

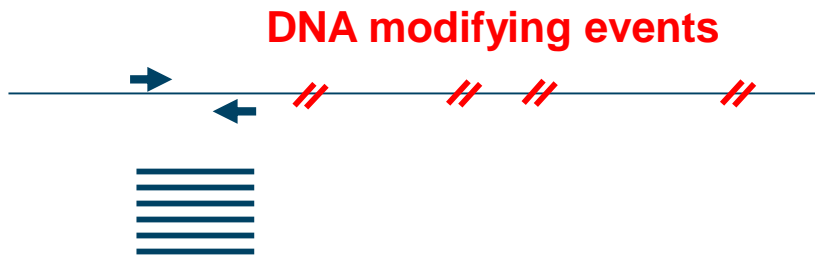
VIABILITY PCR AND ASSESSMENT OF UV DISINFECTION EFFICIENCY: AMPLICON SIZE MATTERS

How dead is dead 2017

Andreas Nocker, Laura Seidel, Mili
Shah, Julios Kontchou, Martin
Strathmann, Gabriela Schaule

Effect of amplicon length

'Short' PCR



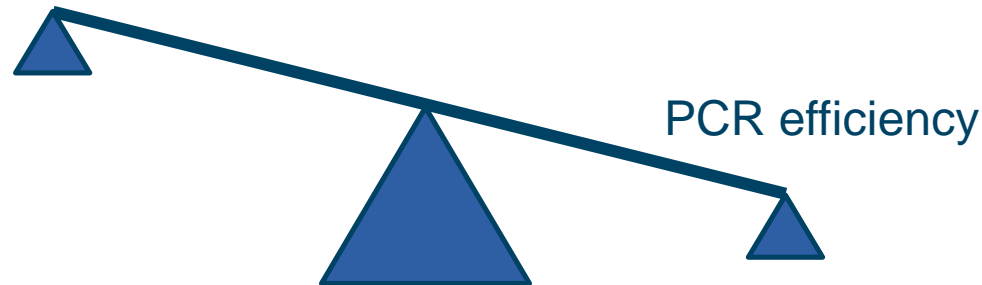
short amplicons

'Long' PCR



long amplicons

live-dead discrimination



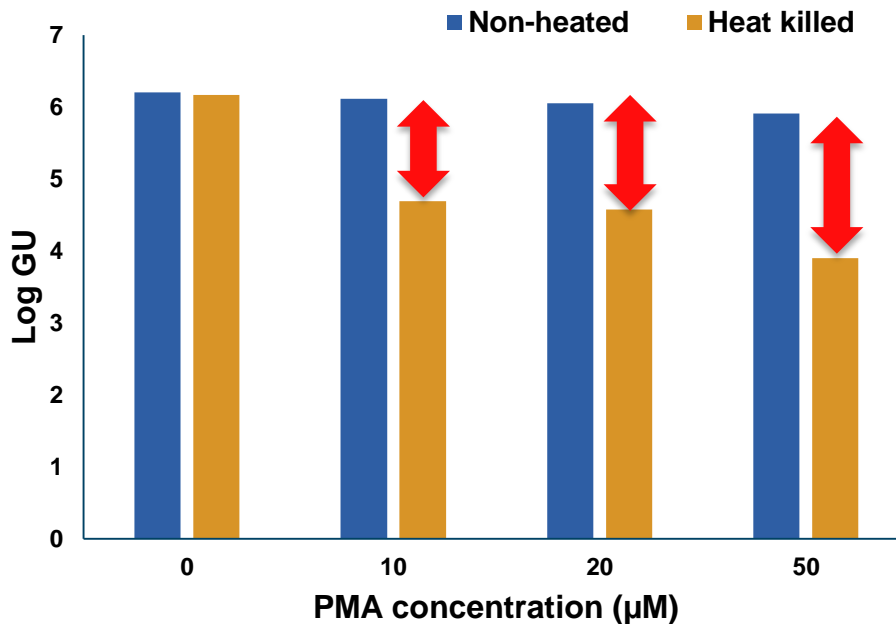
vPCR performance for *Legionella pneumophila*



Julios Kontchou

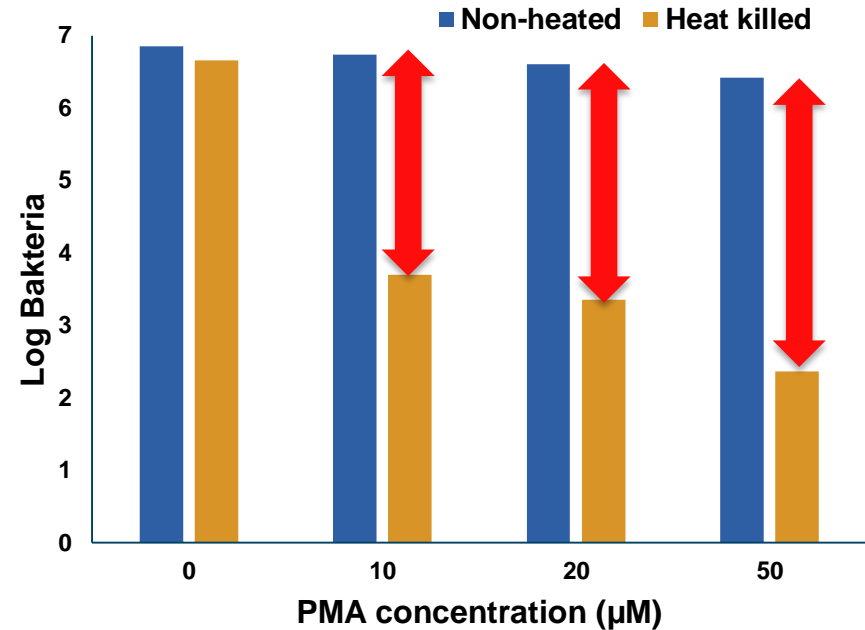
BioRad iQ-Check[®]

(Approx. 100 bp)



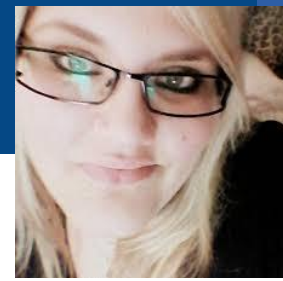
Novel assay

(633 bp)

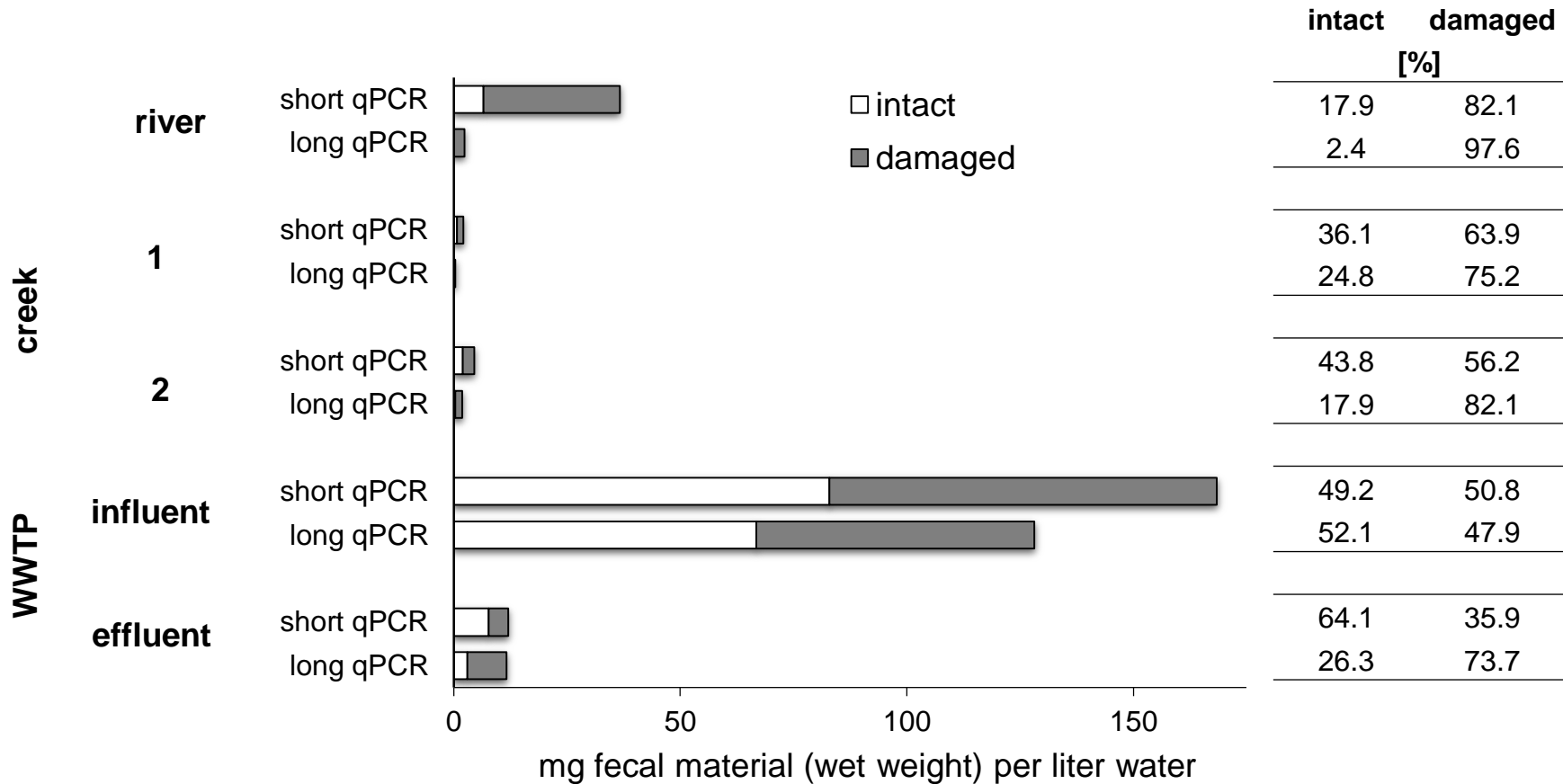


Technical parameters determine how many damaged cells you see.

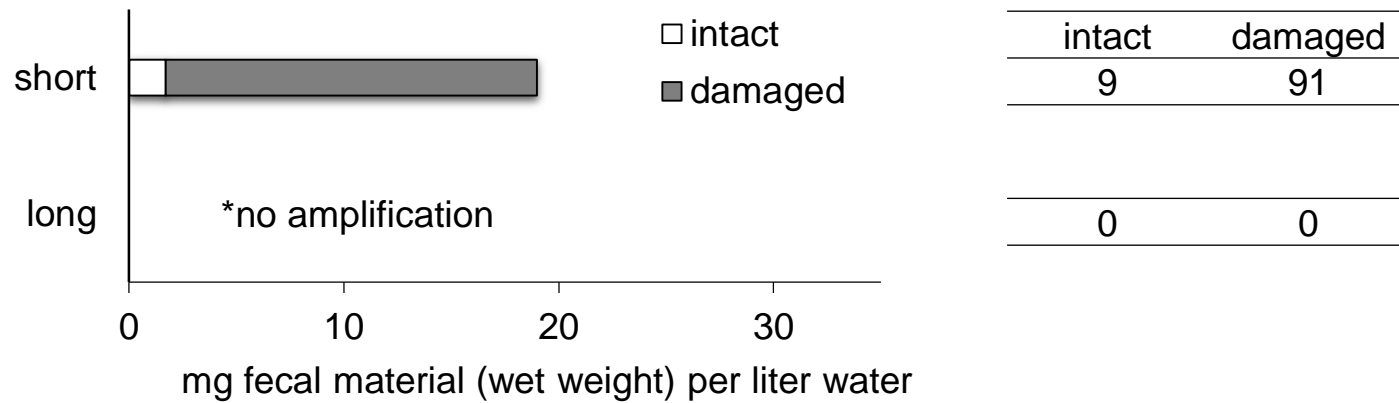
Effect of amplicon length on intact-damaged ratios



Laura Seidel

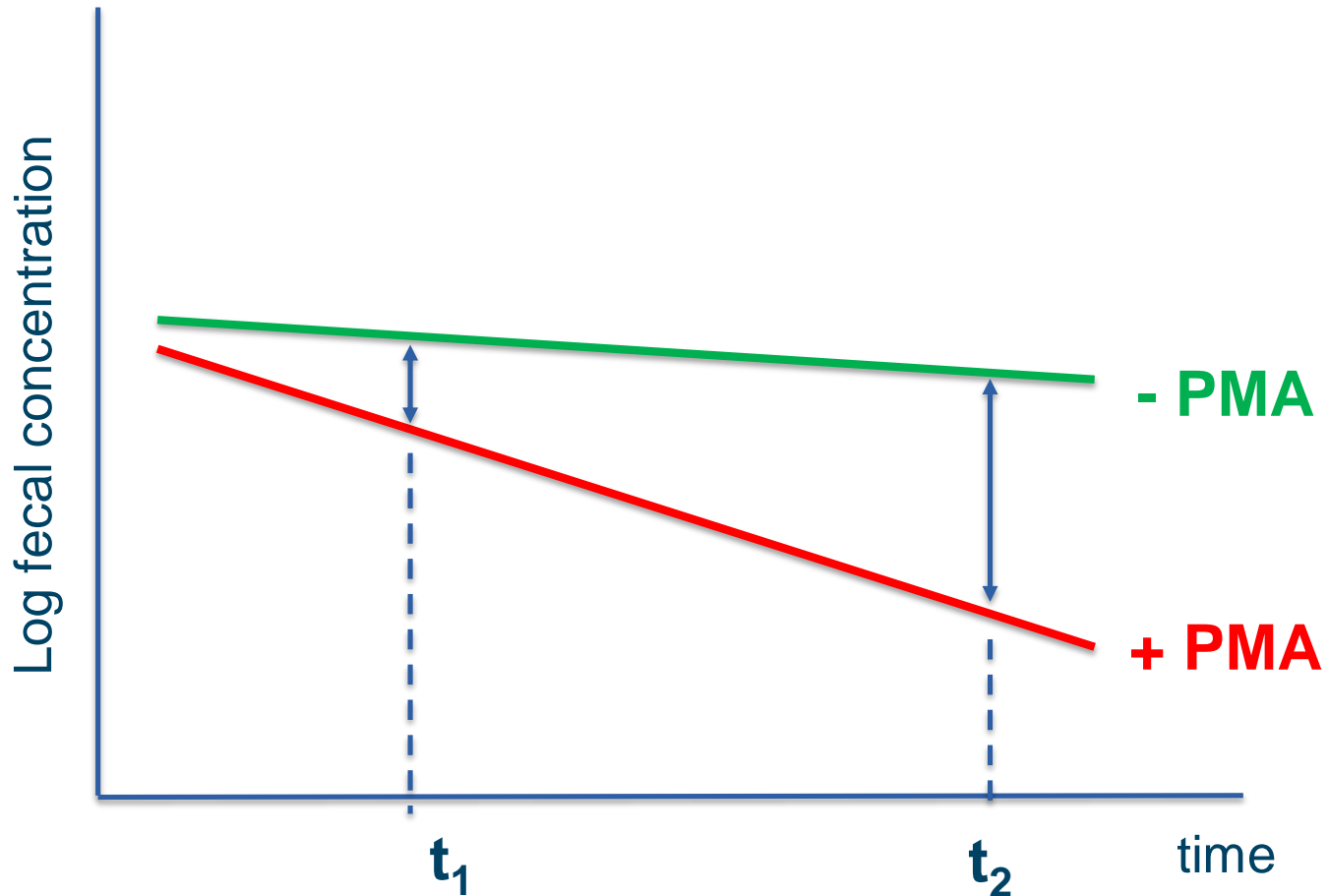


Effect of amplicon length: ruminant signals from river



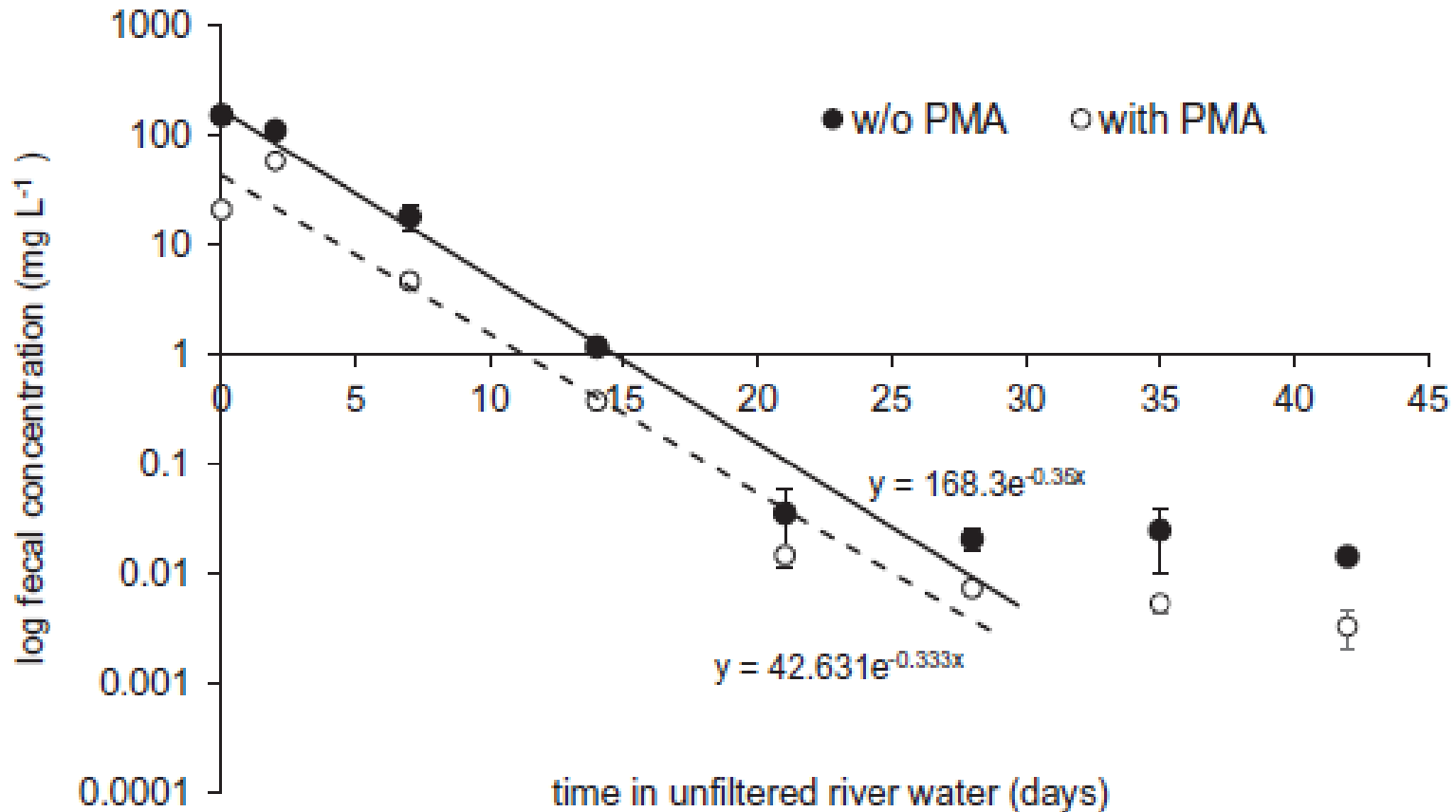
Seidel et al. 2017. J Microbiol Methods 140:23-31.

Degradation kinetics of cow poo in river water



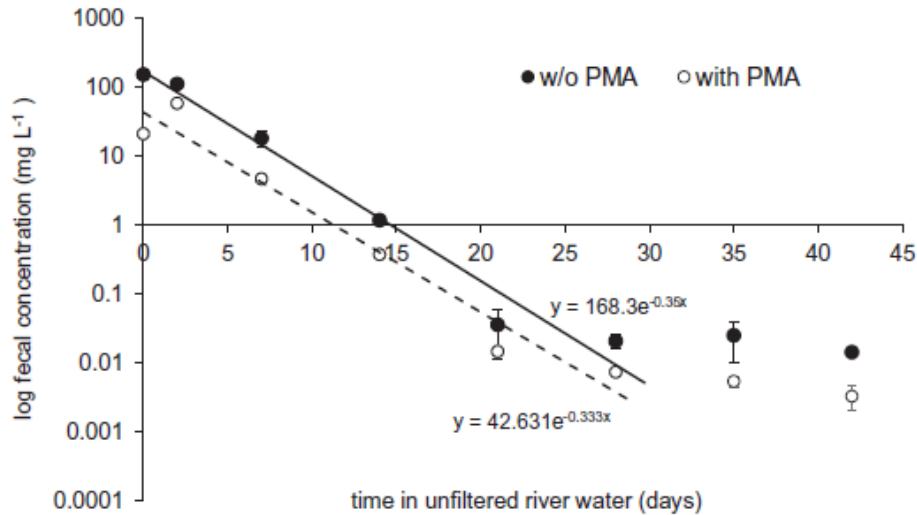
Degradation kinetics of cow poo in river water

Short amplicons

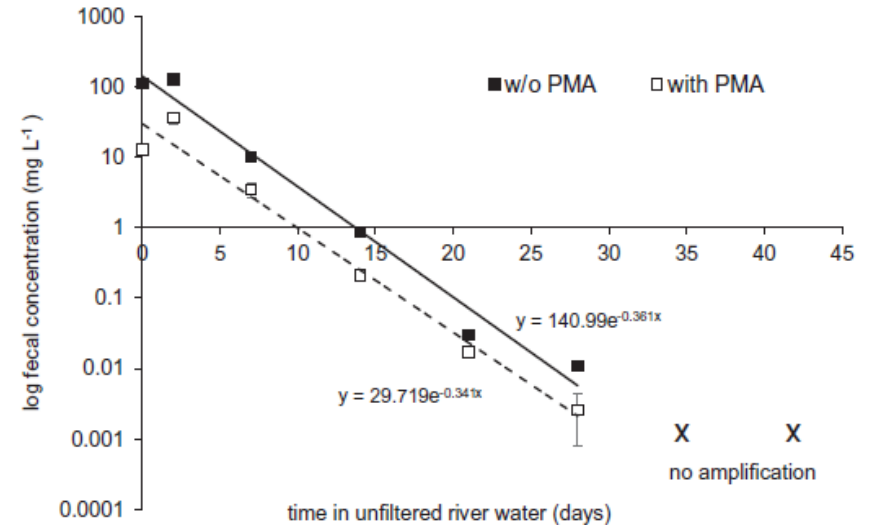


Degradation kinetics of cow poo in river water

Short



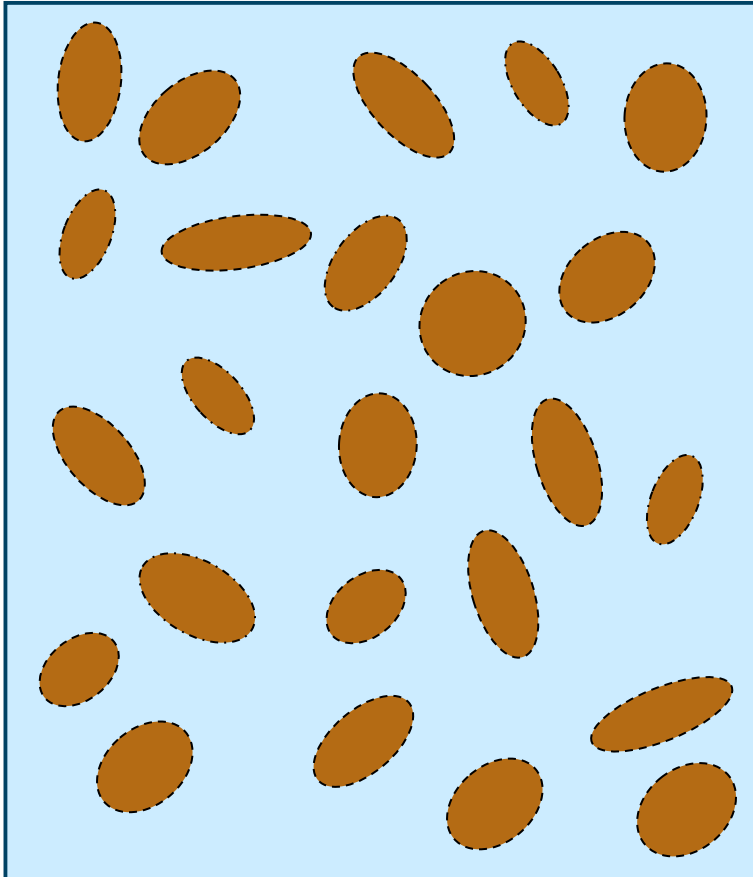
Long



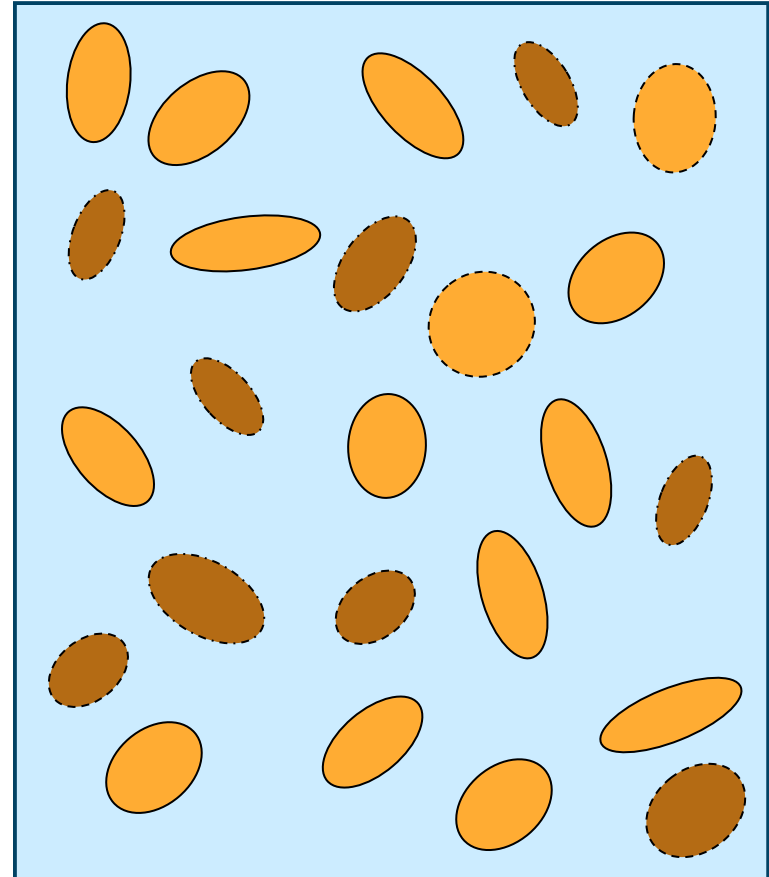
- No accumulation of damaged cells over time (dead bodies don't take over)
- No detectable fragmentation of DNA over time, DNA seems to be removed as an entity

How do populations degrade?

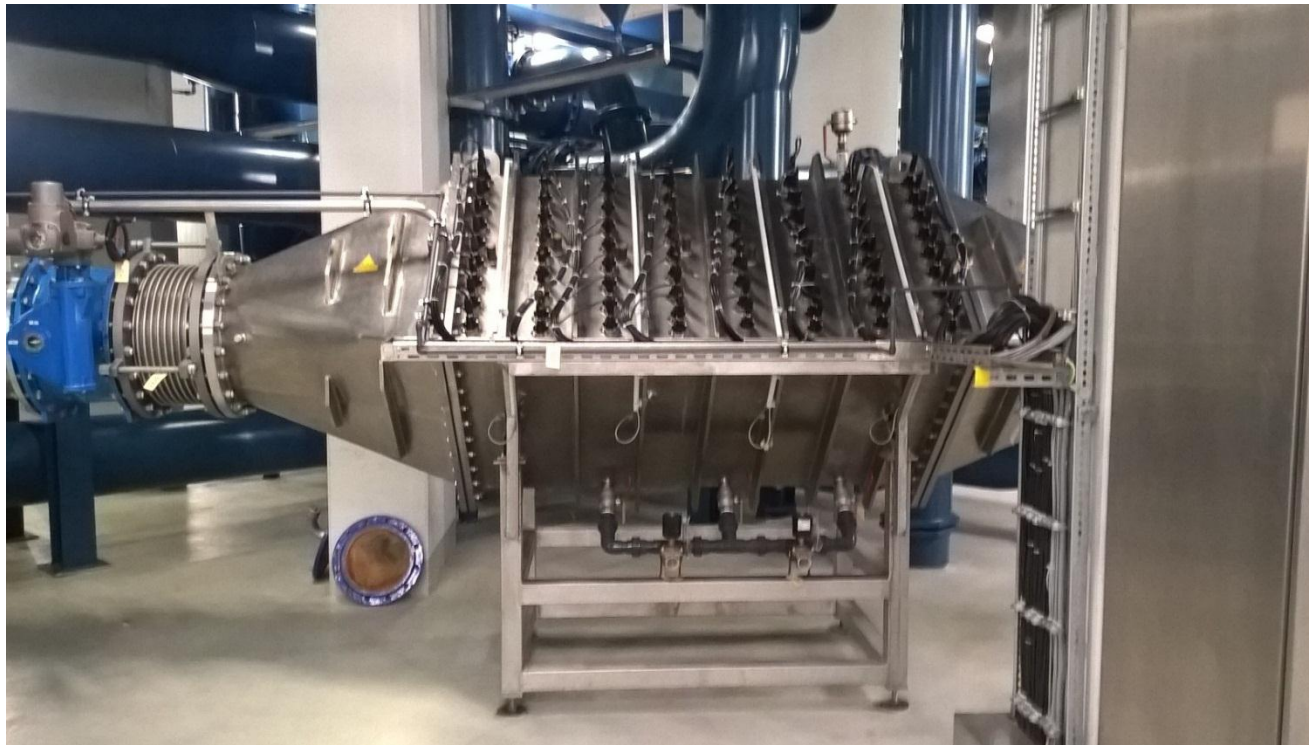
Scenario A



Scenario B



Biodosimetry

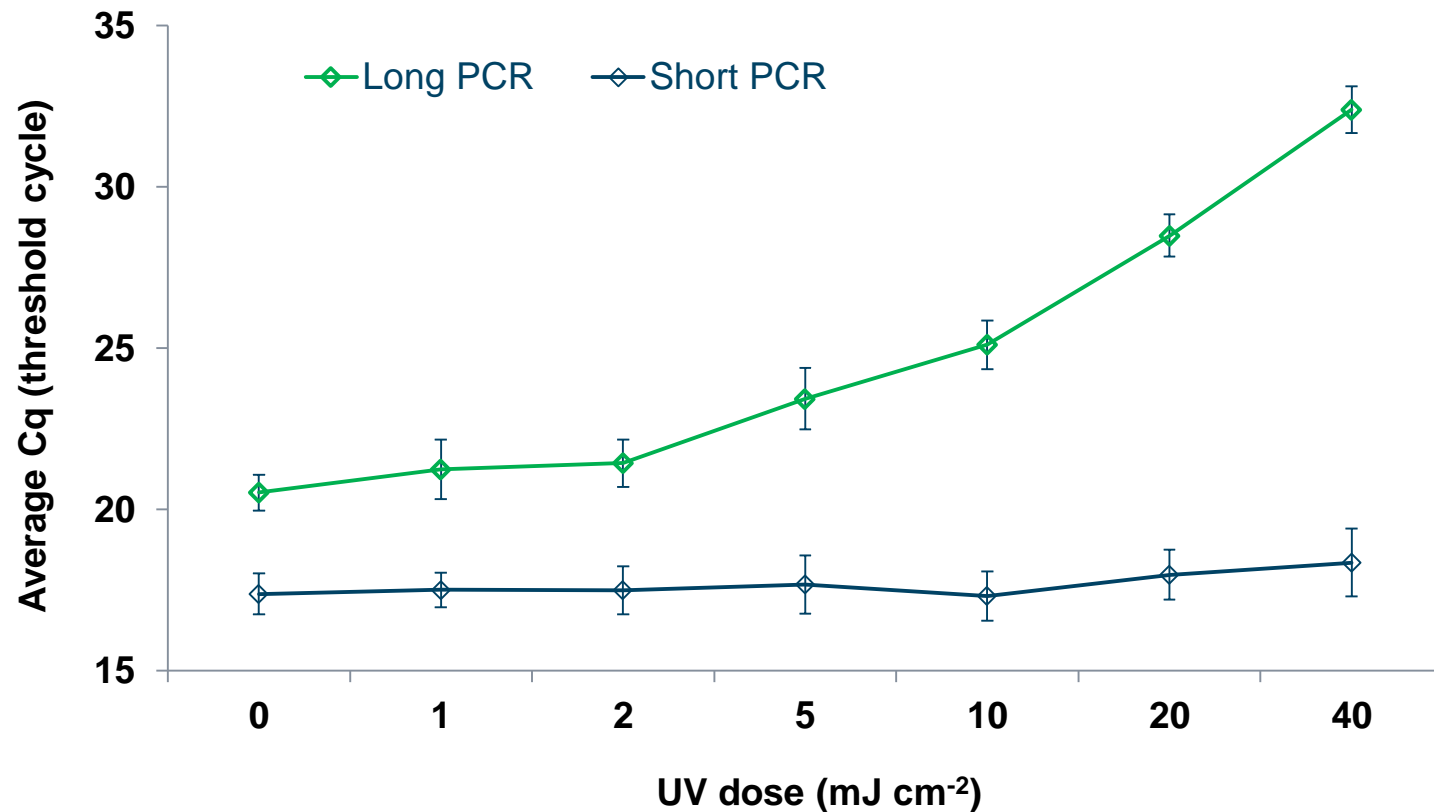


Effect of UV-C on amplifiability of DNA from exposed bacteria

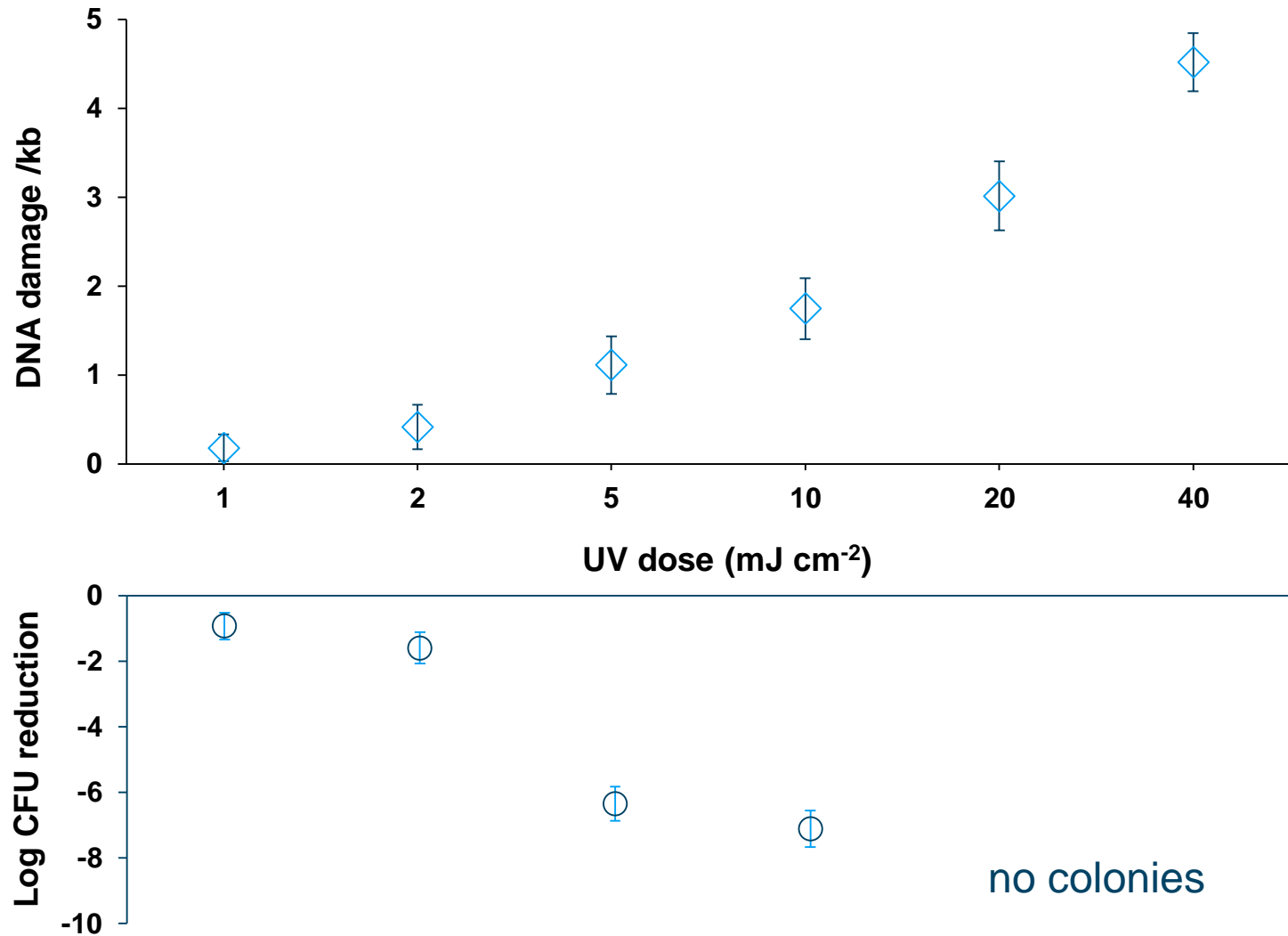


Mili Shah

Aqueous *E. coli* suspension exposed to different UV doses.



Effect of UV-C on *E. coli*



Disinfection efficiency in different water treatment works

