Decellularized Spinach Biomaterials Support Physiologically Relevant Mechanical Cyclic Strain and Prompt a Stretch-Induced Cellular Response

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Supporting Information

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Ashlee F. Harris[1]†*, Jerome Lacombe[1,2]†*, Noelia M. Sanchez-Ballester[3,4], Shaun Victor[1], Killian A.J. Curran[5], Alan R. Nordquist[1], Baiju Thomas[1], Jian Gu[1,2], Jean-Luc Veuthey[5], Ian Soulairol[3,4] and Frederic Zenhausern[1,2,5,6]*

[1] Center for Applied NanoBioscience and Medicine, College of Medicine Phoenix, University of Arizona, 475 North 5th Street, Phoenix, Arizona, USA 85004
[2] Department of Basic Medical Sciences; College of Medicine Phoenix, University of Arizona, 425 N 5th St., Phoenix, Arizona, USA 85004
[3] ICGM, CNRS, ENSCM, University Montpellier, 34000 Montpellier, France
[4] Department of Pharmacy, Nîmes University Hospital, 30900 Nîmes, France
[5] School of Pharmaceutical Sciences, University of Geneva, Geneva, Switzerland
[6] Department of Biomedical Engineering, College of Engineering, The University of Arizona, Tucson, Arizona, USA, 85721
†These authors contributed equally to this work

***Correspondence:**

University of Arizona COM – Phoenix
Biomedical Sciences Partnership Building, 6th Floor
475 North 5th Street
Phoenix, Arizona, USA 85258

ashleeharris@arizona.edu (Ashlee F. Harris); jlacombe@arizona.edu (Jerome Lacombe); fzenhaus@arizona.edu (Frederic Zenhausern)

Table S1: Sequences of primers used for qRT-PCR

Gene	Forward Primer	Reverse Primer
ANLN	ATGTCTTCGTGGCCGATTTGA	CTCTGACAGTGAGTGAGTTTCCTGTTT
CALM1	ACTGGCATCCTGCTTTAGCC	CCATTTGCCTCGCTCAACAC
COL1A1	TCTGCGACAACGGCAAGGTG	GACGCCGGTGGTTTCTTGGT
COL3A1	CGCCCTCCTAATGGTCAAGG	TTCTGAGGACCAGTAGGGCA
COL4A1	CCAAGGGCGACAGAGGTTTG	ATAAAACTCACCAGGCTCCCC
COL6A1	GAAGAATGTCACCGCCCAGA	GGTGGTGTCAAAGTTGTGGC
CTGF	AGGAGTGGGTGTGTGACGA	CCAGGCAGTTGGCTCTAATC
CYR61	AGCCTCGCATCCTATACAACC	TTCTTTCACAAGGCGGCACTC
DIAPH3	GCGGTATGCATTGTAGGGGA	CAGGAGATGTAACCAGGGCA
GAPDH	CTCCTGCACCACCAACTGCT	GGGCCATCCACAGTCTTCTG

Table S2: Requirements of mechanical stretching device

Requirements	Purpose	Custom-designed Features
Cyclic stretching	Reproduce human adult lung breathing movements	18 rpm geared high torque motor
Clamping System	Secure plant tissue while under strain	Screw and vice system
Humidity-resistant	Withstand 100% humidity of a laboratory incubator	Steel less material and plastic only
Heat-resistant	Withstand 37°C of the laboratory incubator	Temperature resistance motor
Compact size	Fit multiple devices into a laboratory incubator	60 mm x 83 mm x 71.3 mm
Sterile	Avoid biological contamination	Materials compatible with ethanol washes and UV irradiation
Biocompatible	Avoid cellular toxicity	Polycarbonate and Teflon materials
Liquid containment (small volumes)	Sample reservoir for cell culture medium	10 to 10.5 mL, cell culture chamber

Figure S1.

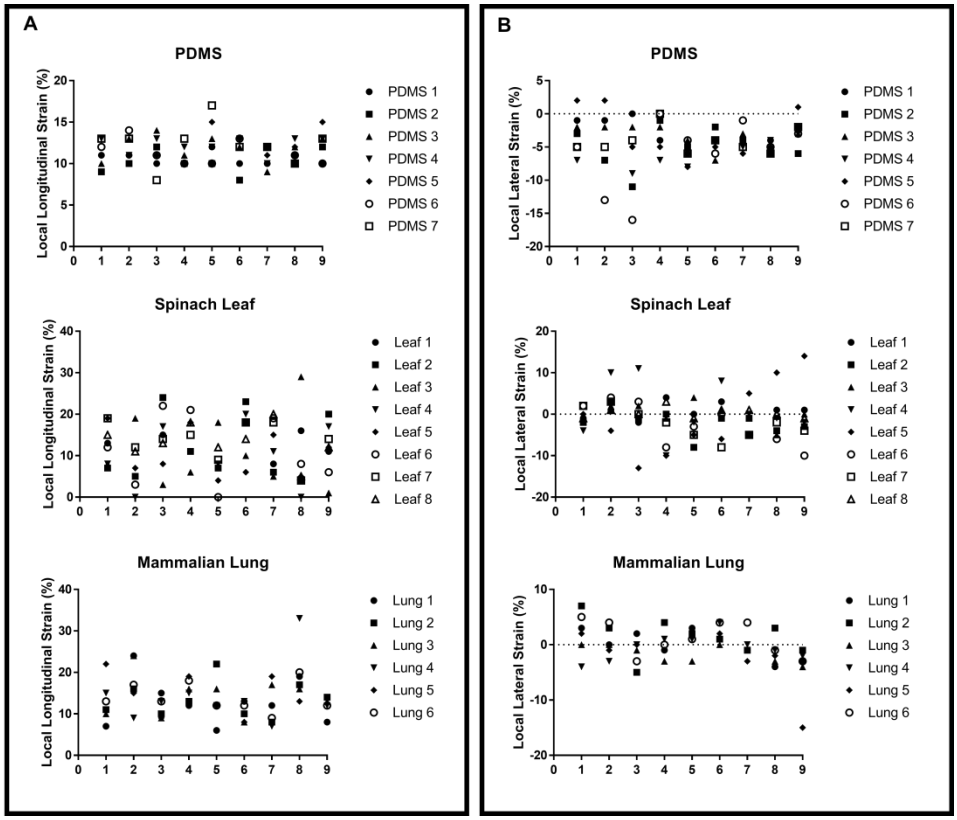

Figure S1. Local strain percentage for each of the three materials: PDMS, decellularized spinach leaf and decellularized mammalian tissues. (A) Local longitudinal and (B) local lateral strain values mapped within each of the nine local regions.

Figure S2.

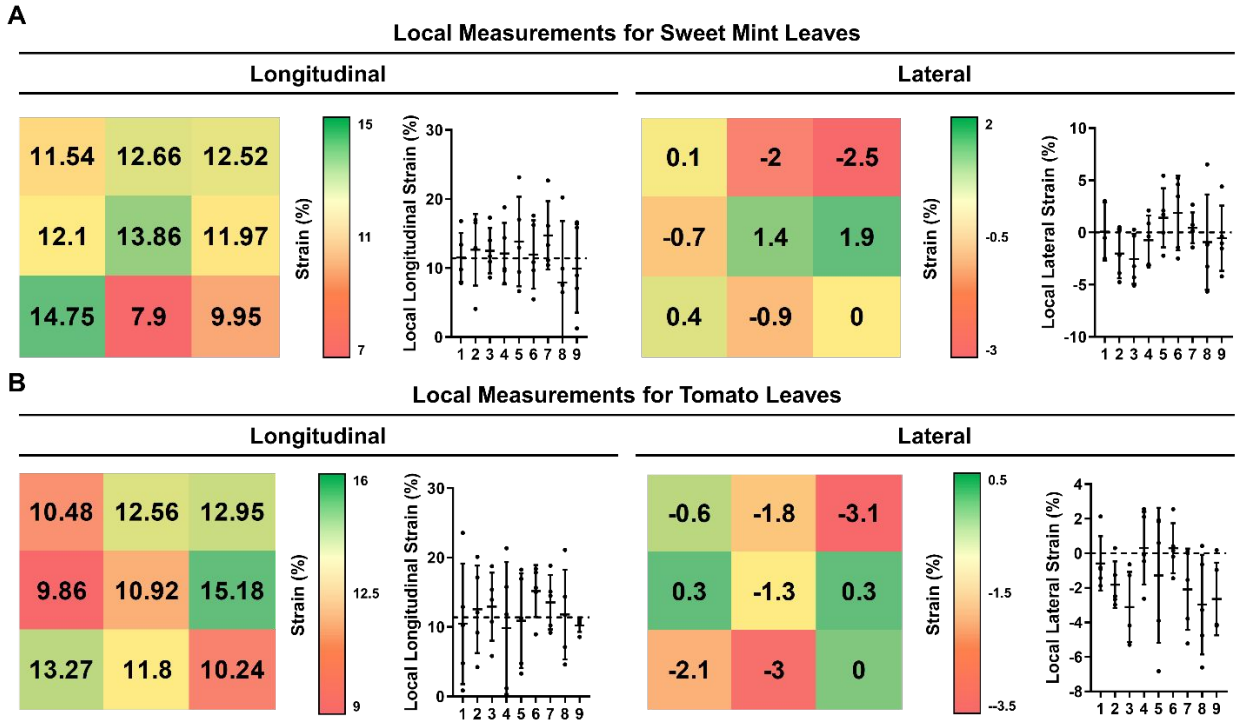

Figure S2. Local longitudinal and lateral strain values of sweet mint (A) and tomato (B) leaves (n = 5)

Figure S3.

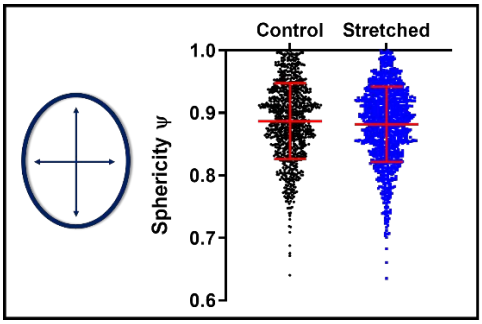

Figure S3. Graph comparing A549 nuclear sphericity in stretched and un-stretched (control) samples. (n > 800 nuclei from three independent experiments)