

Supplementary Information

Peptide-based microcapsules obtained by self-assembly and microfluidics as controlled environments for cell culture

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All peptides were synthesized, characterized and purified successfully. MALDI-MS was used to characterize the mass of the synthesized peptides (Fig. S1-S2, A).

The expected mass for C₁₆V₃A₃K₃ (C₅₈H₁₁₁N₁₃O₁₀) was 1150.58, two main peaks were found by MALDI-MS, corresponding to [M] m/z = 1150.84, and [M+Na]⁺ m/z = 1172.83 (Fig. S1A).

The expected mass for C₁₆V₃A₃E₃ (C₅₅H₉₅N₉O₁₇) was 1152.68, one main peak was found by MALDI-MS, m/z = 1152.80 (Fig. S2A).

Analytical HPLC of the collected fractions showed a single peak after purification for all the PAs (Fig. S1-S2, B)

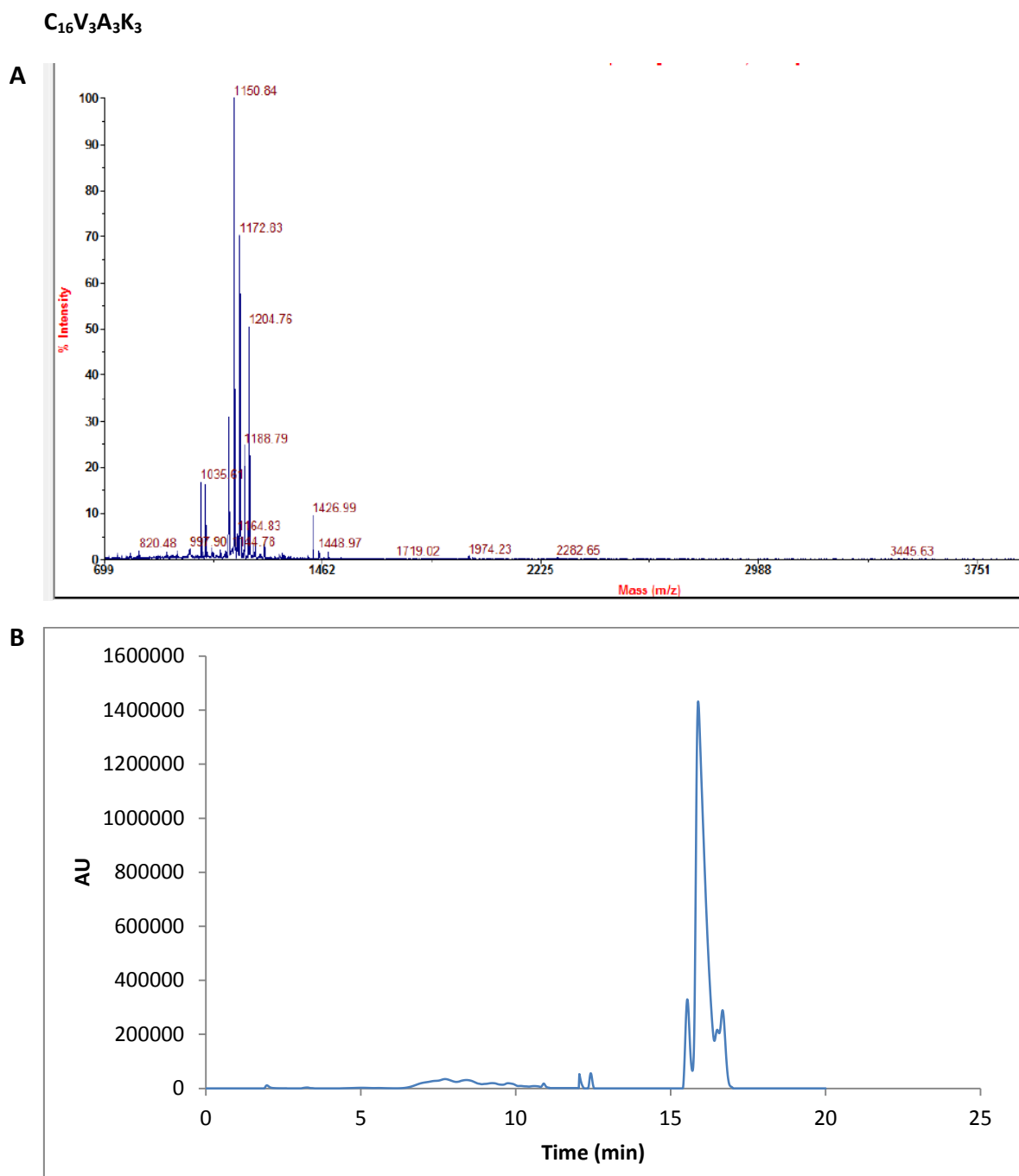


Figure S1. Representative MALDI-MS data (A) and analytical HPLC trace, detected at 220 nm (B) of C₁₆V₃A₃K₃.

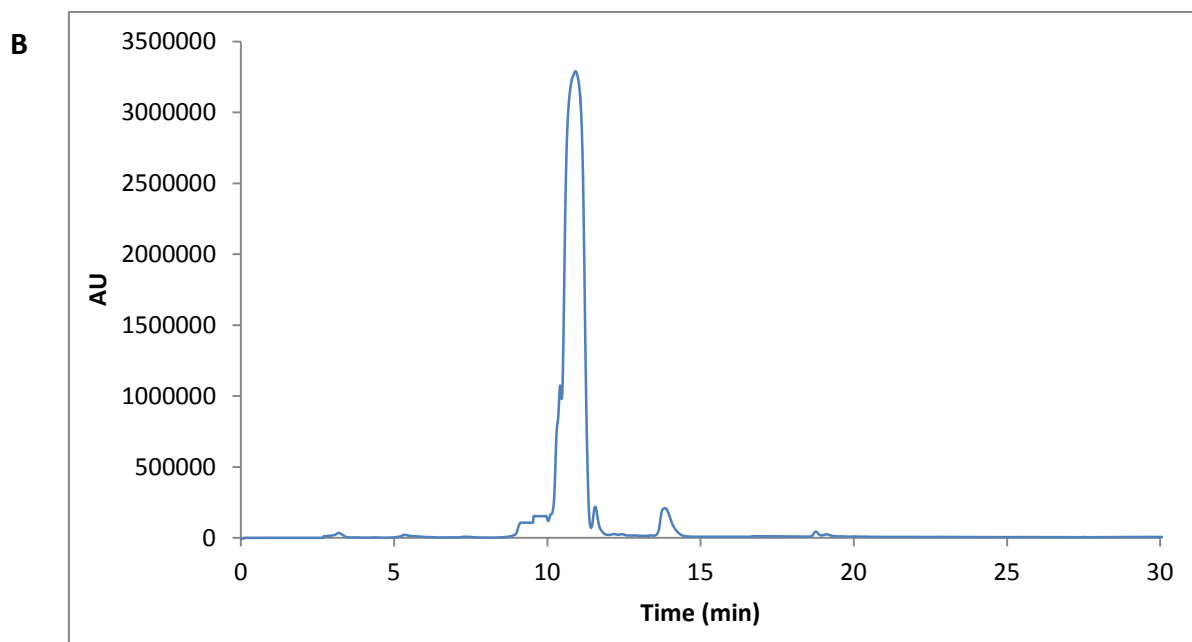
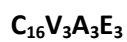


Figure S2. Representative MALDI-MS data (A) and analytical HPLC trace, detected at 220 nm (B) of $C_{16}V_3A_3E_3$.

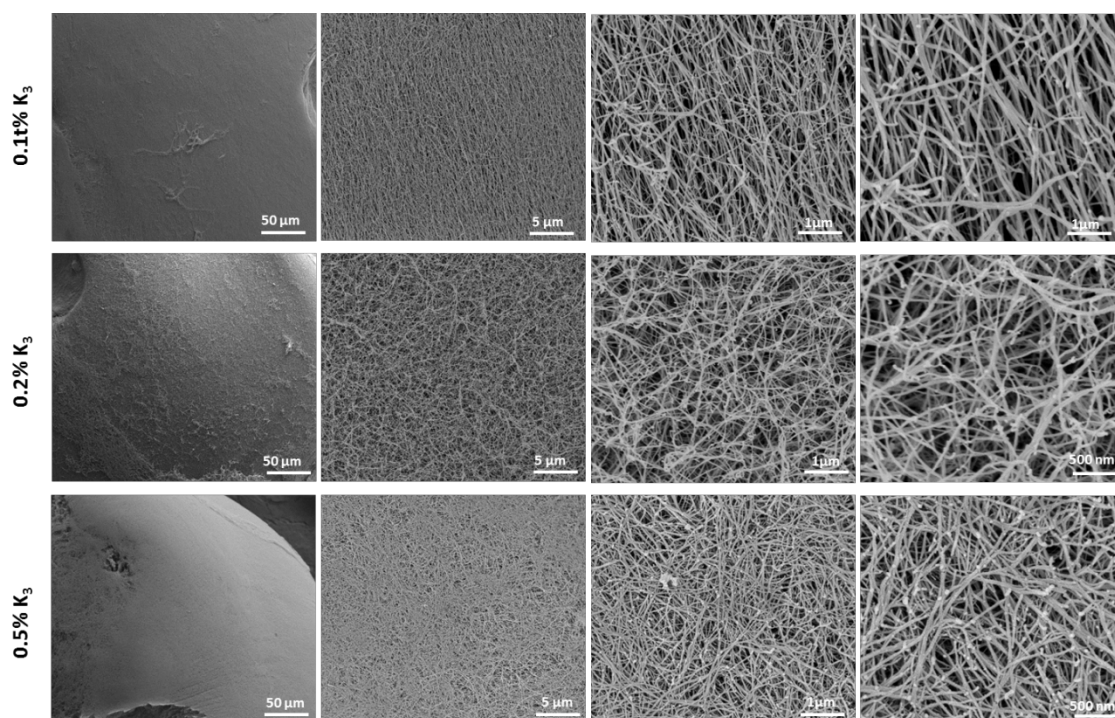
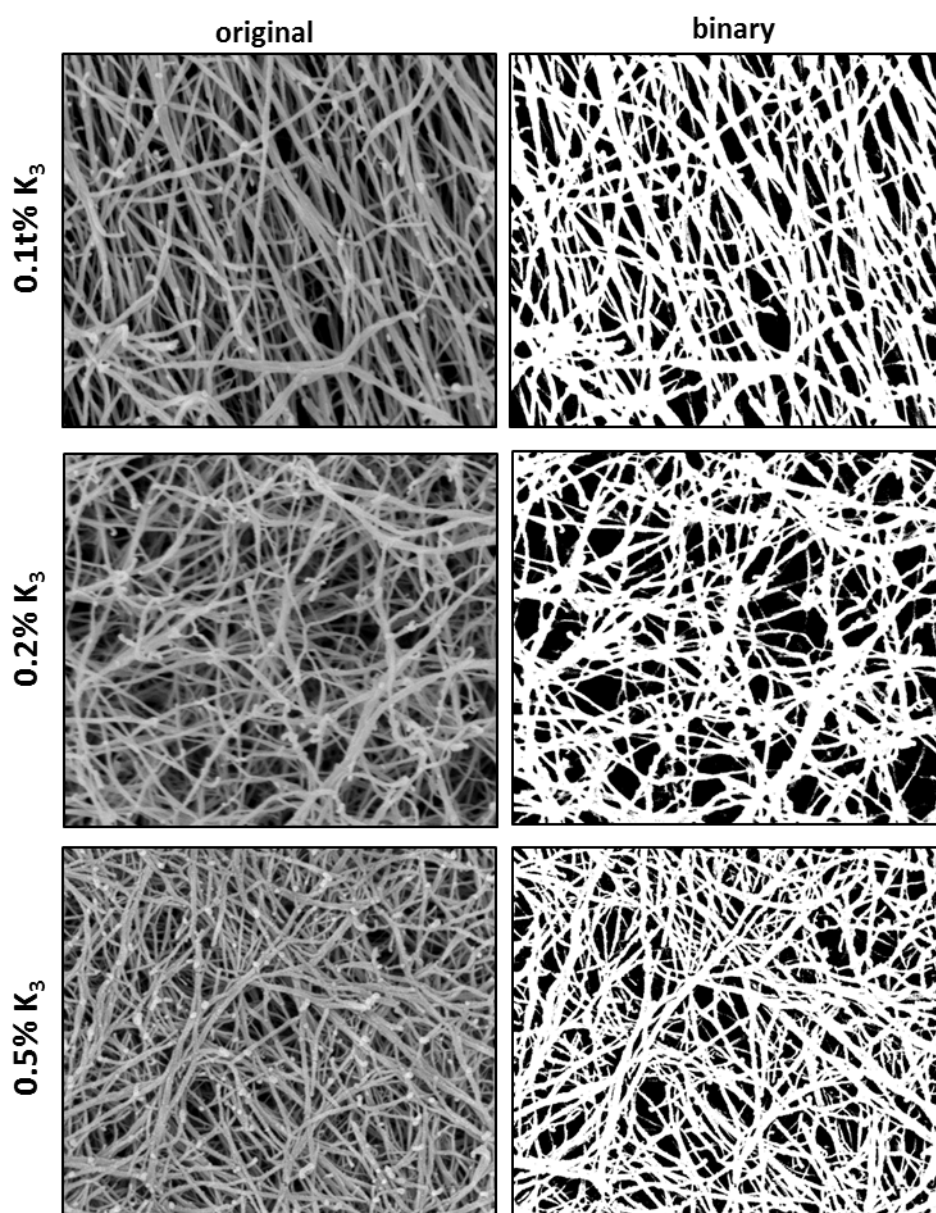


Figure S3. SEM micrographs of capsule external surface at different magnifications and as function of K₃-PA concentration.

Capsule shell porosity was estimated using SEM micrographs and ImageJ software (NIH, USA) for image analysis and processing.^{S1} To separate the nanofibers from the background, a threshold was set to the image by assigning the pixels in the image as either completely white or black. Once the range was selected a binary image was created (Fig. S4) by the software in which objects (nanofibers) are white and background is black. The measurement tool was then used to quantify the area covered by the pores or by the nanofibers. Since the image area was known, the area fraction filled by the pores was calculated giving an estimated value of porosity.



%K3	Estimated Porosity (%)
0.1	64.4
0.2	41.6
0.5	23.1

Figure S4. SEM micrographs of external surface of capsules prepared at different K₃-PA concentrations and images processed with ImageJ software (A). Estimated porosity of capsule shell as function of K₃-PA concentrations.

References

- S1. J. Farmer, B. Duong, S. Seraphin, S. Shimpalee, M. J. Martinez-Rodriguez, J. W. Van Zee, *J. Power Sources*, 2012, **197**,1-11.