Placental proteins proteomic identification is associated with subsequent allergic disease in childhood

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ABSTRACT

Background: Allergic disease has risen to epidemic proportions during recent years. Prenatal events are important in determining disease susceptibility via environmental influences on placental function and fetal programming. We hypothesize that childhood susceptibility to allergy is increased through significant alterations in placental function that exert a programming effect on the fetal immune system. We aim to identify the placental proteins associated with childhood allergy using placental tissue from two populations of women whose children have different risks of allergic disease susceptibility. **Methods:** Placental tissue will be examined using a proteomic approach that involves quantitative label-free comparative MS and data analysis is performed using Mascot database and MaxQuant software. Placental tissue from children without allergy were compared to children with allergic diseases (male n=8, female n=8). **Results:** Three candidate proteins were identified in placental samples associated with subsequent allergic disease in all children that include Human Biglycan (ratio of >2-fold change), Human Amine oxidase [flavin-containing] A and Human Amine oxidase [flavin-containing] B (ratio <0.5-fold change), all relative to non-allergic samples. Moreover, there were 19 proteins significantly altered in placentae of allergic males and 21 proteins altered in placentae of allergic female relative to non-allergic children. Many of these proteins could exert a programming effect on the fetal immune system including Human Ig heavy chain V-I region HG, Human Complement C3, and Human Apolipoprotein B-100. **Conclusion:** The current findings suggest protein expression varies in utero in children who subsequently develop allergy and the altered expression of these proteins vary in a sex specific manner.