

Biomimetic Electrospun PVDF/Self-Assembling Peptide Piezoelectric Scaffolds for Neural Stem Cell Transplantation in Neural Tissue Engineering

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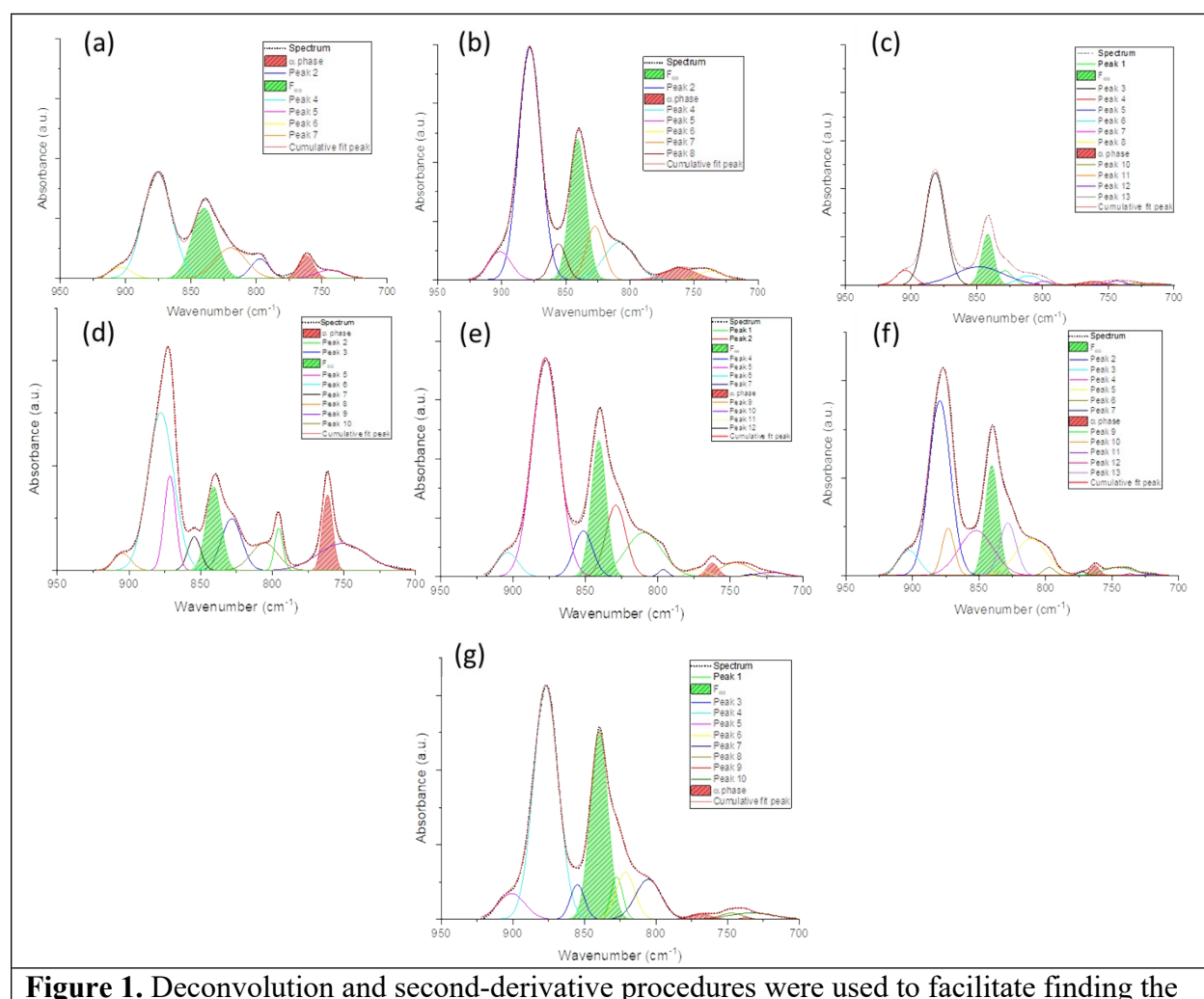
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peak positions corresponding to the α , β , and γ in their IR spectra (range 950-700 cm^{-1}) and for the quantitative analysis of the phase content. (a) PVDF, (b) PVDF-SDS, (c) PVDF-SDS-al, (d) PVDF-DMF100, (e) PVDF-SDS-DMF100, (f) PVDF-FAQ(LDLK)₃, and (g) PVDF-SDS-FAQ(LDLK)₃.

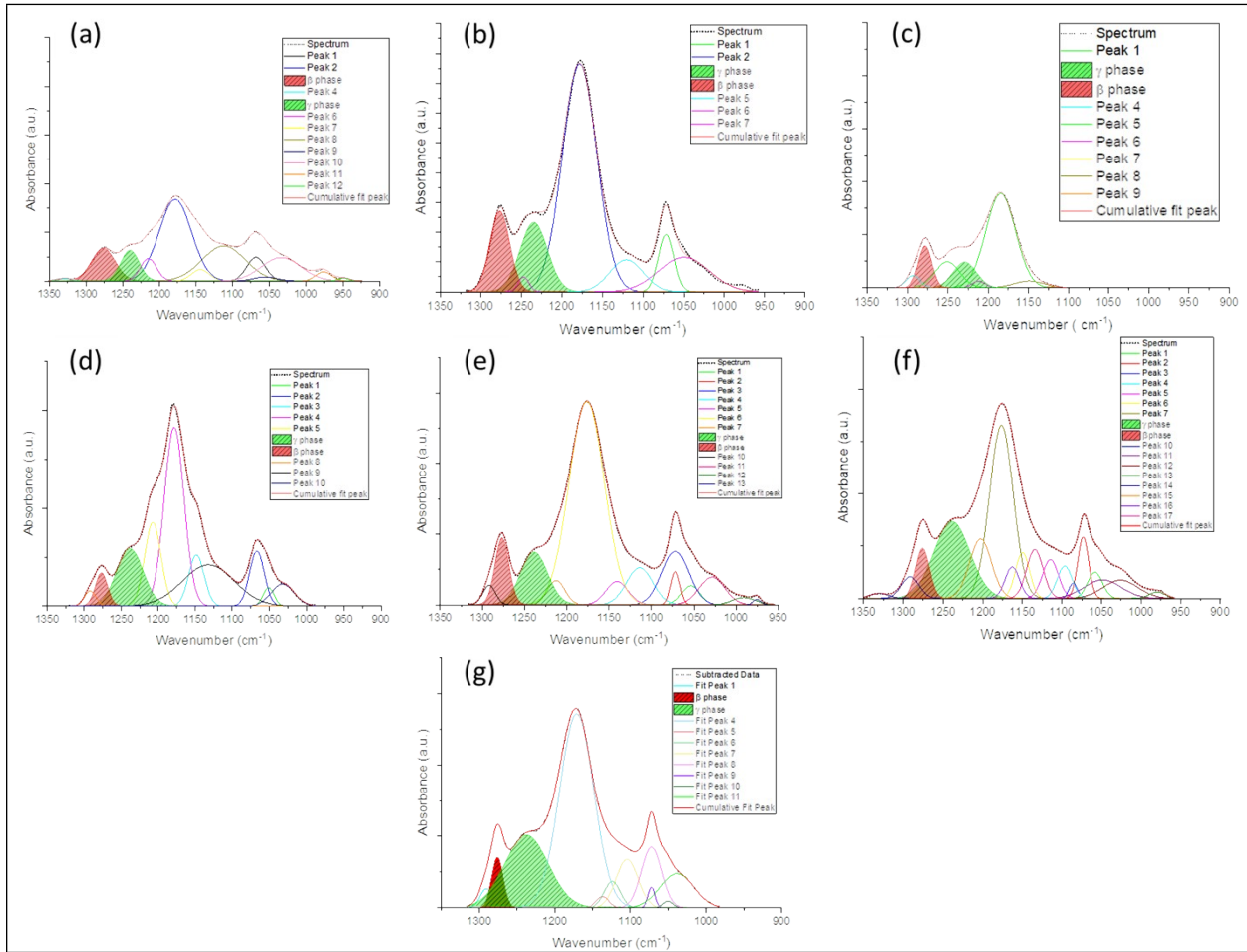


Figure 2. Deconvolution and second-derivative procedures were used to facilitate finding the peak positions corresponding to the β and γ in their IR spectra (range 1350-950 cm^{-1}) and quantitative analysis of the phase content. (a) PVDF, (b) PVDF-SDS, (c) PVDF-SDS-al, (d) PVDF-DMF100, (e) PVDF-SDS-DMF100, (f) PVDF-FAQ(LDLK)₃, and (g) PVDF-SDS-FAQ(LDLK)₃.

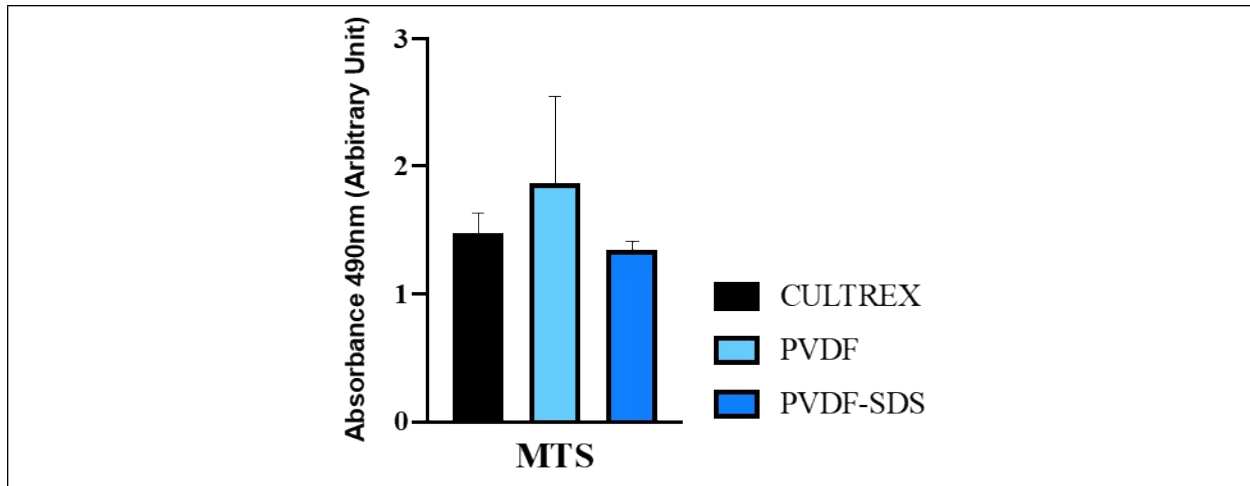


Figure 3. MTS assay on our PVDF and PVDF-SDS samples to assess cytotoxicity. Cultrex, the gold standard, was used as the control. Stem cells were seeded in both the control group and on the PVDF and PVDF-SDS samples. The graph shows no significant differences in cell viability between the PVDF and PVDF-SDS samples and the positive control, Cultrex. As depicted, the cell viability for both PVDF and PVDF-SDS samples closely aligns with the positive control, confirming their biocompatibility.

Table 1. Piezoelectric experiments to investigate the correlation between the thickness of PVDF meshes and the resulting voltage and capacitance.

Sample (mg/cm ²)	V _{AC rms} [mV]	V _{p-p} [mV]	C _{100Hz} [pF]	Θ _{100Hz} [pF]	C _{100kHz} [pF]	Θ _{100kHz} [pF]
1	58.22	181.5	375	-89.4	369	-89.4
2	180	532	217	-89.2	210	-89.6
3	625	1780	159	-89.4	154	-89.5
4	38	120	210	-89.3	201	-89.4

V_{AC}: Voltage Alternating Current

V_{p-p}: peak-to-peak voltage

C: Capacitance

Θ: phase shift