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## Introduction

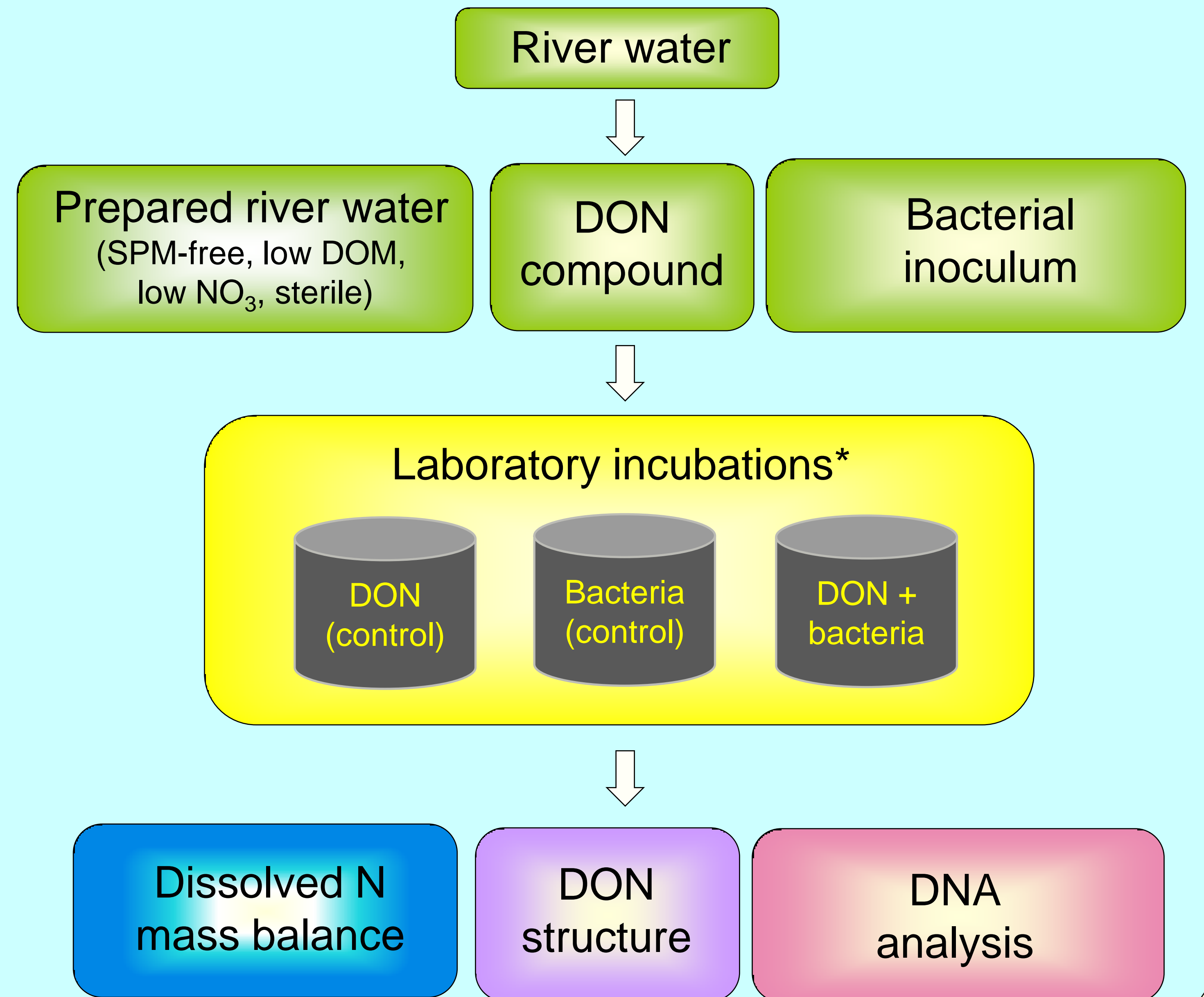
### Why study dissolved organic nitrogen?

- Inputs of reactive N to the environment have doubled over the last 100 years
- Global riverine flux of dissolved organic nitrogen (DON) to coastal waters is ca. 31-37 % of total dissolved N
- Europe accounts for ca. 8 % of annual global DON export from rivers to coastal waters, 40 % of which is anthropogenic

### Aims of Project

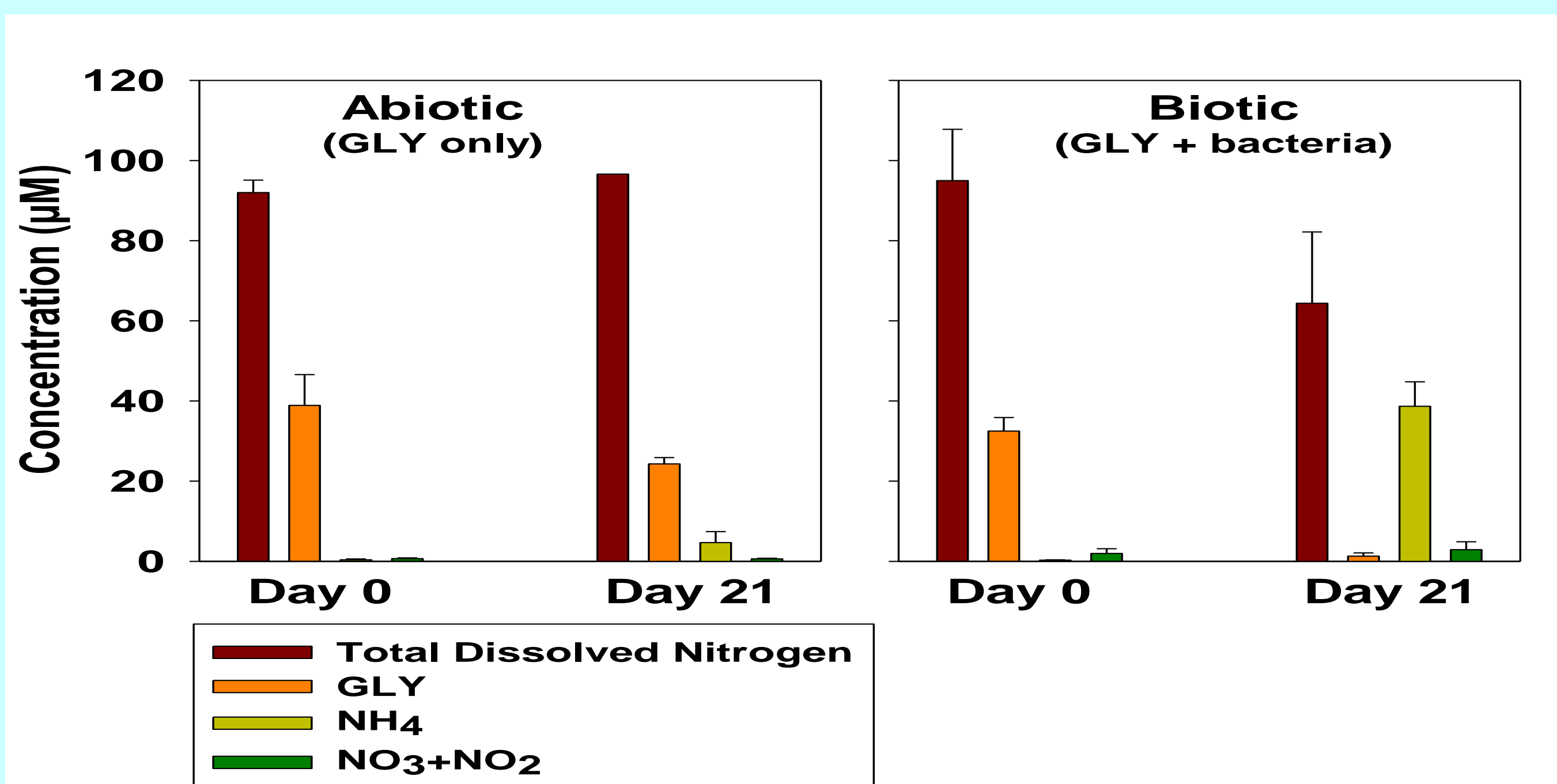
- To determine the biodegradation of natural and anthropogenic DON compounds in river water, at *environmentally relevant concentrations*, using incubations containing riverine bacteria
- To determine the degradation patterns of DON compounds using Electrospray Ionisation-tandem Mass Spectrometry
- To identify the bacteria modifying DON using PCR amplification of DNA with 16S rDNA primers and subsequent analysis

## Methods

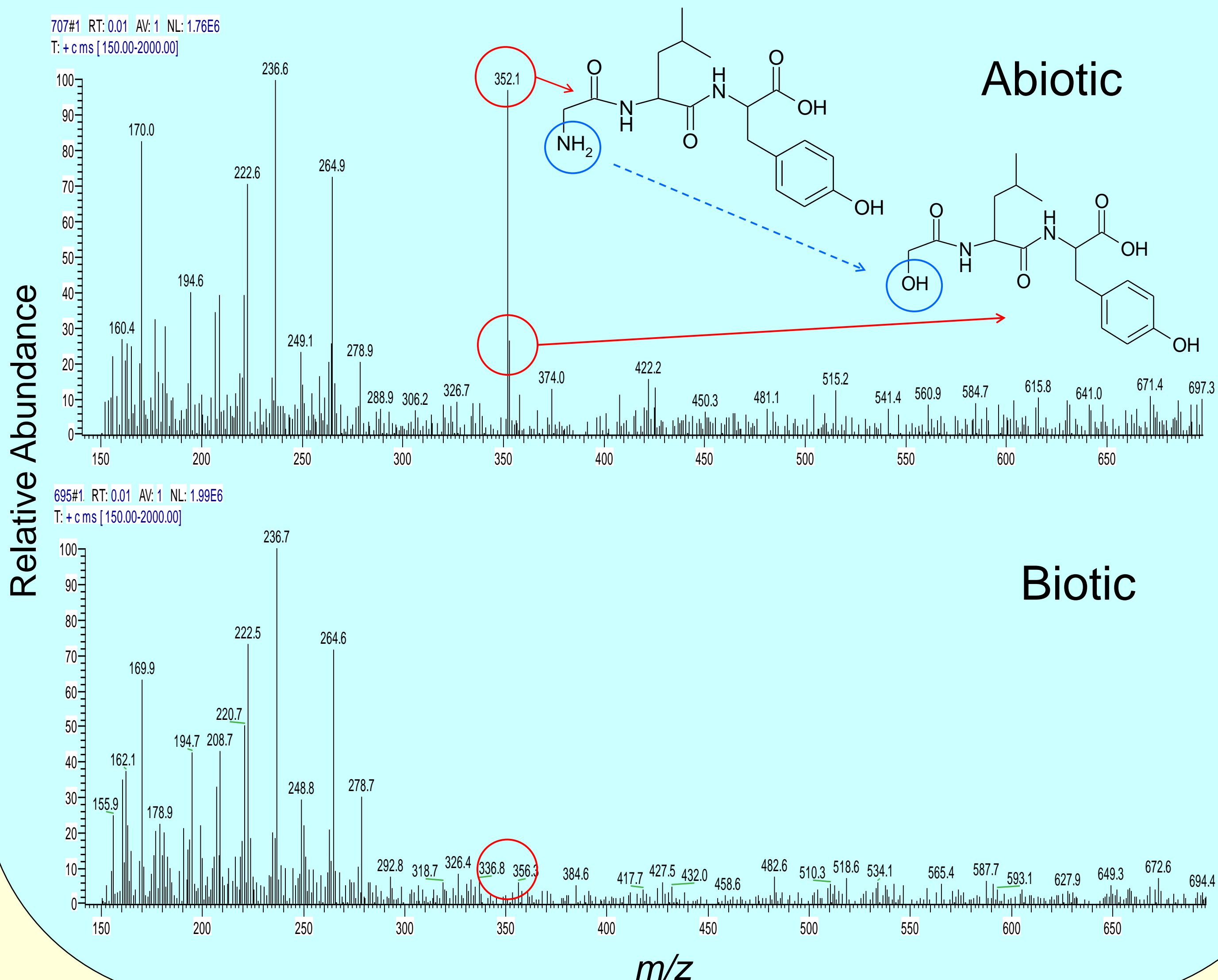


\*Each incubation was performed in triplicate

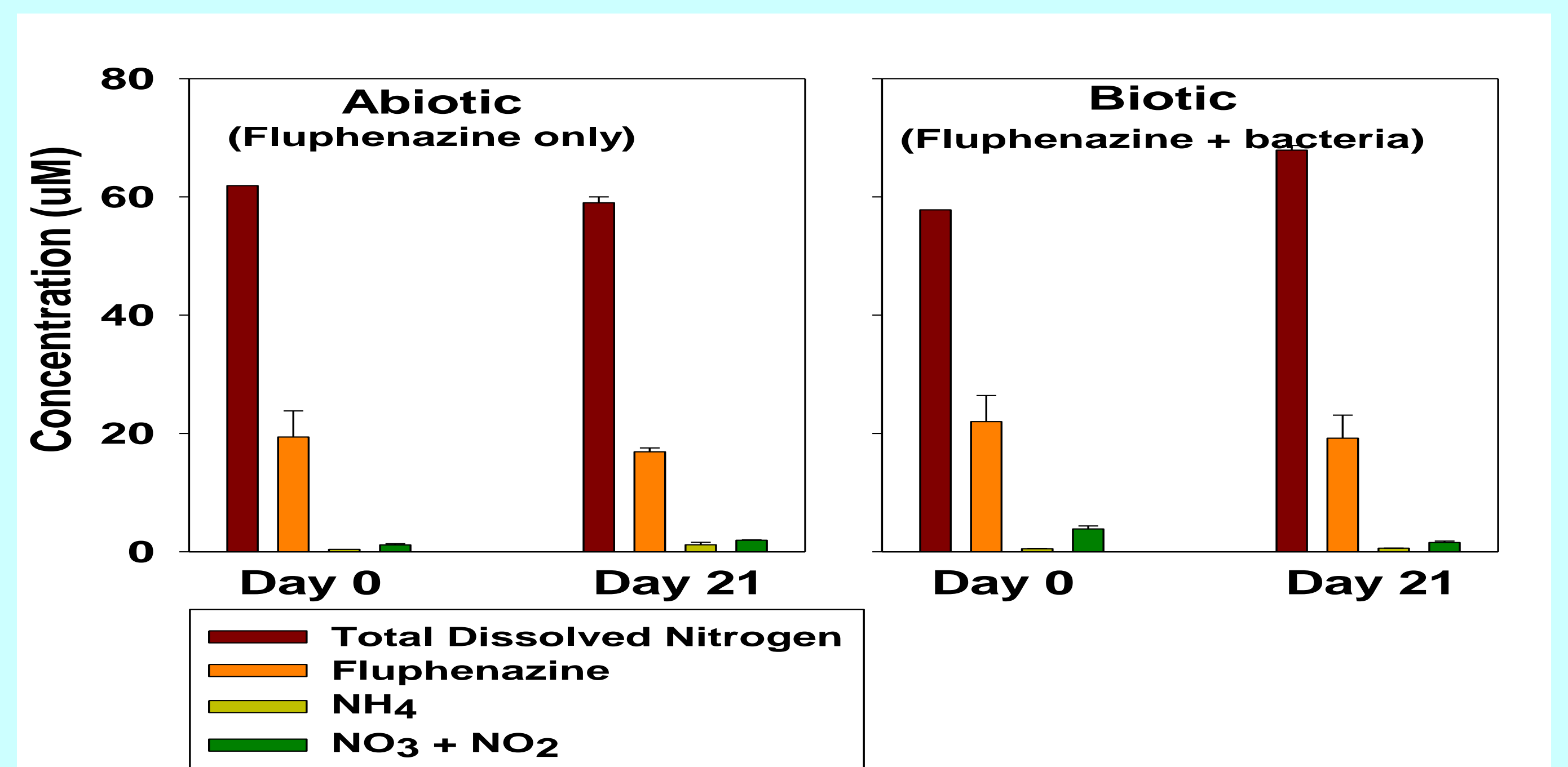
## Results



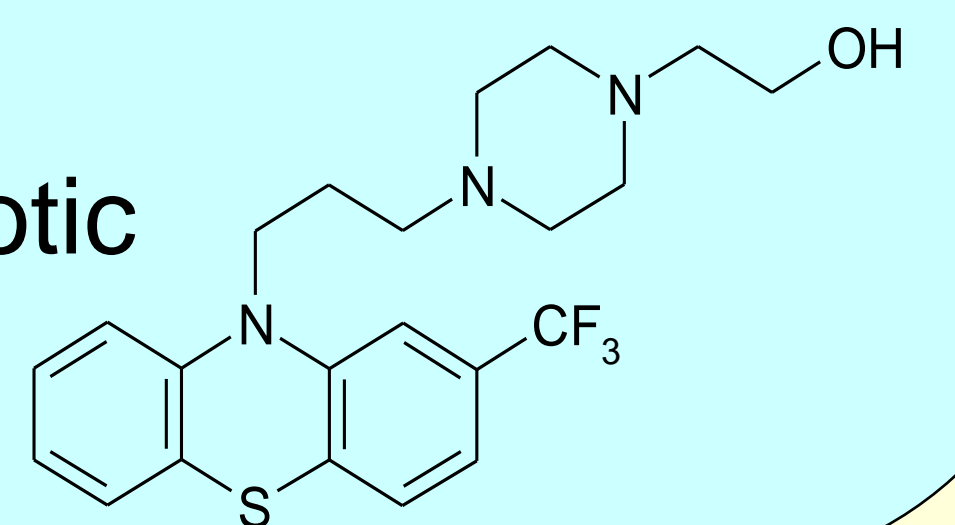
Glycine - Leucine -Tyrosine (GLY, a peptide) undergoes some hydrolytic deamination under abiotic conditions, but is completely removed from solution by bacteria, as shown in the ESI-MS ion chromatographs below



## Results



Fluphenazine (a pharmaceutical) was not modified under either abiotic or biotic conditions. ESI-MS spectra did not reveal degradation products



## Summary and way forward

### Outcomes

- The experimental design works
- Natural DON was degraded; anthropogenic DON was recalcitrant

### Future work

- For natural DON, challenge bacteria with more complex molecules
- For anthropogenic DON, continue investigating molecules of varied structure
- Undertake incubations using bacteria from contrasting rivers
- Incorporate C and N supplements during incubations with recalcitrant DON

BARON is funded by the Natural Environment Research Council (NE/E006302/1)