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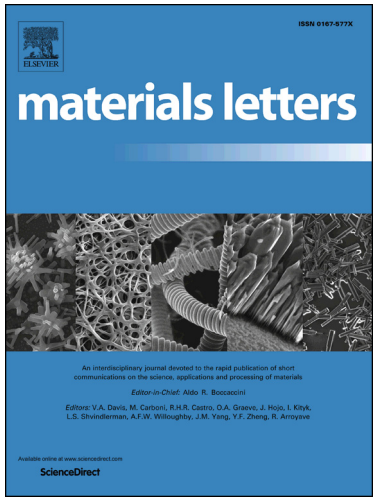

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PII: S0167-577X(18)30415-4
DOI: https://doi.org/10.1016/j.matlet.2018.03.051
Reference: MLBLUE 24012

To appear in: *Materials Letters*

Received Date: 14 November 2017
Revised Date: 20 February 2018
Accepted Date: 8 March 2018

Please cite this article as: B. Merle, X. Kraus, M. Tallawi, B. Scharfe, M. El Fray, K.E. Aifantis, A.R. Boccaccini, M. Göken, Dynamic Mechanical Characterization of Poly(Glycerol Sebacate)/Poly(Butylene Succinate-Butylene Dilinoleate) Blends for Cardiac Tissue Engineering by Flat Punch Nanoindentation, *Materials Letters* (2018), doi: https://doi.org/10.1016/j.matlet.2018.03.051

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Dynamic Mechanical Characterization of Poly(Glycerol Sebacate)/Poly(Butylene Succinate-Butylene Dilinoleate) Blends for Cardiac Tissue Engineering by Flat Punch Nanoindentation

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Abstract

The viscoelastic properties of polymer blends of poly(glycerol sebacate) (PGS) and poly(butylene succinate-dilinoleate) (PBS-DLA) copolymer intended for cardiac tissue patches are investigated by dynamic flat punch nanoindentation at frequencies ranging from 1 to 45 Hz. The storage modulus is found to depend weakly on the testing frequency, the lowest value being for 1 Hz, which corresponds to the usual heart rate. More significantly, it is found that varying the PGS content between 40 and 70 wt% allows tuning the storage modulus of the blends between 11 and 38 MPa. The reliability of the nanoindentation method is validated by reference dynamic mechanical measurements on thicker PBS-DLA samples using a tensile testing machine.

Keywords: nanoindentation; dynamic mechanical analysis; cardiac tissue engineering

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