

Poster

Isolation of microorganisms or genes from environmental samples of various origins, able to degrade drugs or resist antibiotics



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Keywords: Degradation of drugs; Antibiotic resistance; Metagenomic library

ABSTRACT

Motivation: The occurrence of drugs in the environment, due to the massive use of these by humans, has produced that these compounds accumulate and so, their removal is complicated [1]. None of the physical and chemical methods used to treat this contamination show an absolute efficiency. We decided to identify live microorganisms or biodegradations pathways able to degrade several pharmaceuticals and potentially useful in bioremediation of drugs contamination of the environment. For the isolation of live microorganisms, we have used different samples (water of a wastewater treatment plant, soil of a countryside contaminated with pesticides and pig slurry). In these samples, we can find persistent pharmaceuticals or compounds with structures which seem to drugs [2].

On the other hand, from a metagenomic library, we have tried to find antibiotic resistance genes and/or biodegradation pathways that allow microorganisms to resist antibiotics or use drugs as carbon sources respectively.

Methods: For the isolation of microorganisms able to use pharmaceuticals as carbon source, samples from different origin were incubated with a set of drugs. Enrichment cultures were prepared in minimal medium with a drug. When we observe growth differences between the control flask and the sample flask, we isolate colonies from cultures by plating in petri dishes. Once we obtain colonies, we identify microorganisms responsible for the degradation of the drug.

For the second strategy, we conjugate a metagenomic library containing 100.000 clones, from a composting pile from an oil refinery, with a receptor *Escherichia coli* and selected resistance to several antibiotics or ability to grow in minimal medium using different pharmaceuticals as carbon source.

Results: We have obtained differential growth in flasks with ibuprofen and carbamazepine, indicating that these cultures could contain microorganisms able to grow using drug as carbon source and even as nitrogen source.

In the second strategy, we have achieved transconjugants resistant to ceftriaxone and transconjugant able to grow in naproxen.

Conclusions: Up to now, we have not succeeded to isolate microorganisms able to grow in different drugs as a carbon source, though we are still in the process of isolating from flasks IBU and CBZ.

In the second strategy we have detected clones that confer resistance to CFX and a clone seems to confer the ability to grow in NPX as a carbon source, though both results are pending confirmation.

REFERENCES

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