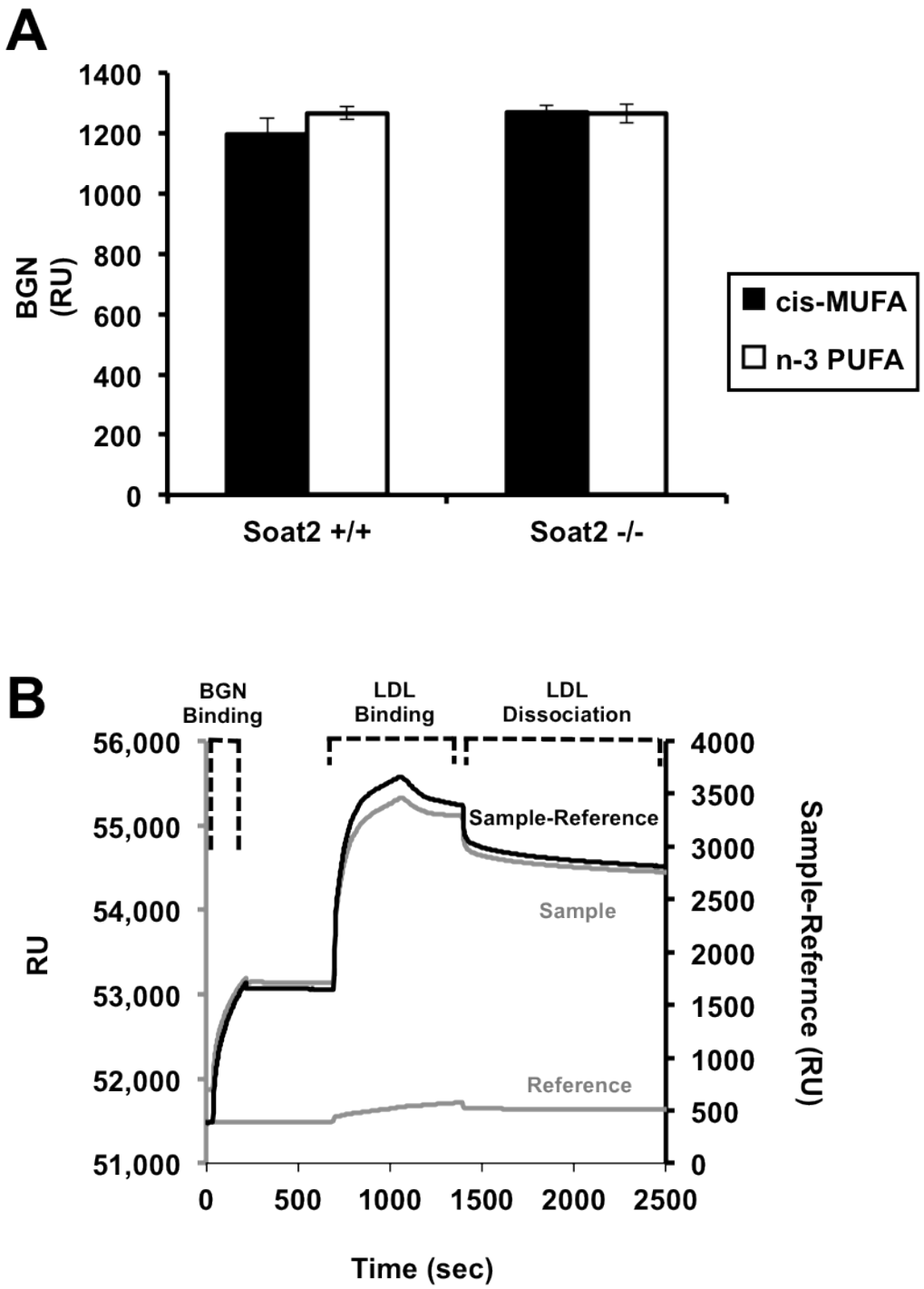
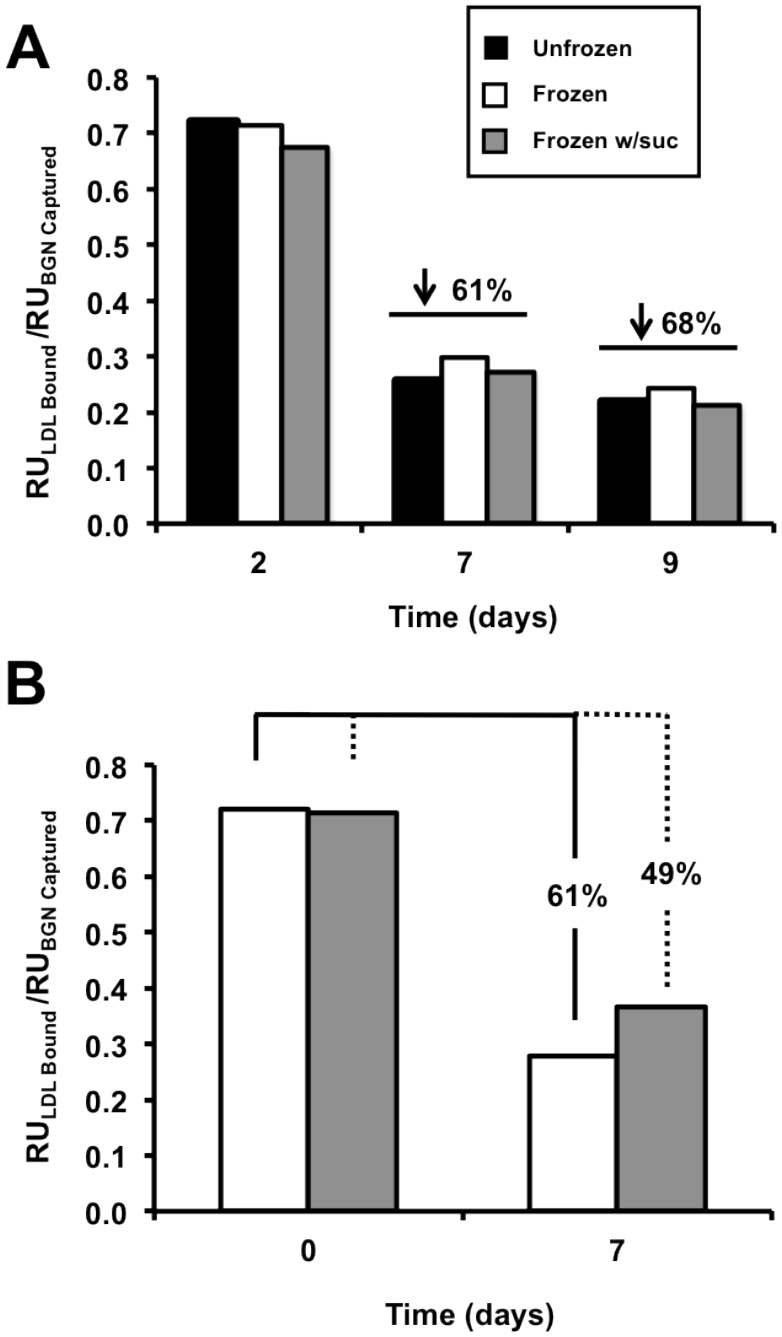
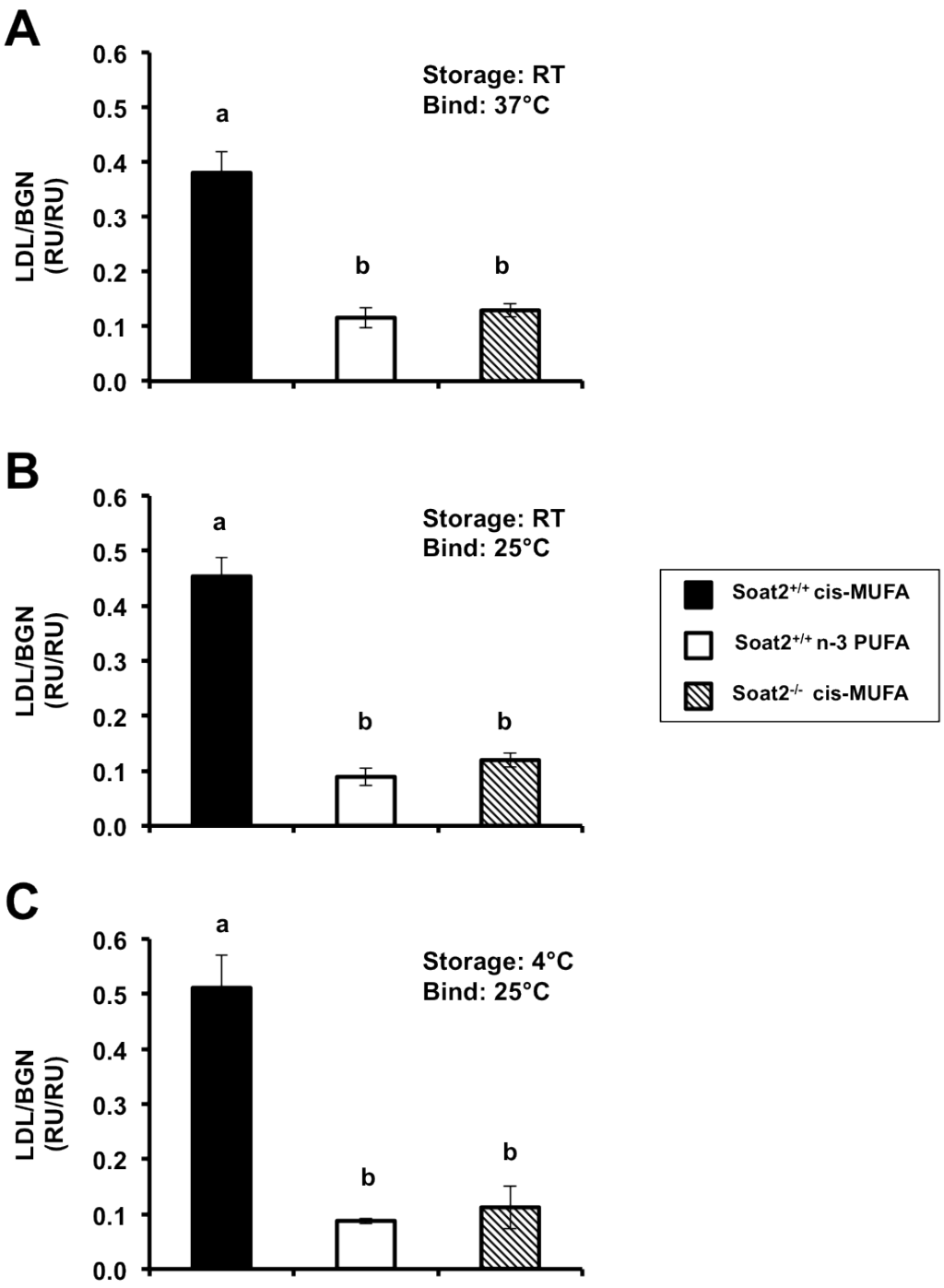


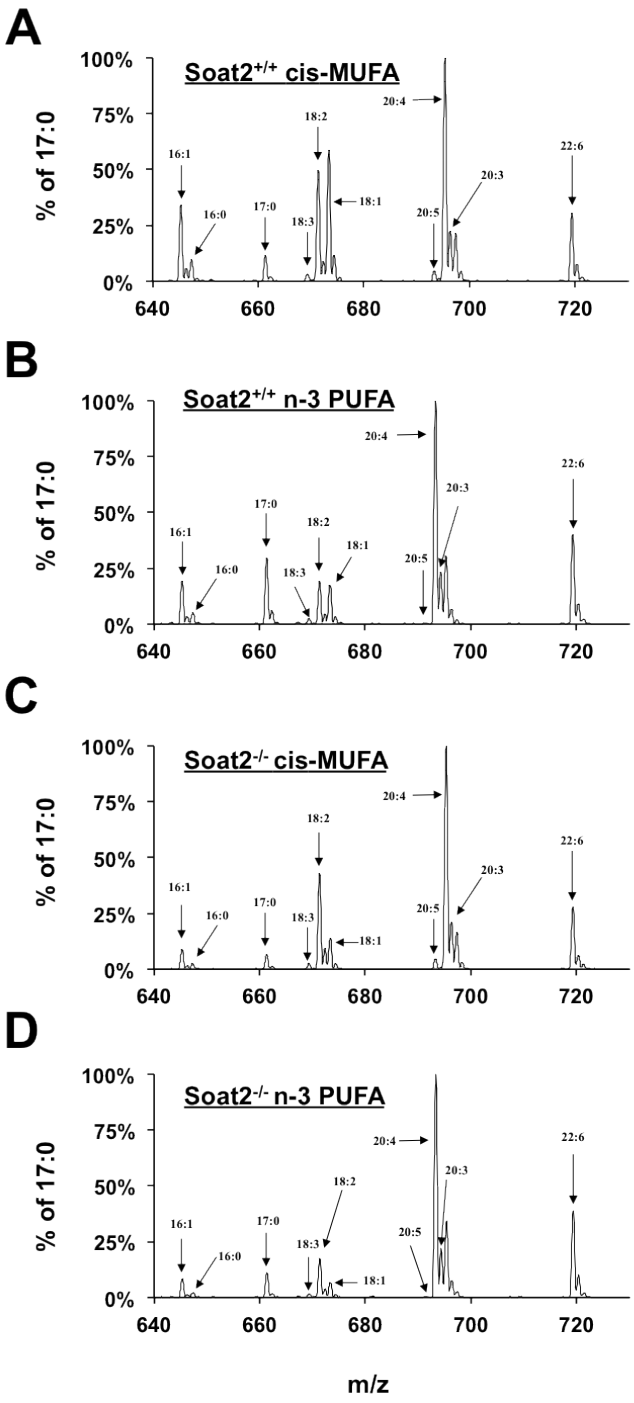
Supplementary Figure 1: Kinetic responses of biglycan attachment and LDL-biglycan binding assessed by SPR. A: Response of BGN attachment to mAb for each cycle prior to LDL binding for experimental groups. Bars represent mean (± SEM) for n=6-12 cycles for each group. **B:** Representative kinetic response of the sample channel and reference channels (gray) and the RU difference between channels (black) of BGN attachment to the mAb on the surface of the chip, LDL binding to BGN, and LDL dissociation. LDL was isolated from an $SOAT2^{+/+}$ mouse consuming the cis-MUFA diet for this plot.



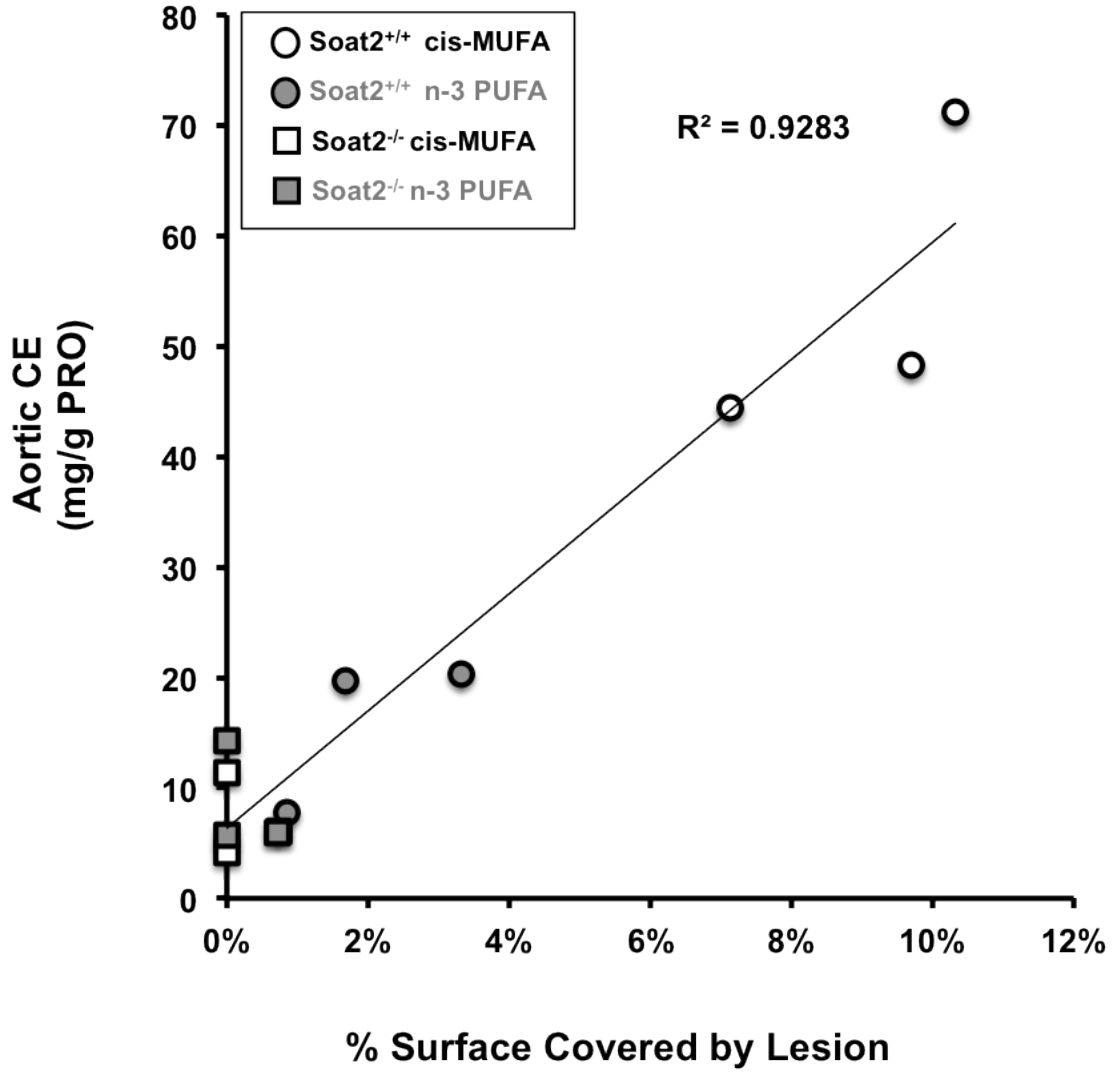
Supplementary Figure 2: Signal loss of LDL binding over time. A: Binding of LDL isolated directly from unfrozen plasma, plasma thawed after freezing at -80°C, and plasma thawed after freezing at -80°C in 10% sucrose from the same Soat2$^{+/+}$ mouse fed chow. LDL were isolated by gel filtration chromatography on day 1 from three aliquots of plasma and were maintained at 4°C until binding at 2, 7, and 9 days after isolation. **B:** Binding of LDL isolated from plasma from the same Soat2$^{+/+}$ mouse consuming chow that was frozen at -80°C with or without sucrose. LDL was isolated from plasma frozen for 1 hour on the same day as collection or from plasma frozen for 9 days post-collection. In both cases, binding assays were performed within 24 hours of LDL isolation.



Supplementary Figure 3: Lack of effect of temperature for storage or binding of UC Isolated LDL particles on SPR measurement of LDL binding to biglycan. A: Binding between LDL and BGN at 37°C for LDL particles stored at room temperature. **B:** Binding between LDL and BGN at 25°C for LDL stored at room temperature. **C:** Binding between LDL and BGN at 25°C for LDL stored at 4°C. The bars represent the means (± SEM) for 3 mice for each experimental group. Bars with different letters are significantly different at $P<0.05$.



Supplementary Figure 4: Cholesteryl ester spectra from mass spectrometry. Representative spectra for CEs for **A:** Soat2$^{+/+}$ mice fed the cis-MUFA diet, **B:** Soat2$^{+/+}$ mice fed the n-3 PUFA diet, **C:** Soat2$^{-/-}$ mice fed the cis-MUFA diet, and **D:** Soat2$^{-/-}$ mice fed the n-3 PUFA diet.



Supplemental Figure 5: Relationship between surface area and chemical evaluation of atherosclerosis. Surface area is expressed as a percentage of the surface covered by lesion. The relationship was analyzed by regression analysis for n=3 mice per experimental group and the least squares best-fit regression line and regression coefficients are included in the figure.