

P063 Live imaging and quantification of proteasome activity in *C. elegans*

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Malfuctions in the ubiquitin-proteasome system (UPS) are detected in various diseases including neurodegenerative diseases and cancer. Although the proteasome has been under intense investigation in yeast and *in vitro*, the mechanism of its functional regulation in animals remains elusive. We have taken advantage of the simplicity, transparency and short lifespan of the nematode *C. elegans* to develop an *in vivo* live imaging system for proteasome activity. Our reporter system is based on photo-convertible fluorescent proteins that are targeted for degradation by the ubiquitin-proteasome system. With this method, we can visualize and quantify proteasome activity in selected cells in living animals. Our results reveal not only impairment of the proteasome by RNAi or mutants, but also significant differences in proteasome activity between cell types in our transgenic animals. Furthermore, we are able to study how aging affects proteasome function in different tissues of an animal. Our results reveal, for the first time, cell type-specific proteasome activity in a living multicellular organism.