Table 1. Simulation Parameter Values

Parameter	**Figure 3**	**Figure 4**	**Figure 5**	**Figure 6**	**Figure 7**	**Figure 8**	**Figure 10**
L	$1, 3, 5, 7, 10$	3	5	5	5	5	$3, 5, 8$
l_c	$0.2, 0.3, 0.5, 0.8$	$0.3, 0.5$	0.3	$0.2, 0.3$	$0.2, 0.3$	0.4	$0.15, 0.2, 0.3, 0.4$
μ_e/μ_c	100	100	$3 - 300$	100	100	100	100
μ_c	0.01	0.01	$0.01 - 0.3$	0.01	0.01	0.01	0.01
ξ	$10, 100$	$5, 10, 100$	$1, 10, 100$	$10, 100$	$10, 100, 330$	$10, 100$	$10, 100$
υ			$0.1, 0.3, 1$	$0.1, 1$	$0.1, 1, 3$	$0.1, 1$	0.1
ϕ			0.25	0.5	$0.25, 0.75$	0.25	0.25
τ_r		$0.1 - 10^4$			$0.01 - 10^3$	$0.01 - 10^3$	10
σ	$0.0002 - 0.01$	$0.00003 - 0.005$					

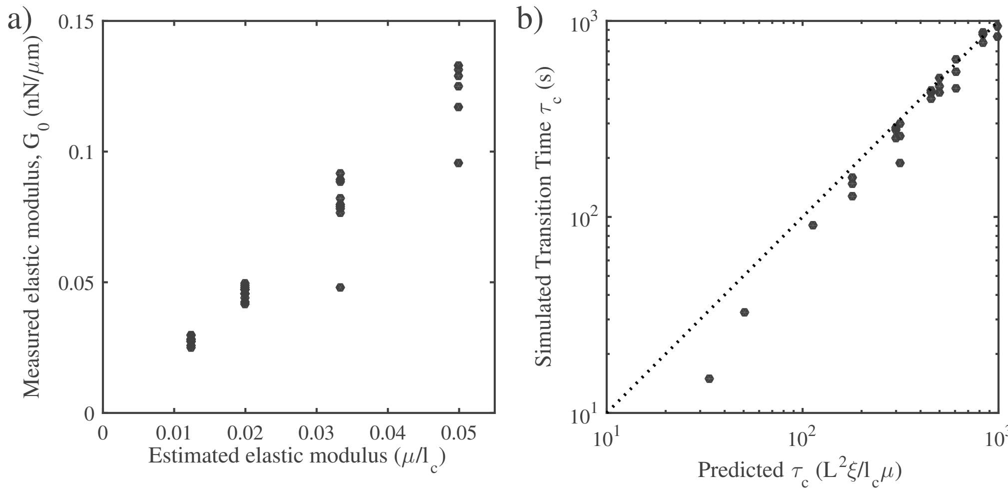

Figure 1. Mechanical properties of passive networks. **a)** Elastic modulus of networks. Our measurements closely match prediction of $G_0 \sim \mu/l_c$. **b)** Placeholder for inevitably another figure relevant to passive properties.

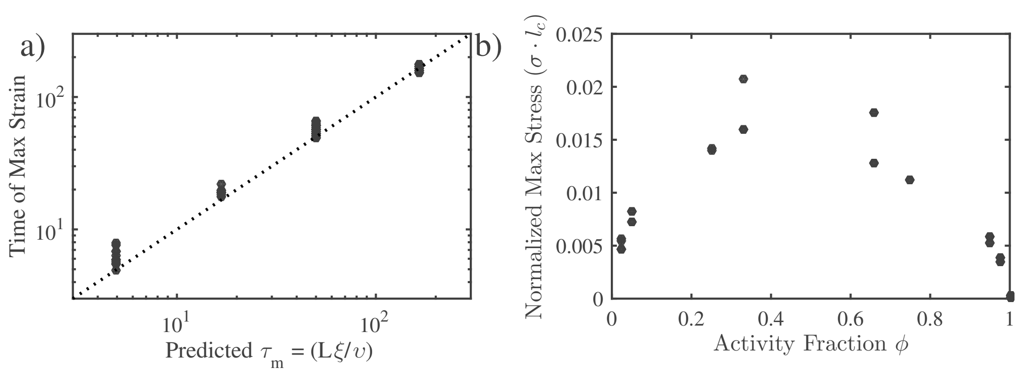

Figure 2. Mechanical properties of active networks. **a)** Timescale of maximum strain in networks free to contract. This relationship was found phenomenologically. **b)** Dependence of network stress on the fraction of cross-links which are active. Note that the network stress approaches 0 as ϕ approaches 0 or 1.

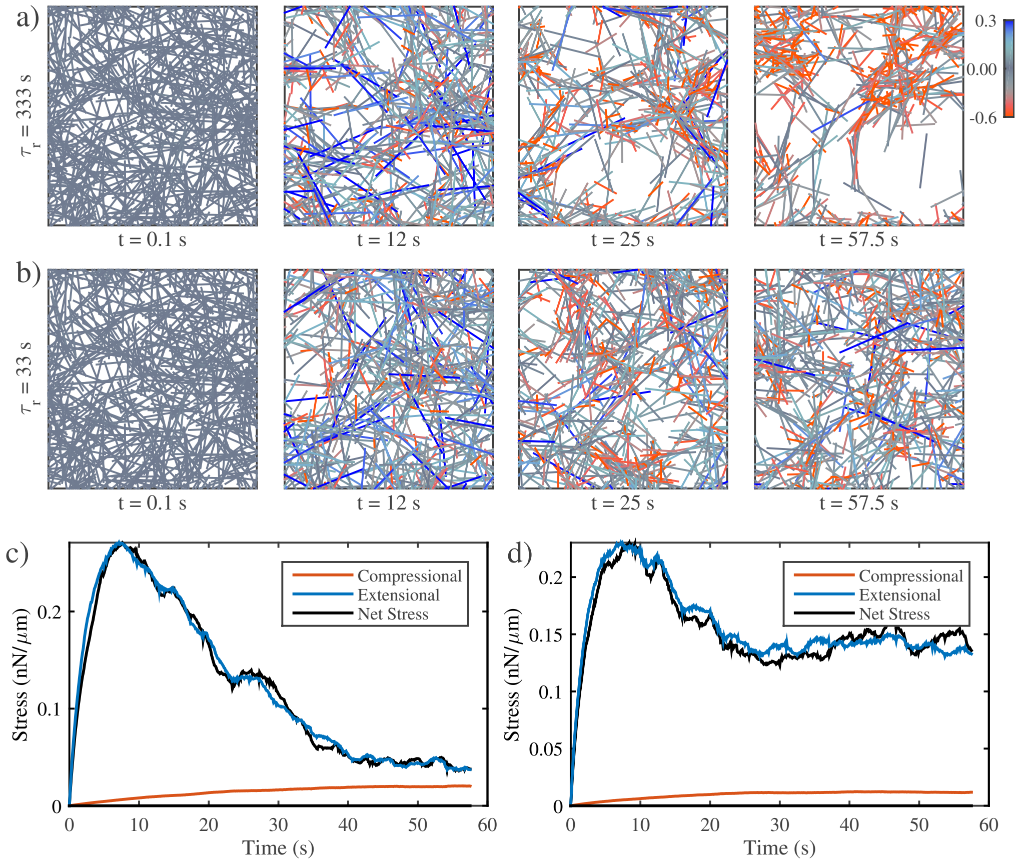

Figure 3. Tearing of active networks is prevented via recycling. **a)** An active network undergoing large scale deformations due to active filament rearrangements. **b)** The same network as in a) but with a shorter filament recycling time. **c)** Time trace of internal stresses for network in panel a. **d)** Time trace of internal stresses for network in panel b.

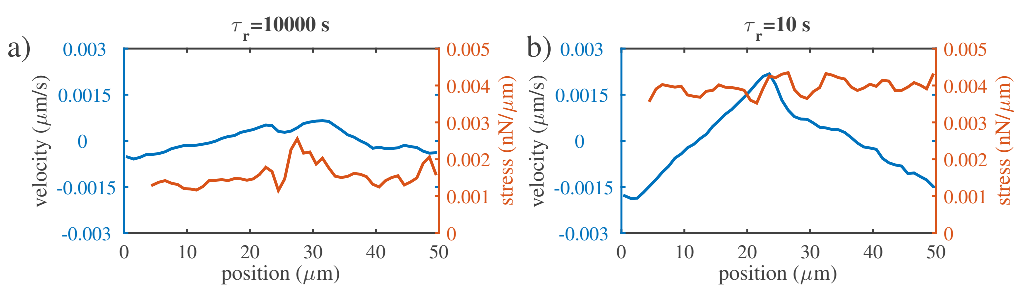

Figure 4. Stress and strain profiles of networks with contractile and passive domains. **a)** Blue line indicates strain velocity profile while orange represents net stress as measured in the main text. **b)** Same as panel a except for the condition where recycling time is 10 s. Note the increase in net stress and the corresponding increase in flow rate.