

**Table S1.** Relative anisotropy fits for each PS

Solution	Rotational Lifetime (ns)
Buffer	$0.64 \pm 0.05$
GGO	$0.58 \pm 0.04$
GGO Trolox	$0.72 \pm 0.04$
GGO TSQ	$0.62 \pm 0.03$
GGO ROXS	$0.67 \pm 0.04$
PCA	$0.47 \pm 0.03$
PCA Trolox	$0.57 \pm 0.04$
PCA TSQ	$0.14 \pm 0.02$
PCA ROXS	$0.027 \pm 0.001$