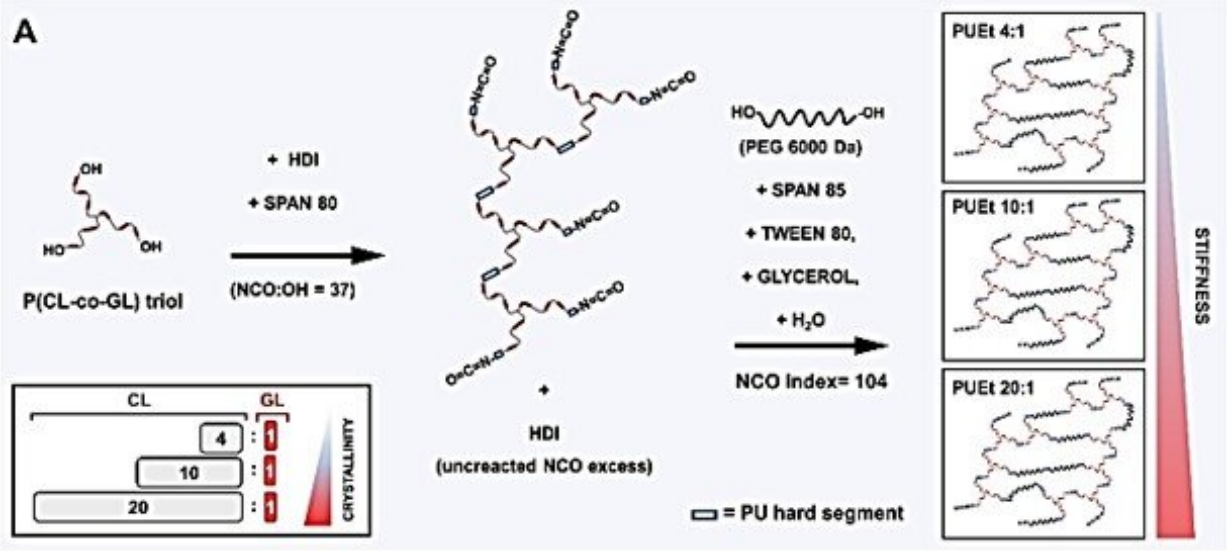
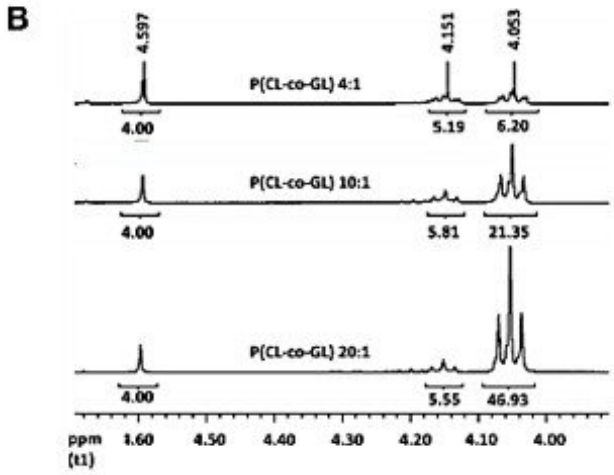
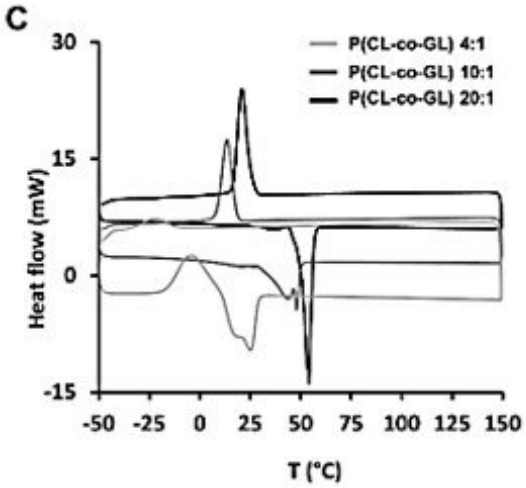
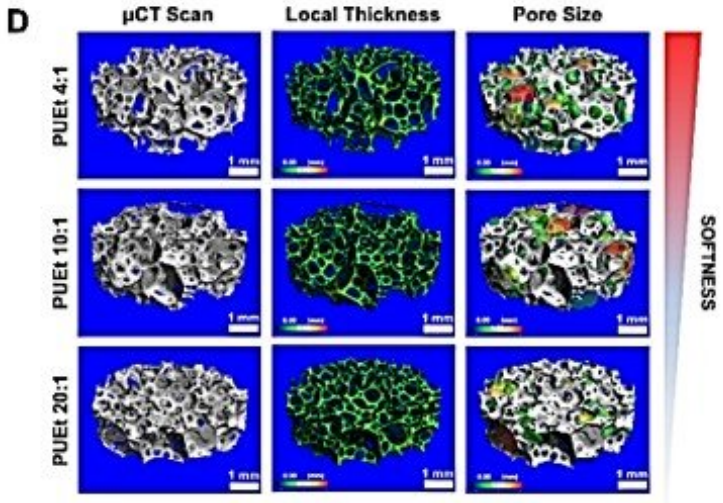
Soft tissue regeneration in a cell-free scaffold microenvironment

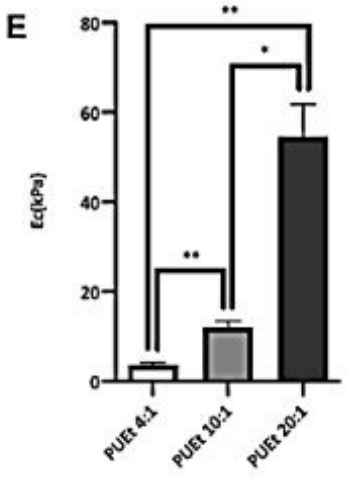
July 7 2021, by Thamarasee Jeewandara


A
P(CL-co-GL) triol
+ HDI
+ SPAN 80
(NCO:OH = 37)
HDI
(uncreacted NCO excess)
(PEG 6000 Da)
+ SPAN 85
+ TWEEN 80,
+ GLYCEROL,
+ H2O
NCO Index= 104
= PU hard segment
PUEt 4:1
PUEt 10:1
PUEt 20:1
STIFFNESS
CL
GL
4
10
20
CRYSTALLINITY


B
4.597
4.151
4.053
P(CL-co-GL) 4:1
4.00
5.19
6.20
P(CL-co-GL) 10:1
4.00
5.81
21.35
P(CL-co-GL) 20:1
4.00
5.55
46.93
ppm (t1)
4.60
4.50
4.40
4.30
4.20
4.10
4.00


C
P(CL-co-GL) 4:1
P(CL-co-GL) 10:1
P(CL-co-GL) 20:1
Heat flow (mW)
30
15
0
-15
-50
-25
0
25
50
75
100
125
150
T (°C)


D
µCT Scan
Local Thickness
Pore Size
PUEt 4:1
PUEt 10:1
PUEt 20:1
1 mm
SOFTNESS


E
80
60
40
20
0
**
*
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PUEt 4:1
PUEt 10:1
PUEt 20:1

(A) Schematic representation of the synthetic route of 3 PUEt scaffolds of different stiffnesses, starting from 3 polyester triols: P(CL-co-GL) of different CL:GL ratios and accordingly of different crystallinities. Physicochemical properties of the 3 PUEt scaffolds formulations and the related precursors: (B) 1HNMR spectra of the 3 polyesters P(CL-co-GL) 4:1, P(CL-co-GL) 10:1, P(CL-co-GL) 20:1 showing correspondence between the ratio between CL and GL in the final products compared to the reactants; (C) DSC traces overlay of the 3 polyesters showing different thermal properties as a functions of the ratio CL: GL; (D) μCT scan micrograph (up), graphical rendering of the local thickness (middle) and of the pore size (bottom) of the 3 scaffolds formulations PUEt 4:1, PUEt 10:1 and PUEt 20:1; (E) graphical representation of the compression elastic moduli (Ec) of the 3 scaffolds formulations, showing statistically significant difference between: PUEt 10:1 and PUEt 20:1 (*p