The Effects of Radiation on Aquatic Invertebrates: Combining Field Studies in Lakes of Varying Contamination at Chernobyl with Laboratory Studies

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Rationale/Background

• Lack of studies in the natural environment regarding biological effects of long-term chronic exposure in aquatic invertebrate populations

• Assessment of biological effects across multiple species is necessary for remediation of past and future radioactive releases

• Combined laboratory and field studies are required to assess applicability of lab data to natural populations

• Controversy regarding the doses at which significant impacts occur to natural populations
Project Aims

• To elucidate the biological effects of ionizing radiation on aquatic invertebrate species using a number of phenotypic and genetic endpoints and establish the level at which these effects occur in the field

• To compare the radiosensitivities of freshwater and marine aquatic invertebrate species

• To assess the applicability of laboratory exposures to field populations
Research Outline – Laboratory Exposures

Gammarus pulex – Freshwater Amphipod Species

Control Population
0.1 mGy/d⁻¹
1 mGy/d⁻¹
10 mGy/d⁻¹

Echinogammarus marinus – Marine Amphipod Species

Sperm Counts
Viability Assays
Comet Assay
Research Outline – Field Studies: Chernobyl & Belarus

*Asellus aquaticus* – *Freshwater Isopod Species*

Population Parameters

Genetic Diversity - AFLP

Fluctuating Asymmetry