Supporting Information

Rate Determination of Azide Functionalization onto Reactive Alkyne Polymer Brush Scaffolds: Utilizing Conventional and Biocompatible Cycloadditions for Tunable Surface Modification

*Sara V. Orski, Gareth R. Sheppard, Selvanathan Arumugam, Rachelle M. Arnold, Vladimir V. Popik, and Jason Locklin**

Table S1. List of important vibrational modes and assignments for the GATR-FTIR spectra of surface attached poly(NHS4VB) and reactive derivatives.

Surface	Frequency (cm^{-1})	Assignment [a]	Figure
poly(NHS4VB)	1801	C=O in phase str of imide	1a, 2a, 3a
	1769	C=O out of phase str of imide	
	1738	C=O str of ester	
	1607	p-substuted aromatic	
	1258	Asym. C-O str	
	1205	C-N str, Amide III	
	1026	Sym. C-O str	
poly(NHS4VB) functionalized with DIBO amine	3555	NH str	1b
	3010	Arom C-H str	
	2932, 2825	CH_2 str	
	2258	C≡C str	
	1660	Amide I	
	1613	p-substitued arom	
	1563	Amide II	
	1489, 1432	Arom ring str	
	1264	Amide III, CN str	

	1233,1035	C-O str	
DIBO functionalized polymer brushes coupled with azido-RB	3566	NH str	1c
	3067	Arom C-H str	
	2960, 2867	CH_3 str	
	2926, 2859	CH_2 str	
	2254	Residual C≡C str	
	1633	Amide I	
	1596	C=N str of triazole	
	1554	Amide II	
	1262	N=N str of triazole	
	1179	S=O str	
poly(NHS4VB) functionalized with ADIBO amine	3544	NH str	2b
	3011	Arom C-H str	
	2931, 2879	CH_2 str	
	2243	C≡C str	
	1654	Amide I & Arom-NH-C=O str	
	1607	p-substitued arom	
	1538	Amide II	
	1500, 1444	Arom ring str	
	1289	Amide III, CN str	
ADIBO functionalized polymer brushes coupled with azido-RB	3541	NH str	2c
	3010	Arom C-H str	
	2974, 2826	CH_2 str	
	2248	Residual C≡C str	
	1643	Arom-NH-C=O str	
	1588	C=N str of triazole	
	1550	Amide II	
	1241	N=N str of triazole	
	1178	S=O str	
Poly (NHS4VB) functionalized with propargyl amine	3555	NH str	3b
	3280	C≡CH str	
	2960, 2891	CH_2 str	
	2216	C≡C str	
	1640	Amide I	
	1607	p-substitued arom	
	1535	Amide II	
	1491	Arom ring str	
	1309	Amide III, CN str	
Alkyne functionalized brushes coupled with azido-RB	3567	NH str	3c
	3068	Arom C-H str	
	2955, 2879	CH_3 str	
	2927, 2826	CH_2 str	
	2257	Residual C≡C str	
	1650	Amide I	
	1594	C=N str of triazole	

1534	Amide II
1258	N=N str of triazole
1176	S=O str

[a]Abbreviations: str, stretch; arom, aromatic

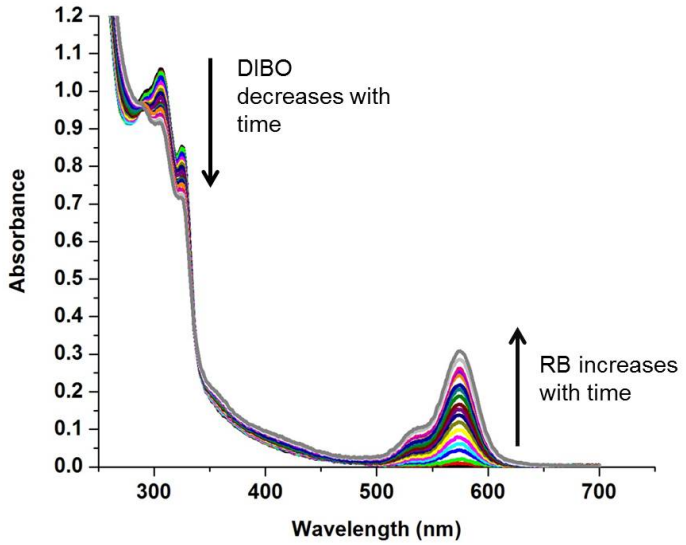

Figure S1. UV-Vis spectra of DIBO polymer brushes undergoing catalyst free cycloaddition with azido-RB dye.

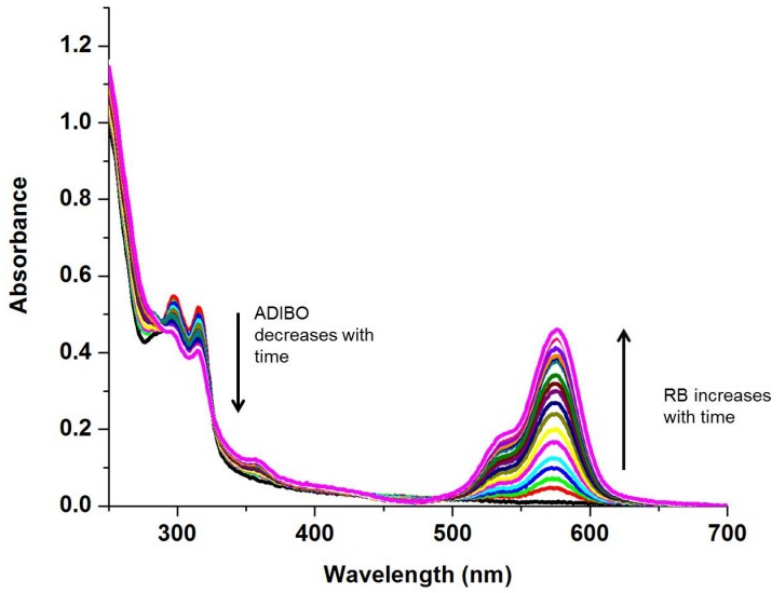

Figure S2. UV-Vis spectra of ADIBO polymer brushes undergoing catalyst free cycloaddition with azido-RB dye.

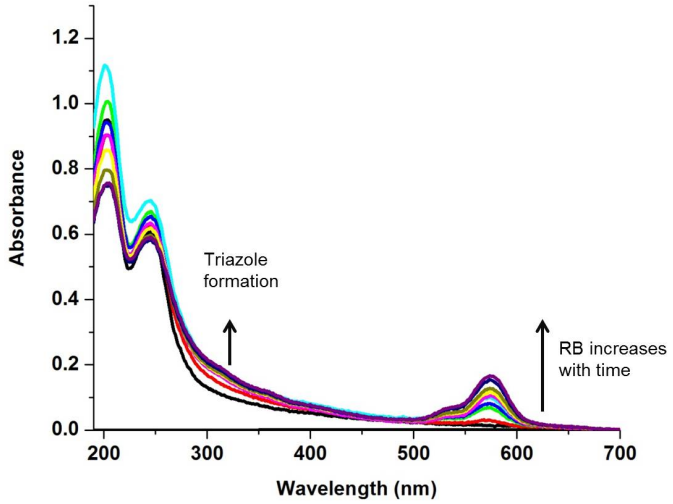

Figure S3. UV-Vis absorption spectra of propargyl derivatized polymer brushes functionalized with azido-RB by CuAAC over the course of a two minute reaction.

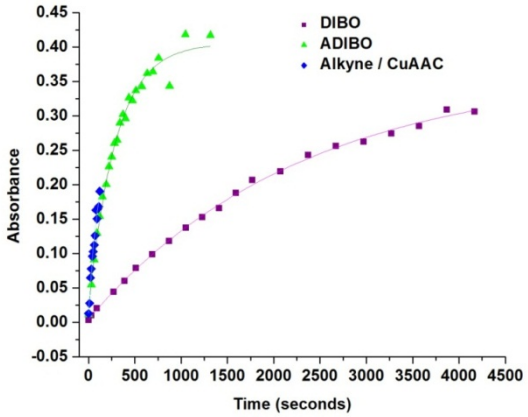

Figure S4. Absorbance data of functionalization time for DIBO (purple squares), ADIBO (green triangles), and alkyne (blue diamonds) with azido-RB. The graph illustrates absorbance changes until final absorbance A_∞ is reached. The solid lines are meant to guide the eye.

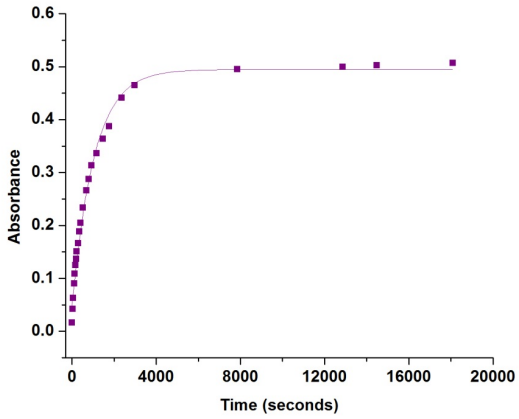

Figure S5. Increase in azido-RB absorbance with time for a dilute (500 μM) azide solution. The line is meant to guide the eye.