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Perspective

# Proteomics Investigation during Preterm Infants for Biomarkers Discovery

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## DESCRIPTION

Proteomics is a scientific solution that enables for the combined estimation of many proteins and has led to the discovery of numerous unique biological markers [1]. Plasma proteomics has the benefit of requiring only a little amount of blood to examine hundreds, if not thousands, of proteins and can detect changes in protein expression associated with ageing and disease [2]. Preterm birth is the biggest cause of death in children in the world [3]. Over the last few decades, considerable technological advancements in newborn care have resulted in an increase in the survival of infants born preterm (37 weeks' gestation), particularly those born extremely preterm (28 weeks' gestation). Premature birth delivery is associated with major morbidities such as Intraventricular Hemorrhage (IVH), Necrotizing Enterocolitis (NEC), Bronchopulmonary Dysplasia (BPD), and neurosensory abnormalities, despite technological breakthroughs that have improved survival in these vulnerable groups [4]. Plasma proteomics has previously been used to identify proteins that may be involved in the development of retinopathy or prematurity. Astonishingly preterm birth affects around 12% of pregnancies globally, and it is still the leading cause of infant illness and mortality. ATBs are caused by microbial-induced preterm labor, which is mediated by an inflammatory process that threatens both maternal and baby health. An untargeted mass spectrometry discovery was done on 51 biotic mid zone amnion samples from premature neonates in the hunt for novel predictive biomarkers of ATB and preterm Prelabour Rupture of the Membranes (pPROM) and to increase knowledge of infection-related ATB. Preterm birth is linked to a higher risk of complications, which are defined as a group of connected complicated disorders that define the clinical fate of a preterm-born neonate. These faults are caused by the neonate's systemic immaturity and manifest the immanent negative effects of life-sustaining intensive care operations (a specific set of environmental risk factors) [5].

Thirst signals were easily identifiable in neonatal saliva during the development of oral feeding biomarkers. Their presence suggests that they may not only play a significant role in regulating eating behavior in newborns, but also that protein levels in saliva may be required for the maturation of the gut–brain axis, which is required for successful oral feeding. NPY2R is an appetite hormone and candidate gene for obesity development and food intake control that was originally discovered in 1996 [6]. After normalization, one feeder's NPY2R expression (F6) remained an anomaly. The study was conducted on protein collected from the saliva of ten feeding-successful and ten feeding-unsuccessful infants who were age, sex, and post-conceptional age matched. To normalize for starting protein concentrations, immunoassays were developed for five oral feeding biomarkers and two reference biomarkers (GAPDH and YWHAZ). Normalized protein concentrations were linked to both eating status and previously published gene expression profiles at the time of sample collection. In neonatal saliva, only the reference proteins and those implicated in hunger signaling were found at detectable amounts. NPY2R and AMPK expression patterns coincided with gene expression patterns previously observed in successful and failed feeders and predicted feeding outcome. Salivary proteins involved with hunger signaling are easily measurable in neonatal saliva and can be used to determine whether the infant is ready for oral feeding. This research offers the groundwork for the creation of a proteomic platform that can be used to measure neonatal oral feeding maturity [7].

Biomarker discoveries in the preterm newborn population. Biomarkers for various outcomes related with preterm delivery have been identified using a variety of proteomic approaches, including tandem mass spectrometry, immunoassays, and MALDI-TOF MS. Future research will concentrate on biomarkers in order to better understand the mechanisms underlying preterm delivery and to find predictive protein biomarkers for problems or long-term squeals linked with preterm birth.

## REFERENCES

1. Ahram M, Petricoin EF. Proteomics discovery of disease biomarkers. Biomar. insights. 2008;3:BMI-S689.

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2. Ignjatovic V, Geyer PE, Palaniappan KK, Chaaban JE, Omenn GS, Baker MS, et al. Mass spectrometry-based plasma proteomics: considerations from sample collection to achieving translational data. J Proteome Res. 2019;18(12):4085-97.
3. Walani SR. Global burden of preterm birth. Int J Gynaecol Obstet. 2020;150(1):31-3.
4. Cheong JL, Spittle AJ, Burnett AC, Anderson PJ, Doyle LW. Have outcomes following extremely preterm birth improved over time?. Semin Fetal Neonatal Med. 2020;25(3):101114.
5. Glass HC, Costarino AT, Stayer SA, Brett C, Cladis F, Davis PJ. Outcomes for extremely premature infants. Anesth Analg. 2015;120(6):1337.
6. Hunt SC, Hasstedt SJ, Xin Y, Dalley BK, Milash BA, Yakobson E, et al. Polymorphisms in the NPY2R gene show significant associations with BMI that are additive to FTO, MC4R, and NPFFR2 gene effects. Obesity (Silver Spring). 2011;19(11):2241-2247.
7. Khanna P, Maron JL, Walt DR. Development of a rapid salivary proteomic platform for oral feeding readiness in the preterm newborn. Front Pediatr. 2017;5:268.