Somatostatin receptor 2

Somatostatin receptor type 2 is a protein that in humans is encoded by the SSTR2 gene.

Somatostatin acts at many sites to inhibit the release of many hormones and other secretory proteins. The biologic effects of somatostatin are probably mediated by a family of G protein-coupled receptors that are expressed in a tissue-specific manner. SSTR2 is a member of the superfamily of receptors having seven transmembrane segments and is expressed in highest levels in cerebrum and kidney.

Somatostatin receptor 2 has been shown to interact with SHANK2.

Most pituitary neuroendocrine tumors express SSTR2, but other somatostatin receptors are also found. Somatostatin analogs (i.e. Octreotide, Lanreotide) are used to stimulate this receptors, and thus to inhibit further tumor proliferation.

Somatostatin receptor 2 (SSTR2) expression has previously been documented in olfactory neuroblastoma (ONB). Here, we fully characterize SSTR2 expression in ONB and correlate staining results with clinicopathologic parameters including Hyams grade. We also assess SSTR2 immunohistochemistry expression in various histologic mimics of ONB to assess its diagnostic functionality. 78 ONBs (51 primary biopsies/excisions and 27 recurrences/metastases) from 58 patients were stained for SSTR2. H-scores based on intensity (0-3 +) and percentage of tumor cells staining were assigned to all cases. 51 histologic mimics were stained and scored in an identical fashion. 77/78 (99%) ONB cases demonstrated SSTR2 staining (mean H-score: 189, range: 0-290). There were no significant differences in staining between primary tumors and recurrences/metastases (mean H-score: 185 vs 198). Primary low-grade ONB had somewhat stronger staining than high-grade tumors (mean H-score: 200 vs 174). SSTR2 expression had no prognostic value when considering disease-free or disease-specific survival. SSTR2 staining is significantly higher in ONB than its histologic mimics (mean H-score: 189 vs 12.9, $p < 0.001$) suggesting a potential use of the marker in diagnosis of ONB. In conclusion, SSTR2 is consistently expressed in ONB suggesting a role for somatostatin-analog based imaging and therapy in this disease. More generally, SSTR2 may be another marker of neuroendocrine differentiation in ONB [1)]

SSTR-2 expression was highly sensitive and specific in all 148 meningiomas, regardless of WHO grade. According to TASC analysis, SSTR-2 is the most promising receptor for meningioma targeting. After establishing in vitro meningioma models, SSTR-2 cell membrane expression was confirmed in two of three meningioma cultures as well. This indicates that specific fluorescence in an experimental setting can be performed for the further development of targeted fluorescence guided meningioma surgery and near-infrared fluorescent tracers targeting SSTR-2 [2)].

1)
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2)
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as a potential tumour-specific marker for fluorescence-guided meningioma surgery. Acta Neurochir (Wien). 2018 Jun 1. doi: 10.1007/s00701-018-3575-z. [Epub ahead of print] PubMed PMID: 29858948.