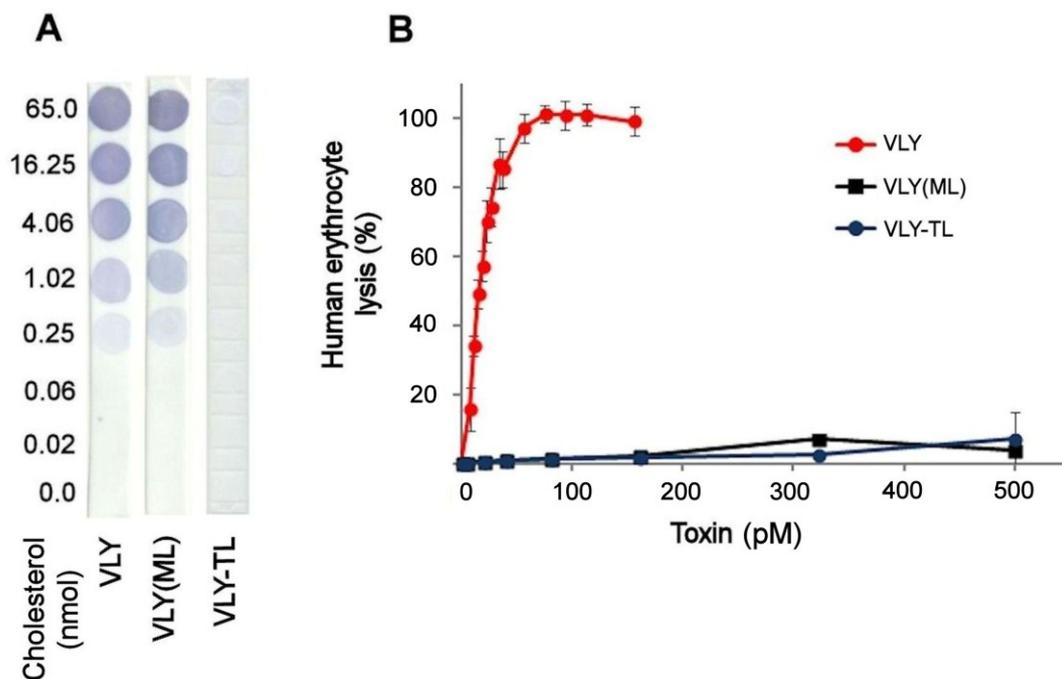
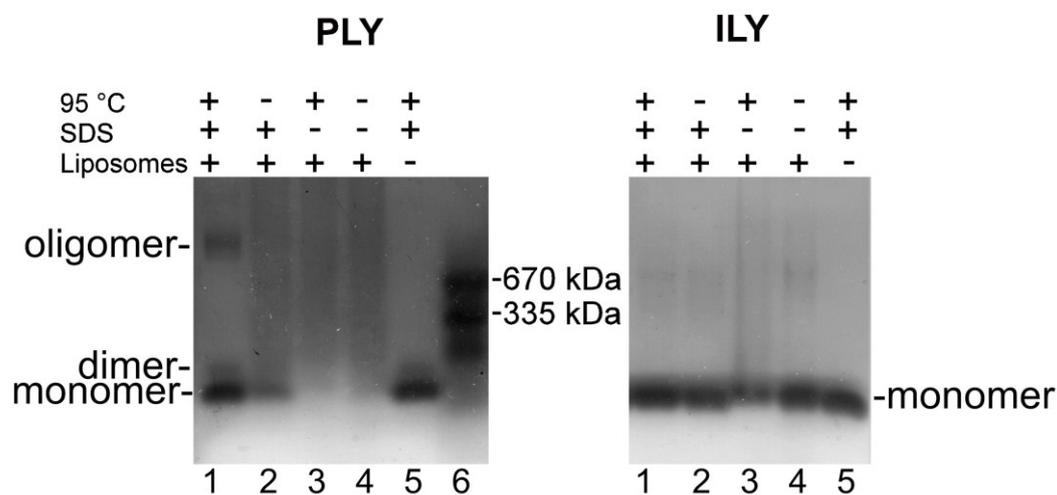


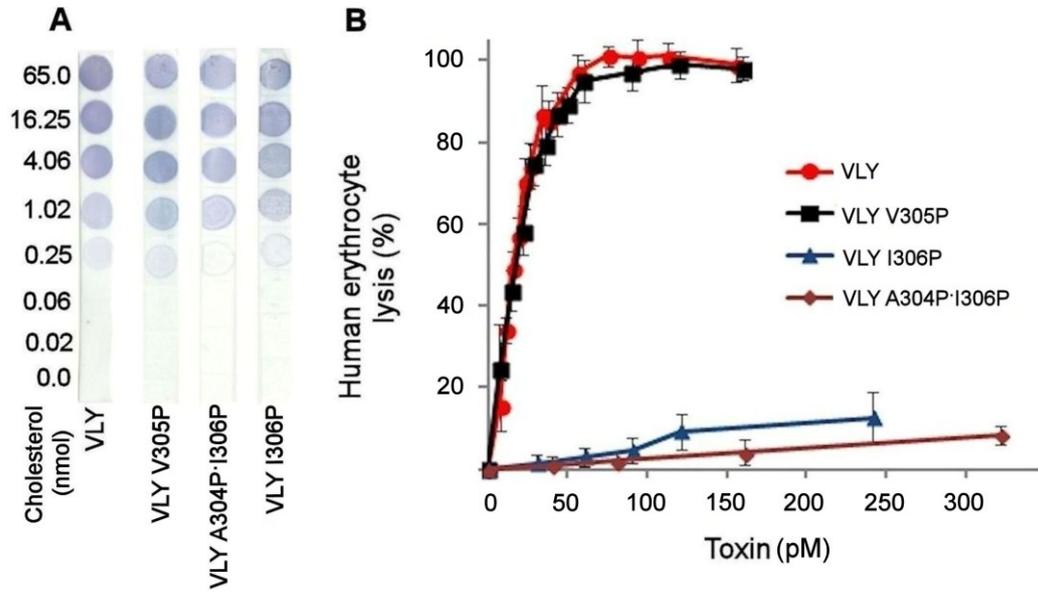
## Supplementary Information



**Figure S1.** (A) Binding of vaginolysin (VLY) and its mutants to polyvinylidene difluoride (PVDF) membrane-immobilized cholesterol; (B) Hemolytic activity of VLY mutants on human erythrocytes.



**Figure S2.** Oligomer formation on cholesterol-rich liposomes by pneumolysin (PLY) and intermedilysin (ILY) detected by denaturing agarose gel electrophoresis. Lane 6: molecular mass marker bovine thyroglobulin crosslinked with glutaraldehyde. The protein marker prepared in SDS-containing sample buffer was heated to 95 °C for 7 min. Thyroglobuline forms a dimer of ~670 kDa and a monomer (~335 kDa) is also observed.



**Figure S3.** (A) Binding of vaginolysin (VLY) and its mutants to polyvinylidene difluoride (PVDF) membrane-immobilized cholesterol; (B) Hemolytic activity of VLY mutants on human erythrocytes.