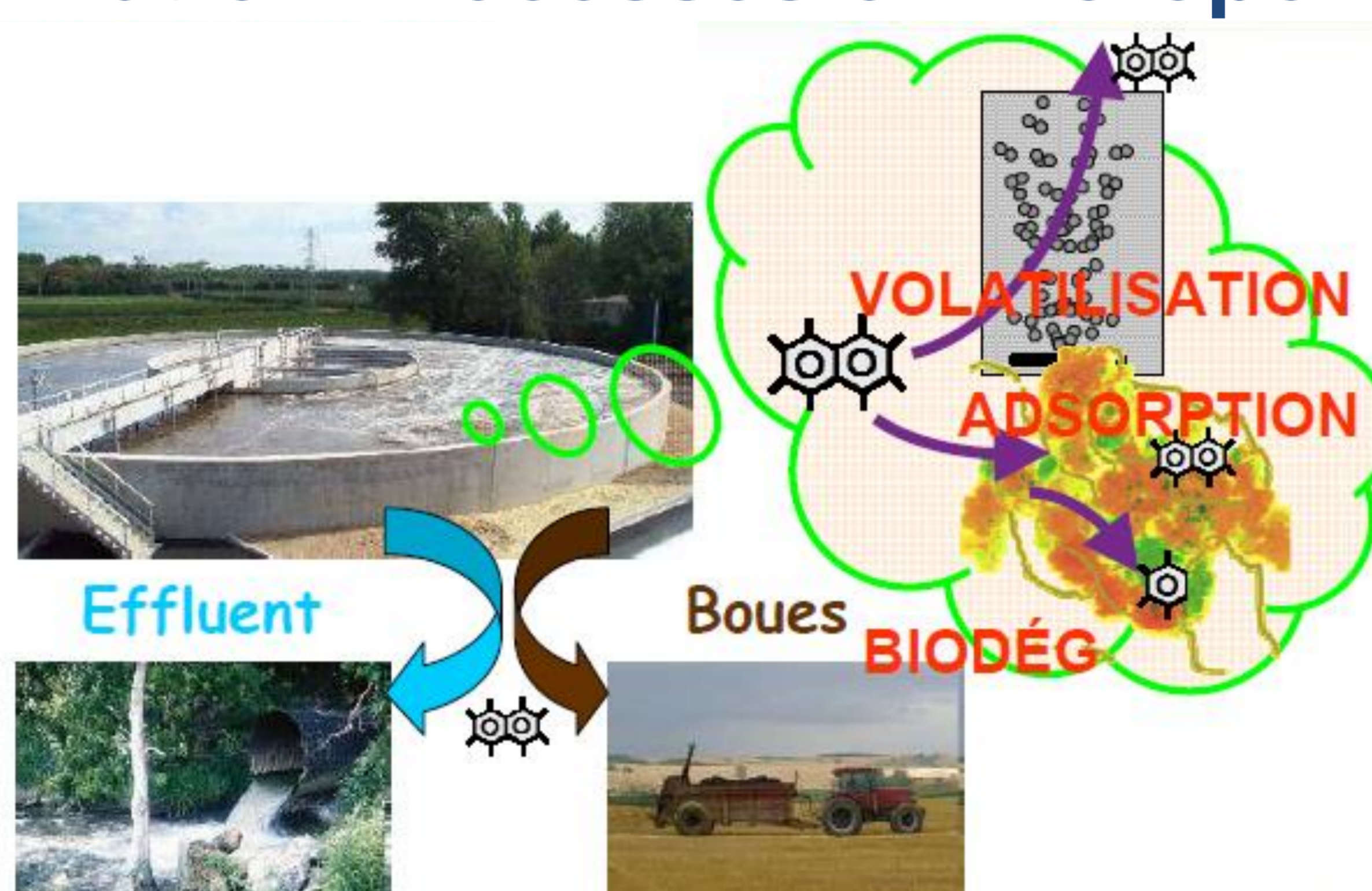


## Pharmaceutical Micropollutants in Waste Water: 4 sources

- Hospitals
- Pharmaceutical Industries
- Intensive animal livestock
- Domestic waste water



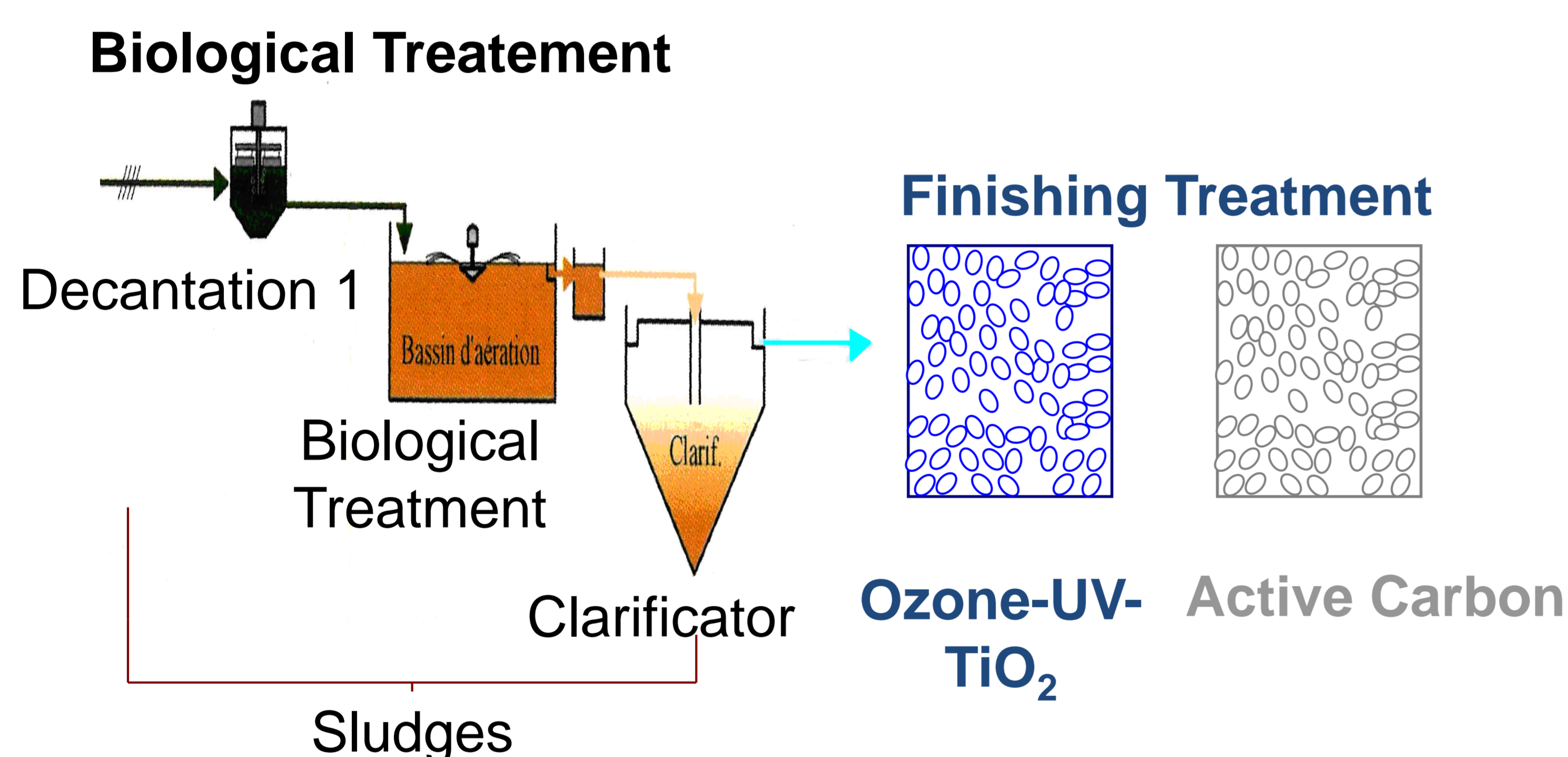
## Elimination Processes of micropollutants in WWTP



Biological Treatment in WWTP <50% degradation

- Reduction of micropollutant by
- 1) ADSORPTION ON SLUDGES
  - 2) VOLATILISATION
  - 3) BIODEGRADATION

## Scheme of the suggested treatment



## Model water

- Diclofenac, 17 alpha-ethinyl estradiol, 17 beta-oestradiol
- Erythromycine, Clarithromycine, Azithromycine
- Furosémide, Sulfamethoxazole, Carbamazepine

## European Water Directive

2013: diclofenac, 17alpha-ethinyl-estradiol, 17betaoestradiol added to the water directive watching list : Concentration and, toxicity data monitored at european scale.

2015: 3 macrolides antibiotics added: erythromycine, clarithromycine, azithromycine

## Toxicity tests

Toxicity measurement of waste waters with daphnies *Daphnia Magma* and fluorescent bacteria *Vibrio fischerii*

