

MURC 2019

Presentation ID: 142

Presentation Format: Poster Presentation

Presentation Title: Stress Granules Contribute to Pediatric Brain Tumors Response to Oxidative Stress. A New Therapeutic Opportunity?

In the tumor microenvironment cells need to face potentially lethal acute changes including oxidative stress. To overcome oxidative stress tumor cells form stress granules (SGs), clusters of RNA and RNA-binding proteins (RBPs). Through a previous report we found that RBPs promote the cellular antioxidant response by activating the transcription factor NRF2 (NFE2L2) leading to upregulation of genes critical for cell survival. We set out to determine if pediatric brain tumours rely on the formation of SGs to overcome oxidative stress and progress as well as to determine if SG inhibition could be a therapeutic approach for pediatric tumors. We analyzed public databases of mRNA expression of several RBPs and NFE2L2. Immunohistochemistry (IHC) for G3BP1, NRF2 and an oxidative stress marker was performed on tumour slides. Pediatric brain tumor cell lines were treated with NaAsO₂ and diethylmaleate to induce the formation of SGs by oxidative stress. SG presence was then determined by immunofluorescence (IF) with antibodies against the RBPs G3BP1 and TIA-1. In AT/RT, pGBP and EPN tumours, G3BP1 was among the RBPs showing a higher degree of correlation with NFE2L2 IHC confirmed the mRNA results. In pGBM high levels of G3BP1 were also predictive of poor outcome. NaAsO₂ and diethylmaleate treatments resulted in oxidative stress and induced the RBPs G3BP1 and TIA-1 to form SGs in vitro. SGs represent important mediators for the adaptive response of pediatric brain tumors to oxidative stress. Futures studies will aim at discovering and validating pharmacological therapeutic approaches to block SGs in pediatric brain tumors.

Themes:

Check (highlight) the most applicable theme according to the abstract.

<input type="checkbox"/> Innovation and Technology	<input checked="" type="checkbox"/> Health and Wellness	<input type="checkbox"/> Culture and Society	<input type="checkbox"/> Sustainability and Conservation
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Comments: Avoid using jargon or define terms as MURC is a generalist conference

Commented [C1]: Perhaps provide some background or context before diving straight in

Commented [C2]: Not everyone will know what RNA is

Commented [C3]: Can you define/elaborate the abbreviated term?