The Effects of E-beam Sterilization on Poly-L-lactic acid (PLLA) Mechanical, Material and Thermal Properties

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Electronic Supplementary Information

Gel Permeation Chromatography

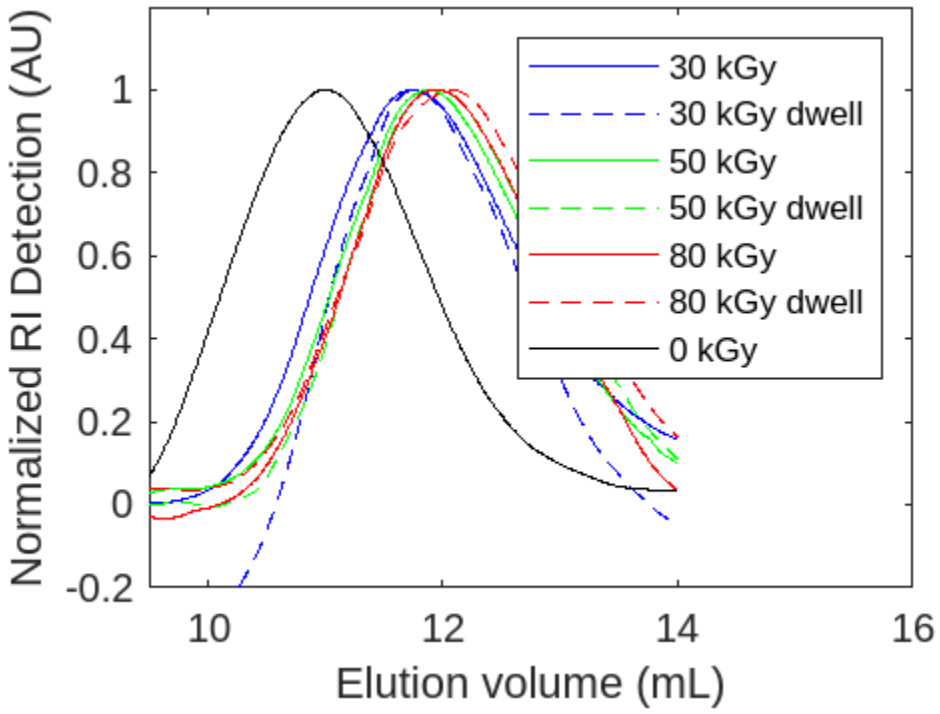

Figure S1. The normalized refractive index (RI) detection is plotted against the elution volume through the chromatography column, for a sample (n=1) from each treatment condition, and a control (unirradiated) sample. Raw data was normalized and a baseline adjustment was applied using a custom MATLAB script. Elution volume correlates positively to the elution time of the sample from the instrument, such that larger elution volumes correspond to longer elution times, and a lower average molecular weight of the sample.

DSC Characterization

A decrease in molecular weight, attributed to irradiation-induced chain scission increases chain mobility and therefore results in a decreased energy requirement to reorient the polymers in the cold crystallization phase.[1]

Thermogravimetric Analysis

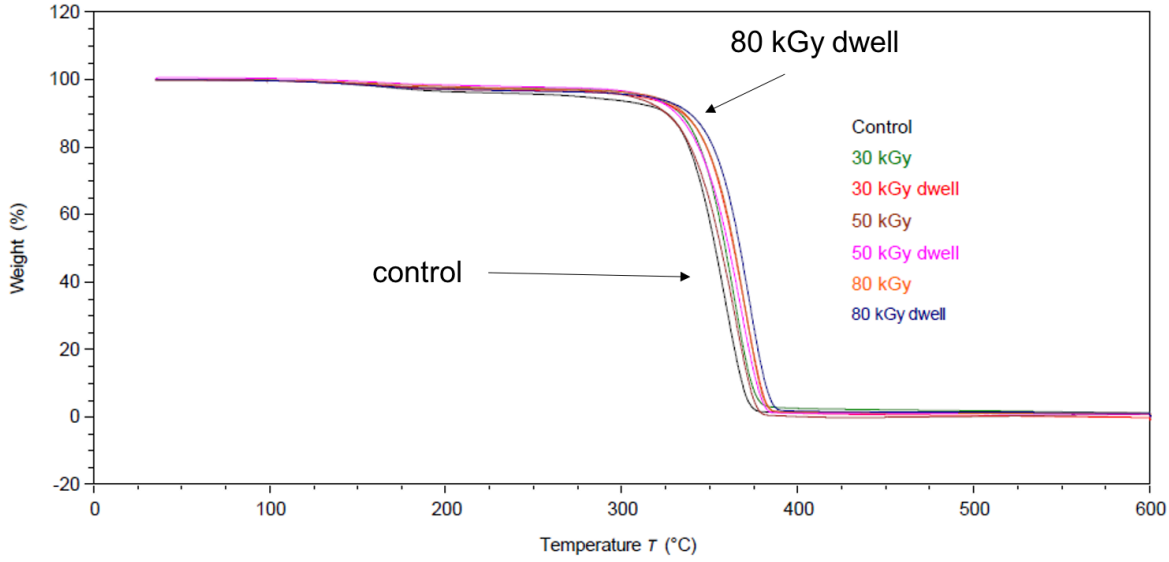

Figure S2. Thermogravimetric Analysis results are displayed above for each of the sample conditions (n = 3). Irradiated samples show an increase in thermal stability, attributable to crosslinking in the polymer.

References

[1] Loo, J., Ooi, C., & Boey, F. (2005). Degradation of poly(lactide- co-glycolide) (PLGA) and poly(l-lactide) (PLLA) by electron beam radiation. *Biomaterials, 26*(12), 1359-1367.