Intraflagelar transport (IFT) is a bidirectional continuous process providing growth, maintenance and remodeling of eukaryotic cilia and flagella. The cilia and flagella are microtubular-based organelles with several functions such as signalling and motility. Building blocks of the ciliary cytoskeleton are produced in the cell body and needs to be transported to the distal end, which is the sole place of their assembly. This transport is facilitated by the IFT complexes, which are carried from the cell body along the microtubules towards the distal end by kinesin motor protein. Subsequent recycling of the IFT units as well as turnover of ciliary building blocks is facilitated by dynein powered movement towards the cell body. The regulation of this process is still unknown. While composition of the IFT machinery has been characterized, the processes related to IFT switch from distal-end directed to the proximal-end directed, which happens at the ciliary tip, are largely unknown. Another outstanding question concerns how is the IFT regulated in order to achieve a defined length of the cilium. This thesis briefly examines the structure of cilium, composition of the IFT machinery and the processes occurring during the transport and discuss several possible models of IFT regulation.