

The effect of ionising radiation on marine invertebrates

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TREE

Transfer - Exposure - Effects:

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Aim

- Expose marine invertebrates, primarily bivalve molluscs (*Mytilus sp.*) to a range of radionuclides of differing emission characteristics
- Measure biological end points such as DNA damage, the expression of key genes and their knock on effects on higher levels of biological organisation
- Apply the concepts of 'omics' such as genomics, proteomics and transcriptomics

Current research

Optimizing experimental protocols:

- The comet assay which measures DNA strand breaks
- An immunocytochemistry technique or assay called the 53BP1, which measures the presence/concentration of a macromolecule (in this case a protein) using an antibody. This binding protein is of particular interest as it plays a role in DNA repair

Current research

- Some crude DNA extractions and PCR (Polymerase chain reaction) on mussel tissue to identify between mussel species
- Optimizing a technique for sex determination of the mytilus mussel
- I have recently started writing an article review on the molecular response of marine organisms to ionising radiation.

Future research

- **An investigation into the effect of ionising radiation on a range of life history stages in marine invertebrates**
- As changes to reproductive success could have detrimental consequences, from a population to ecosystem level, it could be beneficial to determine the effect of radionuclides on the developmental stages (from embryonic to juvenile/growth stages) of a range of marine invertebrates
- To date there have been few studies on marine invertebrates which investigate the response to radionuclides over a whole life span, it may therefore be beneficial to use a organism with a shorter life span such as copepods

Future research

- As we all know we are living in a time of climatic change, therefore ionising radiation is not an isolated environmental threat to marine invertebrates.
- It would therefore be interesting **to investigate the effect of multiple environmental stressors such as temperature or pollutants such as metals, in addition to radionuclides on a range of marine invertebrates.**

Thank you for listening