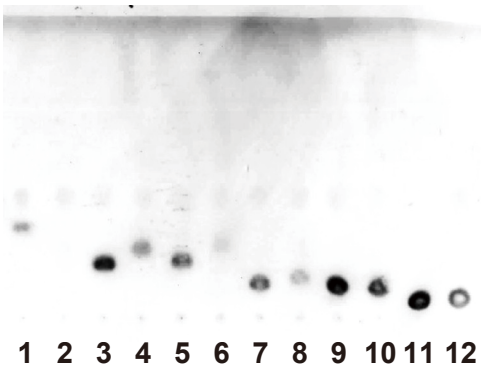

Supplemental Fig. S1. **Degradation of various unsaturated heparin disaccharide by UGL.** Unsaturated heparin disaccharides were incubated at 30˚C with SagUGL and resultant products were detected on the TLC plate. *Lane 1*, sulfate-free unsaturated heparin disaccharide (HΔ0S, 17.5 nmol); *lane 2*, HΔ0S (17.5 nmol) with SagUGL; *lane 3,* unsaturated heparin disaccharide with a sulfate group at nitrogen position of GlcN residue (HΔNS, 17.5 nmol); *lane 4,* HΔNS (17.5 nmol) with SagUGL; *lane 5*, unsaturated heparin disaccharide with a sulfate group at C-6 position of GlcNAc residue (HΔ6S, 17.5 nmol); *lane 6*, HΔ6S (17.5 nmol) with SagUGL; *lane 7*, unsaturated heparin disaccharide with sulfate groups at nitrogen position and C-6 position of GlcN residue (HΔNS6S, 17.5 nmol); *lane 8*, HΔNS6S (17.5 nmol) with SagUGL; *lane 9*, unsaturated heparin disaccharide with sulfate groups at C-2 position of ΔGlcA residue and nitrogen position of GlcN residue (HΔNS2'S17.5 nmol); *lane 10*, HΔNS2'S (17.5 nmol) with SagUGL; *lane 11*, unsaturated heparin disaccharide with sulfate groups at C-2 position of ΔGlcA residue, nitrogen position of GlcN residue, and C-6 position of GlcN residue (HΔNS6S2'S, 17.5 nmol), *lane 12*, HΔNS6S2'S (17.5 nmol) with SagUGL.