oekotoxzentrum
centre ecotox

Luminescent Bacteria Test (Microtox) with *Aliivibrio fischeri*

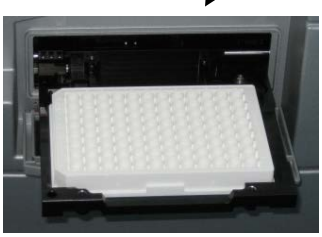
Bioassay with the marine luminescent bacterium *Aliivibrio fischeri* to detect a general toxicity resp. to detect substances with an inhibitory effect on bioluminescence

Aliivibrio fischeri (lyophilised)

+

Reconstitution solution

Incubation 15°C



Measurement with a luminometer at 0h

Plate A: Test culture

Merge plates A and B

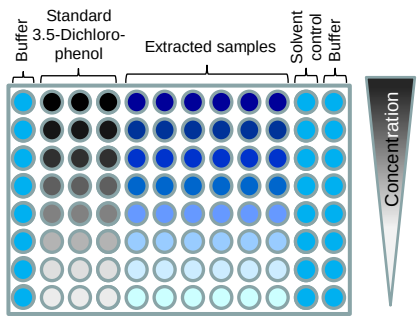
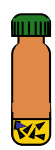


Plate B: Sample plate



Extracted environmental sample in solvent

Incubation:
30 minutes
at room temperature in the dark

Measurement with a luminometer after 30 minutes

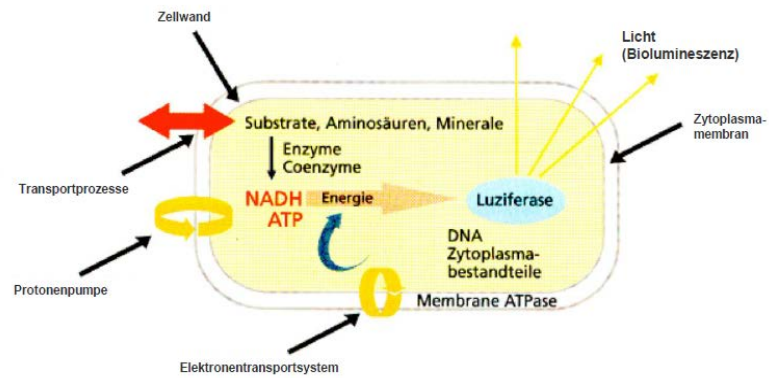
Test principle

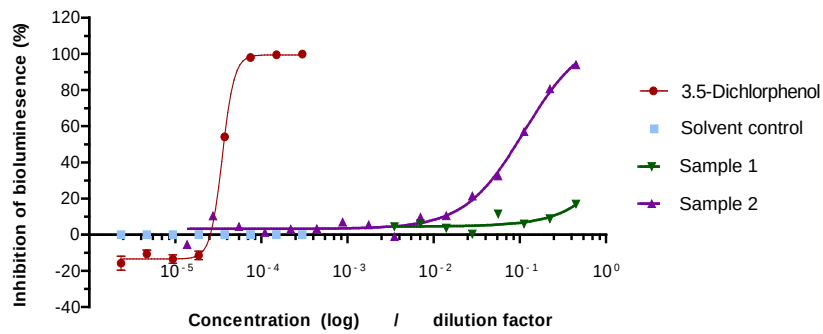
- Bioluminescence is linked to the cell metabolism.
- Toxic effects on the cell metabolism are shown by the inhibition of bioluminescence.

$$FMNH_2 + O_2 + R\text{-}CHO \xrightarrow[\text{Luciferase}]{\text{Bact. Luciferin}} FMN + H_2O + R\text{-}COOH + h\nu_{\text{Light}}$$

Endpoint

- Inhibition of bioluminescence [%] (general toxicity)



Inhibition %
(Reduction of the bioluminescence during 30 minutes of incubation compared to the negative control)

Buffer	3.5-Dichloro-phenol	3.5-Dichloro-phenol	3.5-Dichloro-phenol	Sample 1	Sample 1	Sample 1	Sample 2	Sample 2	Sample 2	Solvent control	Buffer
1.3%	99.8%	99.8%	99.9%	17.0%	20.7%	17.0%	93.9%	95.4%	95.%	1.3%	-1.3%
-1.5%	99.6%	99.5%	99.6%	8.8%	6.6%	8.8%	80.6%	87.0%	82.5%	-1.5%	1.5%
-4.5%	98.0%	97.9%	97.8%	6.1%	1.3%	6.1%	56.9%	63.4%	59.8%	-4.5%	4.5%
-2.5%	53.4%	54.3%	54.7%	11.5%	5.9%	11.5%	32.5%	33.0%	32.2%	-2.5%	2.5%
-0.8%	-8.3%	-16.0%	-10.1%	0.4%	3.3%	0.4%	21.4%	21.1%	16.1%	-0.8%	0.8%
1.4%	-13.2%	-9.4%	-17.7%	3.6%	5.2%	3.6%	10.5%	14.5%	8.1%	1.4%	-1.4%
2.2%	-10.6%	-7.0%	-14.1%	6.2%	5.3%	6.2%	9.6%	10.4%	14.2%	2.2%	-2.2%
-0.1%	-8.1%	-18.8%	-20.3%	4.5%	-2.4%	4.5%	-1.1%	-5.4%	0.9%	-0.1%	0.1%