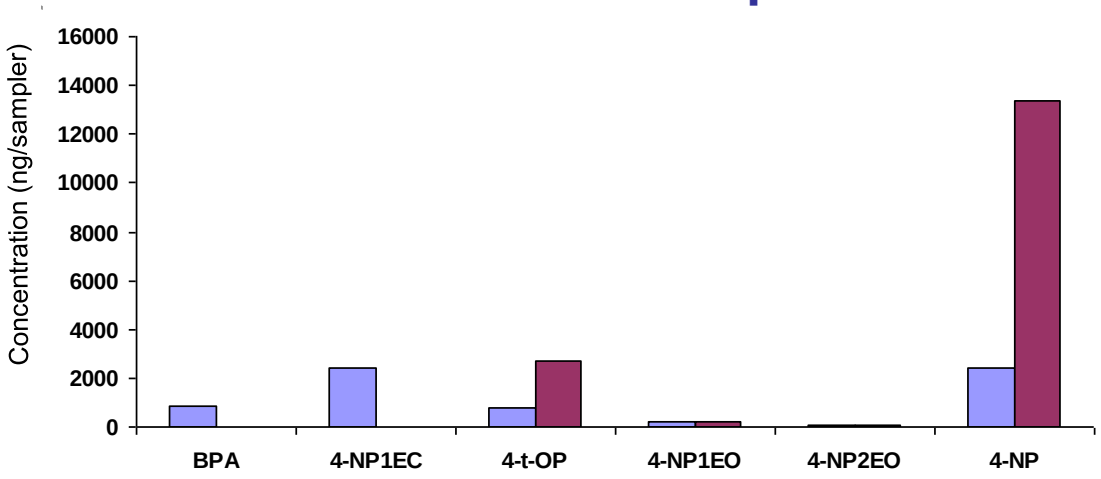
POCIS vs SPMD for sampling alkyphenols and BPA in WWTP effluents

POCIS vs SPMD:

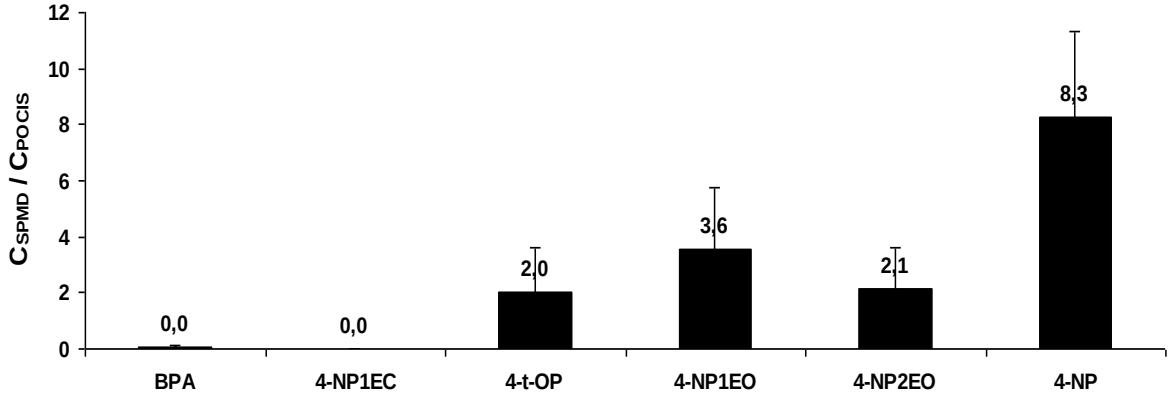
- BPA and 4-NP1EC only detected in POCIS
  ➢ SPMD non adapted for these molecules

- OP, NP, NPEOs more concentrated in SPMD than in POCIS
  ➢ SPMD more efficient than POCIS for these molecules

POCIS and SPMD exposed 21 d



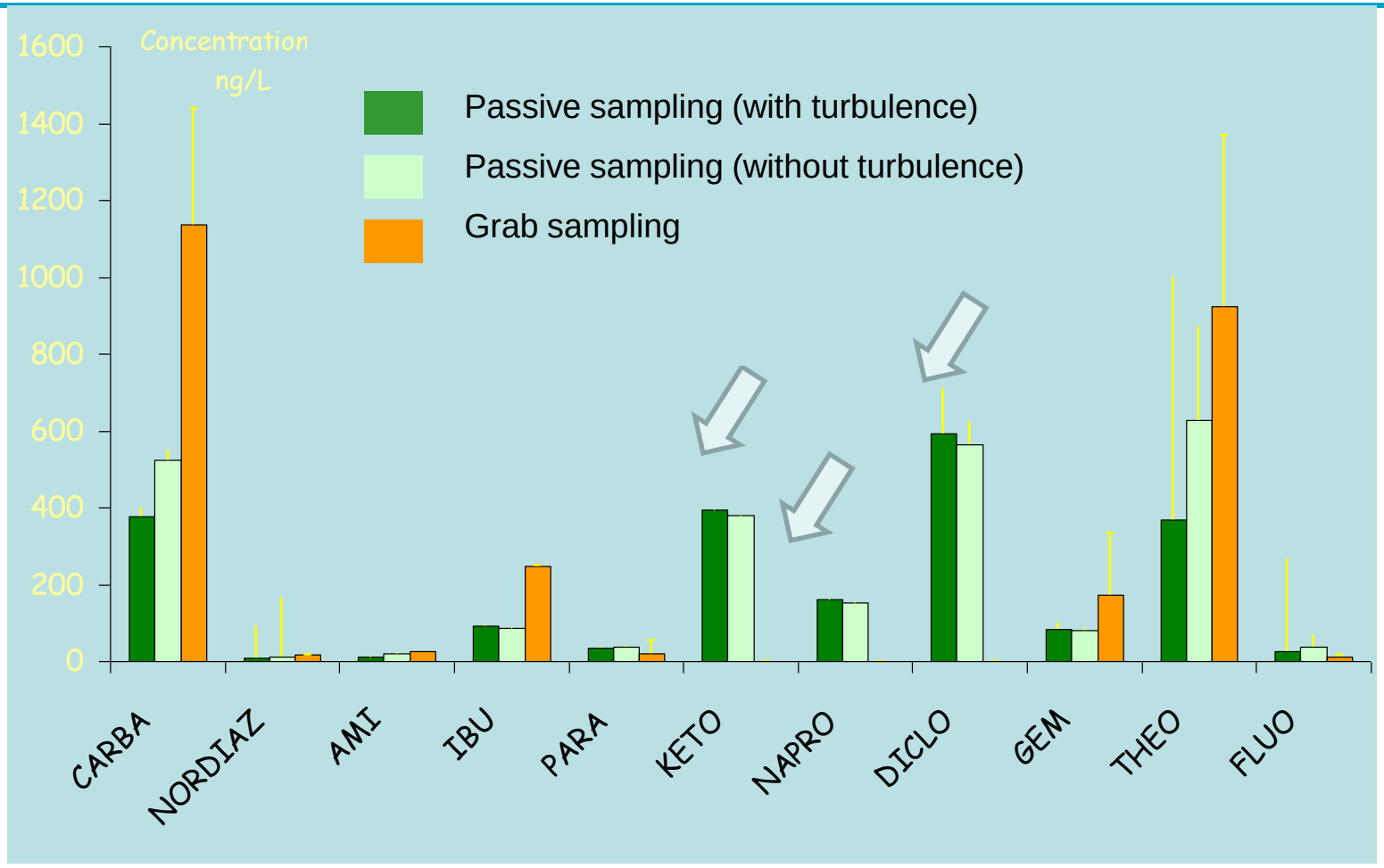
C_{SPMD}/C_{POCIS} (mean for 3 campaigns)



Evaluation of alkylphenol concentrations in effluents by POCIS

Effect of agitation

Evaluation of pharmaceutical concentrations in effluents by POCIS



➢POCIS sampling allows to limit matrix effects (ketoprofene, naproxene and diclofenac)

Betablocker sampling (in the river Bourbre and WWTP effluents from Bourgoin Jallieu)

Concentration in POCIS:
Upstream < Downstream < Effluent

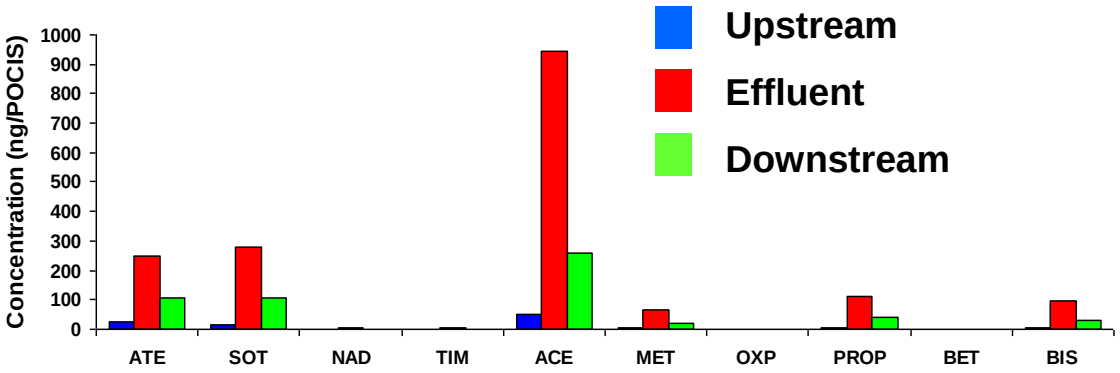
POCIS vs grab sample:

- no decrease of QL
- Similar fingerprints (3 groups of micropollutants)

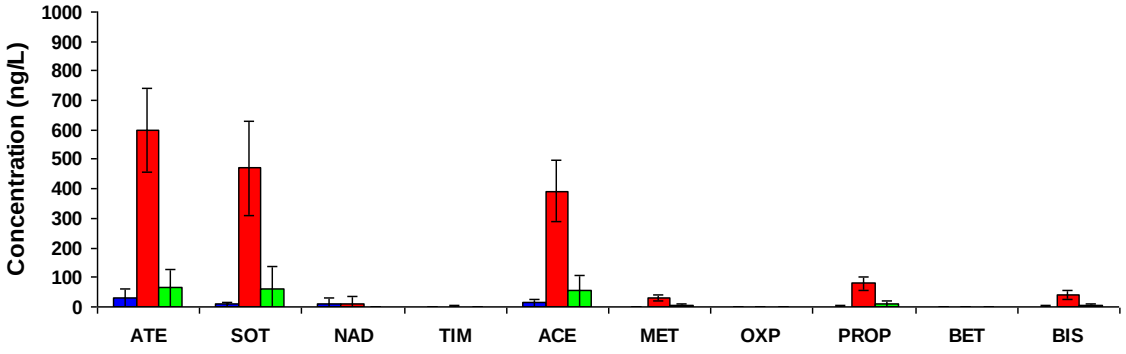
☛Betablockers not detected in SPMD (exposed 21 d)

Concentration in grab water sample (1L):
Upstream < Downstream < Effluent

In POCIS exposed 21 d



In grab water sample (1L)



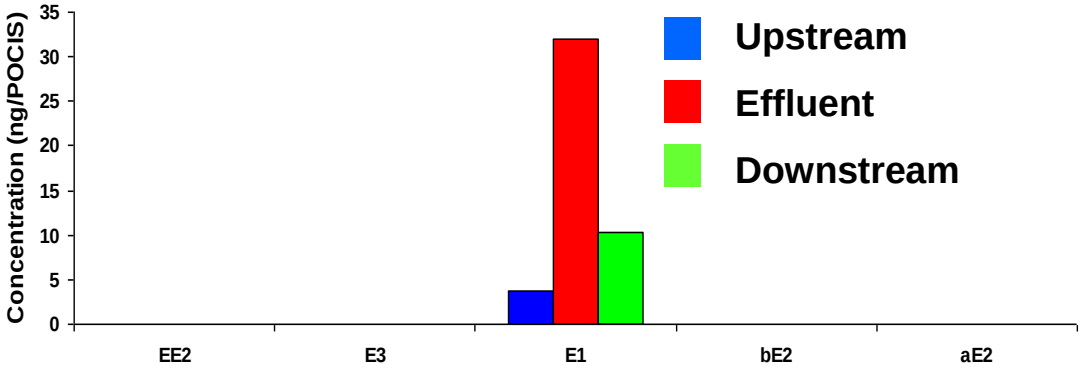
Hormone sampling (in the river Bourbre and WWTP effluents from Bourgoin Jallieu)

Concentration in POCIS:
Upstream < Downstream < Effluent

POCIS vs grab sample:

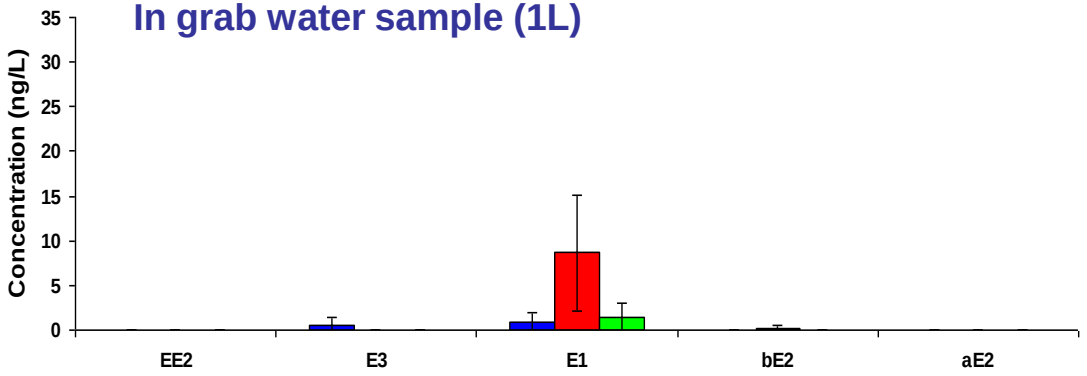
- no decrease of QL
- Similar fingerprints

In POCIS exposed 21 d



☛Hormones not detected in SPMD (exposed 21 d)

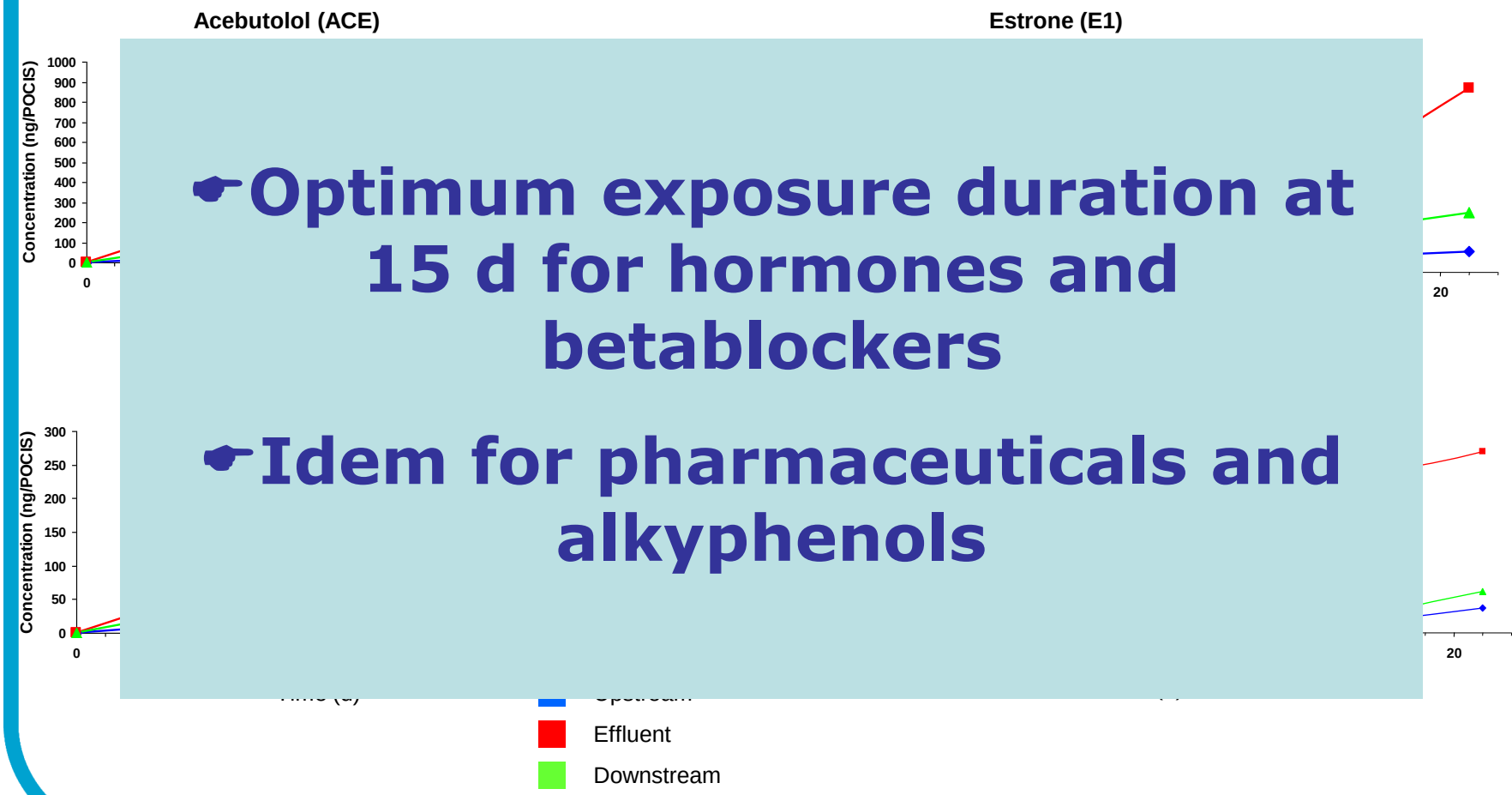
In grab water sample (1L)



Concentration in grab water sample (1L):
Upstream < Downstream < Effluent

Optimum exposure duration for POCIS in situ – accumulation kinetic curves

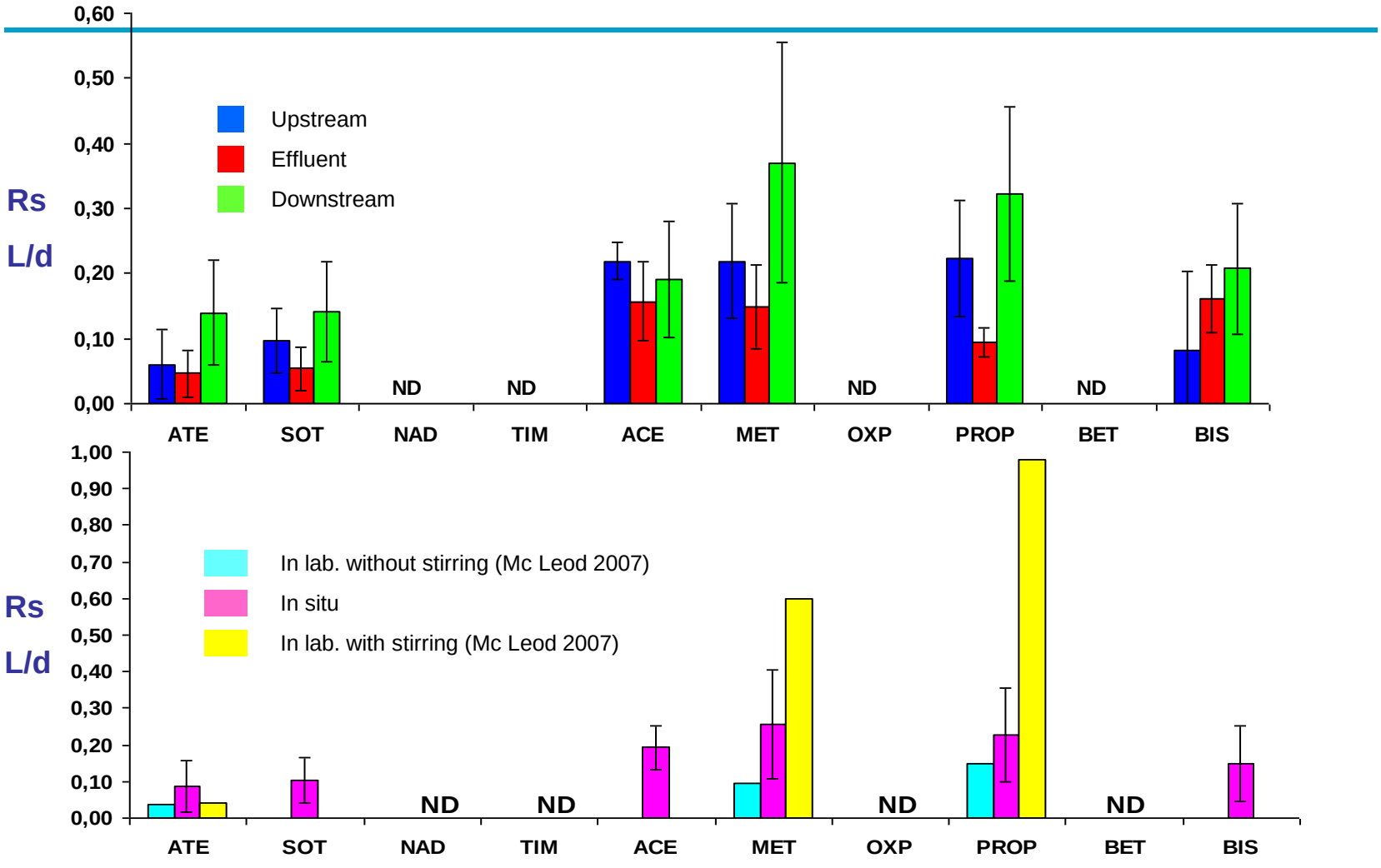
Example for hormones and betablockers in the Bourbre river



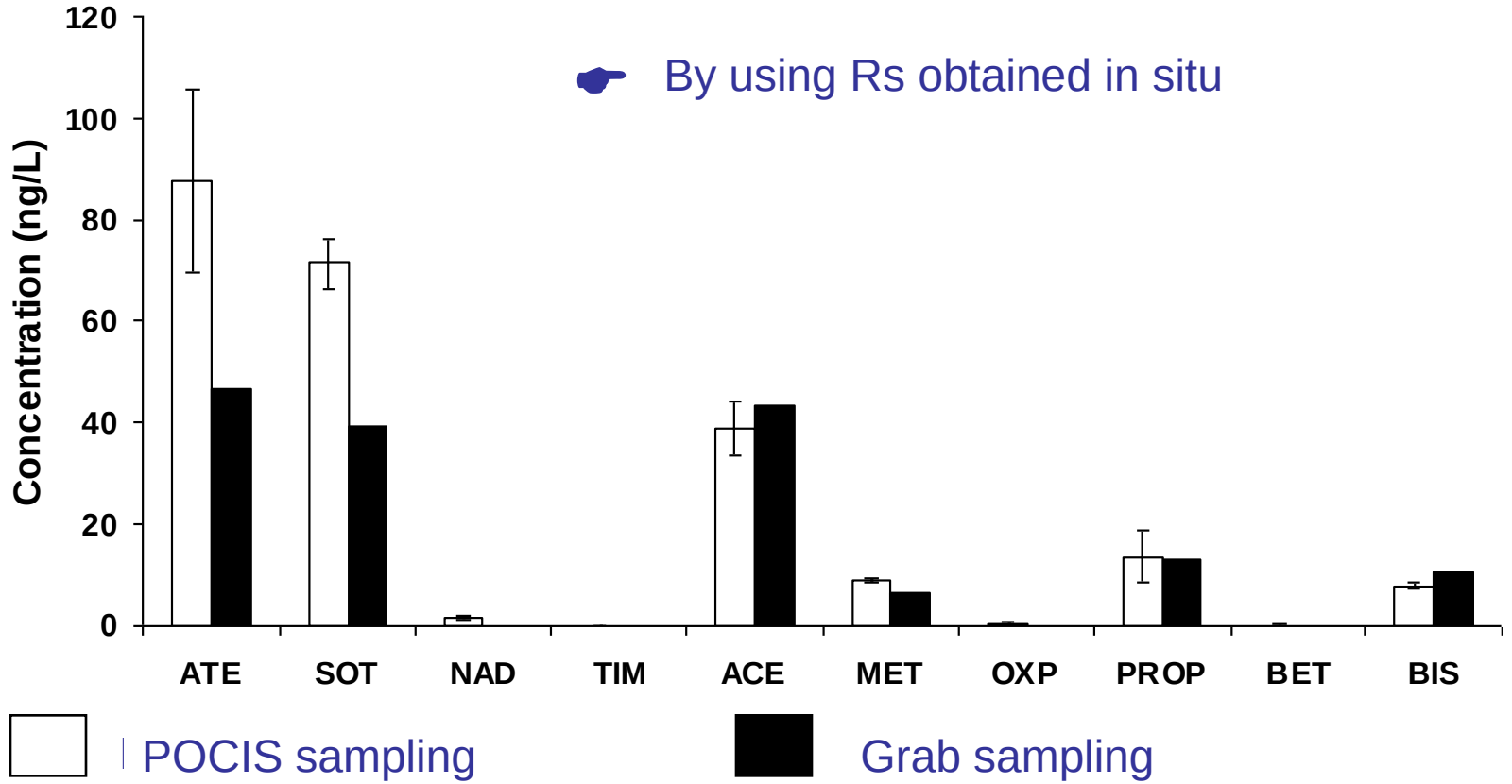
☛Optimum exposure duration at 15 d for hormones and betablockers

☛Idem for pharmaceuticals and alkyphenols

Evaluation in situ of Rs for POCIS



Evaluation of betablocker concentrations in the Seine river from POCIS sampling



Conclusions-1

DGT :

Validity of their applicability in wastewaters for metals

Allow to estimate a time weight average concentration for labile metals

Optimum exposure durations between 1 and 2 weeks

SPMD :

Validity of their applicability in wastewaters for PAH

Allow to estimate a time weight average concentration for dissolved PAHs

Non adapted for sampling hormones, betablockers, BPA, hydrophilic alkyphenols

More efficient than POCIS for hydrophobic alkylphenols

Optimum exposure durations at 1 week for wastewaters and at 2 to 3 weeks for receiving rivers

Conclusions-2

POCIS:

✓Adapted for sampling hydrophilic alkylphenols, BPA, pharmaceuticals, hormones

✓For betablockers and hormones, after 14-21 d of exposure ☞ None concentration effect when compared with water grab sampling

✓Optimum exposure duration of 15 d

✓Difficulty to find PRC to better evaluate TWAC

LDPE and PDMS membranes :

Validation of a spiking procedure

Development of a simple calibration procedure in laboratory to obtain sampling rates

Conclusions-3

Possibility to evaluate R_S directly in situ

Which strategy to evaluate TWAC: R_S litterature vs R_S laboratoire vs R_S in situ ?

Thank you for your attention

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