

S12-2 Molecular mechanism behind the barrier function of tight junctions

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Epithelial cellular sheets not only transport various substances using membrane transporters but also restrict the passive diffusion of solute through the intercellular space by the action of tight junctions, one mode of intercellular junctions. The barrier property of tight junctions varies from very tight to fairly leaky depending on physiological requirements of cell types. Recent analyses on claudins, major components of membrane contacts of tight junctions, have clarified the molecular mechanism behind the barrier property of tight junctions. Claudins comprise a multi-gene family containing more than 20 members, and the difference in the combination and proportion of claudin types creates the functional diversity of tight junction barriers. Studies on various claudin KO mice and human hereditary diseases with claudin mutations have revealed the role of tight junctions *in vivo*. Furthermore, a molecular component of tricellular junctions, where three cells meet, has been recently identified and characterized. These studies will lead to better understanding of the barrier property of tight junctions at the molecular level.