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Glycosylation signatures of type 2 diabetes complications and metabolic syndrome

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Stellingen behorende bij het proefschrift getiteld
“Glycosylation Signatures of Type 2 Diabetes Complications and Metabolic Syndrome”

1. Regarding the further development of plasma *N*-glycan profiles as markers of suboptimal health status and metabolic syndrome one should prioritize research into understanding their role in disease progression over their immediate clinical application. (this thesis)
2. The associations of plasma *N*-glycosylation patterns with type 2 diabetes complications highlight their potential as biomarkers, but the overlap with glycosylation changes in other metabolic and inflammatory conditions underscores the need for careful evaluation of their disease specificity. (this thesis)
3. IgG *N*-glycosylation patterns should be studied in the context of broader inflammatory and metabolic changes, as isolating them may oversimplify their role in type 2 diabetes complications. (this thesis)
4. *N*-glycan profiling using dried blood spots represents a minimally invasive and cost-effective approach for distinguishing pre-diabetes from diabetes, but its clinical applicability is limited by the need for larger validation studies and mass spectrometry confirmation of glycan structures. (this thesis)
5. Sialylation and fucosylation alterations in glycan structures are strongly associated with the development of chronic diseases such as diabetes and cancer (doi: 10.1038/nrc3982), indicating their potential as universal disease markers that require standardized clinical protocols.
6. The inflammatory role of IgG *N*-glycosylation, together with its association with risk factors such as aging, obesity, dyslipidemia, and type 2 diabetes, suggests that changes in IgG *N*-glycan profiles are involved in the pathogenesis of ischemic stroke by regulating the inflammatory response (doi: 10.1186/s12974-018-1161-1), an insight that opens new avenues for exploring longitudinal glycan monitoring within stroke prevention frameworks.
7. A novel integrated pipeline for site-specific quantification of *N*-glycosylation enhances the accuracy of glycopeptide analysis in large-scale clinical samples and facilitating the discovery of potential biomarkers for diseases such as chronic kidney disease (doi: 10.1007/s43657-023-00150-w), thereby inviting a necessary emphasis on prioritizing its reproducibility and validation in independent cohorts.
8. *N*-glycan analysis of immunoglobulin G (IgG) isolated from dried blood spots has shown that DBS are a stable source material for robust IgG *N*-glycan analysis, suitable for conditions where traditional blood sampling is impractical (doi: 10.1093/glycob/cwz061), supporting their potential use in large-scale glycomic studies and conventional clinical applications.
9. More than happiness, hope is the real cornerstone of life, as hope sustains humanity and acts as a powerful catalyst for every journey.
10. The integrity of science depends on transparency and FAIR principles, ensuring that data and methods are accessible, reusable, and reliable. Implementing these principles builds trust, fosters collaboration, and accelerates discoveries that positively impact society.
11. Knowledge is a precious inheritance, manners are like beautiful garments that adorn a person and remain timeless, and thoughtful reflection acts as a clear mirror (Adapted from Imam Ali, 7th Century, Nahjul Balagha book), underscoring that academic integrity and ethical responsibility are just as vital to scientific progress as empirical findings themselves.
12. Human beings are part of one body and if one is affected with pain, others cannot rest easy. If one has no sympathy for the pain of other human beings, then he/she should not be called human (Adapted from Saadi Shirazi, 13th Century, Gulistan book); similarly, scientific and societal progress should be accompanied by responsibility for the well-being of others and recognition of shared human vulnerability.