Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Supplementary Information for

Emerging investigator series: Linking Nanoparticle Infiltration and Stomatal Dynamics for Plant Nanobionics

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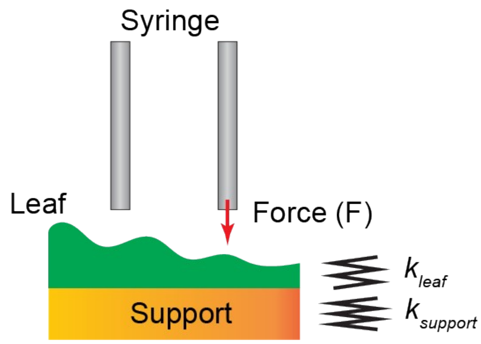

Figure S1. Mechanical model of the infiltration system. As the needless syringe applies force (F) to the assembly, it displaces a leaf and a support layer with the respective spring constants.

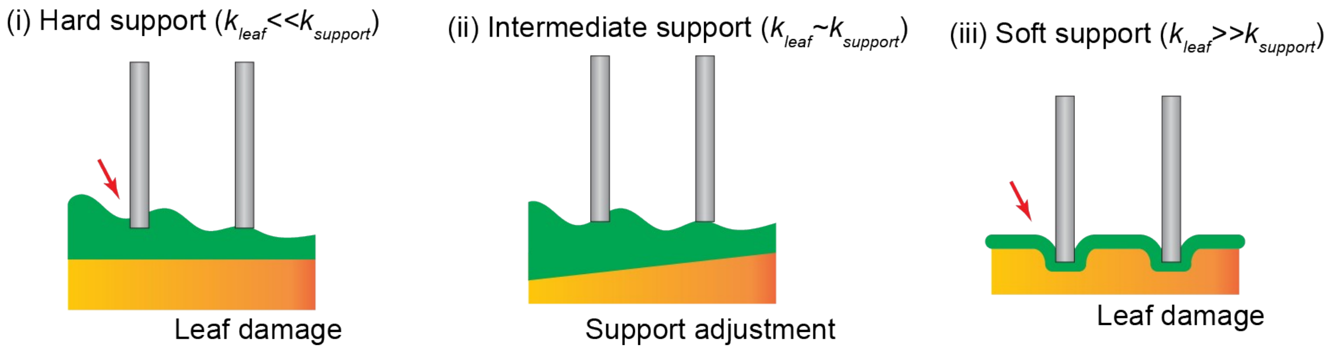

Figure S2. Various compression scenarios for the infiltration system. (i) When the support material is harder than the leaf, then the leaf compression will dominate, leading to early damage. (ii) When the spring constants are commensurate, support adjustments helps to planarize leaf surface, minimizing leaks. (iii) When the support is too soft, then its compression will be large, promoting leaf bending that necessarily impedes infiltration.

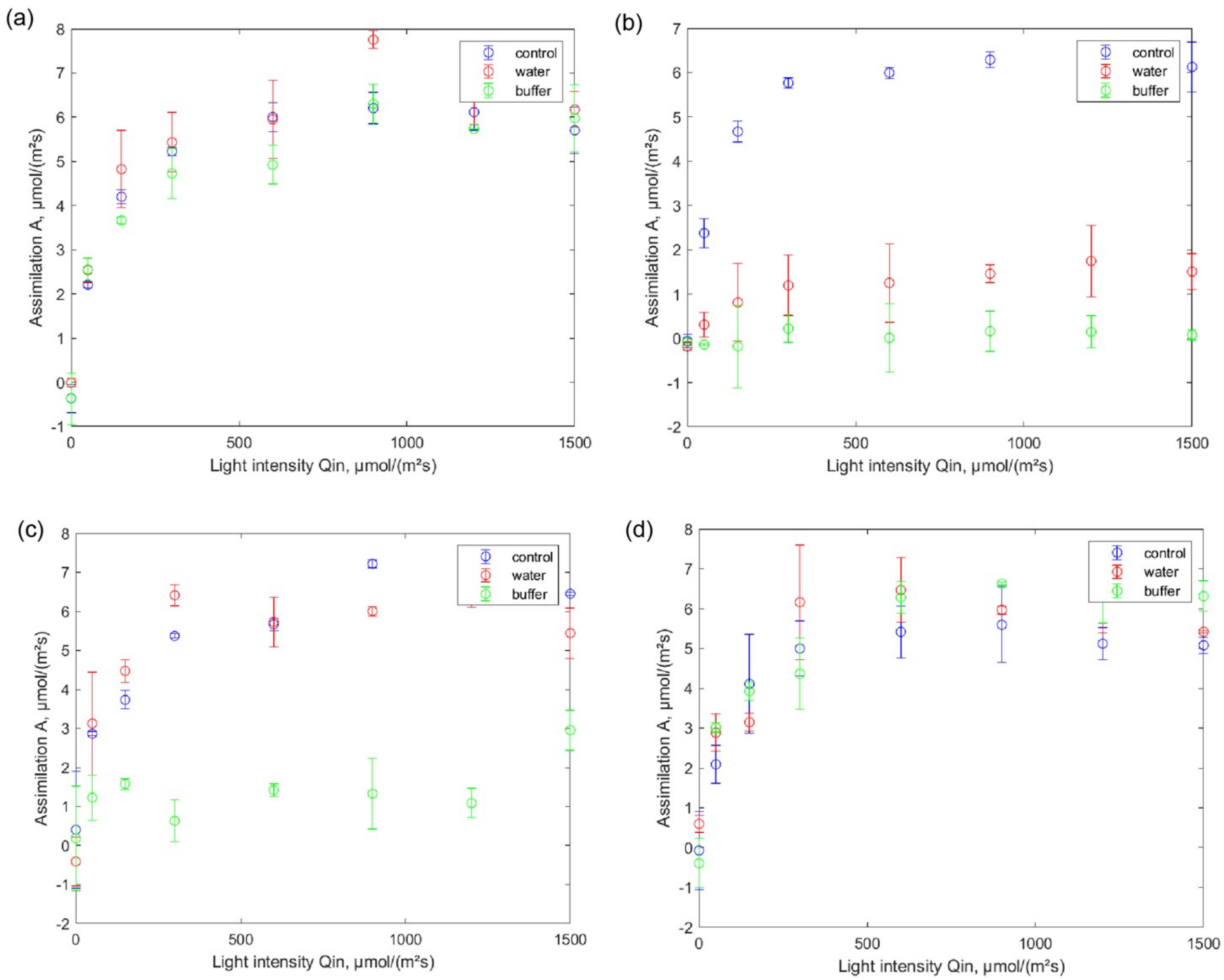

Figure S3. Effects of material infiltration. Leaf assimilation of Peace Lily plants one day before infiltration (a), right after infiltration (b), three days after (c), and seven days after (d). Measurements were taken around 12-2 PM local time. Plants were infiltrated with water and buffer solutions (*n*=3).

Table S1. Statistical analysis of the infiltration force results.

Applied force (N)	Normalized infiltration efficiency	Standard deviation (n=5)	P value for unpaired t-test
0.25	0.03075	0.01325	1E-4
0.5	0.878	0.54125	0.57
0.75	1.1405	0.26625	0.58
1	1.03375	0.30875	N/A
1.25	1.06275	0.403	0.91
1.5	0.95375	0.458	0.74
1.75	0.78825	0.47875	0.25
2	0.578	0.38275	0.07

Table S2. Statistical analysis of the leaf assimilation of Piece Lily plants at Q_{in} = 600 µmol/(m^{2}s).

	Assimilation	**Standard deviation (n=3)**	**Assimilation**	**Standard deviation (n=3)**	**Nanotubes**	**Assimilation**	**P value for unpaired t-test (water vs. control)**	**P value for unpaired t-test (nanotubes vs. control)**
	Control		*Water*		*Nanotubes*			
Day -1								
--	2.5	0.24	2.53	0.28	2.43	0.16	0.89	0.7
Day 0	--	--	--	--	--	--	--	--
--	2.25	0.28	1.43	0.36	0.42	0.34	0.04	0.002
Day 3	--	--	--	--	--	--	--	--
--	2.43	0.38	2.05	0.35	1.01	0.29	0.38	0.0068
Day 7	--	--	--	--	--	--	--	--
	1.99	0.31	1.89	0.37	1.86	0.39	0.74	0.67