Supplementary information

1.Degree of substitution of (2-ethylhexanoyl)chitosan (CS-EHA).

C/N molar ratio obtained based on the elemental analysis data was used to calculate the degree of substitution of CS-EHA. Elemental analysis of CS-EHA was calculated for (C15H15NO5)0.77(C6H11NO4)0.230.25H2O. Calculated: C,58.75: H,5.57:N,5.3. Obtained results: C, 58.57: H, 5.45: N, 5.22. Based on the elemental analysis, DS was calculated and provided in Table 1.An increase in carbon percentage for CS-EHA with respect to chitosan confirmed the substitution. From the C/N molar ratios, the increase in mass was obtained as 13.08 g/mol and DS was found to be 0.78.

Table 1. Degree of substitution of CS-EHA

 C(%) N(%) m(C)/m(N)#  DS

Chitosan 44.71 8.69 6.0 ---

CS-EHA 58.57 5.22 13.08 0.78\*

Note: # m represents number of moles \*refers to 78% substitution with respect to free amine group of CS-EHA.

Degree of substitution (DS) is calculated as per the following formula.

 Increase in molar mass ratio [m(C)/m(N)] of CS-EHA under test

DS = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ x 100

 Increase in molar mass ratio [m(C)/m(N)] of CS-EHA (theoretical)