Isolation of complex glycans utilizing fluorescent tagging for in-situ bioconjugation and its resultant applications

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Glycochemistry plays a vital role within biological processes such as cellular signalling, DNA repair and cellular structure. One challenge within current biological studies of these complex glycans revolves around the disentanglement and separation of glycans from a biological matrix. Utilizing recent advances in oxidative release of N-linked glycans from glycoconjugates and subsequent conjugation to an amine, it is possible to isolate pure samples with HILIC (hydrophilic interaction liquid chromatography). This approach, along with 2-TEAB (2-thioethyl-aminobenzamide), can be extended for the purpose of isolation of simple glycans using C18 media. Furthermore, reversible disulfide formation can be utilized to catch 2-TEAB conjugated glycans onto activated thiol-containing polymer supports. This method would enable a pull-down approach of glycans from natural samples by in-situ installation of a desired auxiliary through selective reductive amination and reductive release on demand. Collectively, utilizing this simplistic approach to isolate complex glycans from biological sources through these well-established fluorescent tagging and isolation protocols; it will then be possible to gain further access to these highly branched N-glycans for therapeutic and biological studies.