Suppression of miR-424 in Breast Cancer Cells with Hyperglycemia Promotes Metastasis

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Introduction: Diabetes worsens the prognosis of breast and many other cancers by enhancing the metastatic potential of cancer cells through mechanisms which are not very well studied. MicroRNAs have lately been shown to be involved in several physiological processes in normal and diseased states. We hypothesized that miR-424 acts as a key player in hyperglycemia induced invasive abilities thereby promoting metastasis. We further hypothesized that mechanismistically, miR-424 influences breast cancer cells through a Rho-GTPase family member, CDC42 (Cell division control protein 42).

Materials and Methods: For this study, malignant triple negative breast cancer cells, MDA-MB-231 were used. To mimic hyperglycemia in vitro, cells were incubated with 10mM glucose. Further, we established stable cell lines with miR-424 over expression and ablation maintained with 10mM and 5mM glucose containing media respectively.

Results: Our findings suggested that invasion and migration were altered with modulation of miR-424 experimental compared to control. Over expression of miR-424 led to a decrease in invasion and migration. This was also supported by protein levels of E-Cadherin which was increased with over expression of miR-424. CDC42 was predicted to be one of the targets for miR-424. CDC42 has been associated with invasive ability of cancer cells. Our data indicated a negative correlation between CDC42 and miR-424. We also found that miR-424 had significant impact on the cancer stem cell behavior decreasing sphere forming capacity. Further, the activity of key stem cell associated transcription factors like SOX2 and Nanog were suppressed by miR-424.

Conclusion: Hyperglycemia promotes metastasis through miR-424-CDC42 axis. Further studies are warranted.

An Environmental Scan of Diagnostic Practices for Children with Disabilities in El Paso

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Introduction: With the prevalence of developmental disabilities on the rise in the United States, it is important that pediatric healthcare providers are adequately screening when there are concerns about a child’s development and making appropriate referrals when necessary. These steps are critical in reaching an early diagnosis. However, current research suggests that there are several factors that influence screening and referral practices in healthcare settings.

Purpose: This 2- phase study aimed to analyze how parents of children with developmental disabilities and pediatric healthcare providers viewed screening, referral, and diagnostic practices in the El Paso area.

Methods: During Phase 1, 110 surveys were completed (60 parents, 43 professionals, 5 individuals with developmental disabilities, 2 “other”). Participants were asked to rate the effectiveness of various services, including screenings, referrals, and diagnostic practices. Participants also answered open-ended questions regarding healthcare practices for children with developmental disabilities. During phase 2, researchers held a summit and invited parents and stakeholders from the community to discuss the challenges that were identified in phase 1.

Results & Conclusion: Results demonstrated a significant difference in how parents and professionals rate the effectiveness of both referral and diagnostic practices (p < .05). Parents rated both of these services lower than professionals. No statistical differences were found in screening practices. Future research should aim to minimize the gap between these views and improve healthcare practices for these children.