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#### TİROİD BEZİ HİSTOLOJİSİ

Tiroid Bezinin Yerleşimi ve Genel Özellikleri  
Tiroid Bezinin Foliküler Yapısı  
Anjiyofoliküler Birim (AFU)  
Tiroid Bezindeki Hücre Tipleri  
Folikül Hücreleri (Tiroositler)  
Tiroid Hormonlarının Üretimi  
Parafoliküler Hücreler (C Hücreleri)  
İnterfoliküler Alandaki Hücreler  
Kök Hücreler  
KLİNİK İLİŞKİ  
PARATIROID BEZİ HİSTOLOJİSİ  
Paratiroid Bezinin Yerleşimi ve Genel Özellikleri  
Paratiroid Bezindeki Hücre Tipleri  
Esas Hücreler  
Parathormon Üretimi  
Oksifil Hücreler  
KLİNİK İLİŞKİ

#### ADRENAL BEZ HİSTOLOJİSİ

Adrenal Bezlerin Yerleşimi ve Genel Özellikleri  
Adrenal Bezlerin Korteksi  
Zona Glomeruloza  
Zona Fasikülata  
Zona Retikularis  
Adrenal Bezlerin Medullası  
KLİNİK İLİŞKİ  
ENDOKRİN PANKREAS HİSTOLOJİSİ  
Pankreasın Yerleşimi ve Genel Özellikleri  
Langerhans Adacıkları (Endokrin Pankreas)  
Langerhans Adacıklarındaki Hücre Tipleri  
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## TİROİD BEZİ HİSTOLOJİSİ

### Tiroid Bezinin Yerleşimi ve Genel Özellikleri

Tiroid bezi ön boynun alt kısmına (larinksin aşağısı, trakeanın önü) yerleşmiş olan endokrin bir bezdir. Şekil olarak kelebeğe benzeyen bu bezin sağlı sollu iki lateral lobu ve bu loblara birbirine bağlayan bir köprü işlevi gören **istmus** bölümü mevcuttur. Yaklaşık olarak her bir lobun uzunluğu 5 cm, genişliği 2.5 cm ve ağırlığı 20-30 g'dır. Popülasyonun yaklaşık %15'inde istmustan yukarıya doğru uzanan ve piramidal lob adı verilen, tiroglossal kanalın embriyolojik bir kalıntısı bulunur.

Tiroid bezini dıştan saran fibröz bağ doku kapsülü, kan ve lenf damarları ile sinirleri taşır. Kapsülün parenkim içine uzattığı trabeküller, organı düzensiz lobüllere ayırır.

Tiroid bezini besleyen arterler; eksternal karotid arterin dalı olan süperior tiroid arteri, subklavien arterden çıkan trunkus tiroservikalisin dalı olan inferior tiroid arteri ve bazı bireylerde bulunan, arkus aortadan çıkan arteria tiroidea imadır.

Tiroid bezinin süperior tiroid veni ve orta tiroid veni, internal juguler vene dökülür, inferior tiroid veni ise brakioyosefalik vene dökülür.

Karmaşık bir lenf ağı foliküllerin etrafını sarar, bu ağdaki lenf sıvısı kapsül altı lenf kanallarına

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## KAYNAKLAR

- Brissova M, Fowler MJ, Nicholson WE, Chu A, Hirshberg B, Harlan DM ve ark. Assessment of human pancreatic islet architecture and composition by laser scanning confocal microscopy. *J Histochem Cytochem* 2005;53:1087–97.
- Cabrera O, Berman DM, Kenyon NS, Ricordi C, Berggren PO, Caicedo A. The unique cytoarchitecture of human pancreatic islets has implications for islet cell function. *Proc Natl Acad Sci U S A* 2006;103: 2334–2339.
- Colin IM, Deneff JF, Lengelé B, Many MC, Gérard AC. Recent Insights into the Cell Biology of Thyroid Angiofollicular Units. *Endocr Rev* 2013;34(2):209–238.
- Da Silva Xavier G. The Cells of the Islets of Langerhans. *J Clin Med* 2018;7: 54.
- de los Rios C, Cano-Abad MF, Villarroya M, Lopez MG. Chromaffin cells as a model to evaluate mechanisms of cell death and neuroprotective compounds. *Pflugers Arch - Eur J Physiol* 2018;470:187.
- Degosserie J, Heymans C., Halbout M, D'Auria L, Van Der Smissen P, Vertommen D ve ark. Extracellular vesicles from endothelial progenitor cells promote thyroid follicle formation. *J Extracell Vesicles* 2018;7(1):1487250.
- Demir R. (Ed.). *di Fiore Histoloji Atlası Fonksiyonel İlişkileriyle*. Ankara: Palme Yayıncılık; 2001.
- Demir R. (Ed.). *Histoloji ve Hücre Biyolojisi, Patolojiye Giriş*. Ankara: Palme Yayıncılık; 2006.
- Elayat AA, el-Naggar MM, Tahir M. An immunocytochemical and morphometric study of the rat pancreatic islets. *J Anat* 1995;186(3):629–637.
- Fawcett DW. *Bloom and Fawcett, A Textbook of Histology*. 12th ed. New York: Chapman & Hall; 1994.
- Gerard AC, Xhenseval V, Colin IM, Many MC, Deneff JF. Evidence for co-ordinated changes between vascular endothelial growth factor and nitric oxide synthase III immunoreactivity, the functional status of the thyroid follicles, and the microvascular bed during chronic stimulation by low iodine and propylthiouracil in old mice. *Eur J Endocrinol* 2000;142:651–660.
- Gérard AC, Many MC, Daumerie C, Costagliola S, Miot F, Devijlder JJM, ve ark. Structural Changes in the Angiofollicular Units between Active and Hypofunctioning Follicles Align with Differences in the Epithelial Expression of Newly Discovered Proteins Involved in Iodine Transport and Organification. *J Clin Endocrinol Metab* 2002;87(3):1291–1299.
- Hick AC, Delmarcelle AS, Bouquet M, Klotz S, Copetti T, Forrez C ve ark. Reciprocal epithelial:endothelial paracrine interactions during thyroid development govern follicular organization and C-cells differentiation. *Dev Biol* 2013;381(1):227-240.
- Imada M, Kurosumi M, Fujita H. Three-dimensional aspects of blood vessels in thyroids from normal, low iodine diet-treated, TSH-treated, and PTU-treated rats. *Cell Tissue Res* 1986;245:291–296.
- Jameson JL, DeGroot LJ, De Kretser DM, Giudice LC, Grossman AB, Melmed S ve ark. *Endocrinology: Adult and Pediatric*. Philadelphia: Elsevier/Saunders; 2016.
- Leeson TS, Leeson CR, Paparo AA. *Text/Atlas of Histology*. Philadelphia: Saunders; 1988.
- Martín-Lacave I, Borrero MJ, Utrilla JC, Fernández-Santos JM, de Miguel M, Morillo J ve ark. C cells evolve at the same rhythm as follicular cells when thyroidal status changes in rats. *J Anat* 2009;214(3):301–309.
- Mills SE. *Histology for Pathologists*. 4th ed. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2012.
- Okamoto M, Hayase S, Miyakoshi M, Murata T, Kimura S. Stem cell antigen 1-positive mesenchymal cells are the origin of follicular cells during thyroid regeneration. *PLoS One* 2013; 8: pp. e80801
- Ovalle WK, Nahirney PC, Netter FH. *Netter's Essential Histology*. 2nd ed. Philadelphia: Saunders/Elsevier; 2008.
- Ritter C, Miller B, Coyne DW, Gupta D, Zheng S, Brown AJ ve ark. Paricalcitol and cinacalcet have disparate actions on parathyroid oxyphil cell content in patients with chronic kidney disease. *Kidney Int* 2017;92:1217–1222.
- Ritter CS, Haughey BH, Miller B, Brown AJ. Differential gene expression by oxyphil and chief cells of human parathyroid glands. *J Clin Endocrinol Metab* 2012;97:E1499–E1505.
- Ross MH, Pawlina W. *Histology: A Text and Atlas, with Correlated Cell and Molecular Biology*. 6th ed. Baltimore, MD: Lippincott Williams & Wilkins; 2011.
- Shtukmaster S, Narasimhan P, El Faitwri T, Stubbusch T, Ernsberger U, Rohrer H ve ark. MiR-124 is differentially expressed in derivatives of the sympathoadrenal cell lineage and promotes neurite elongation in chromaffin cells. *Cell Tissue Res* 2016;365:225.
- Shtukmaster S, Schier MC, Huber K, Krispin S, Kalcheim C, Unsicker K. Sympathetic neurons and chromaffin cells share a common progenitor in the neural crest in vivo. *Neural Dev* 2013;8:12.
- Solakoğlu S, Erdoğan A, Mutlu HS (Ed.). *Junqueira's Temel Histoloji*. İstanbul: Nobel Tıp Kitabevleri; 2015.
- Solakoğlu S. (Ed.). *Lippincott Görsel Anlatımlı Çalışma Kitapları: İnsan Sistemleri*. İstanbul: Nobel Tıp Kitabevleri; 2018.
- Standring S. *Gray's anatomy: The anatomical basis of clinical practice*. 41st ed. New York: Elsevier Limited; 2016.
- Thomas T, Nowka K, Lan L, Derwahl M. Expression of endoderm stem cell markers: evidence for the presence of adult stem cells in human thyroid glands. *Thyroid* 2006;16:537–544.
- Unsicker K, Krisch B, Otten U, Thoenen H. Nerve growth factor-induced fiber outgrowth from isolated rat adrenal chromaffin cells: Impairment by glucocorticoids. *Proc Natl Acad Sci U S A* 1978;75(7):3498-3502.
- Utrilla, JC, Gordillo-Martínez F, Gómez-Pascual A, Fernández-Santos JM, Garnacho C, Vázquez-Román V ve ark. Comparative study of the primary cilia in thyrocytes of adult mammals. *J Anat* 2015; 227: 550–560.
- Wierup N, Sundler F, Heller RS. The islet ghrelin cell. *J Mol Endocrinol* 2014;52(1): R35-R49.
- Yamazaki K, Eyden BP. Interfollicular fibroblasts in the human thyroid gland: recognition of a CD34 positive stromal cell network communicated by gap junctions and terminated by autonomic nerve endings. *J Submicrosc Cytol Pathol* 1997;29:461-476.
- Yukawa M, Takeuchi T, Watanabe T, Kitamura S. Proportions of various endocrine cells in the pancreatic islets of wood mice (*Apodemus speciosus*). *Anat Histol Embryol* 1999;28:13–16.