TRAIL

In the field of cell biology, TNF-related apoptosis-inducing ligand (TRAIL), is a protein functioning as a ligand that induces the process of cell death called apoptosis.

TRAIL is a cytokine that is produced and secreted by most normal tissue cells. It causes apoptosis primarily in tumor cells, by binding to certain death receptors. TRAIL and its receptors have been used as the targets of several anti-cancer therapeutics since the mid-1990s, such as Mapatumumab. However, as of 2013, these have not shown significant survival benefits.

TRAIL has also been implicated as a pathogenic or protective factor in various pulmonary diseases, particularly pulmonary arterial hypertension.

TRAIL has also been designated CD253 (cluster of differentiation 253) and TNFSF10 (tumor necrosis factor (ligand) superfamily, member 10).

Mercer-Smith et al. provided evidence that hiNeuroS-TRAIL cells can migrate to and suppress the growth of Non-small cell lung cancer metastases in combination with radiation. In vitro cell, tracking and post-mortem tissue analysis showed that hiNeuroS-TRAIL cells migrate to Non-small cell lung cancer tumors. Importantly, isobolographic analysis suggests that TRAIL with radiation has a synergistic cytotoxic effect on NSCLC tumors. In vivo, mice treated with radiation and hiNeuroS-TRAIL showed significant (36.6%) improvements in median survival compared to controls. Finally, bulk mRNA sequencing analysis showed both NSCLC and hiNeuroS-TRAIL cells showed changes in genes involved in migration following radiation. Overall, hiNeuroS-TRAIL cells +/- radiation have the capacity to treat NSCLC metastases [1)]

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Mercer-Smith AR, Buckley A, Valdivia A, Jiang W, Thang M, Bell N, Kumar RJ, Bomba HN, Woodell AS, Luo J, Floyd SR, Hingtgen SD. Next-generation Tumor-homing Induced Neural Stem Cells as an Adjuvant to Radiation for the Treatment of Metastatic Lung Cancer. Stem Cell Rev Rep. 2022 Apr 19. doi: 10.1007/s12015-022-10375-3. Epub ahead of print. PMID: 35441348.