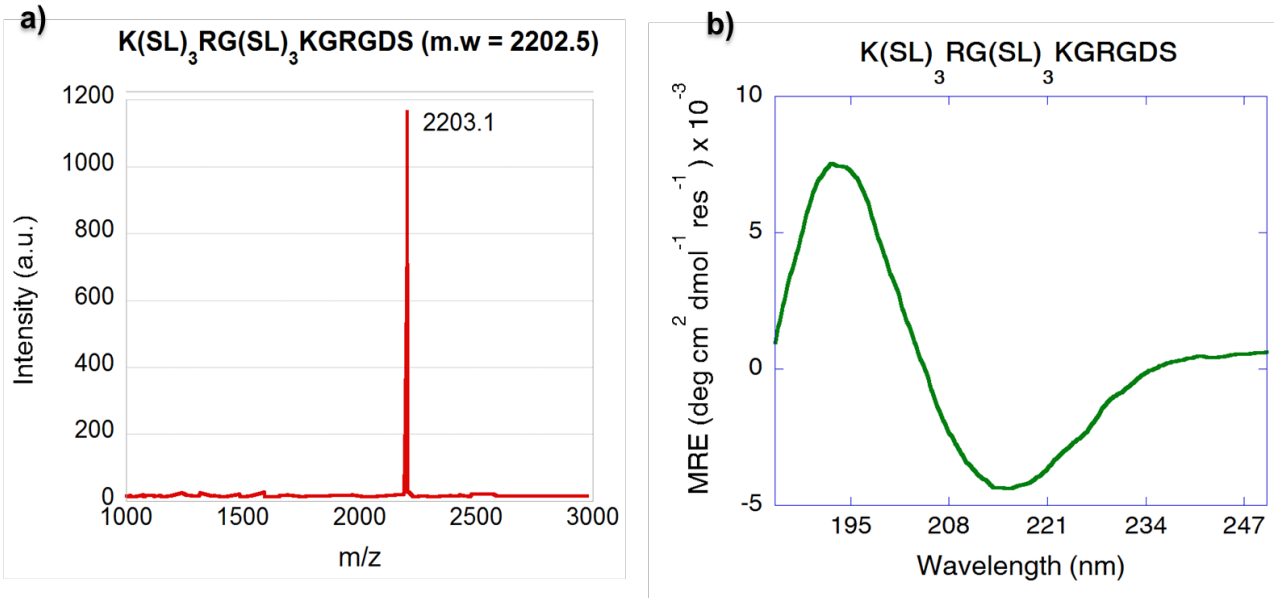
Two Step Self-assembly of Liposome-Multidomain Peptide Nanofiber Hydrogel for Time-Controlled Release

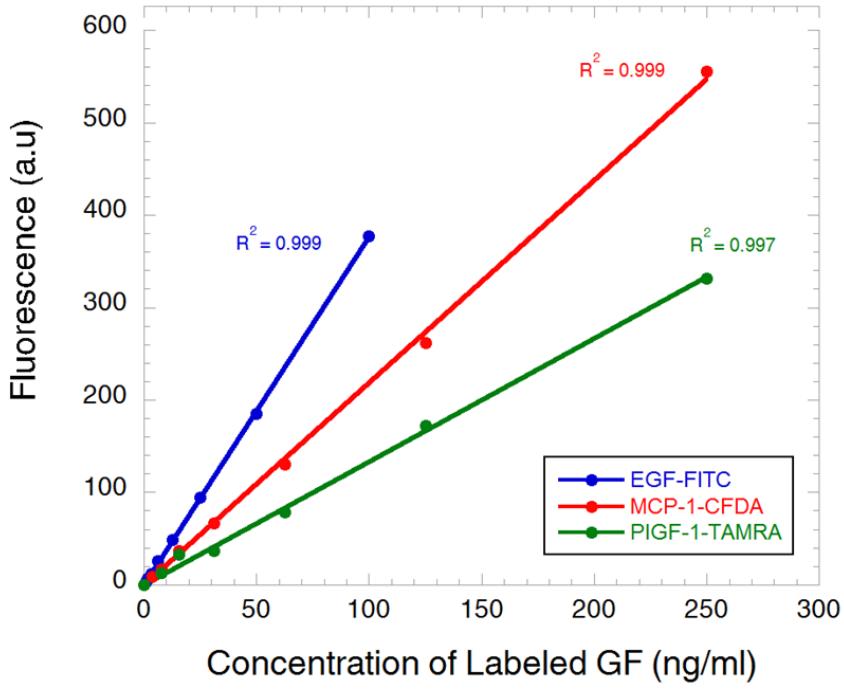
Navindee C. Wickremasinghe[§], Vivek A. Kumar[§] and Jeffrey D. Hartgerink[§¶]*

Rice University, Bioscience Research Collaborative, 6500 Main Street, Houston, TX, 77030
[§]Department of Chemistry
[¶]Department of Bioengineering
[*]to whom correspondence should be addressed: jdh@rice.edu

SUPPORTING INFORMATION



SI Figure S1. a) MALDI-TOF mass spectrometry data for K(SL)3RG(SL)3KGRGDS peptide. Expected mass: 2202.5 [M+H+], observed mass: 2203.1 [M+H+] b) CD spectrum for K(SL)3RG(SL)3KGRGDS peptide showing β-sheet characteristics.



SI Figure S2. Sample EGF-FITC, MCP-1-CFDA and PlGF-1-TAMRA standard curves.

Modeling release data:

The Korsmeyer-Peppas equation describes diffusion-related drug release from hydrophilic polymeric matrices.[41,42]

The Weibull function is typically employed to describe triphasic or sigmoidal release curves. Previous studies involving biodegradable microspheres have indicated suitability of Weibull function for release from delivery systems that show an erosion-dominated process coupled with minimal diffusive release rates.[43,44] 'β'or the shape factor in the Weibull equation characterizes the shape of the curve as exponential (β=1), sigmoid or S-shaped with upward curvature followed by a turning point (β>1) or parabolic, with a higher initial slope and after that consistent with exponential (β<1).[44]

	Release from hydrogel only			Release from liposomes in gel		
Single release profiles	Korsmeyer-Peppas equation for burst release: $\frac{M_t}{M_\infty} = k\left(t^n\right)$			Weibull equation for sigmoidal (delayed) release: $\frac{M_t}{M_\infty} = 1 - e^{[-\propto(t^\beta)]}$		
	k	**n**	$\mathbf{R^2}$	**α**	**β**	$\mathbf{R^2}$
EGF-FITC	0.304	0.399	0.884	0.0035	2.05	0.992
PlGF-1-TAMRA	0.458	0.300	0.967	0.0140	1.94	0.972
MCP-1-CFDA	0.825	0.069	0.966	0.0098	3.38	0.979

SI Table S1. R^2 values and constants in curve fits (burst release model and sigmoidal release model) of each GF release profile (single release).

	Release from hydrogel only			Release from liposomes in gel		
EGF-PlGF-1 bimodal release curves	Korsmeyer-Peppas equation for burst release: $\frac{M_t}{M_\infty} = k\left(t^n\right)$			Weibull equation for sigmoidal (delayed) release: $\frac{M_t}{M_\infty} = 1 - e^{[-\propto(t^\beta)]}$		
	k	**n**	$\mathbf{R^2}$	**α**	**β**	$\mathbf{R^2}$
EGF-FITC	0.192	0.612	0.971	0.0002	3.41	0.948
PlGF-1-TAMRA	0.451	0.314	0.983	0.0064	2.27	0.989

SI Table S2. R^2 values and constants in curve fits (burst release model and sigmoidal release model) of the EGF-FITC/PlGF-1-TAMRA bimodal release profiles.