

Supporting Information

# Solid-state $^{13}\text{C}$ NMR Delineates the Architectural Design of Biopolymers in Native and Genetically Altered Tomato Fruit Cuticles

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	COO 185-165 (ppm)	Aromatic 165-92 (ppm)	COO+CHO+CH <sub>2</sub> O+CH <sub>3</sub> O	CHO CH <sub>2</sub> O CH <sub>3</sub> O 92-50 (ppm)	(CH <sub>2</sub> ) <sub>n</sub> 50-8 (ppm)	CHO	CH <sub>2</sub> O	COO/[(CH <sub>2</sub> ) <sub>n</sub> ]	Aromatic/[(CH <sub>2</sub> ) <sub>n</sub> ]	(COO+CHO+CH <sub>2</sub> O+CH <sub>3</sub> O)/[(CH <sub>2</sub> ) <sub>n</sub> ]	(CHO+CH <sub>2</sub> O+CH <sub>3</sub> O)/[(CH <sub>2</sub> ) <sub>n</sub> ]	(CH <sub>2</sub> ) <sub>n</sub>	CHO/CH <sub>2</sub> O	CHO/[(CH <sub>2</sub> ) <sub>n</sub> ]
	504	1397	1764	1206	6049	854	396	0.08	0.23	0.29	0.20	1.00	2.16	0.14
	557		2012	1455	7036	840	599	0.08		0.29	0.21	1.00	1.40	0.12
	559	1903	2136	1577	7099	897	501		0.27	0.30	0.22		1.79	0.13
OuterRR M82OuterRR										0.29	0.22		1.8	0.134
	344	216	847	603	3430	257	339	0.10	0.06	0.28	0.18	1.00	0.76	0.07
	338		976	638	3595	250	376	0.09		0.27	0.18	1.00	0.66	0.07
	397	305	1152	755	4659	308	437	0.09	0.07	0.25	0.16	1.00	0.70	0.07
InnerRR M82InnerRR										0.26	0.17		1.1	0.07

Table S1:

Integrated signal intensities were evaluated using both counting of pixels using Photoshop software (shown here) and cut-and-weigh methods, specifying the following chemical shift ranges for each major functional group: alkyl chains (8-50 ppm); alkoxy groups (50-92 ppm); arenes and alkenes (92-165 ppm); carboxyl and/or amide groups (165-185 ppm). We have also reported the number of pixels from two biological replicates of M82 outer red ripe cutin in this table.

Instrumental error limits (10-15%) were evaluated for the compositional analyses by repeating the DPMAS measurements using two different values of high-power <sup>1</sup>H decoupling. Biological error limits (~15%) were evaluated from measurements on replicate RR cutin samples.

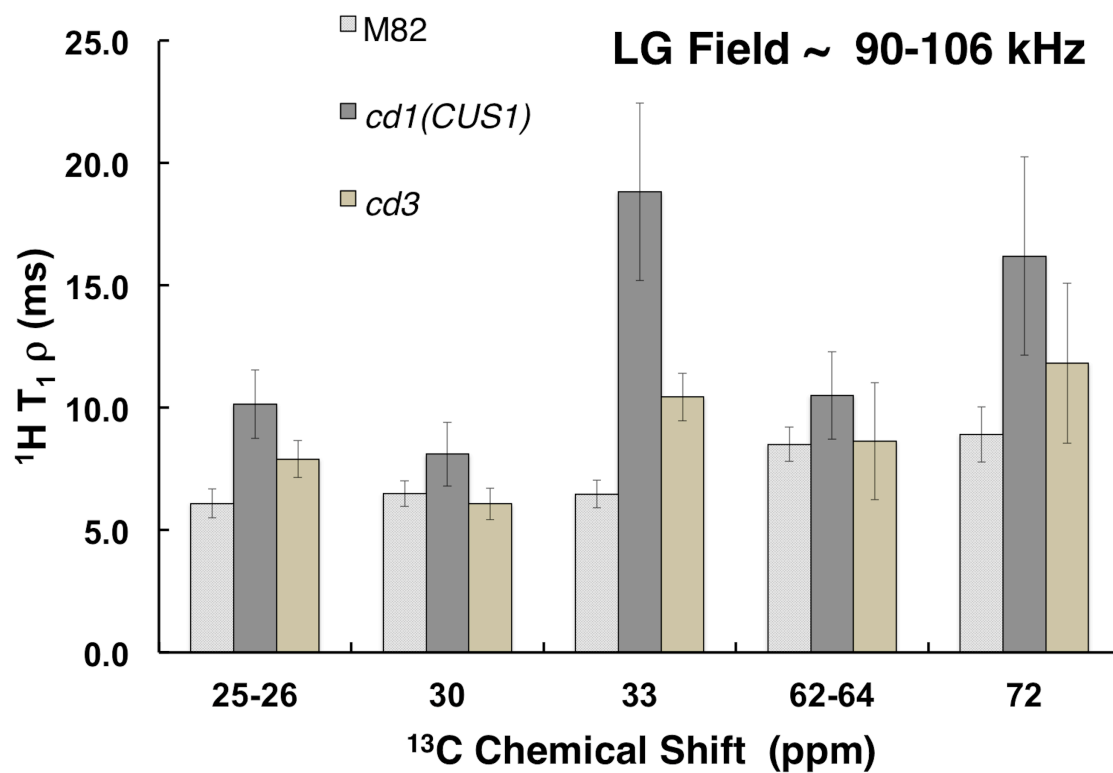


Figure S1: Rotating-frame spin relaxation times,  $T_{1\rho}(\text{H})$ , measured with a Lee-Goldburg (LG) spin-lock field of  $\sim 90\text{-}106$  kHz via the respective attached carbons.

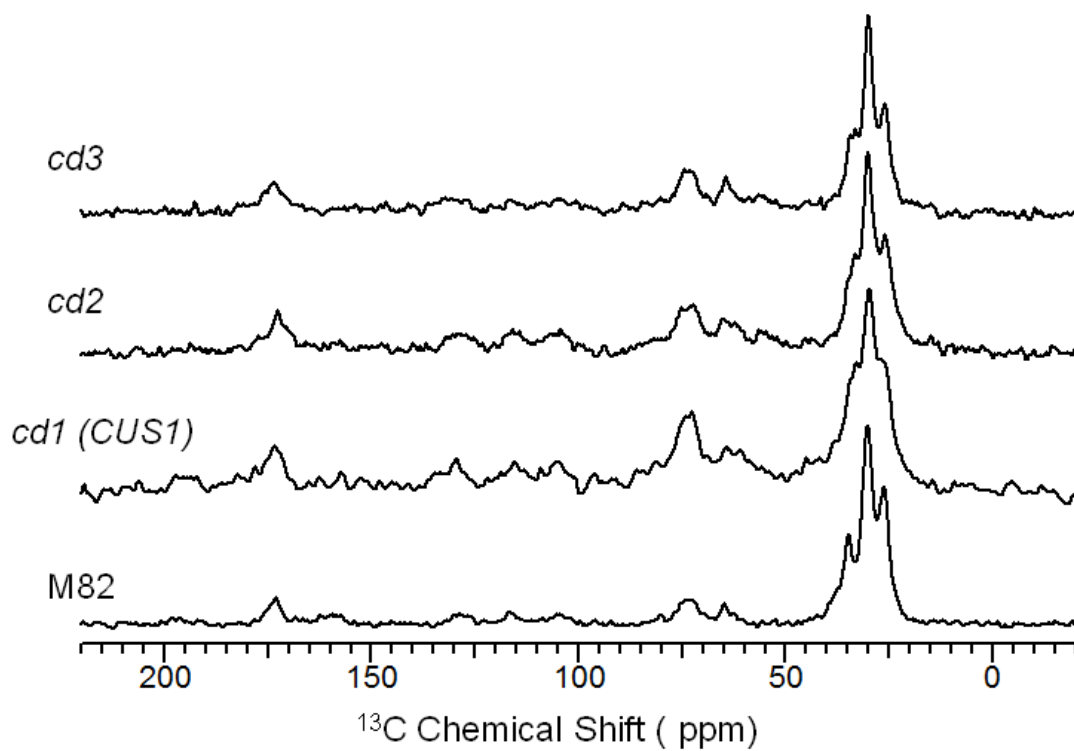


Figure S2: 150 MHz DPMAS  $^{13}\text{C}$  NMR spectra obtained at 10 kHz MAS with  $^1\text{H}$  decoupling power corresponding to 175-180 kHz.