

SL201

연사 1

Light signal transduction mechanism in Stentor coeruleus

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Stentor coeruleus is a unicellular heterotrich ciliate that can exhibit a step-up photophobic response and a negative phototactic response. The photoreceptor, stentorin, is located in the pigment granule just below the cell membrane. Proton transfer from the excited state stentorin is thought to be an initial process and subsequent calcium influx induces the ciliary beat reversal.

Recent evidence suggests that cGMP and heterotrimeric G proteins are involved in this light signal transduction pathway as in the vertebrate visual system. Furthermore, a 39KDa protein from the Stentor membrane fraction was detected by immunoblot analysis with the AS/7 antisera against the carboxyl decapeptide of transducin alpha subunit.

As a first step to trace each molecule in the light signal transduction pathway, a G protein alpha subunit gene from Stentor was cloned by the PCR approach. Even though just part of the G protein alpha subunit gene was cloned, it is homologous to the mammalian Gi type alpha subunit (amino acid sequence identity is 60%)

To check the possibility that stentorin may interact with a G protein directly, the location of the G protein alpha subunit was investigated by immunogold labeling of the AS/7 antisera. The result indicated that the G protein is located in the myoneme and the kinetosome fibre. These organelles are responsible for cell contraction and cell extension.