Supplementary Table S1. Phage display libraries used in this study.
Details regarding the phage display libraries, including naming schemes and applications herein, are provided.

Phage Library Name	Type of Library	ScFv Template	Theoretical Diversity	Application
AXL40	Discovery	unique single-framework with predetermined CDRs and four phospho-binding CDR-H2 spike-ins	1.0×10^{10}	initial identification of SEP-specific scFvs
AXL41	Discovery	unique single-framework SEP-specific scFv with mutagenized CDR-L2, -L3, -H2, and -H3	1.2×10^{10}	initial identification of SEP-specific scFvs
DEL6691	Directed Evolution	unique SEP-specific scFv identified from AXL40 biopanning and mutagenized using error-prone PCR	1.0×10^{8}	evolving a SEP-specific scFv to bind to the unmodified, native epitope
DEL6695	Directed Evolution	unique SEP-specific scFv identified from AXL40 biopanning and mutagenized using error-prone PCR	1.7×10^{8}	evolving a SEP-specific scFv to bind to the unmodified, native epitope
DEL6698	Directed Evolution	unique SEP-specific scFv identified from AXL41 biopanning and mutagenized using error-prone PCR	1.0×10^{8}	evolving a SEP-specific scFv to bind to the unmodified, native epitope
AML6691 Clone 1	Affinity Maturation	unique NAT-evolved scFv identified from AML6691 biopanning and mutagenized using error-prone PCR	7.1×10^{7}	improving the affinity of an evolved scFv to the unmodified, native epitope
AML6691 Clone 2	Affinity Maturation	unique NAT-evolved scFv identified from AML6691 biopanning and mutagenized using error-prone PCR	6.3×10^{7}	improving the affinity of an evolved scFv to the unmodified, native epitope