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Cell differentiation and differentiation therapy in neuroblastoma

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Neuroblastoma is the most common solid tumor of infancy and the most common extra-cranial solid tumor of childhood. Neuroblastoma arises from the neural crest cell precursors of the sympathetic nervous system that fails to complete the process of differentiation, which provides the basis for differentiation therapy, a treatment approach to induce the differentiation of the malignant cells and thereby leading to tumor growth arrest. However, only a limited number of differentiation agents is available to treat neuroblastoma, and resistance to current available differentiation agents is common. This highlights the needs to develop new and more effective differentiation agents. My research goals are to identify novel genes that control neuroblastoma cell differentiation and to discover new differentiation agents from various sources for treating neuroblastoma using a functional high-content screening approach that was recently developed in our group. This approach is based on quantification of the morphological differentiation marker of neuroblastoma cell – neurite outgrowth. By exploiting this screening approach, we have identified a group of novel differentiation-inducing micro-RNA mimics, synthetic oligo-nucleotides used to raise intracellular levels of micro-RNAs. These micro-RNA mimics induce the differentiation of neuroblastoma cells that are both sensitive and resistant to current differentiation agents, showing the promise of developing micro-RNA based differentiation therapeutics to treat neuroblastomas that are resistant to current differentiation agents. Besides the work on micro-RNAs, we are currently expanding the discovery of novel differentiation agents to other drug sources, including natural products and synthetic small molecule compounds.

Biography

Liqin Du received her PhD degree from the University of Kentucky. She completed her Post-doctoral training at University of Texas Southwestern Medical Center at Dallas. She is currently an Assistant Professor in the Department of Chemistry and Biochemistry at Texas State University in USA. She has published more than 20 peer-review papers. Her current primary research interest is neuroblastoma cell differentiation and differentiation therapy, with goals to identify novel genes that control neuroblastoma cell differentiation and to discover new differentiation agents from various sources for treating neuroblastoma.

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