With steady advances in analytical technologies, the knowledge in glycomics is also increasing rapidly. Over the last decade, specific glycans have been described that are associated with several diseases, including cancer and inflammation, with host-pathogen interactions and with various developmental stages during stem cell development and differentiation. Simultaneously, deeper structural insight on glycosylated biopharmaceutical protein therapeutics manufactured in CHO or other cell systems has been achieved. This information is highly relevant for clinicians and biomanufacturing industries as a new class of glycobiomarkers emerges. However, most methods of glycoanalysis are primarily research tools or high throughput tools in a research setting and are not amenable as point-of-care or on-site detection and sensor devices. One of the challenges in building reliable glycobiosensors is the lack of a library of lectins or antibodies that possess high specificity and sensitivity for specific glycan motif detection. Some recent research reports have demonstrated the use of recombinant protein engineering, phage display and aptamer technologies in the production of mimics of lectins, as well as the construction of biosensors that are capable of rapidly detecting glycan motifs at low levels in labeled and label-free manner. These are primarily proof-of-principle reports at this stage, but some of the approaches or a combination of these approaches will lead to functional glycobiosensors in the coming years which will be valuable tools for clinical, biopharmaceutical and life sciences research community.