

FIGURE 25.1 Comparison of the linear structures of heparin and heparan sulfate. Note that beyond the tetrasaccharide linkage region heparin has a consistent pattern of repeating disaccharides. On occasion a 3-O-SO₃ is present in the GlcNSO₃ (not shown). By contrast, heparan sulfate has short stretches of heparinlike structure separated by regions that are poorly sulfated within which is GlcA rather than sulfated IdoA.

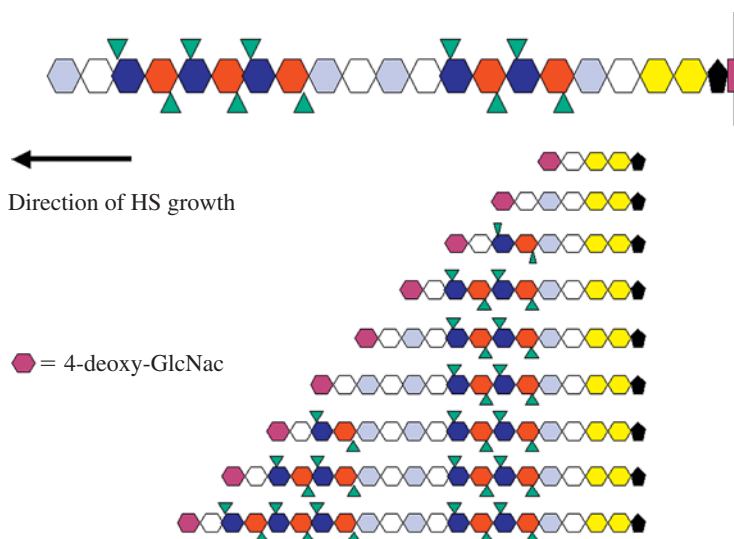


FIGURE 25.2 Nested series of HS polysaccharides that would be generated by 4-deoxy-GlcNac if there is a specific HS linear structural pattern (e.g., top of figure) that exists at a specific proteoglycan serine locus. Each of these will begin with the Xyl-Gal-Gal-GlcA tetrasaccharide linkage region that serves as a bridge between the elongating HS chain and the relevant proteoglycan serine residue and terminate with 4-deoxy-GlcNac. These unique structures “tag” each end of the polysaccharide. Because HS grows by the alternating addition of GlcNac and GlcA, the shortest polysaccharide within the isolated HS preparation will be a pentasaccharide consisting of Xyl-Gal-Gal-GlcA-4-deoxy-GlcNac. Each larger HS within the isolated polysaccharides population will increase in size by a disaccharide consisting of GlcA-4-deoxy-GlcNac and a MW of approximately 400. Sulfation occurring in the disaccharide immediately behind the truncation site may increase the MW by an additional 200 to 250 mass units. With unique tags at each end of these polysaccharides, the intervening sugar modifications should be amenable to mass spectrometric analysis to determine the consistent linear structural pattern, if present.