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ABSTRACT BOOK

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Hydrogen peroxide is a signaling molecule generated in mitochondria that can positively regulate neuropeptide secretion from dense core vesicles (DCVs). We previously showed that hydrogen peroxide generated by the mitochondrial superoxide dismutase SOD2 increases secretion of the neuropeptide-like protein FLP-1 from the AIY interneuron, and that the calcium independent protein kinase C family member PKC-1 mediates the effects of hydrogen peroxide on DCV secretion. SNAP-25 is a SNARE protein that mediates the fusion step of exocytosis, and the phosphorylation of SNAP25 on a conserved serine residue by PKC has been implicated in positively regulating exocytosis in a number of systems. Here we test whether the worm SNAP25 ortholog, RIC-4 is a target of PKC-1 phosphorylation in promoting peroxide-induced FLP-1 secretion. Acute treatment with the mitochondrial toxin juglone leads to increased FLP-1 secretion from AIY, as measured by increased coelomocyte fluorescence of FLP-1::Venus-expressing animals. We found that a reduction-of-function *ric-4* mutation decreases baseline FLP-1 secretion and eliminates juglone-induced FLP-1 secretion. Expression of wild type *ric-4* cDNA fully restores normal baseline and juglone-induced FLP-1 secretion to *ric-4* mutants. Expression of a *ric-4* variant in which the putative phosphorylated serine has been mutated to alanine (ric-4(S189A)) restores baseline FLP-1 secretion but fails to restore juglone-induced FLP-1 secretion to *ric-4* mutants. Similarly, introducing the S189A substitution into the endogenous *ric-4* locus using CRISPR/Cas9 results in no change in secretion of FLP-1 under non-stressed conditions, but significantly impairs juglone-induced FLP-1 secretion. Thus, the phosphorylation of RIC-4 on Ser189 may be important for FLP-1 exocytosis specifically during oxidative stress. Because the ric-4(S189A) substitution does not eliminate juglone-induced FLP-1 secretion, we propose that PKC-1 may phosphorylate RIC-4 as well as additional as-yet unidentified targets to control stress-induced DCV exocytosis.

1030V **A candidate of GPCR-type thermoreceptor involved in heat tolerance of *C. elegans*** Chinatsu Morimoto[1], Chie Miyazaki[1], Kohei Ohnishi[1], Tohru Miura[1], Akane Ohta[1], Astushi Kuhara[21]Graduate school of Natural Science, Inst. for Integrative Neurobio., Konan univ., Japan, [2]Graduate school of Natural Science, Inst. for Integrative Neurobio., Konan univ., Japan, PRIME, AMED

Temperature is essential for animals to survive. To identify novel mechanisms of animal thermosensation, we are analyzing temperature acclimatization and tolerance of nematode *C. elegans*, as a simple model. In cold tolerance, wild-type animals which were cultivated at 15°C can survive at 2°C, while 25°C-cultivated wild-type can not survive at 2°C. Also, we are analyzing heat tolerance with temperature acclimatization; 25°C-cultivated wild- type can survive at 31°C, whereas 15°C-cultivated animals can not survive at 31°C. Temperature signaling for cold tolerance are transducted via trimeric G protein in thermosensory neuron (Ohta et al., *Nature commun*, 2014; Kuhara et al., *Science*, 2008), however a GPCR-type thermoreceptors that could function upstream of the G proteins have not been found. We performed exhaustive RNAi screening for about 1000 GPCR genes, and found that 86 GPCRs were involved in cold tolerance. Among them, we are analyzing about *srx* gene because *srx* knock-out mutant showed significantly increased-cold tolerance, in this study. However, we found that abnormal cold tolerance of *srx* mutant was caused by second mutation in mutant genome, and found that its responsive gene was a *snt-2* gene encoding synaptotagmin. Therefore, we constructed additional knockout mutants of *srx* gene by using CRISPR-Cas9, and isolated knockout alleles, but all of them were not abnormal in cold tolerance. We then tested various temperature-related assay, we found that *srx* mutant showed abnormally increased-heat tolerance. To determine the expression pattern of SRX, we used a whole neuron multicolor map strain called NeuroPAL, and SRX was expressed in an chemosensory neuron. SRX was localized at the sensory cilium and dotted at axon and cellbody of the neuron at a head of wild-type. By contrast, SRX::GFP was not localized at sensory cilium and was accumulated at the cell body in *unc-101* mutant impairing clathrin adaptor that transports proteins to dendrite specifically. To determine whether the chemosensory neuron is responsive to temperature stimuli, we introduced calcium imaging. We found that Ca2+ concentration in the neuron of wild-type was increased upon warming. To investigate whether SRX is responsive to temperature, we are attempting to ectopically expressing GPCR SRX in non-warm sensitive gustatory neuron ASER and culture cell.

1031V **Geraniol protects against oxidative stress and proteotoxicity in *Caenorhabditis elegans* Parkinson›s disease models** Stéfano Romussi[1], Natalia Andersen[1], Sofía Ibarguren[2], Diego Rayes[1], María José De Rosa[11]Instituto de Investigaciones Bioquímicas de Bahía Blanca (INIBIBB-CONICET). Departamento de Biología, Bioquímica y Farmacia (UNS), [2]Departamento de Biología, Bioquímica y Farmacia (UNS)

Due to the increase in life expectancy worldwide, age-related disorders such as neurodegenerative diseases have become more prevalent. Elevated levels of oxidative stress could modulate the progression of neurodegenerative diseases. For example, in Parkinson's disease it has been shown that compromising the capacity to scavenge free radicals can exacerbate α-synuclein (α-syn) aggregation and proteotoxic damage.

Geraniol, a plant-derived essential oil, has recognized antioxidant properties. Considering that oxidative stress contributes to proteotoxic disease progression, compounds with antioxidant activity have been postulated as potential therapeutic agents. *C.*

elegans is widely used in biomedical research. There is a high level of homology between *C. elegans* and mammalian genes (including proteins involved in cytoprotective mechanisms). In fact, several neurodegenerative diseases can be recapitulated in this animal.

In this work, we use *C. elegans* Parkinson's disease models to evaluate the *in vivo* effect of geraniol. We found that geraniol improves impaired locomotion in these animal models. Interestingly, geraniol also decreases α-syn aggregation. In addition, our last preliminary results suggest that DAF-16 is not involved in geraniol activity. So far, these results indicate a potential antiproteotoxic effect of this drug in *C. elegans* Parkinson's disease models. Therefore, we propose to combine genetic, microscopy and behavioral techniques to unravel geraniol effect in *C. elegans* neurodegenerative diseases models.

These studies could provide a proof of concept of the potential of geraniol as a promising compound to retard proteotoxic diseases.

1032V **Propionate Regulates the Sexual Motivation through Gut-brain Axis in *C. elegans* Males** Yi Sin Wang, Chun Hao Chen
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Microbiomes have been shown to modulate the host's motivations through gut-brain interactions, whereas underlying neural mechanisms are poorly understood. Here, we investigate the effect of bacterial diets on the sex drive of *C. elegans* males. Males reared on *Escherichia coli* OP50, the standard diet in the laboratory, display mate-searching behavior by leaving food sources. By contrast, males reared on a bacterial diet *Comamonas sp.* DA1877 significantly reduce the leaving tendency, while the locomotor activity and the food preference are preserved. These observations suggest that bacterial diets affect the sex drive in males. Interestingly, odors, water-soluble molecules, and vitamin B12 from DA1877 are dispensable. In addition, reducing sex drive requires exposure to limited live DA1877 mixed with OP50 at the adult stage, demonstrating a dominant effect on motivational changes. We find that the motivational changes by DA1877 depend on the presence of a short-chain fatty acid propionate in the host, as the accumulation of propionate in the *pcca-1* and *acdh-1* mutants that disrupt the propionate breakdown pathway and exogenous supply of propionate on the DA1877 diet restore the sex drive in males. Through a screen of neurotransmitter mutants, we identify that octopamine is required and sufficient to modulate the mate-searching behavior, providing a neural pathway that modulates the motivation in males. Lastly, the effect of DA1877 on motivational changes is evolutionarily conserved in androgynous *C. remanei*. Our study thus illustrates how the microbiome regulates the sexual motivation in *C. elegans* males by modulating host metabolism and octopaminergic pathways, which endows a paradigm to gain mechanistic insights into intricate gut-brain interactions for motivational controls.

1033V **The metabotropic glutamate receptor homologs MGL-1 and MGL-2 are key for sensing nutritional status in *C. elegans*** Ailin Lacour[1], Maria Gabriela Blanco[2], Agustina Zabala[1], María José De Rosa[1], diego hernan rayes[11]Instituto de Investigaciones Bioquímicas de Bahía Blanca, Departamento de Biología, Bioquímica y Farmacia (CONICET-UNS), [2]Instituto de Investigaciones Bioquímicas, Departamento de Biología, Bioquímica y Farmacia de Bahía Blanca (CONICET-UNS)

The mechanisms that allow the nervous system (NS) to sense nutritional state and adapt animal behavior are poorly understood in most species. The simplicity of its NS and its known connectome make C. elegans a useful system to study these mechanisms. Results from our laboratory showed that inhibition of the tyraminergic neuron RIM during fasting, enhances serotonin release from other neurons when the animal reencounters food, allowing it to slow down locomotion and start feeding. Mutations in the GPCRs, MGL-1 and MGL-2, located in two presynaptic interneurons to RIM have been reported to induce autophagy even in well-fed animals. Here, we performed behavioral assays on mgl-1; mgl-2 double mutants. We found that these animals, even when well fed, show a significant decrease in locomotion when they find food, similar to fasted wild-type animals. Moreover, when we exposed these mutants to GFP-expressing bacteria, the fluorescence in the intestine is higher than that of wild-type animals, suggesting a higher feeding rate. These initial results suggest that the metabotropic receptors MGL-1 and MGL-2 are key for satiation sensing. We propose, therefore, to determine what these satiety signals are and the neuronal circuits involved. Given that this behavioral plasticity modulated by the nutritional state is observed throughout the animal kingdom, and that several fundamental processes are highly conserved, these results may provide universally relevant information.

1034V **Effects of temperature on mechanosensation and neurodegeneration** victoria c collio[1], Juan pablo Castillo[2], Andrea Calixto[21]science faculty, Universidad de Valparaíso, [2]Universidad de Valparaíso

Mechanotransduction is a fundamental process underlying the senses of touch, balance, proprioception and hearing. Mechanosensory channels have been identified in bacteria, yeast, insects and vertebrates, belonging to various superfamilies. In *C. elegans*, MEC-4, a DEG/ENaC family protein is the pore forming unit of the mechanosensory channel, expressed in the Touch Receptor Neurons (TRNs). Accessory proteins to the channel are MEC-2, associated with the inner leaflet of the plasma membrane and MEC-6, located in the extracellular domain. A gain of function mutation (A713V) in MEC-4 located in residues near trans-