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Contribution of insulin-like growth factor 2 mRNA-binding protein 1 (IGF2BP1) to basal cell carcinoma development

Basal cell carcinoma (BCC) is the most common form of cancer affecting more than four million people each year. Although BCC metastasizes rarely, if left untreated it can destroy tissues and nearby organs and cause disfigurement. BCC arises in the basal cells of the epidermis and is caused mostly by long term sun exposure. Activation of GLI1 is a key step in the initiation of the tumorigenic program leading to BCC. We previously showed that Gli1 was also regulated by Wnt signaling in a IGF2BP1-dependent manner. Moreover, the regulation of Gli1 by the Hh upstream signal was IGF2BP1- dependent as well. We hypothesized that Wnt-induced and IGF2BP1-dependent regulation of GLI1 expression and activities was important in the development of BCC. To test our hypothesis, we used the CRISPR/Cas9 approach to knock down IGF2BP1 in UW-BCC1 cells. UW-BCC1 cells depleted of IGF2BP1 were injected subcutaneously in the flank of immunocompromised mice and tumor growth was monitored weekly for a period of eight weeks. We observed that knockdown of IGF2BP1 in UW-BCC1 cells significantly reduced tumor growth in xenograft mice compared to controls ($P< 0.01$). A reduction in the expression of some Wnt and Hh targets was observed in the tumors as well. We also observed a gender disparity in the development of tumors using UW-BCC1 cells. IGF2BP1 appears to contribute to BCC development and might represents a novel target in the treatment of basal cell carcinoma.

Biography

Felicite Noubissi is Assistant professor in the department of biology at Jackson State University. The mission of her research program is to investigate cellular and molecular mechanisms underlying tumor development and resistance to drug. Her work uncovered an RNA-binding protein, insulin-like growth factor 2 mRNA binding protein (IGF2BP1), which seems to play a critical role in colorectal cancer development and metastasis. Dr. Noubissi's work also demonstrated a mechanism of cross-talk between Wnt and Hh signaling pathways which is mediated by IGF2BP1 and important in basal cell carcinoma development. Dr. Noubissi has published in many journals including nature, cancer research and JID. Her research has been supported by a career development award and Freinkel Diversity Fellowship from the society for Investigative Dermatology and grants from the national institute of health (NIH).

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