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CDK4/6 inhibitors reduce cell proliferation in pediatric brain tumors

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Childhood tumors are a heterogeneous group of neoplasm that occurs predominantly during 0-18 years of age. In Western countries, children's cancer accounts for about 2% of all cancer cases. In childhood tumors, central nervous system (CNS) tumors ranked second. Due to development of medical technology and medicine, the 3-year survival rate of childhood tumors has improved in Western countries, but the survival rate of some malignant brain tumors is still dismal, such as glioblastoma. Therapeutic approaches for children with brain tumors include surgery, radiotherapy and chemotherapy. After surgical resection of pediatric brain tumors, radiotherapy and high-dose chemotherapy are considered effective treatments. However, radiation exposure or high-dose chemotherapy may have long-term side effects on brain development, especially in patients under 3 years of age. Therefore, for pediatric patients, finding new target therapy is urgent. Previous studies have indicated that in tumor cells, the cell cycle-regulatory proteins are often mutated or overexpressed, including the cyclin D1 (CCND1), cyclin-dependent kinase 4 (CDK4), and CDK6. Therefore, they became good therapeutic targets for tumors. We collected and analyzed published database from microarray, and found that at least one of CCND1, CDK4 or CDK6 was overexpressed in six malignant pediatric brain tumors, including GBMs, anaplastic astrocytomas, medulloblastomas, AT/RTs, ependymomasa and PNETs. Using CDK4/6 inhibitors, Palbociclib, have effectively to inhibit cell proliferation and cancer sphere formation. Furthermore, Palbociclib treatment reduced cell cycle and DNA repaired genes expression. Therefore, Palbociclib will be an opportunity to treat a variety of malignant pediatric brain tumors for future.

Biography

Tsung-Han Hsieh has completed his PhD at the age of 30 years from National Yang-Ming University and Postdoctoral Studies from Cancer translational center, Taipei Medical University, Taiwan. Now, He is the assistant research fellow in Taipei Medical University.

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