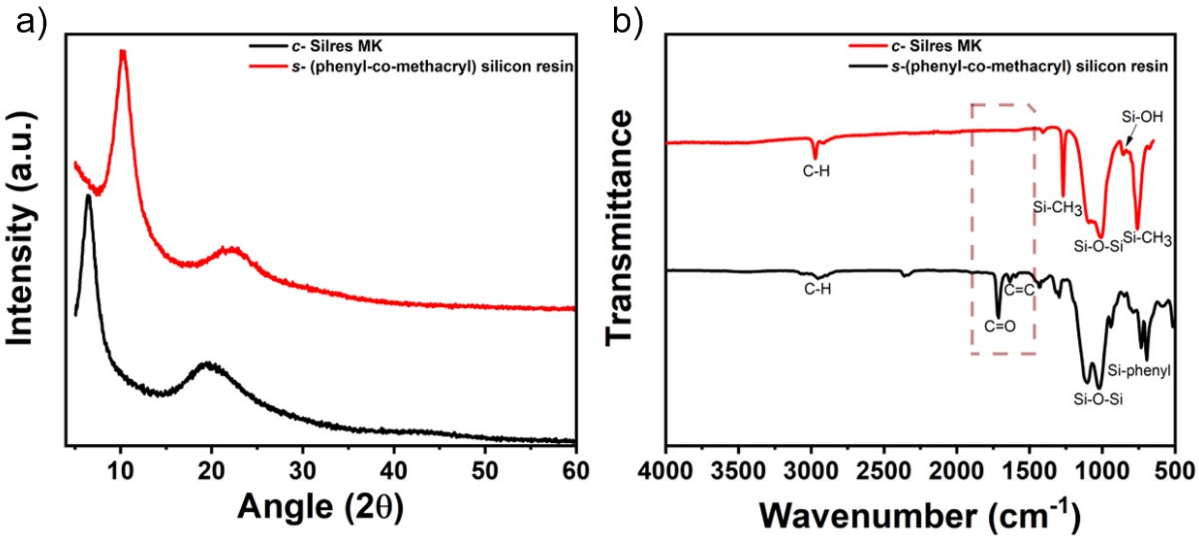

Fig. S4: a) XRD diagrams, b) FTIR spectra of commercial Silres MK and "customized" (phenyl-co-methacryl) silsesquioxane resin.

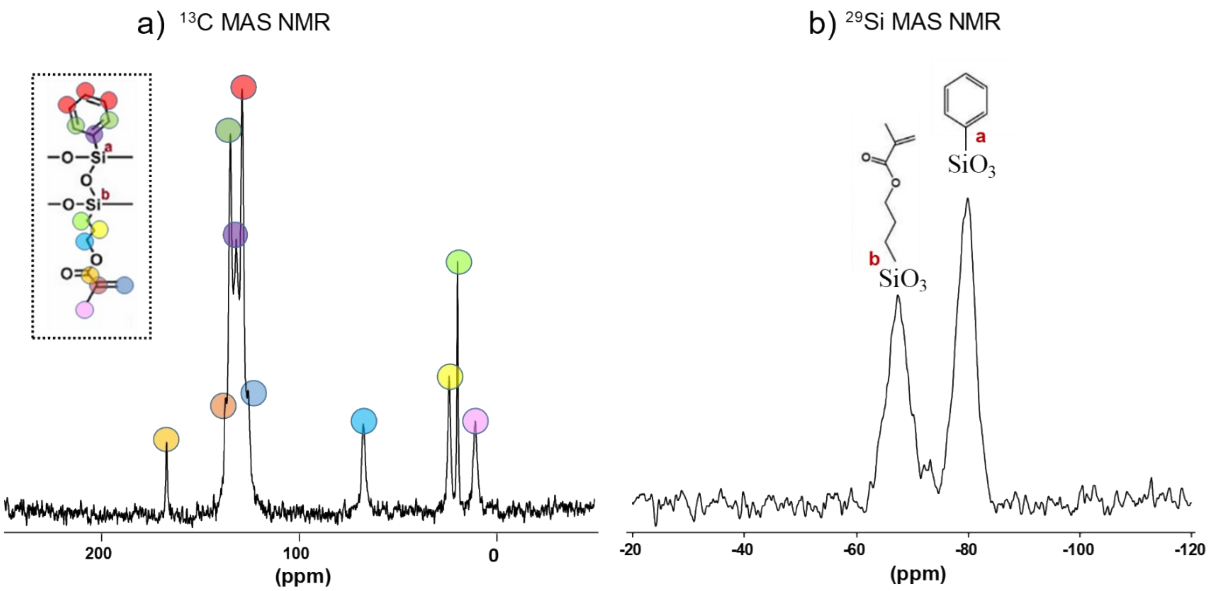

Fig. S5: (a) ^{13}C CP MAS and (b) ^{29}Si MAS solid-state NMR spectra of "customized" (phenyl-co-methacryl) silsesquioxane resin.

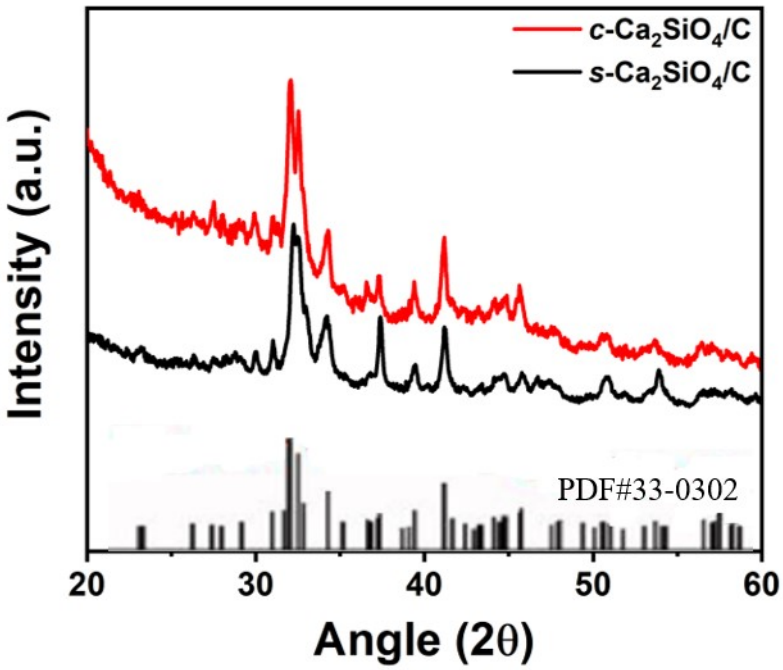

Fig. S6: XRD diagrams of *c*-Ca_2SiO_4/C and *s*-Ca_2SiO_4/C ceramic scaffolds.

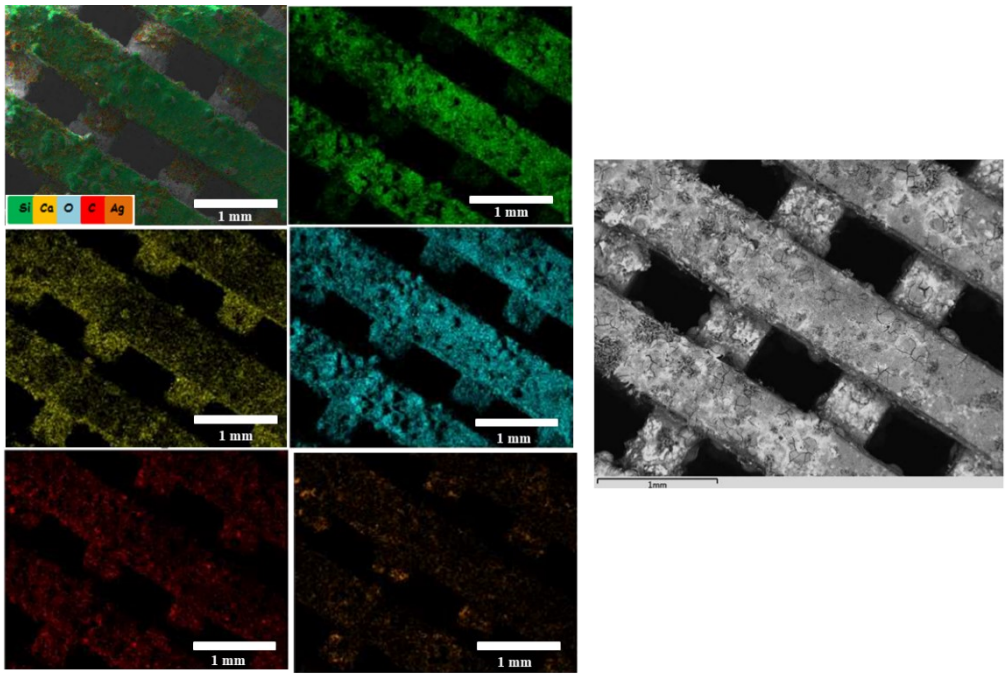

Fig. S7: Scanning Electron Microscopes (SEM) and Elemental mapping (EDX) images of c-Ca_2SiO_4/C-Ag/GO scaffolds functionalized with Ag/GO nanoparticles.

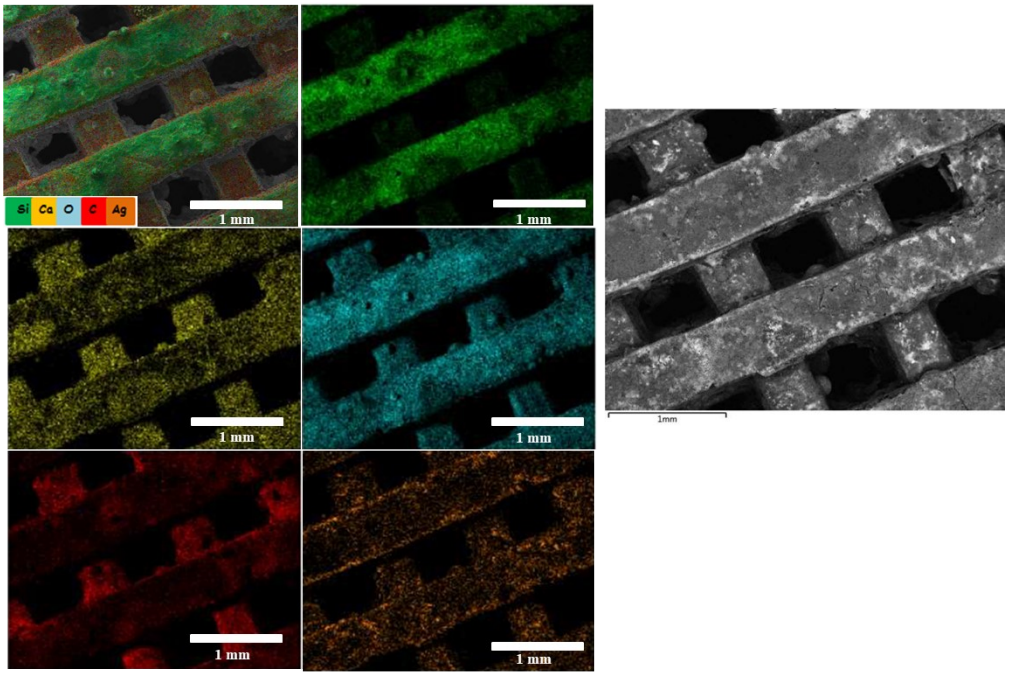

Fig. S8: Scanning Electron Microscopes (SEM) and Elemental mapping (EDX) images of s-Ca_2SiO_4/C-Ag/GO scaffolds functionalized with Ag/GO nanoparticles.