

OUTBIOTICS Project (EFA 183-16)

Innovative technologies for diagnosis, prevention and elimination of emerging pollutants (antibiotics) from the waters of the POCTEFA territory

(january 1st, 2018 - december 31th, 2021)

Interreg
POCTEFA
OUTBIOTICS



POCTEFA
Territory

3 Actions:

Diagnostics
Substitution
Remediation

<http://outbiotics.unizar.es/>

- **Antibiotics:** emergent contaminants
- Large number of **Livestock Farms**
- Increased **Antimicrobial Resistance (AMR)**
- Innovative more effective **Bactericides (Nanomaterials)**
- Improvement of **Wastewater Treatment**



Poctefa 2014-2020 (Program INTERREG V-A Spain-France-Andorra)

Project co-financed at 65% by the **European Regional Development Fund**



"Una manera de hacer Europa"

UNIÓN EUROPEA

Sampling in Aragon's rivers for antibiotics detection and determination



Control points (Aragon)

- ★ Clamor Amarga (Zaidín). 3-ASE
- ★ Cinca (Fraga). 4-ASE
- ★ Alcanadre (Sariñena). 5-ASE
- ★ Flumen (Albalatillo). 6-ASE
- Gállego (San Mateo G.). 7-ASE
- Arba de Riguel (Ejea Caballeros). 8-ASE
- ★ Aragón Subordán (Javierregay). 9-ASE
- Queiles (Novallas). 13-ASE



Ebro river basin (and tributaries)



LC-MS



LODs = 0.0005; AMX = 0.05 ng mL⁻¹
LOQs = 0.0025; AMX = 0.25 ng mL⁻¹

Family	Antibiotic
Sulfonamides	Sulfadiazine
Diaminopyrimidines	Trimethoprim
Quinolones	Enrofloxacin
Macrolides	Azithromycin
β-lactams	Amoxicillin

- 1st Campaign: Apr-May 2018
- 2nd Campaign: Oct-Nov 2018
- 3rd Campaign: Apr-May 2019

Points of greatest pressure
from **livestock farms**

Antibiotics detected in Aragon river's

Results are
in ng mL⁻¹
antibiotic

CONTROL POINT		Campaign	SULFADIAZINE	TRIMETHOPRIM	ENROFLOXACIN	AZITHROMYCIN	AMOXICILLIN
3-ASE	Clamor Amarga (Zaidín)	1	0.30 ± 0.004	D	0.35 ± 0.01	< 0.0005	< 0.05
		2	0.019 ± 0.0005	< 0.0005	D	< 0.0005	< 0.05
		3	D	D	D	< 0.0005	< 0.03
4-ASE	Cinca (Fraga)	1	< 0.0005	< 0.0005	0.38 ± 0.01	< 0.0005	< 0.05
		2	D	D	D	< 0.0005	< 0.05
		3	D	D	D	D	< 0.03
5-ASE	Alcanadre (Sariñena)	1	< 0.0005	< 0.0005	≤ 0.0025	< 0.0005	< 0.05
		2	< 0.0005	< 0.0005	D	< 0.0005	< 0.05
		3	D	D	< 0.0005	D	< 0.03
6-ASE	Flumen (Albalatillo)	1	D	D	D	< 0.0005	< 0.05
		2	0.04 ± 0.002	< 0.0005	D	< 0.0005	< 0.05
		3	D	D	D	D	< 0.03
7-ASE	Gállego (San Mateo G.)	1	< 0.0005	< 0.0005	1.56 ± 0.01	< 0.0005	< 0.05
		2	D	D	D	< 0.0005	< 0.05
		3	D	D	D	< 0.0005	< 0.03
8-ASE	Arba de Riguel (Ejea Caballeros)	1	D	< 0.0005	4.39 ± 0.06	< 0.0005	< 0.05
		2	< 0.0005	D	D	< 0.0005	< 0.05
		3	< 0.0005	< 0.0005	D	< 0.0005	< 0.03
9-ASE	Aragón Subordán (Javierregay)	1	< 0.0005	< 0.0005	0.24 ± 0.01	< 0.0005	< 0.05
		2	< 0.0005	< 0.0005	≤ 0.0005	< 0.0005	< 0.05
		3	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.03
13-ASE	Queiles (Novallas)	1	D	D	0.25 ± 0.01	< 0.0005	< 0.05
		2	< 0.0005	D	D	< 0.0005	< 0.05
		3	< 0.0005	D	D	D	< 0.03

The Project is ongoing. Up to 6 campaigns until autumn 2020.

D: 0.0005 (LOD) - 0.0025 (LOQ) ng mL⁻¹