

Zonula adherens

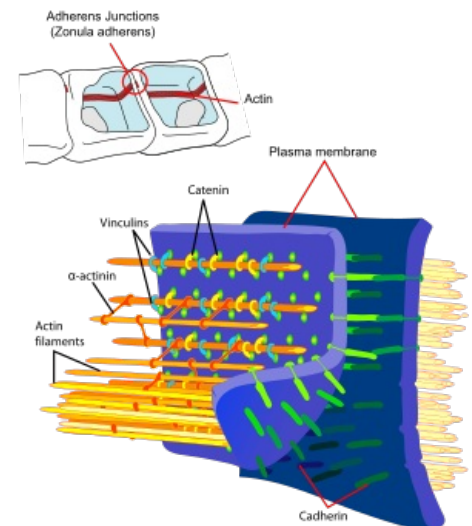
Zonula adhaerens is an oval box, or *zonula*, on a cell, which is one type of **cell junction**. It occurs between **epithelial cells** in general and is also an **integral part of the intercalary disc** between cardiomyocytes. Other sites where it can be found are **synapses**, **endothelial cells**, **membranes limitantes gliae** (superficialis, perivascularis and interna and externa in the retina) and it is also found **between the individual membranes forming the myelin sheath**.

Structure

At the site of the zonula adhaerens, there is a plaque on the inner surface of the cell membrane formed by adhesive proteins where actin filaments **disorganized into a terminal network** are attached.

The continuous band around the cell composed of zonules is called the **fascia adhaerens**, which is usually part of the **junctional complex** (see below). In the fascia, actin filaments **clustered in a thermal network** arranged parallel to the cell membrane attach to the membrane and then form a linear junction through *cadherins* that reinforces the linear fascia occludens.

Cadherins are transmembrane glycoproteins. Their extracellular parts bind to each other, and their intracellular parts bind to the protein **catenin**. Catenin is attached via actin-binding proteins (α -actinin, vinculin) to the actin microfilaments, which form a **terminal network**. E-cadherin is found among epithelial cells, N-cadherin in intercalary discs and VE-cadherin in vascular endothelia.



Structure of zonula adherens

The zonula adhaerens is usually located in the apical region of cells immediately below the zonula occludens. In the light microscope, the so-called **terminal bar** (the classical Czech term is **putty bar**, the more modern term is **junctional complex**), which consists of the zonula occludens, can be observed, zonula adhaerens, and the linear desmosome (the latter serves as the main reinforcing component, as it contains **intermediate cytoskeleton fibres**, which are mechanically much more resistant than **fine actin microfilaments**). In the zonula adherens region, cells are spaced approximately 20 nm apart.

Function

- Strengthen the connection between epithelial cells.
- They keep cardiomyocytes together during systole and diastole. Here it is a very similar connection called the **fascia adhaerens**.
- They are probably responsible for contact inhibition of cells.

Links

Related articles

- Gap junctions
- Zonula Occludens

References

[1] [2]

References

- JUNQUEIRA, Luiz Carlos Uchôa – MESCHER, Anthony L. *Junqueira's basic histology : Text and atlas*. 12. edition. 2010. 467 pp. ISBN 978-0-07-160431-4.
- KONRÁDOVÁ, Václava, et al. *Funkční histologie*. 2. edition. H + H, 2000. 291 pp. ISBN 978-80-86022-80-2.
- 1. JUNQUIERA, L. Carlos – CARNEIRO, José – KELLEY, Robert O, et al. *Základy histologie*. 1. edition. Jinočany : H & H, 1997. 502 pp. pp. 65. ISBN 80-85787-37-7.
- 2. W. KIMBALL, John. *Junctions Between Cells* [online]. The last revision 2011-02-17, [cit. 2011-03-12]. <<http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/J/Junctions.html#adherens>>.

