

Introduction

The multidisciplinary project **MIND** (*Microbiology In Nuclear waste Disposal*) addresses key technical issues that must be tackled to support the implementation of planned geological disposal projects for radioactive wastes across the EU. The project targets a number of “high urgency” and “high importance” topics identified in the most recent IGD-TP Strategic Research Agenda, focusing specifically on **the influence of microbial processes on waste forms and their behaviour, and the technical feasibility and long-term performance of repository components.**

Objectives

WP1: Improving the knowledge base of the behaviour of **organic containing long-lived intermediate level wastes**

WP2: Improving the knowledge base about the influence of microbial processes on **high level waste and spent fuel** geological disposal

WP3: **Integrate, communicate and disseminate** results and conclusions from the above listed objectives to the broad European community involved in radioactive waste disposal

WP1 and WP2: Experimental work at SCK·CEN

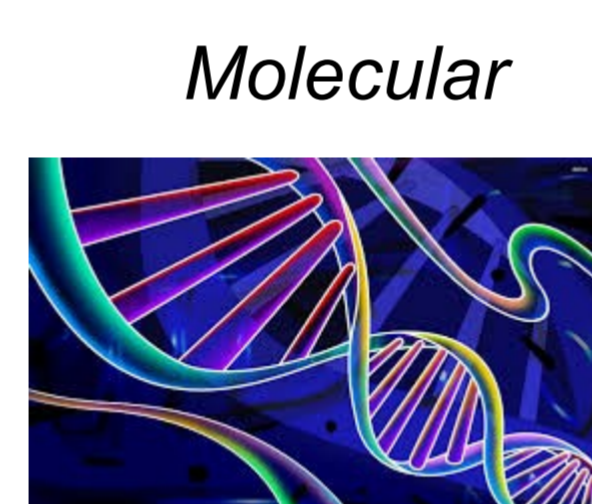
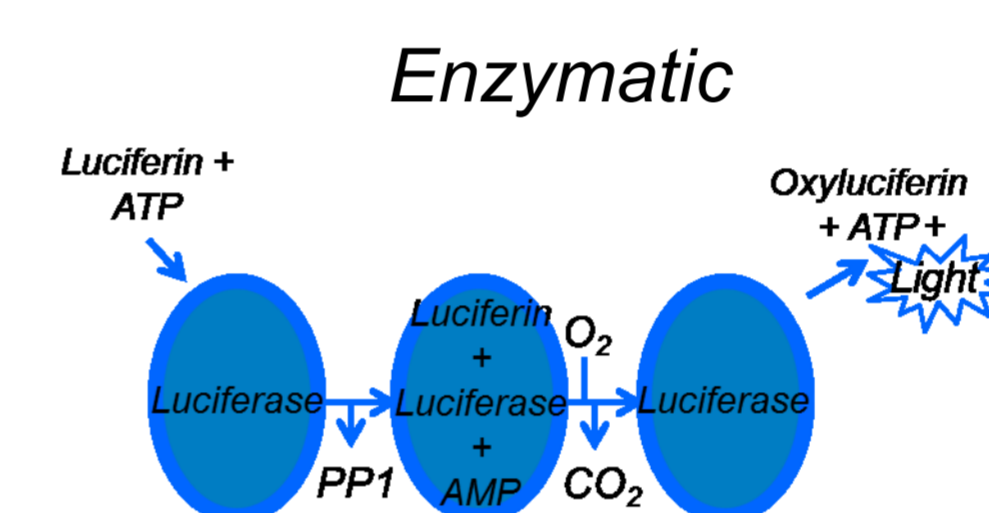
ILW Bitumen Biodegradation (WP 1, part of Task 1.2)

- Solid phase bitumen
- Low molecular weight organic leachates from bitumen
- Host rock water
- Nitrate/ Nitrite/ Sulphate
- High pH
- Host rock microbial inoculum



Incubation at 30 °C during 3 months

Analyses



Microscopic



Outcome

- **Biodegradation or protection mechanisms**
e.g. nitrate reduction, calcification...
- **Intermediate and end products**
e.g. N₂, biogenic acids
- **Reaction kinetics and rates**
e.g. [CO₂] / month, lag phase
- **Boundary conditions**
e.g. pH, energy sources
- **Microbial community patterns**
e.g. surface colonization, dominant species

HLW Cement Biodeterioration or Protection (WP2, Task 2.5)

- Cementitious materials
- Backfill materials
- Plasticizers
- Young and old cement water
- Host rock water
- Bicarbonate
- Host rock microbial inoculum



Incubation at 30 °C during 3 months

WP3: Integration, Communication and Dissemination Lead: SCK·CEN

Task 3.1
Synthesis, evaluation,
abstraction and integration



Task 3.2
Expert conceptualization
and public perception



Task 3.3
Knowledge and
information exchange



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