

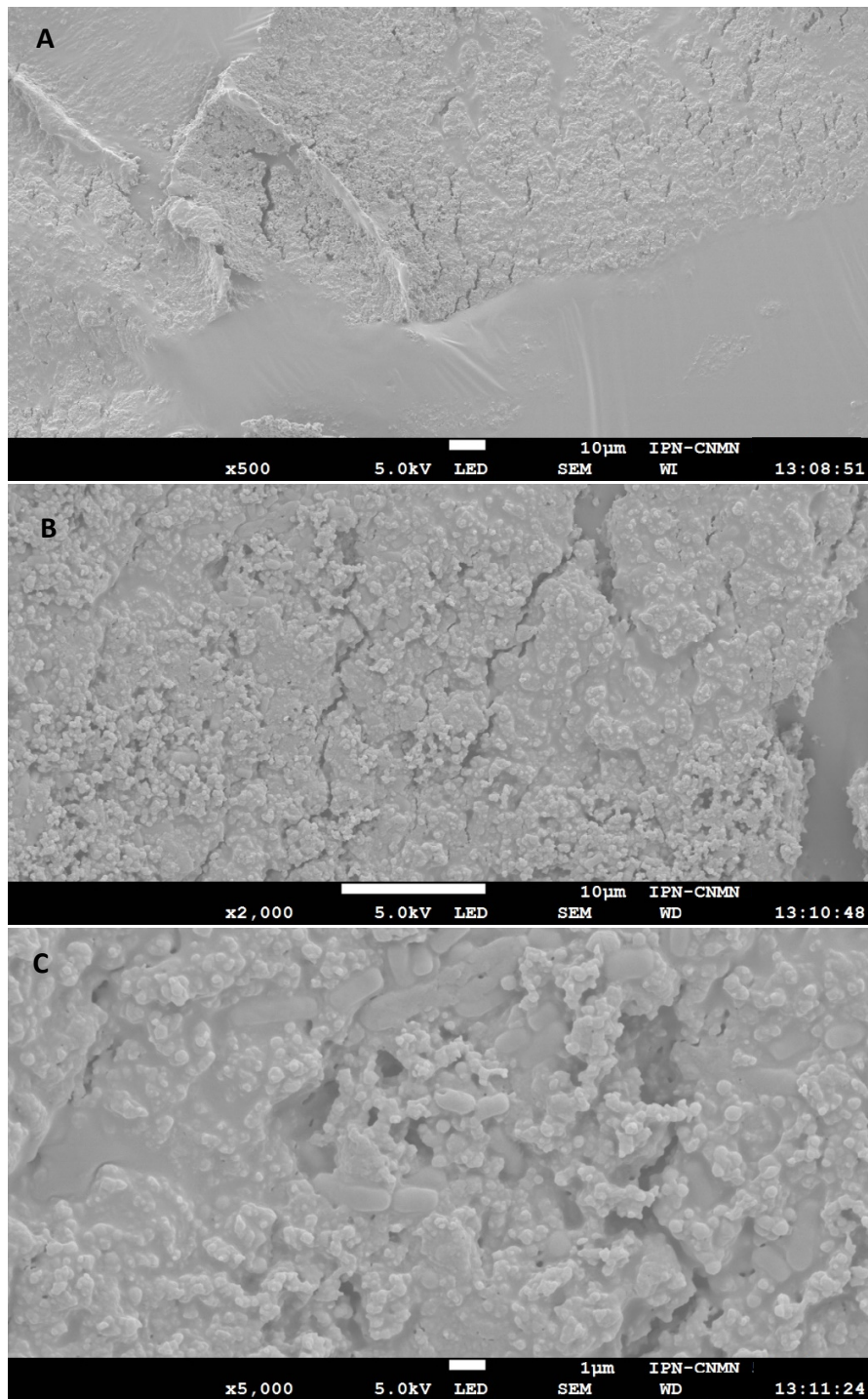


Figure S1 SEM images of the *L. fermentum* K73 culture medium at different magnifications: (A) 500X, (B) 2000X, (C) 5000X

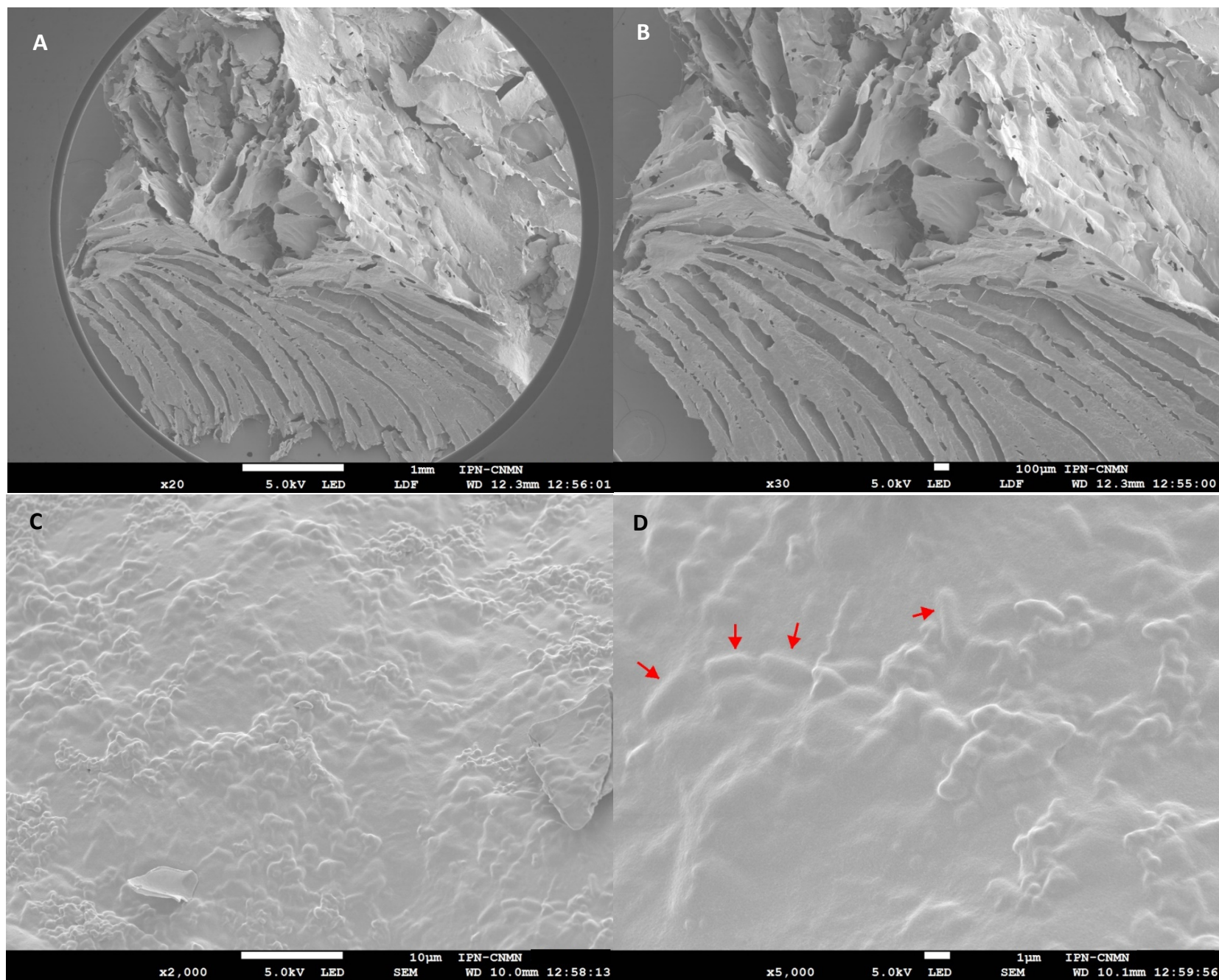


Figure S2 SEM images of the optimal mixture (SW-SA: 0.39/0.61) at different magnifications: (A) 20X, (B) 30X, (C) 2000X, (D) 5000 X

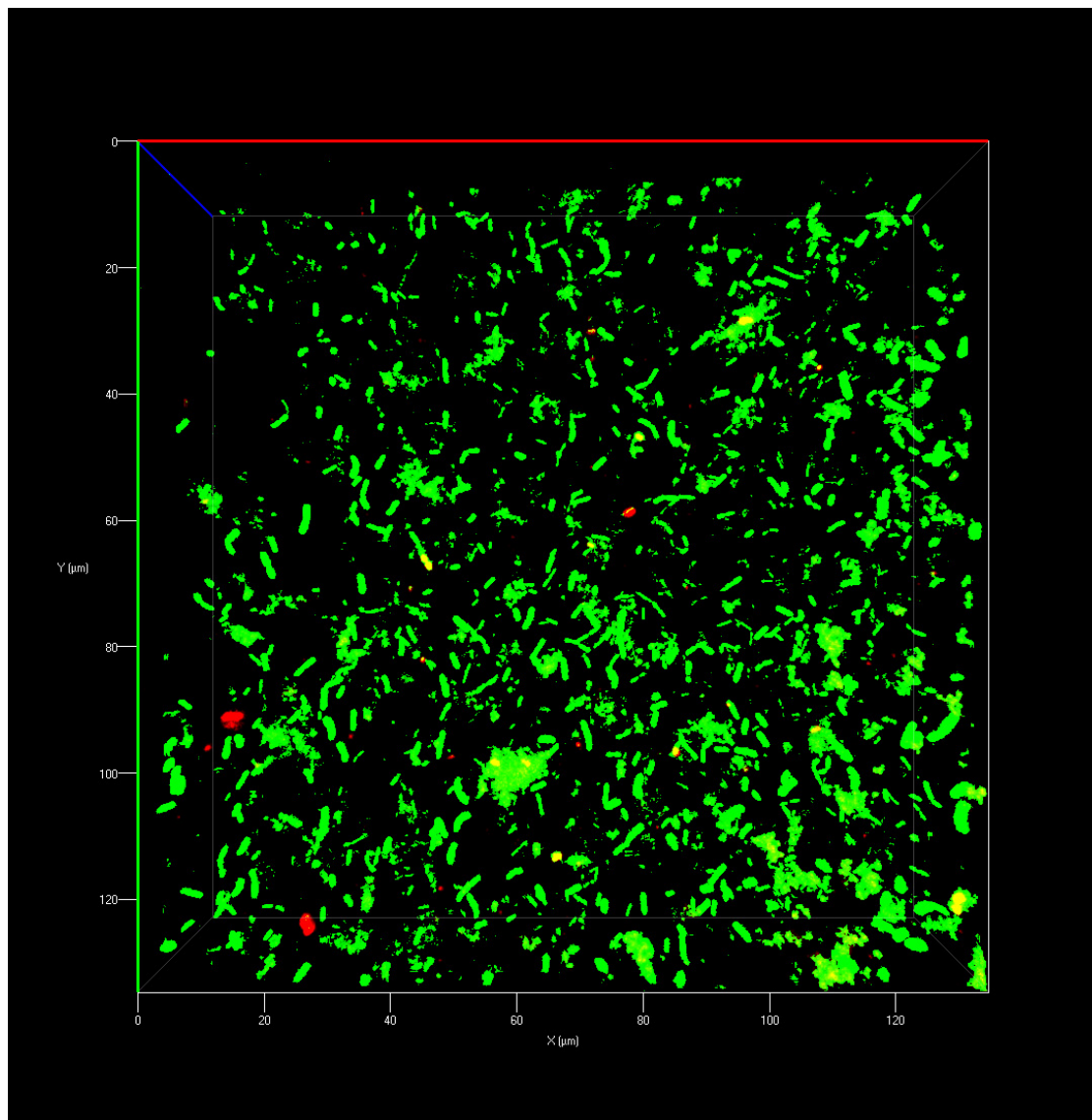


Figure S3 Confocal laser scanning microscopy 3D image for SW-SA bacterial beads

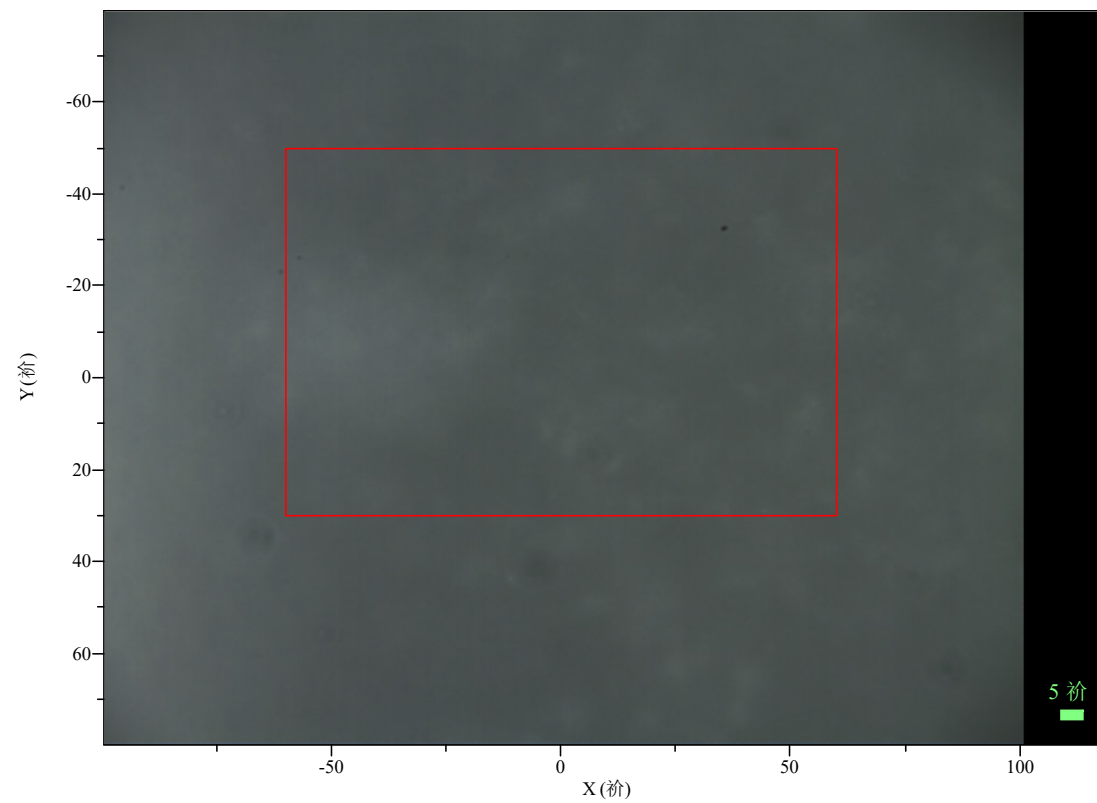


Figure S4 Raman two-dimensional map area

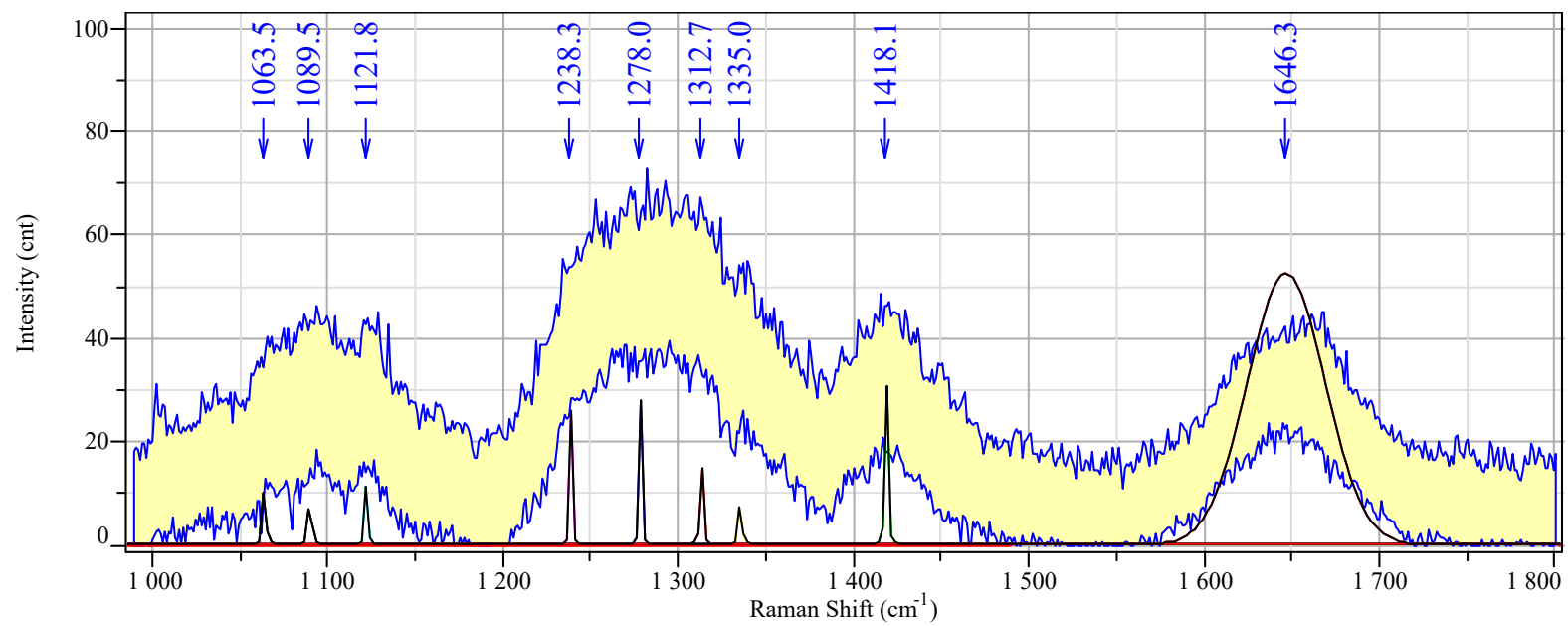


Figure S5 Sodium alginate RAMAN mapping spectra

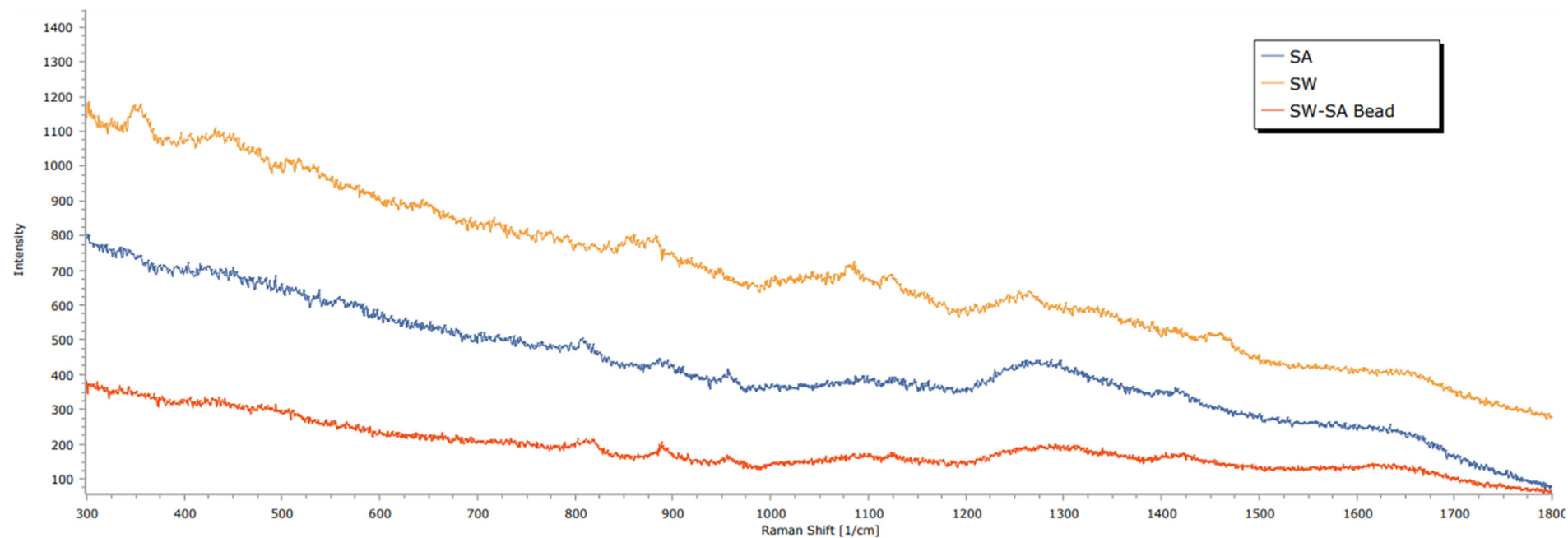


Figure S6 RAMAN analysis of sodium alginate (SA), culture medium, mainly sweet whey (SW), and fresh SW-SA microcapsules