Ferroelectric-specific peptides as building blocks for bio-inorganic
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torial phage display methods have been used to identify a circularly constrained
heptapeptide sequence, ISLLHST, that strongly associates with a perovskite fer-
roelectric, lead zirconium titanate, Pb(Zr$_x$Ti$_{1-x}$)O$_3$ (PZT). The affinity and selec-
tively of binding to polycrystalline MOCVD deposited PZT thin films supported
on Si/SiO$_2$/Pt substrates were determined by titering and immunofluorescence mi-
croscopy, and the peptide was shown to selectively bind PZT in the presence of Pt,
Si, Au, and several different photoresists. Ferroelectric properties were determined
by measurement of the $P - E$ hysteresis loop on unmodified and phage bound PZT
thin films, and no change in the coercive field, $E_c$, or the saturation polarization, $P_s$
was observed after contacting the PZT with aqueous buffer or phage binding. This
work represents an important first step towards rendering perovskite ferroelectrics
compatible with biological molecules. Work is currently underway to study how con-
formational and positional control of tethered biomolecules can be controlled by the
surface charge and/or polarization state of PZT as well as integration into several
proto-type device architectures.