

## SUPPLEMENTAL MATERIAL

**Supplemental Table 1.** Samples for Each End Point

	Control	PAH		
		IPAH	SSc-PAH	SSc-d
Total	7	7	11	6
Cardiac MRI	-	5	11	6
PV Loop	-	5	11	6
Exercise PV Loop	-	4	10	4
Histology	0	4	11	3
Myofilament	7	7	7	6

A total of 7 control, 7 IPAH, 11 SSc-PAH, and 6 SSc-d subjects were recruited for RV septal tissue procurement. A subset of these subjects underwent invasive right ventricular pressure-volume (PV) assessments at rest  $\pm$  exercise. Serum was obtained on all those who underwent RHC. Myocardial tissue went towards different assays (histology, myofilament function) depending on tissue availability.

**Supplemental Table 2. Demographic and Clinical Data**

	Control	IPAH	SSc-PAH	P-value *	SSc-d	P-value †
	N=7	N=7	N=11		N=6	
<b>Demographics</b>						
Age (years)	47 ± 16	56 ± 13	58 ± 13	0.35	59 ± 8	0.92
Female (n, %)	3 (42%)	5 (71%)	10 (91%)	0.09	5 (83%)	1.00
Caucasian (n, %)	5 (83%)	5 (71%)	9 (82%)	0.65	4 (66%)	0.69
BSA (m <sup>2</sup> )	1.8 ± 0.3	2.1 ± 0.2 #	1.8 ± 0.2	0.01	1.7 ± 0.2	0.84
<b>Clinical</b>						
WHO FC I (n, %)		0	1	0.78	0	1.00
WHO FC II (n, %)		4	4	0.78	3	1.00
WHO FC III (n, %)		3	6	0.78	3	1.00
6MWT (%)		75 ± 30%	66 ± 14%	0.50	84 ± 18%	
ERA (n, %)		2 (28%)	1 (9%)	0.53	0 (0%)	1.00
PDE5I (n, %)		3 (42%)	5 (45%)	1.00	0 (0%)	0.10
Pro-BNP (pg/ml)		650 ± 1056	683 ± 620	0.34	389 ± 606	0.13
<b>Cardiac MRI</b>						
RVEDVi (ml/m <sup>2</sup> )		99 ± 28	89 ± 20	0.40	87 ± 22	0.55
RVESVi (ml/m <sup>2</sup> )		51 ± 17	48 ± 21	0.69	46 ± 21	0.84
RVEF (%)		46 ± 7	49 ± 13	0.61	50 ± 13	0.69
RV mass (g)		14 ± 7	14 ± 5	0.69	14 ± 4	0.62

Demographic and clinical characteristics of non-failing donor control, IPAH, SSc-PAH, and SSc without resting PAH (SSc-d) subjects. Wilcoxon-rank-sum was used to compare means of two groups, while Kruskal-Wallis analysis of variance on ranks was used to compare three groups. Proportions were compared using Fisher's exact test. \* Overall P-value of comparison between control, IPAH, and SSc-PAH groups; † P-value comparing SSc-d versus SSc-PAH. # post-hoc P<0.05 versus other groups. BSA, body surface area; WHO, World Health Organization; FC, functional class; 6MWT, Six-minute walk test; ERA, Endothelin-receptor antagonist; PDE5I, Phosphodiesterase-5 inhibitor; Pro-BNP, Pro-brain natriuretic peptide; RVEDVi, RV end-diastolic volume index; RVESVi, RV end-systolic volume index; RVEF, RV ejection fraction.

**Supplemental Figure 1.** Representative affixed skinned myocyte

Example of a live digital image of a skinned myocyte at 40X magnification, affixed and suspended between a force transducer and length controller (Aurora Scientific, Ontario, Canada). Fourier transformation of the digital camera image provided the sarcomere length (SL) below, here measured at 1.831  $\mu\text{m}$ .

