Supporting Information

Encapsulation of Plant Growth Promoting Bacteria in Poly(itaconic acid) Microspheres by Spray-Drying

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Table of Contents

1. NMR

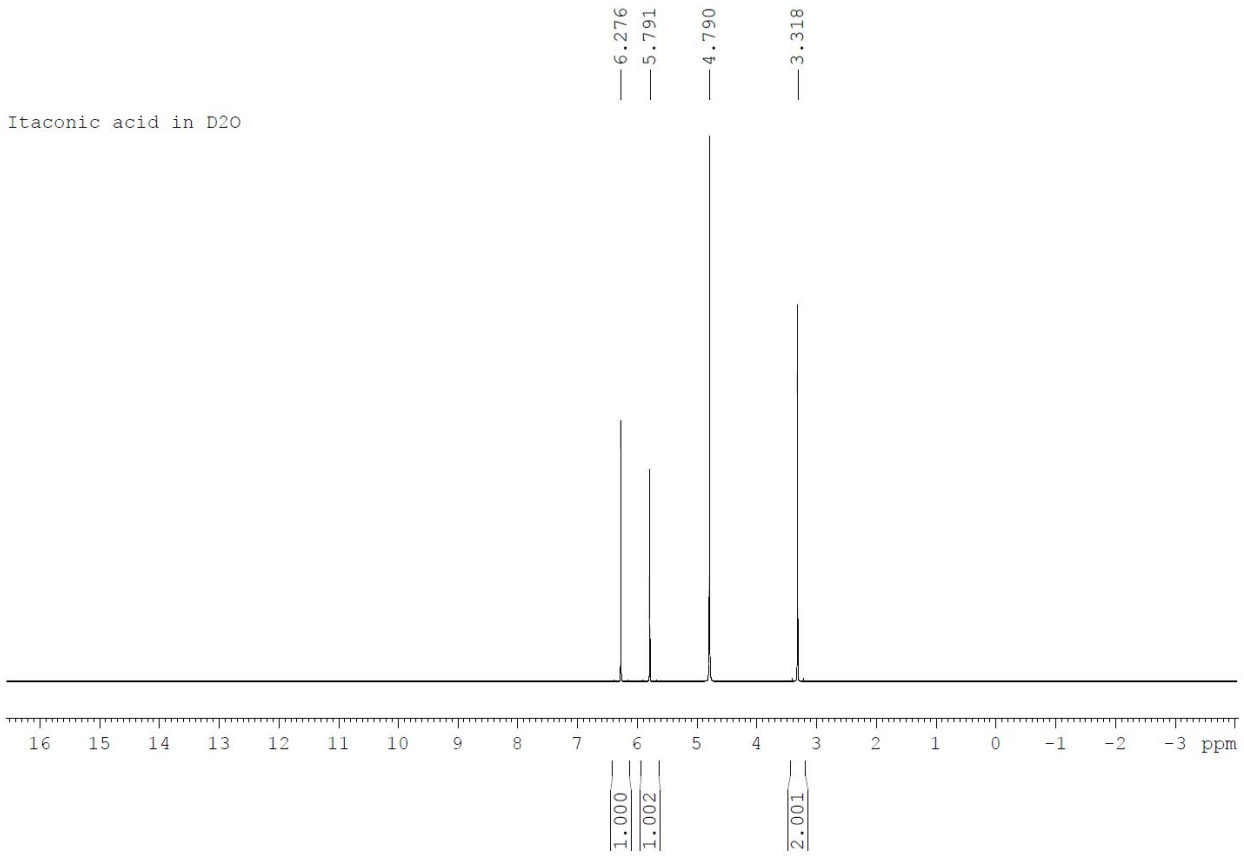

Figure S1: ^{1}H NMR of itaconic acid

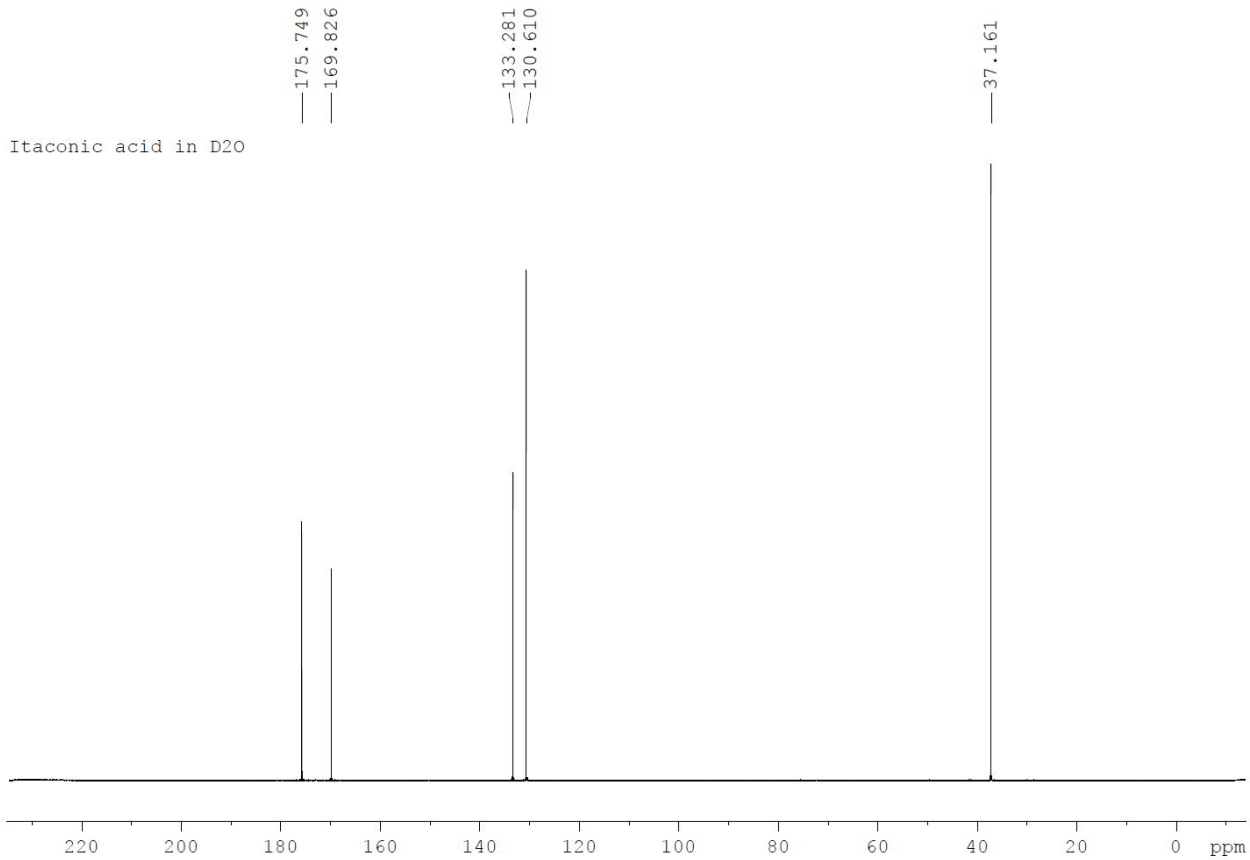

Figure S2: ^{13}C NMR of itaconic acid

NMR of IA

^{1}H NMR (D_2O, 500 MHz) δ 6.28 (s, 1H), 5.79 (s, 1H), 3.32 (s, 2H); ^{13}C NMR ($CDCl_3$, 126 MHz) δ 175.7, 169.8, 133.3, 130.6, 37.2 ppm.

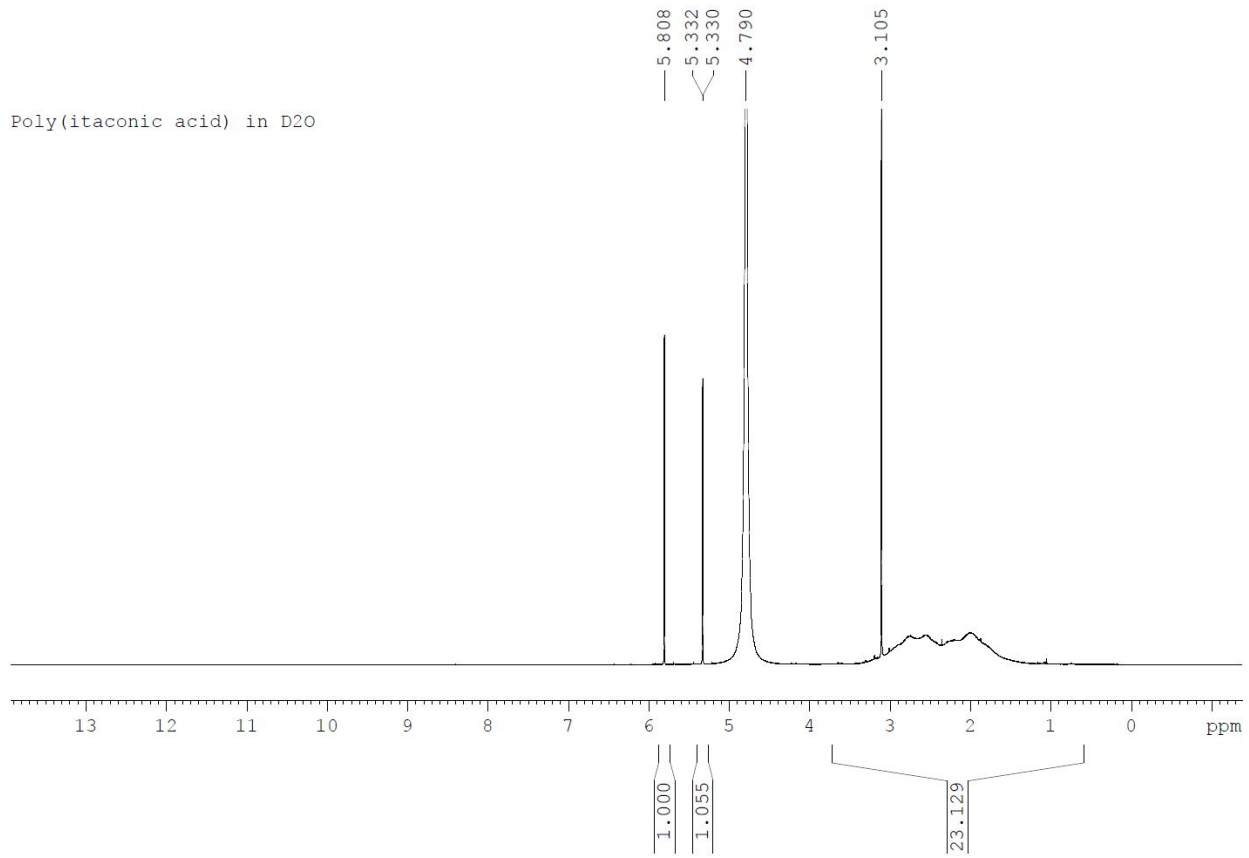

Figure S3: ^{1}H NMR of poly(itaconic acid)

NMR of PIA

^{1}H NMR (D_2O, 500 MHz) δ 3.50-1.20 (m, 4H)

2. Biocompatibility of PIA with bacteria

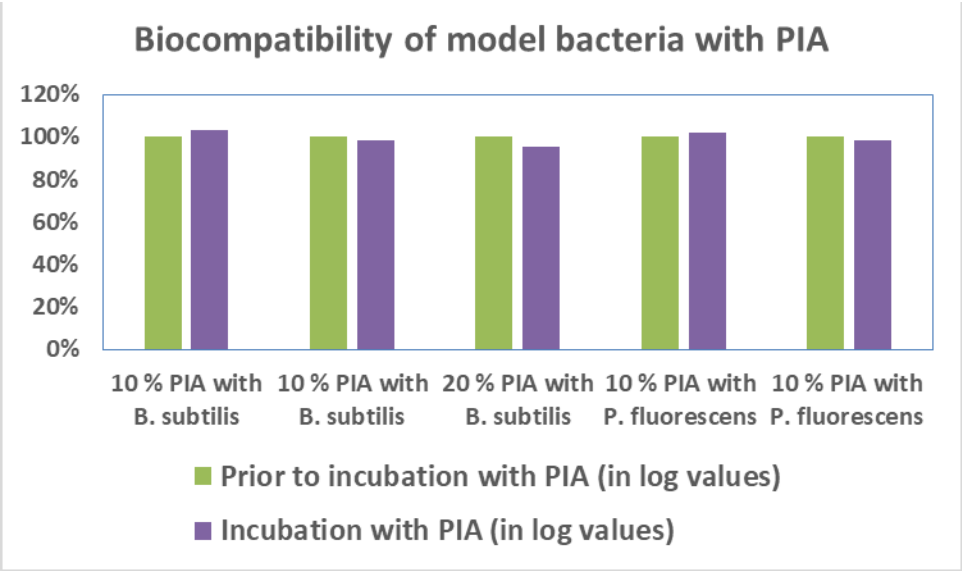

Figure S4: Biocompatibility of PIA with model bacteria *Bacillus subtilis* and *Pseudomonas fluorescens*. Results presented correspond to survival of the microbes calculated as a percentage using the logarithmic values of the CFU prior to incubation with PIA over the logarithmic values of the CFU after incubation with PIA for 1 h.

3. Effect of addition of ethanol in polymer solution at different temperatures, concentrations and over time

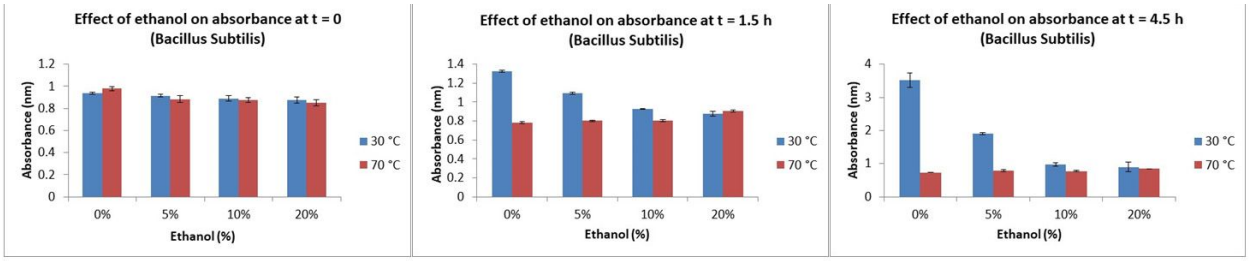

Figure S5: Effect of adding various percentages of ethanol on the growth of *Bacillus subtilis* in terms of cell turbidity at time t = 0, t = 1.5 h and t = 4.5 h for temperatures 30 °C and 70 °C.

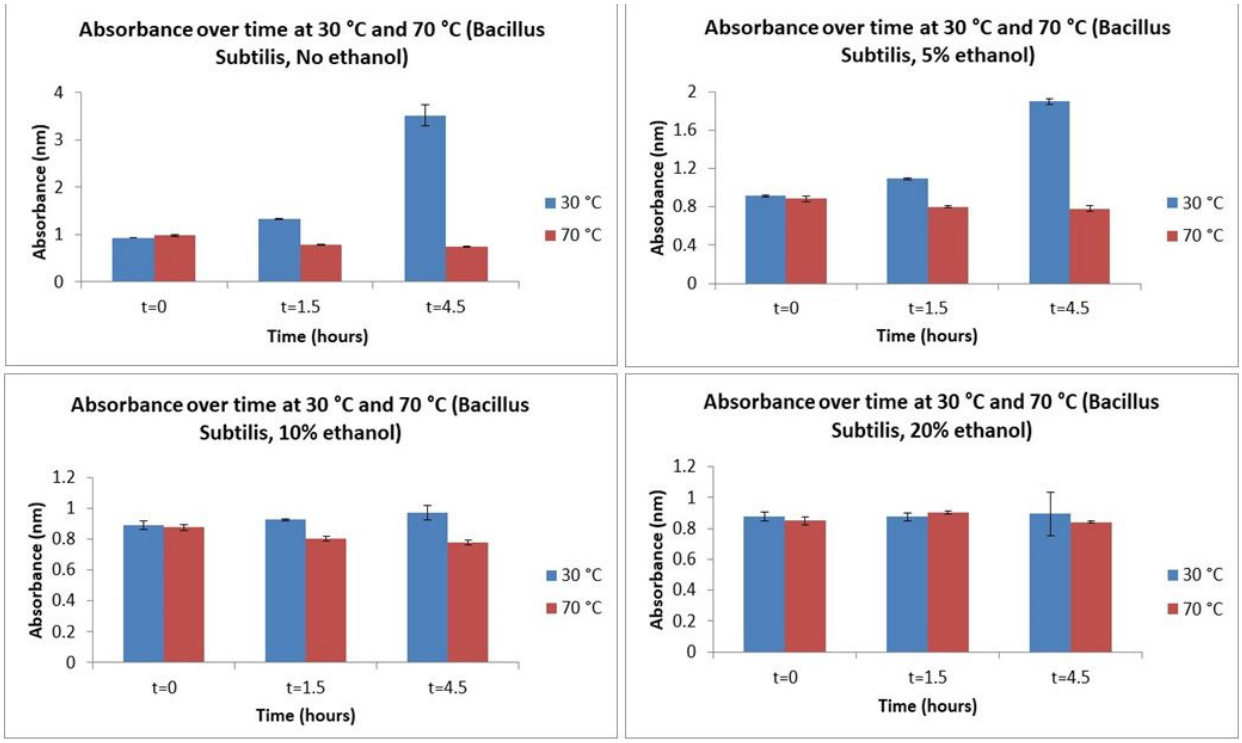

Figure S6: Control experiment for growth of *Bacillus subtilis* in terms of cell turbidity at temperatures 30 °C and 70 °C for time t = 0, t = 1.5 h and t = 4.5 h, at varying percentage of ethanol in the media.

4. Effect of addition of methanol in polymer solution at different temperatures, concentrations and over time

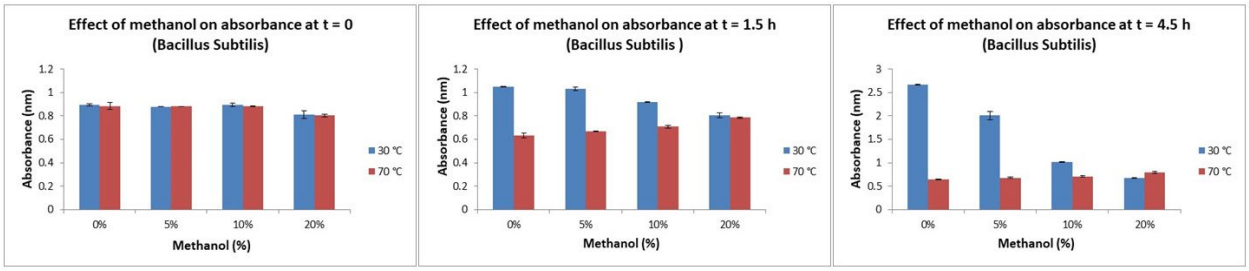

Figure S7: Effect of adding various percentages of methanol on the growth of *Bacillus subtilis* in terms of cell turbidity at time t = 0, t = 1.5 h and t = 4.5 h for temperatures 30 °C and 70 °C.

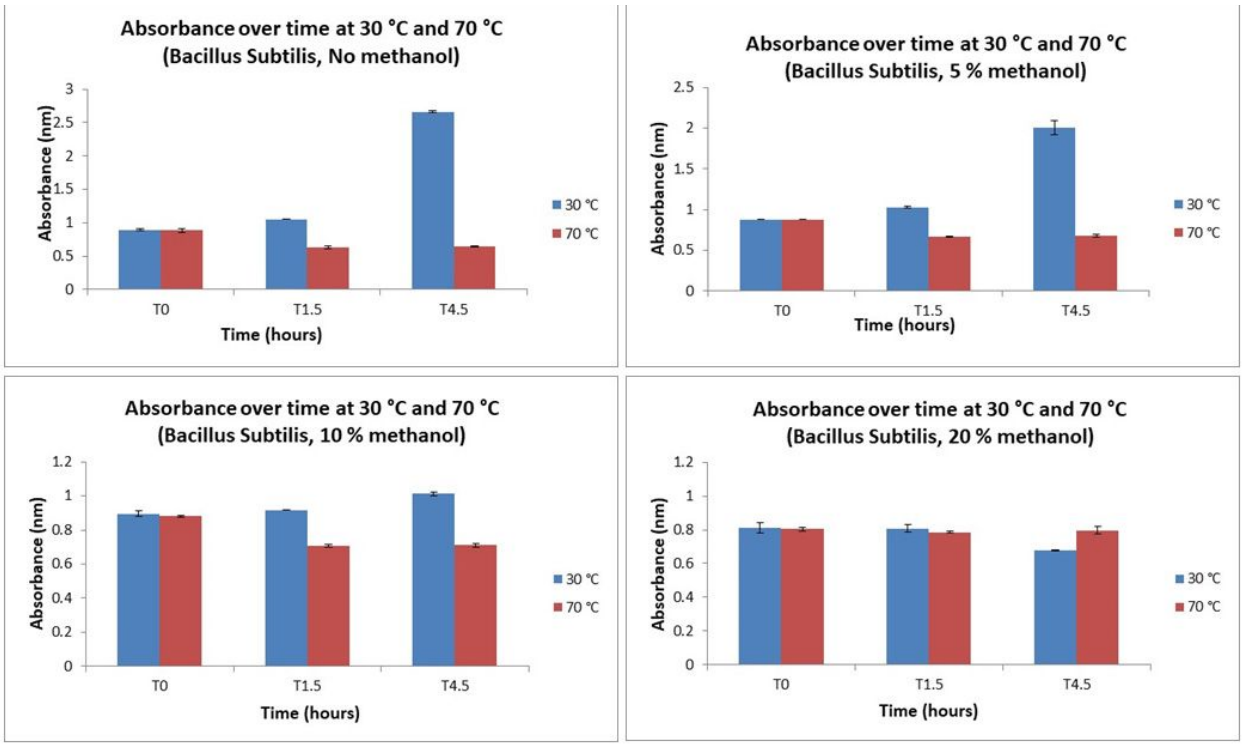

Figure S8: Control experiment for growth of *Bacillus subtilis* in terms of cell turbidity at temperatures 30 °C and 70 °C for time t = 0, t = 1.5 h and t = 4.5 h, at varying percentage of methanol in the media.

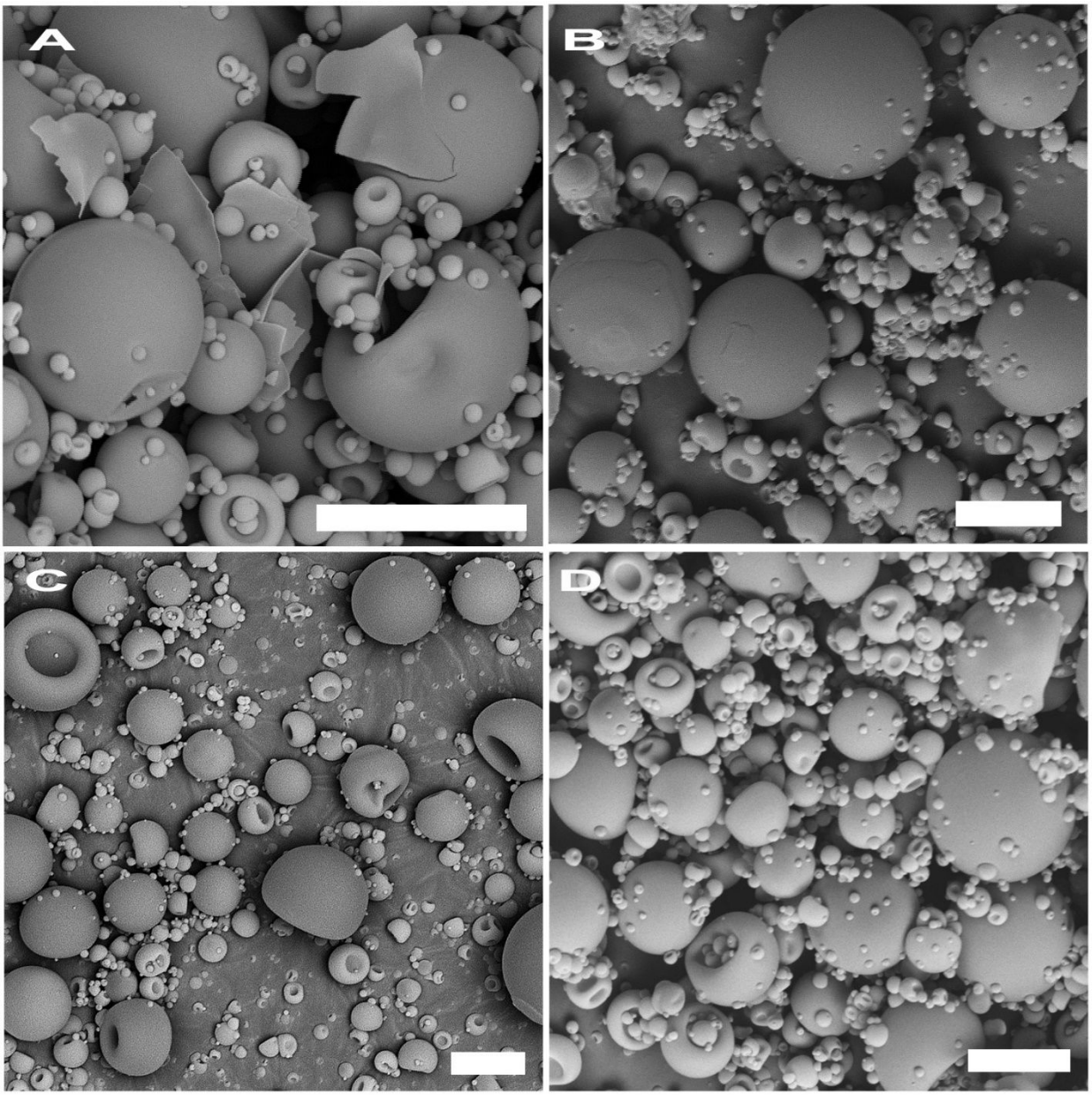

Figure S9: Microscopy images of spray-dried *B. subtilis*-PIA microspheres from PIA solutions containing alcohols in different concentrations, A) 10% PIA + 5% EtOH, B) 10% PIA + 10% EtOH, C) 10% PIA + 5% MeOH, and D) 10% PIA + 10% MeOH. Scale bar = 10 μm