only in wild-type hearts, implicating Nrf2 in this phenomenon. We found an impaired oxygen consumption in heart homogenates from Nrf2-KO mice after IR. We also determined the activation of AMPK and mTOR, and several markers of autophagy by immunoblot. In addition, we found an increase in the expression of the Nrf2 target heme oxygenase 1 (HO-1) in cardiac cells subjected to hypoxia and hypoxia-reoxygenation. Our results suggest that Nrf2 activation could be a potential target against cardiac IR damage.

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A biomarker approach to microplastic ingestion responses of bioindicator commercial fish species: assessing tissue and biochemical relationships

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Plastic debris is a growing environmental problem on a global scale, as plastics and microplastics (MPs) can be ingested by marine organisms that induce toxic effects [1, 2, 3]. The aim of this study was to assess MP intake and antioxidant responses in 3 bioindicator species red mullet, bogue, and anchovy (Mullus surmuletus, Boops boops and Engraulis encrasicolus) for plastic contamination in the Mediterranean Sea. MPs intake was assessed in the gastrointestinal tract of the fish. Further, several enzymes from both liver and brain were analyzed. The antioxidant defenses, Catalase (CAT) and Superoxide Dismutase (SOD), and the detoxifying enzyme Glutathione-S-transferase (GST), were measured in both tissues. The Acetylcholine esterase (AchE), as indicator of neuronal damage, was measured in the brain. Malondialdehyde (MDA) was analyzed as a marker of oxidative damage in brain and liver samples. Total MPs intake and MPs typology differed between the three species, with M. surmuletus showing the lowest intake of MPs, while B. boops showed the highest intake of MPs. An increase in both antioxidant enzymes was evidenced in E. encrasicolus liver activity with respect to MP intake. In brain samples, an increase in CAT activity was found in M. surmuletus and B. boops as a consequence of MPs ingestion. SOD activity in the brain increased in fish that had ingested MPs both in B. boops and E. encrasicolus. GST activity increased in fish that had ingested MPs in M. surmuletus' liver and B. boops brain. The intake of MPs is species-related inherently to habitat they inhibit and can induce a light activation of species-specific detoxifying and antioxidant mechanisms.

References

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Mitochondrial Toxicity and Drug Safety

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Mitochondria are the powerhouses of cells and are involved in numerous cellular functions. Disruption to mitochondrial function can be detrimental and is linked to drug-induced liver injuries, cardiac and neurological damages and more. Early identification of compound perturbation of mitochondrial function, by incorporating mitochondrial toxicity test into drug safety assay panel, allows for optimization of compound chemistry upstream, avoiding drug attrition in later development stages and derisking drug pipelines.

The XF Mito Tox assay design offers a robust assay window to deliver high level assay performance (Z'>0.5). When used with enhanced software tools, the assay reports Mito Tox Index (MTI), which identifies inhibitors and uncouplers in one assay.

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Time-of-day dependent effect of GSPE on hepatic oxidative stress in cafeteria diet treated rats

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