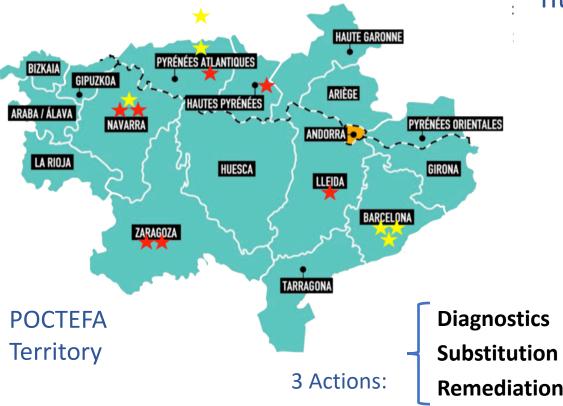
## **OUTBIOTICS Project (EFA 183-16)**

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



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



### 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



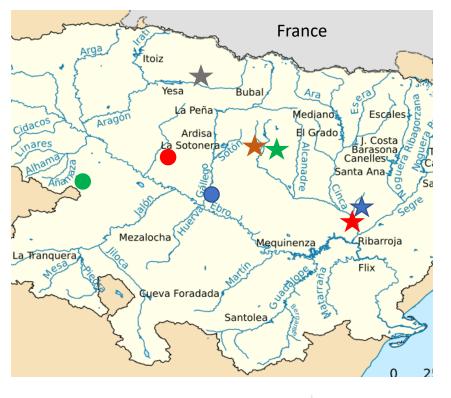


UNIÓN EUROPEA

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

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

# 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)





**LODs** = 0.0005; AMX = 0.05 ng mL<sup>-1</sup> **LOQs** = 0.0025; AMX = 0.25 ng mL<sup>-1</sup>

- 1<sup>st</sup> Campaign: Apr-May 2018
- 2<sup>nd</sup> Campaign: Oct-Nov 2018
- 3<sup>rd</sup> Campaign: Apr-May 2019

Points of greatest pressure from **livestock farms** 

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

## **Antibiotics detected in Aragon river's**



со	NTROL POINT	Campaign	SULFADIAZINE	TRIMETHOPRIM	ENROFLOXACIN	AZITHROMYCIN	AMOXICILLIN	
3-ASE	Clamor Amarga (Zaidín)	1	0.30 ± 0.004	D	$0.35 \pm 0.01$	< 0.0005	< 0.05	
		2	$0.019 \pm 0.0005$	< 0.0005	D	< 0.0005	< 0.05	
		3	D	D	D	< 0.0005	< 0.03	
4-ASE	Cinca (Fraga)	1	< 0.0005	< 0.0005	$0.38 \pm 0.01$	< 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	R
6-ASE	Flumen (Albalatillo)	1	D	D	D	< 0.0005	< 0.05	- 110
		2	0.04 ± 0.002	< 0.0005	D	< 0.0005	< 0.05	•
		3	D	D	D	D	< 0.03	ir –
7-ASE	Gállego (San Mateo G.)	1	< 0.0005	< 0.0005	$1.56 \pm 0.01$	< 0.0005	< 0.05	
		2	D	D	D	< 0.0005	< 0.05	а
		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	$0.24 \pm 0.01$	< 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	

Results are

in **ng mL**-1

antibiotic

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

**D:** 0.0005 (**LOD**) - 0.0025 (**LOQ**) ng mL<sup>-1</sup>