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Special Issue on

Novel Immunotherapeutic Strategies for Neural Crest-derived Tumors and Primitive Neuroectodermal Tumours

CALL FOR PAPERS

Cells derived from the neural crest (NC) are highly migratory and multipotent cells that give rise to multiple cell types and tissues in vertebrate embryo include melanocytes, craniofacial cartilage, nervous systems (neurons and glia), and the adrenal medulla.

Premigratory NC cells arise from the neural tube, acquire migratory capacity, and undergo an epithelial-mesenchymal transition (EMT). NC cells proliferate and migrate to populate target tissues, guided by microenvironmental *stimuli*. The pluripotency of NC cells is progressively limited, and these cells differentiate into appropriate cell types, including Schwann cells, chromaffin cells, and melanocytes. Malignant cells may originate from NC cells, through different processes similar to those occurring in the natural development, supporting cell survival, growth, and invasion, such as i) loss of apicobasilar polarity, ii) changes in cell-cell adhesion, iii) degradation of the ECM, iv) cell proliferation, v) migration, and vi) pluripotency. However, in contrast with normal NC cells, malignant cells do not undergo differentiation but display a dysregulated growth and proliferation, resulting in tumorigenesis at metastatic sites.

The neural crest lineage is extremely diverse and widespread, and tumors derived from the neural crest include medullary thyroid carcinoma (derived from thyroid C cells), ganglioneuroma (derived from peripheral nervous system ganglia), neuroblastoma (derived from sympathoadrenal precursors), melanoma (derived from melanocytes), MPNST (Malignant Peripheral Nerve Sheath Tumors, derived from Schwann cells), and pheochromocytoma (derived from chromaffin cells of the adrenal medulla).

In contrast, primitive neuroectodermal tumors (PNET) are rare tumors derived from neuroectoderm, usually occurring in children and young adults under 25 years of age, with an overall 5-year survival rate of 53%. The majority of tumor cells are derived from neuroectoderm but have not developed and differentiated in the way a normal neuron would, and so the cells appear "primitive," with a different degree of differentiation depending on the type of the tumor. PNET family includes PNET of the central nervous system (CNS PNET) and peripheral PNET. CNS PNET are aggressive neoplasms of the brain, most frequently encountered in the pediatric population and peripheral pNET that includes i) medulloblastoma, the most common, that accounts 12% of pediatric brain tumors, ii) supratentorial PNET that account 15% of all CNS PNET, including pineoblastoma, ependymoblastoma, and medulloepithelioma, and iii) spinal PNET that are very rare. In contrast, peripheral PNET are identical to Ewing sarcomas.

Since prognosis of patients with NC-derived tumors and PNET is still poor, in spite of chemotherapy and adjuvant therapies, several novel therapeutic approaches have been proposed in the last years. In this view, immunotherapeutic approaches hold promises. These approaches are in general based on the use of i) immune effector cells (T cells or NK cells), ii) effector cells endowed with a chimeric antigen receptor (CAR), iii) monoclonal antibodies, and iv) free or encapsulated chemotherapeutic drugs targeted by monoclonal antibodies. Multiple molecules may be targeted by these immunotherapeutic approaches, in particular i) tumor associated antigens, ii) immune checkpoints (i.e., CTLA-4, PD-1), iii) molecules involved in tumor neoangiogenesis (VEGF/VEGFR), iv) growth factors (i.e., FGF, PDGF), and v) immunosuppressive molecules and/or immunoregulatory cells.

We are interested in papers exploring novel immunotherapeutic approaches for human NC-derived tumors and PNET.

Potential topics include but are not limited to the following:

- Preclinical studies describing novel immunotherapeutic approaches for NC-derived tumors and PNET in animal models
- Phase I/II clinical trials describing novel immunotherapeutic approaches tested on patients with NC-derived tumors and PNET
- Basic studies describing novel targets for future immunotherapeutic strategies in patients with NC-derived tumors and PNET

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/jir/ihtd/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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