

Locating social perspectives relevant to genomically-enhanced bioremediation strategies

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At a time when oil producing countries are looking at the creation and implementation of regulations for re-naturalizing oil sands sites, a multidisciplinary cross-Canada project (GROW – Genomics research for optimization of constructed treatment wetlands for water remediation) is looking into developing and applying genomics-based methods to enhance and inform the efficacy and safety of constructed wetlands for the treatment of oil sands process-affected water. As this project also focuses on integrating public preferences, the present study incorporates GE3LS (Genomics, Environment, Economic, Ethical, Legal, Social) concepts to present a scoping review of current social perspectives related to genomics technologies for use in bioremediation. Concepts relevant to green technology, remediation, genomics, and social factors were searched using Web of Science and SCOPUS databases. Results included both black and grey literature to minimize publication bias. Of the 2068 articles initially identified, 547 were removed (duplicates), 1521 had the abstract screened, and 104 were eligible for a full-text review. Three main themes were identified: articles that discussed relevant natural and social science concepts; those that discussed relevant natural science concepts but with no meaningful social concepts; and those that discussed social concepts but in an irrelevant context. The largest group included papers that reviewed omics technologies for remediation applications, with a generally positive bias (from a research perspective). Many of the papers in this group included a brief comment on social perspectives as a major impediment to wider adoption of genomics technologies for remediation, though with no reference to supportive qualitative data. The smallest group included those papers that discussed both relevant science and social factors, though none were particular to oil sands process-affected water, the focus of GROW. It is clear that there is a lack of understanding of existing social perceptions around genomics-based green technologies; therefore, this paper highlights the need for more qualitative research on the social factors that may contribute to wider public acceptance for implementation of bioremediation strategies.