

# Identification of *Escherichia coli* antibiotic resistance genes present in surface and domestic tap water at Johor, Malaysia



Yi Min Ng\* (150015927; Y.Ng2@newcastle.ac.uk), Jia Yee Ho & Yee Chu Kwa  
Supervisors: Dr. Mukhrizah Othman, Prof. Christopher Baldwin & Dr. Michaela Goodson  
School of Biomedical Sciences, Newcastle University, UK

## Introduction

- Antibiotic resistance is a growing public health concern worldwide<sup>[1]</sup>.
- Antibiotic resistance occurs when bacteria can grow in the presence of antibiotic in the environment<sup>[1]</sup>.

## Aim

To **qualify** type of bacteria and to **identify** *Escherichia coli* (*E. coli*) antibiotic resistance genes (ARGs) present in surface and domestic tap water at a village southwest of Johor, Malaysia.

## Conclusion

- *E. coli* from **site of study** showed resistance towards most of the antibiotics tested except for ceftazidime, cefotaxime and gentamicin.
- However, **controls** used in the study also showed even higher resistance towards most of the antibiotics used.

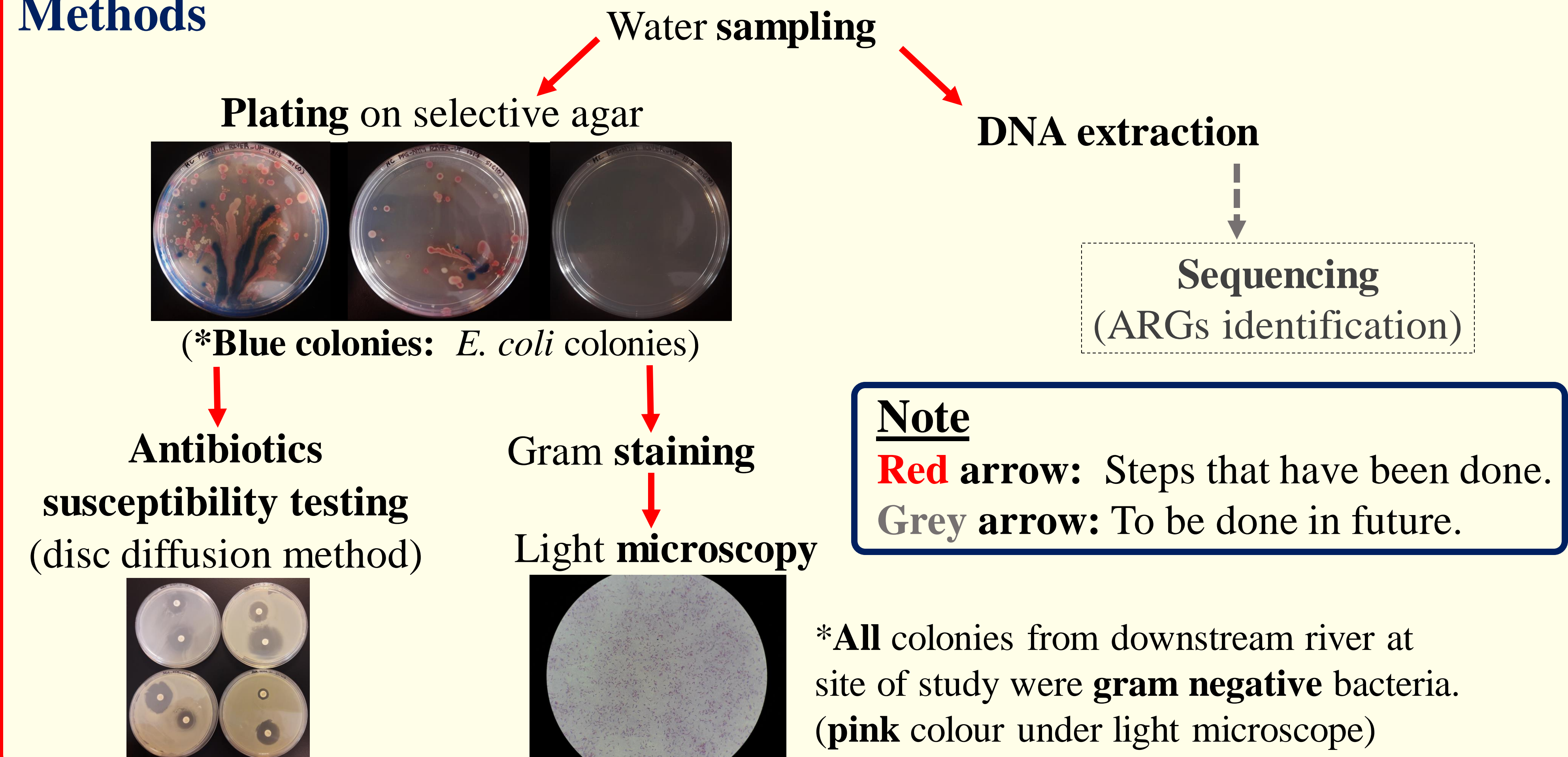
## Next Step

- **Bioreactors** can be placed at site of study to remove bacteria and other pollutants from surface water to prevent spread of ARGs<sup>[2]</sup>.

## References

1. World Health Organisation. Antimicrobial resistance - Fact Sheet. 2016 01/09/2016 [cited 2016 29/09/2016]; Available from: <http://www.who.int/mediacentre/factsheets/fs194/en/>
2. Christgen B, Yang Y, Ahammad SZ, Li B, Rodriquez DC, Zhang T, Graham DW. **Metagenomics shows that low-energy anaerobic-aerobic treatment reactors reduce antibiotic resistance gene levels from domestic wastewater.** *Environmental science & technology.* 2015 Feb 17;49:2577-84.

## Methods



## Results

Antibiotic	Susceptibility/Resistance		
	Site of Study	Control	
		<i>E. coli</i> K12	<i>E. coli</i> B
Ampicillin	Resistant	Very resistant	Very resistant
Ampicillin/Sulbactam	Resistant	Very resistant	Susceptible
Ceftazidime	Susceptible	Susceptible	Very resistant
Ciprofloxacin	Very resistant	Very resistant	Very resistant
Colistin	Resistant	Very resistant	Susceptible
Cefotaxime	Susceptible	Susceptible	Resistant
Gentamicin	Susceptible	Resistant	Very resistant
Sulfamethoxazole trimethoprim	Very resistant	Very resistant	Very resistant

Table showing susceptibility of *E. coli* from site of study towards antibiotics with *E. coli* K12 and B as controls.

\*No bacteria growth was observed on agar plates plated with **tap water** from site of study.