TTF-1

TTF-1 (Thyroid Transcription Factor-1), also known as **NKX2.1**, is a **nuclear transcription factor** essential for the development and function of the **thyroid gland**, **lung**, and **ventral forebrain**. It is frequently used as an **immunohistochemical marker** in neuropathology and oncopathology.

Function

TTF-1 plays a key role in regulating genes involved in:

- **Thyroid development and hormone production**
- **Lung morphogenesis and surfactant protein expression**
- **Brain development**, particularly in the **hypothalamus** and **pituitary gland**

Diagnostic Utility

In pathology, TTF-1 is commonly used as a **marker of origin** for tumors, especially in the following contexts:

- lung adenocarcinoma: Strongly positive
- thyroid carcinoma: Positive in most types
- posterior pituitary tumor: Universally positive across subtypes, including:
  - pituicytoma
  - granular cell tumor
  - spindle cell oncocytoma

In PPTs, **diffuse nuclear positivity for TTF-1** helps distinguish them from other sellar masses such as pituitary adenomas or craniopharyngiomas.

Interpretation in Immunohistochemistry

Marker	Expression in PPTs
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TTF-1	□ Strong nuclear positivity
Vimentin	□ Positive
S100 protein	□ Often positive
Cytokeratin	□ Negative
Chromogranin A	□ Negative

Related Terms

- immunohistochemistry
- pituitary gland
- posterior pituitary tumor

- S100 protein
- vimentin
- Ki67