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Supplementary Materials for

Vasculogenic hydrogel enhances islet survival, engraftment, and function in leading extrahepatic sites

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This PDF file includes:

Supplementary Materials

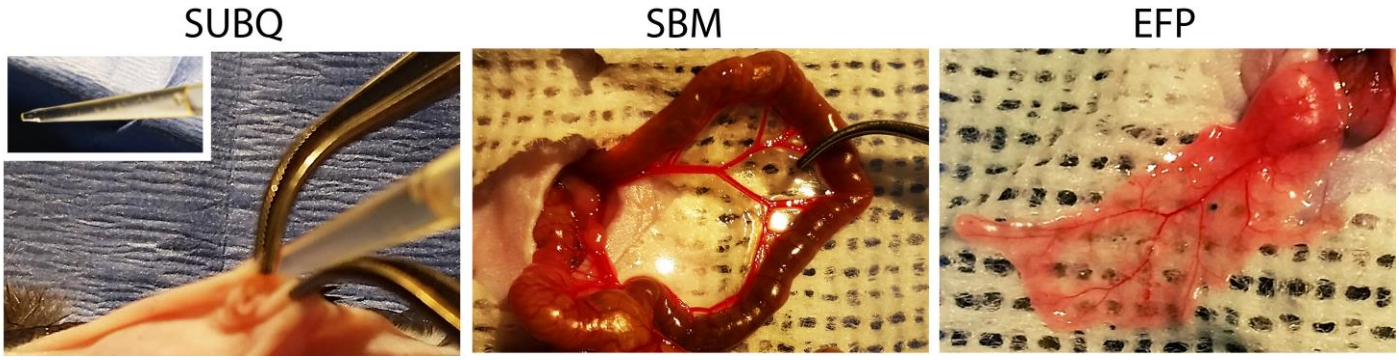

fig. S1. Gross morphology of extrahepatic transplant sites during gel casting.

table S1. Exact *P* values for select comparisons between groups in vascularization metrics analyses.

			Week 2	Week 4
Fractional Area		**Pancreas**	**EFP/PEG-VEGF**	**EFP/PEG-VEGF**
Week 2	**SUBQ/PEG**	0.0143		
	SUBQ/PEG-VEGF	0.0415	0.0264	
	SBM/PEG	0.0375		
Week 4	**SUBQ/PEG**	0.0016		
	SUBQ/PEG-VEGF	0.0074		0.0035
Total Branch Length				
Week 2	**SUBQ/PEG**	0.0010		
	SUBQ/PEG-VEGF	0.0491		
Week 4	**SUBQ/PEG**	0.0054		
	SUBQ/PEG-VEGF	0.0211		0.0031
Junctions				
Week 4	**SUBQ/PEG-VEGF**			0.0170
Branches				
Week 2	**SUBQ/PEG-VEGF**			0.0135
Week 4	**SUBQ/PEG-VEGF**			0.0100

table S2. Exact *P* values for select comparisons between groups in leukocyte presence analyses.

CD45	SUBQ/PEG	SUBQ/PEG-VEGF
SUBQ/PEG-VEGF	> 0.9999	
SBM/PEG	0.0944	
SBM/PEG-VEGF	0.0229	
EFP/PEG	0.0089	
EFP/PEG-VEGF	0.0007	0.0103

CD11b

SUBQ/PEG-VEGF	> 0.9999	
SBM/PEG	0.5708	
SBM/PEG-VEGF	0.0405	
EFP/PEG	0.0096	
EFP/PEG-VEGF	0.0114	0.0170

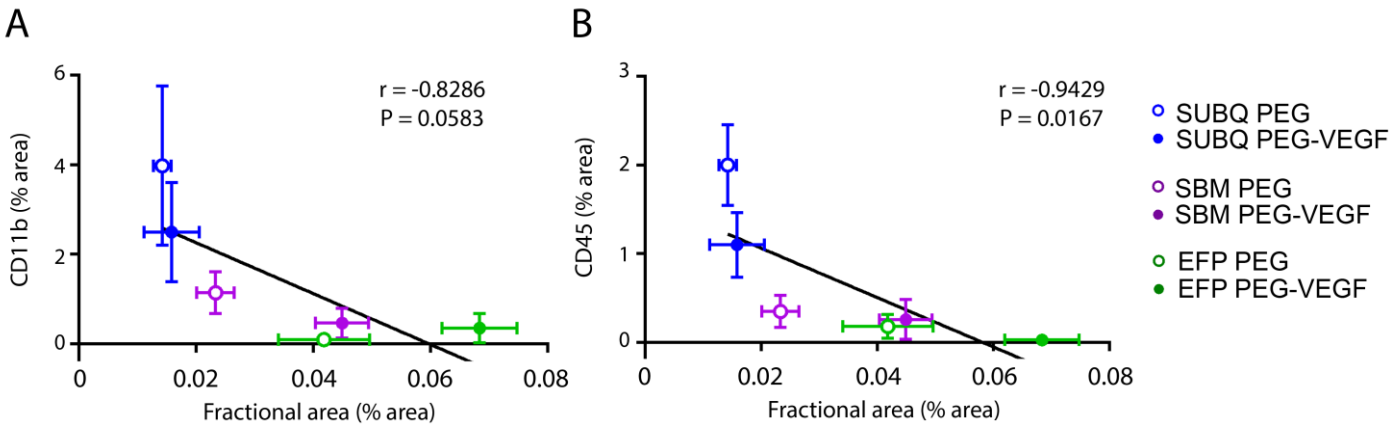

fig. S2. Correlation between site vascularization fractional area and site leukocyte density.

Error bars = SEM. Linear non-parametric two-tailed Spearman correlation.

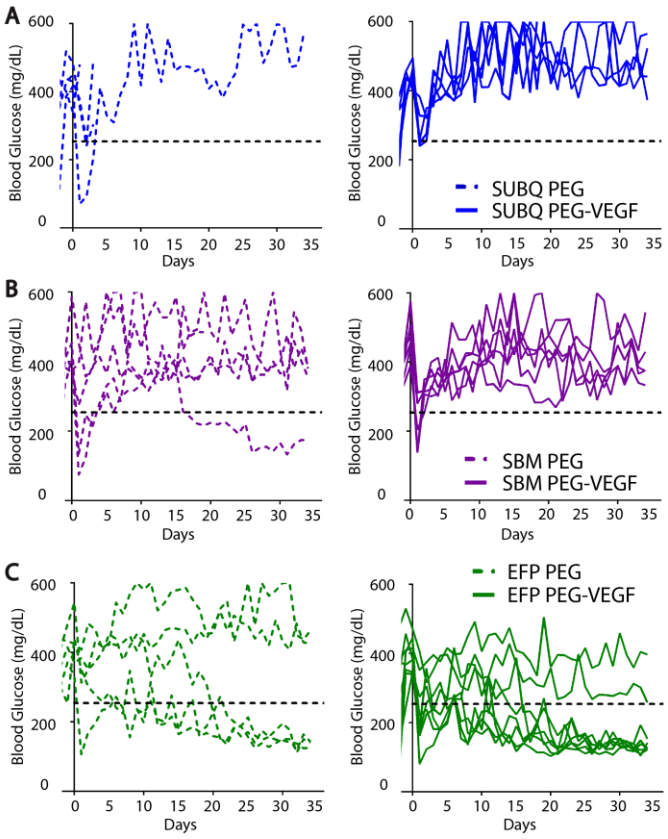

fig. S3. Blood glucose traces demonstrating individual recipient graft performance in extrahepatic islet transplant sites.

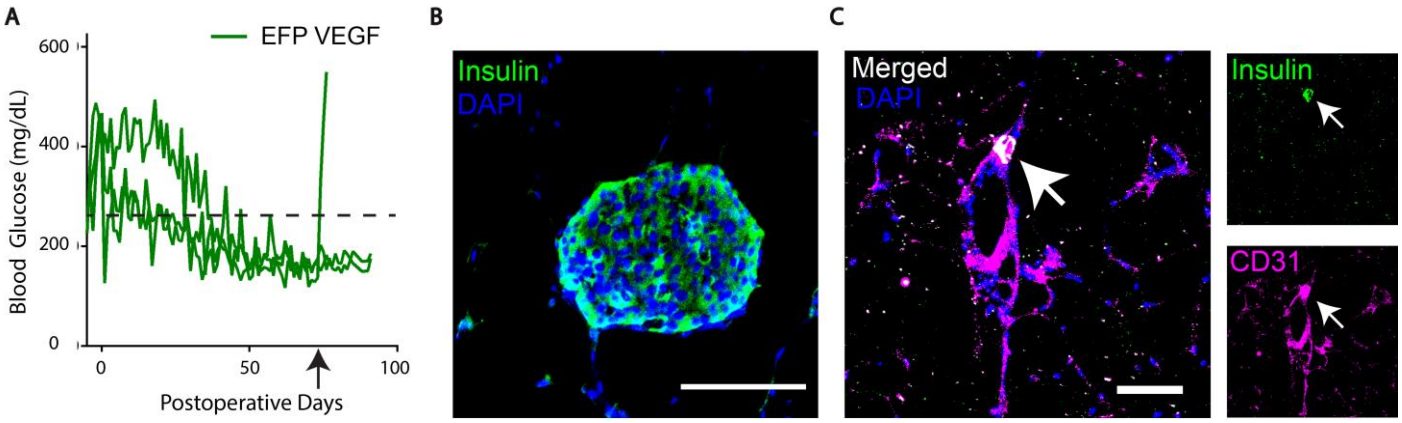

fig. S4. Long-term engraftment of marginal islet mass in EFP with PEG-VEGF. (**A**) A separate EFP/PEG-VEGF marginal islet mass transplant evaluating long-term function out to 100 days confirmed the stability of islet engraftment (N = 3). The black arrow indicates graft removal in one recipient at day 73 post-transplantation, showing return to hyperglycemia. (**B**) Insulin staining confirmed robust islet engraftment, with a peripheral section of an islet (**C**) demonstrating proximal CD31-positive blood vessels. White arrows in (C) highlight part of an islet near a CD31-positive vessel. Scale bars = 100 µm.

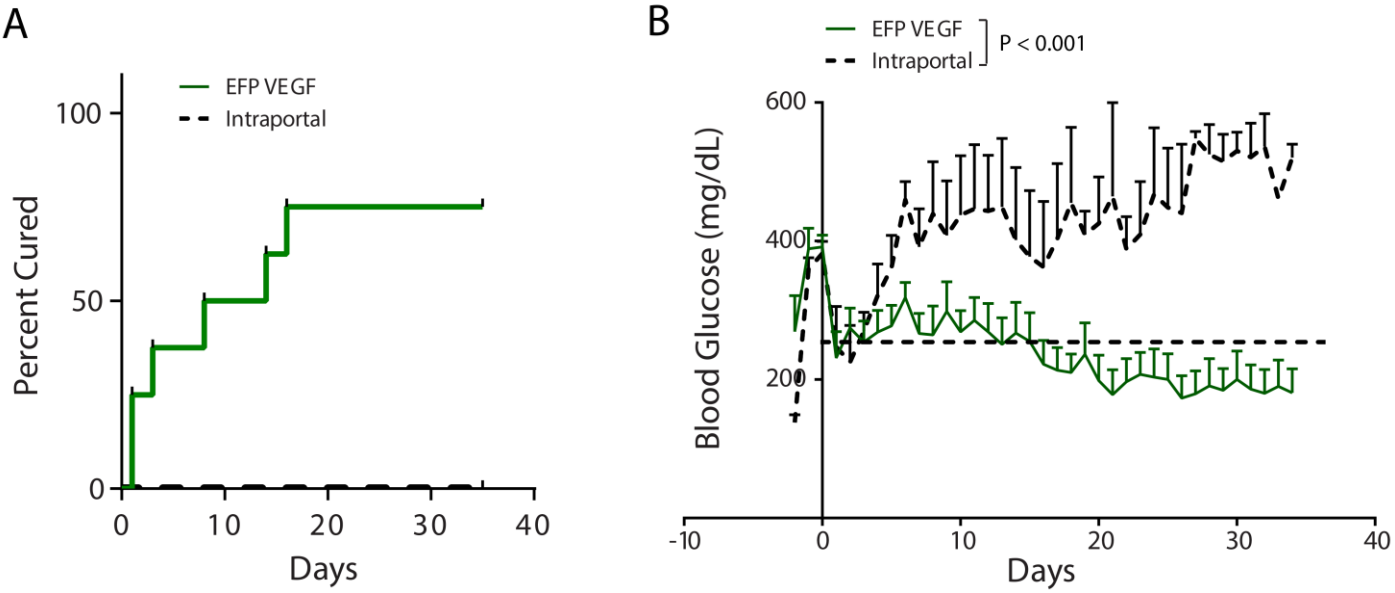

fig. S5. Comparison of reversal in intraportal control islet transplant site and EFP/PEG-VEGF transplant site syngeneic diabetes reversal. (**A**) Survival curves and (**B**) average non-fasting blood glucose measurements (N = 3 intraperitoneal, N = 8 EFP/PEG-VEGF). Two-tailed unpaired t-test. Error bars = SEM.

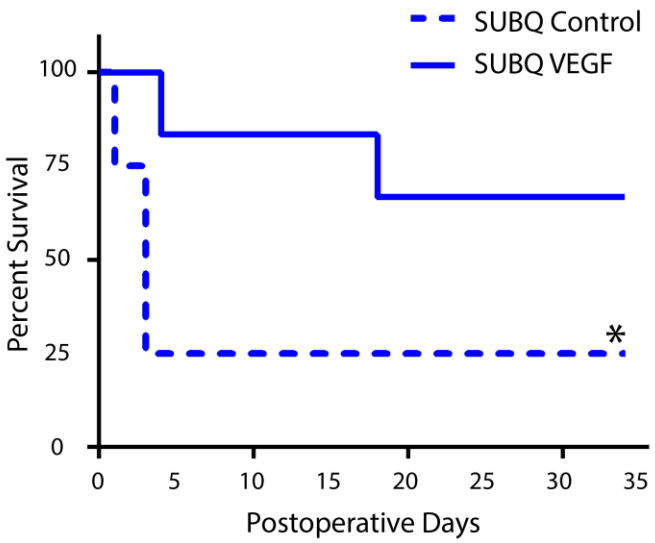

fig. S6. Survival curve for SUBQ groups. * $P < 0.05$ by Log-rank (Mantel-Cox) test.

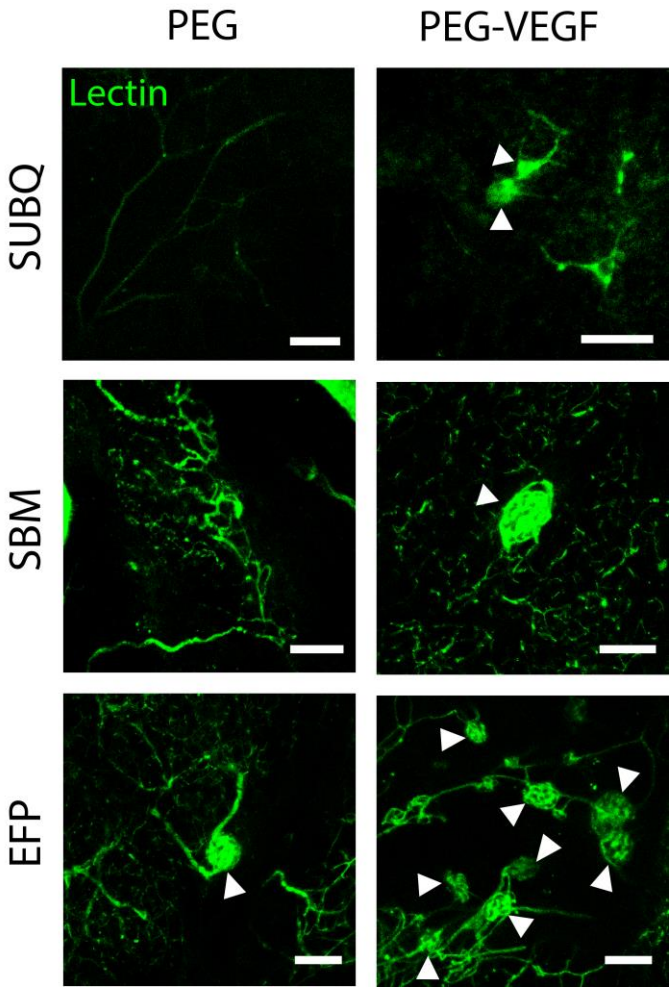

fig. S7. Density of vascularized islets by site as demonstrated by lectin labeling. Images showing transplant-site dependent differences in the density of engrafted and perfused islets (white arrowhead) within extrahepatic transplant sites. Scale bars = 200 μm.

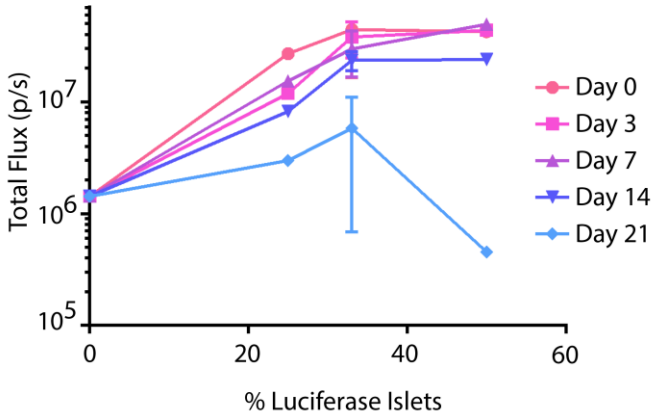

fig. S8. Dose-dependent response of Luc$^+$GFP$^+$ islet signal in B6 recipients in EFP site over a 3-week period.

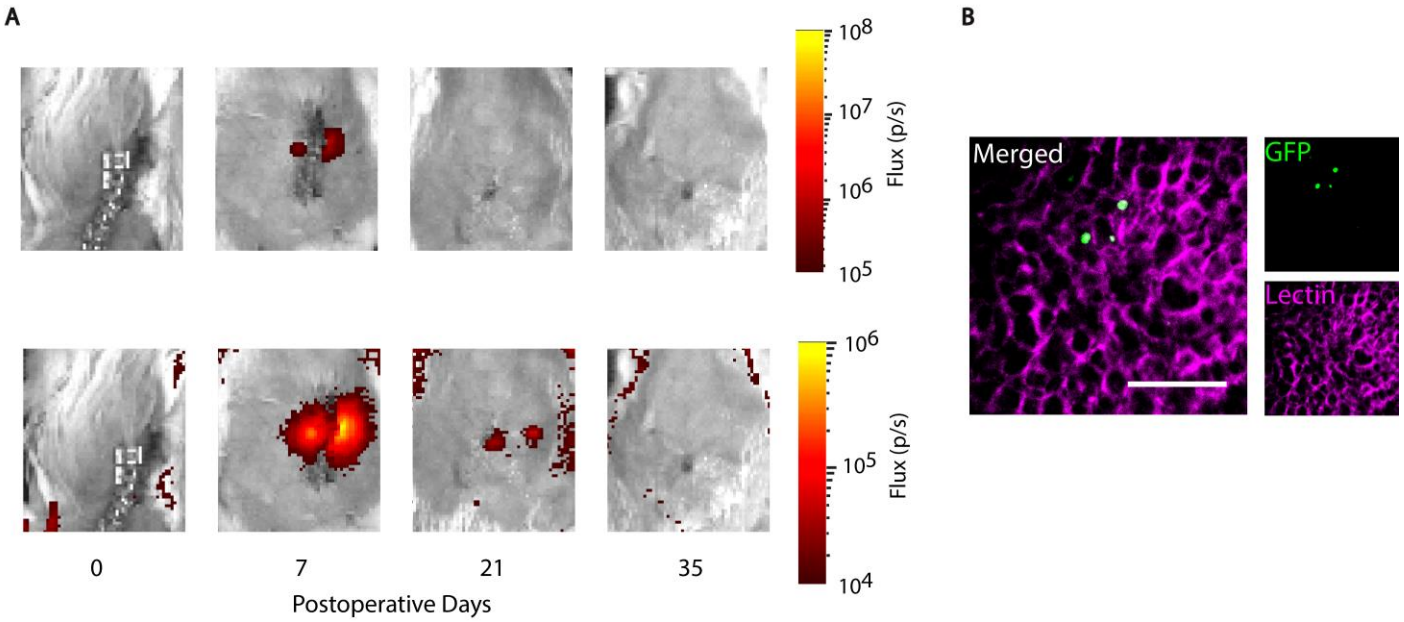

fig. S9. In vivo imaging of intraportally infused islets. (**A**) Bioluminescent imaging of intraportally transplanted islets demonstrated significantly lower luciferase activity of transplanted islets, with near-baseline signal for the majority of the 35 day period. Upper panel: same scale as Figure 5B; lower panel: magnified scale. (**B**) Mice were perfused with lectin to visualize surviving GFP-islets within the intrahepatic vasculature. Scale bar = 100 µm.

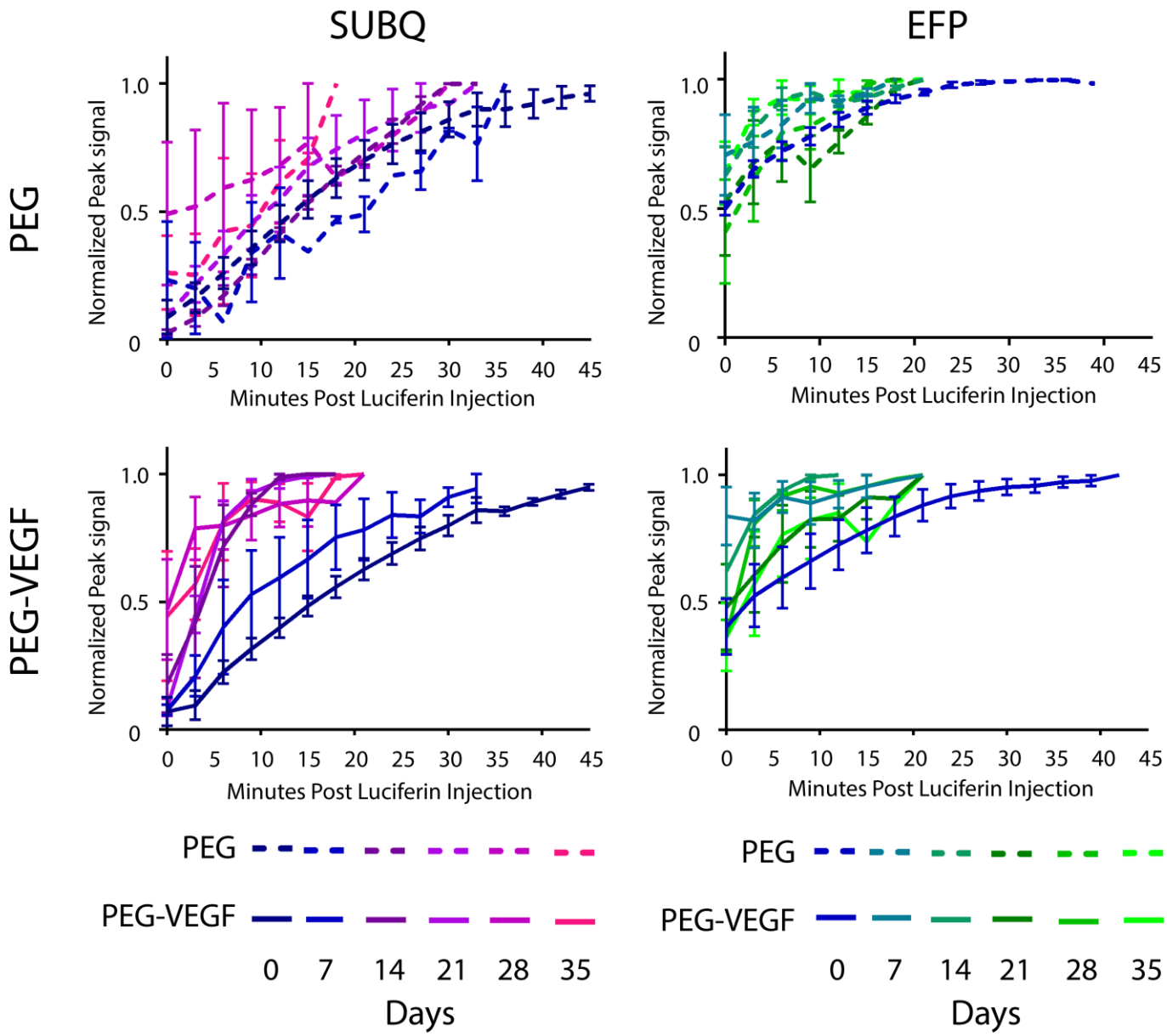

fig. S10. Bioluminescence signal kinetics by time point.