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23360 | Dissecting the sensory defects of *bbs* mutants in *Caenorhabditis elegans*

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Background & Aim: Ciliopathies encompass a group of genetic disorders affecting multiple organs due to dysfunction in cilia: highly conserved organelles found in most human cells. Bardet-Biedl Syndrome (BBS) is a rare ciliopathy characterized by multisystem abnormalities. BBS arises from defects in assembly, composition, or localization of the BBSome, a conserved eight-subunit protein complex crucial in ciliary transport. Sensory neurons rely on cilia to detect environmental stimuli and transduce signals essential for perception. In BBS, defective cilia function disrupts these processes, leading to impaired sensory responses. Despite advances in BBS genetics, the role of ciliary defects in sensory neuron dysfunction remains unclear. To address this gap, we utilize *Caenorhabditis elegans* as a model organism to dissect the sensory impairments associated with BBS mutations. Unlike mammalian systems, *C. elegans* can survive severe ciliary dysfunction, making it ideal for studying BBS mutations. **Methods:** We analyzed *bbs-1* mutants to investigate sensory defects in ciliated neurons, conducting behavioral assays to assess responses to environmental stimuli, and dye-filling assay to evaluate ciliary integrity. **Results:** Preliminary findings indicate disruptions in sensory neuron function, correlating with defects in ciliary morphology. Additionally, defective dye uptake in *bbs-1* mutants suggests compromised ciliary integrity. **Conclusions:** Our findings emphasize the importance of ciliary function in sensory processing in *C. elegans*, reinforcing the role of BBS genes in ciliary integrity. The defects in sensory behavior and ciliary morphology lay the groundwork for further studies on BBS mutations.

Keywords: Bardet-Biedl syndrome, Cilia dysfunction, *Caenorhabditis elegans.*

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