Sophorolipid assisted tunable and rapid gelation of silk fibroin to form porous biomedical scaffolds

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Supporting Information

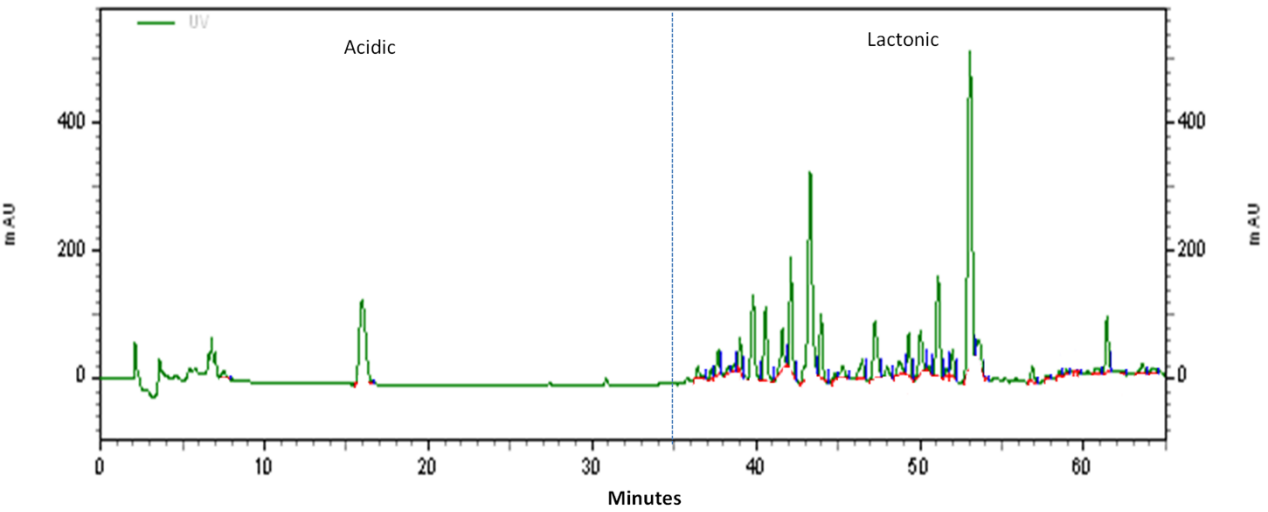

Figure S1 - HPLC elution pattern of Sophorolipid.

The SL sample was subjected to HPLC analysis to get an idea about relative percentages of lactonic and acidic component based on standard sample run. The chromeline-Hitachi HPLC system was used along with C18 column (5 µm, 150 x 4.6 mm). The solvent system used was MilliQ water-Acetonitrile (ACN). Total run time was 65 minutes. For the first 15 minutes, ACN was maintained at 20% then it was gradually raised to 80% upto 40 minutes and was brought to 100% till 50 minutes and thereafter maintained for 15 minutes. The run was performed at flow rate 0.5mL/min and 25°C. The compounds were detected by L-2490 UV detector at 207nm.

As per the HPLC analysis it was found that SL sample contains around 84% of lactonic form and remaining 16% of acidic form. The acidic SL gets eluted first while the lactonic SL show

longer retention time because of higher hydrophobicity (Y. Hu, L.Ju, Enzyme Microb Technol, 29 (2001) 593). Therefore the acidic SLs got eluted within 20 minutes while the peaks eluting after 35minutes were corresponding to lactonic forms.

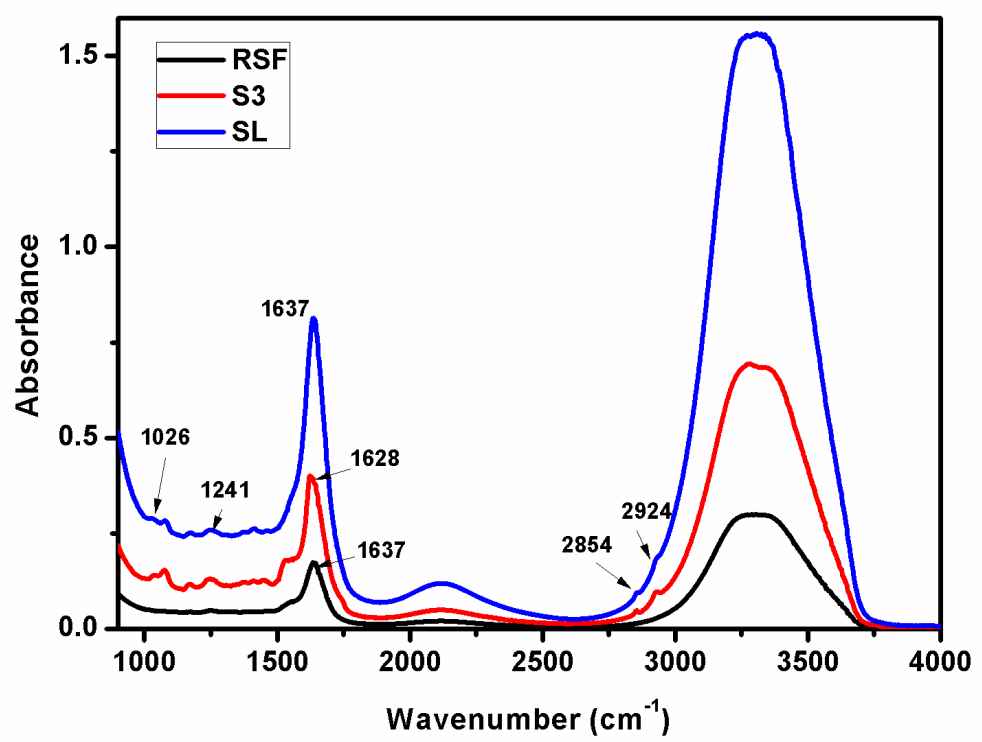

Figure S2 – Comparative FTIR spectrum of RSF, S3 and SL.

FTIR analysis was done on SL solution, RSF solution and SF-SL hydrogel using the H-ATR mode on a Perkin Elmer FTIR Spectrum One spectrophotometer in the range of 900 to 3800 cm^{-1} using a resolution of $4cm^{-1}$.

The FT-IR analysis (Fig. S2) of sophorolipid shows the presence of sugar, which is confirmed by the C–O stretch of C–O–H groups at 1026 cm^{-1}. C-O band (1241 cm^{-1}) of C (-O)-O–C from the acetyl esters corresponds to the ester linked acetyl group at 6'/6'' position of the sugar. The presence of alkyl chain corresponding to the fatty acid is confirmed by symmetrical and asymmetrical stretching of methylene at 2854 cm^{-1} and 2924 cm^{-1} respectively. The broadband at 3370 cm^{-1} corresponds to O-H stretching. The presence of

1637 cm^{-1} band corresponding to C=C stretching, further confirms the presence of fatty acid chain. The FTIR spectrum of SF-SL confirmed the presence of both SF and SL in the hydrogel. The weak peak intensity is attributed to the presence of large amount of water in the samples.