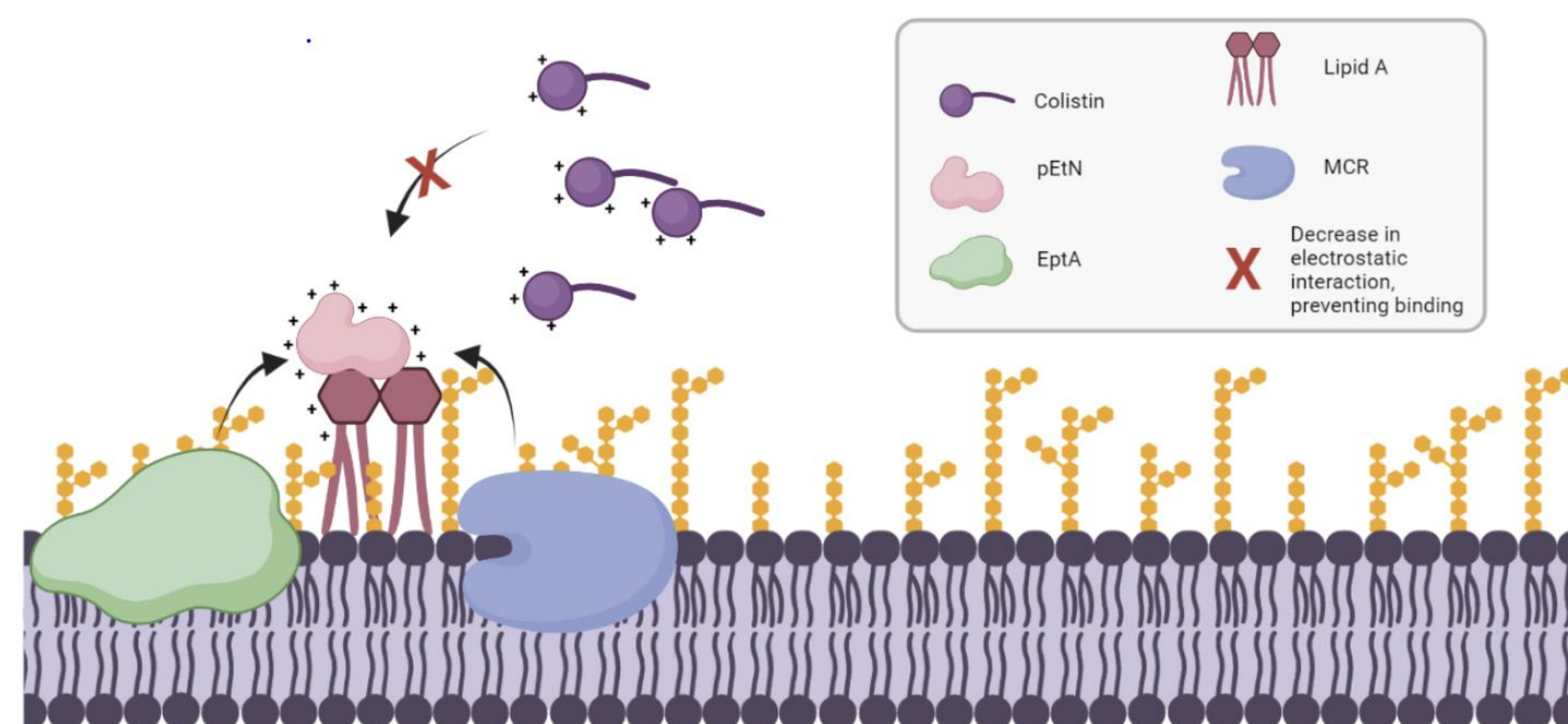
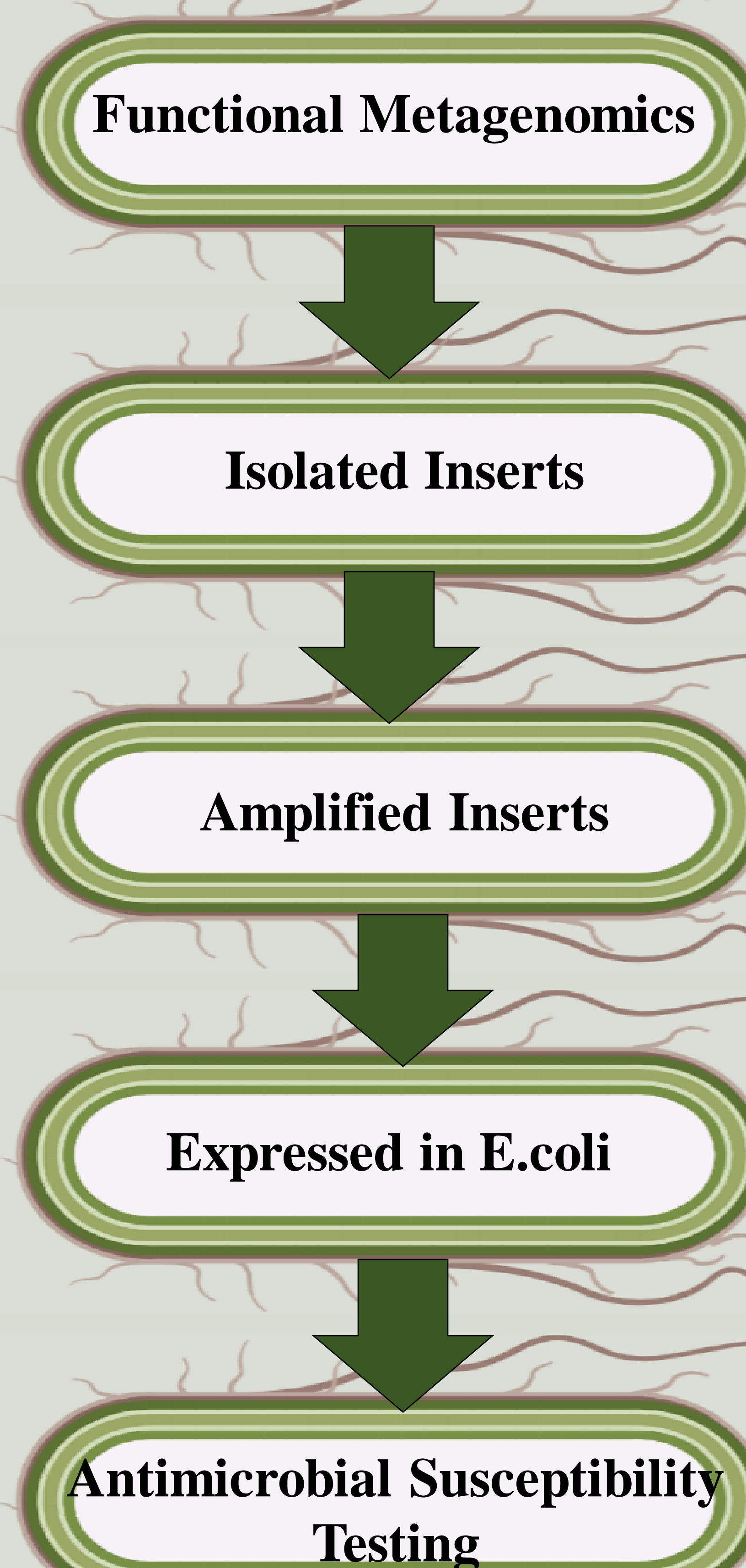


Abstract

- Colistin was one of the last-resort antibiotics able to treat Gram-negative bacterial pathogens without any concern of bacterial resistance.
- This was until resistance to colistin was discovered.
- Inevitable because it is used as a common broad-spectrum prophylaxis treatment in veterinary medicine.
- In the past decade, the first colistin-resistant gene transmitted horizontally was discovered.
- We did exploratory research into discovering novel colistin-resistance genes in an attempt to measure the level of dissemination of colistin-resistance genes.

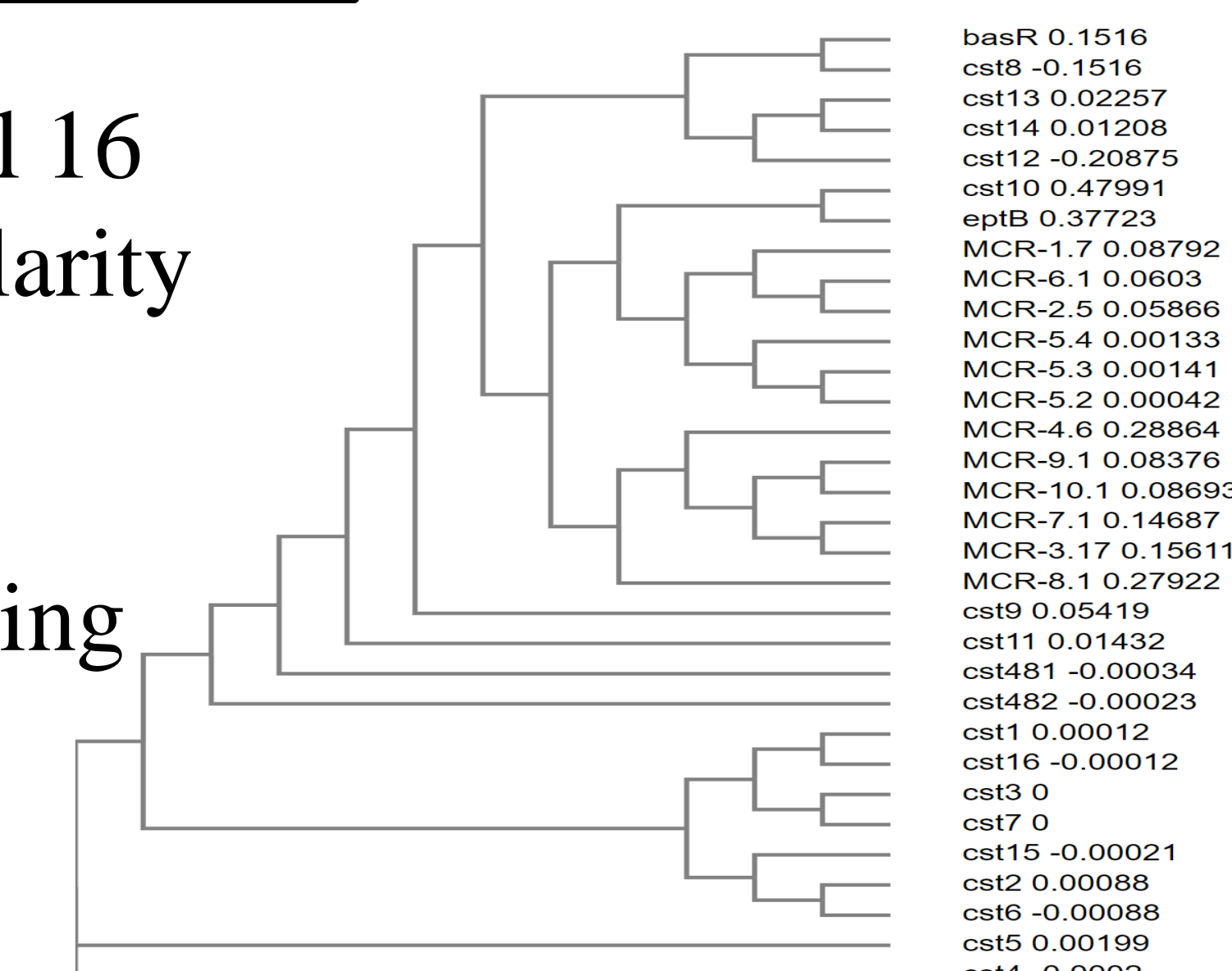


Strategy

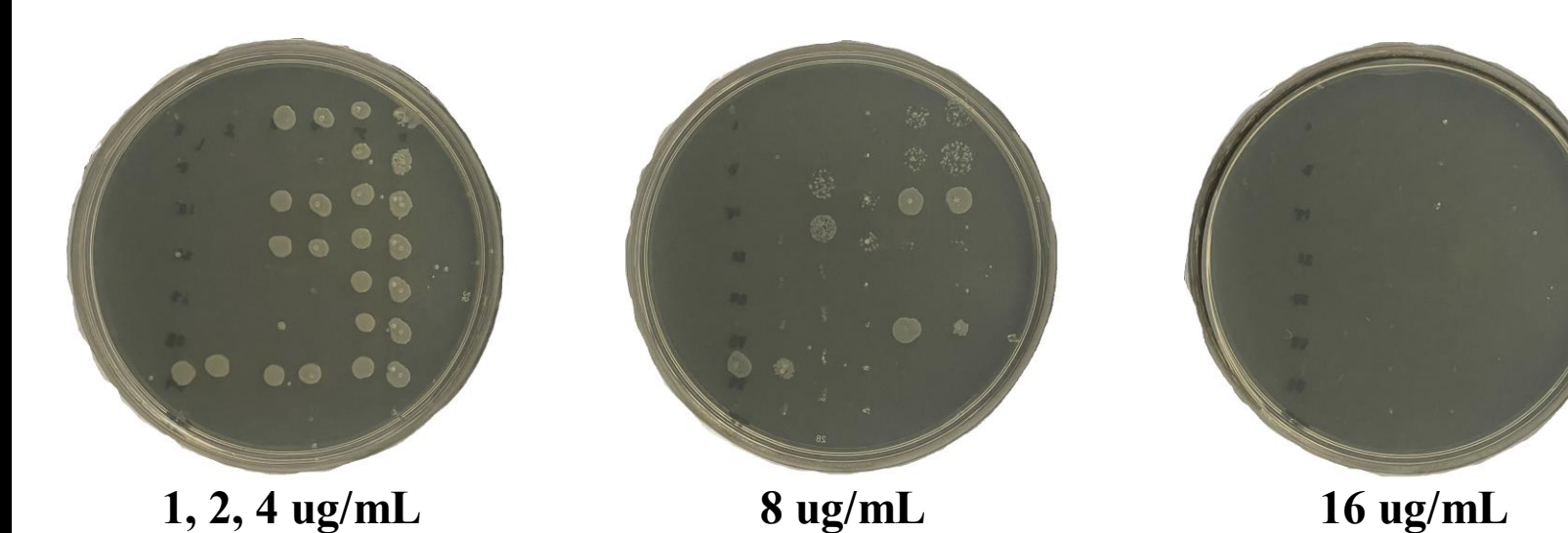


Results

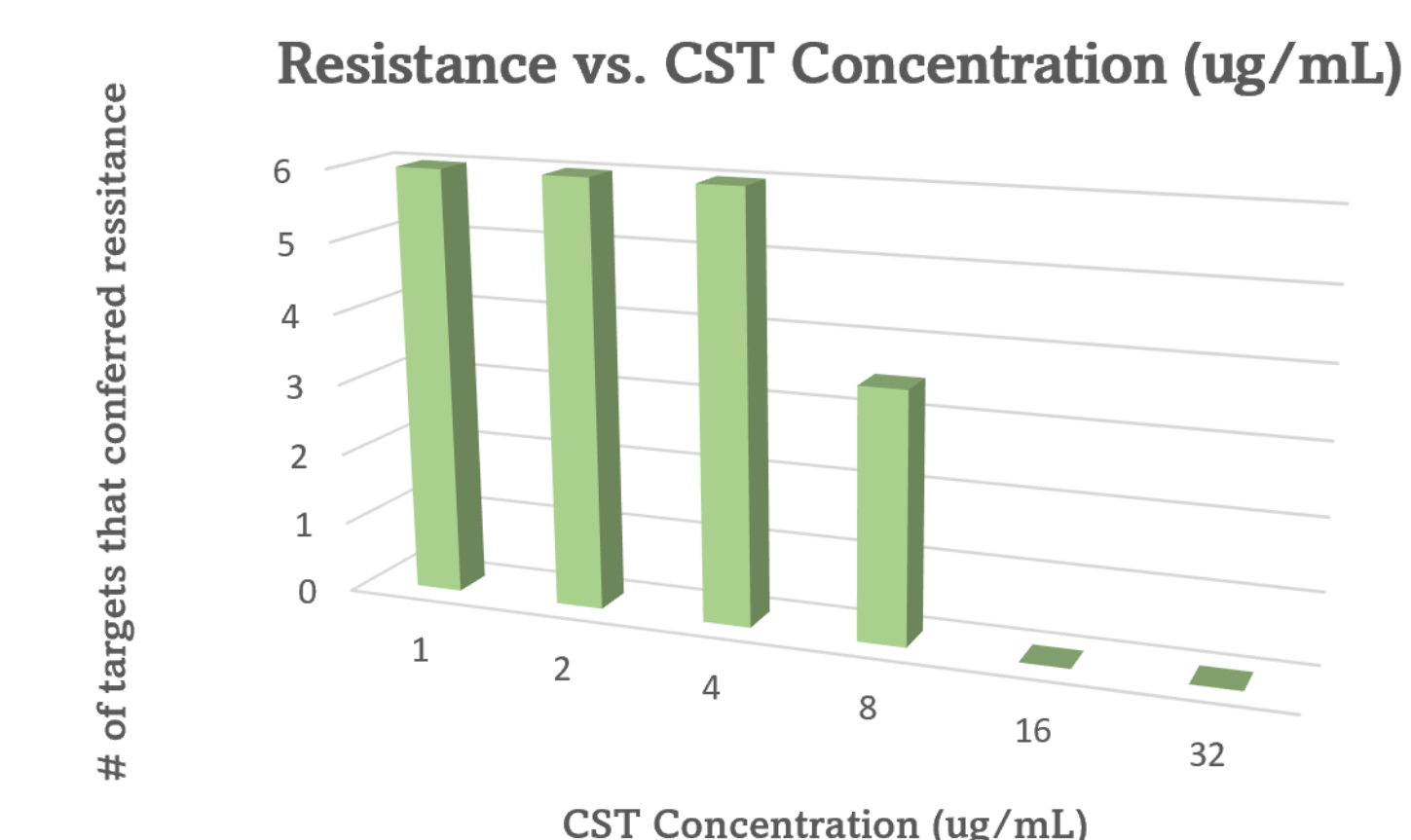
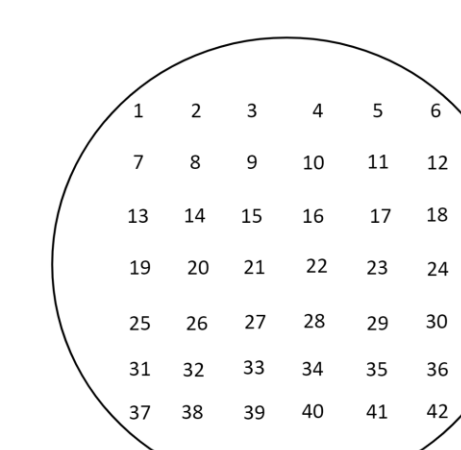
- As shown by the phylogenetic tree, all 16 genes show significant sequence similarity to each other, MCR family, and pEtN transferases which will be verified once they come back from being sequenced.



Targets that grew	# on plate	Concentration ug/mL					
		1	2	4	8	16	32
CST 2	3-6	*	*	*	*		
CST 4	7-10						
CST 5	11-14	*	*	*	*		
CST 6	15-18	*	*	*	*		
CST 7	19-22	*	*	*	*		
CST 8	23-26	*	*	*			
CST 9	27-28						
CST 11	29-32	*	*	*			
CST 13	33-34				*		
CST 14	35-38	*	*	*	*		
CST 16	39-42	*	*	*	*		



- The Microbroth Dilution



- The Agar Dilution Assay shows that a majority of the metagenomic inserts have resistance up until 8 ug/mL, and some even up to 16 ug/mL.

Rationale

- The death toll attributable to antimicrobial resistance is estimated to be 10 million a year in 2050.
- Our findings contribute to surveillance monitoring that is vital for measuring the spread of resistance and demonstrate the consequence of prophylaxis treatment.
- What can be done to curb this ever-expanding issue is through acquiring knowledge of new resistance genes to potentially design antibiotics bacteria cannot resist.

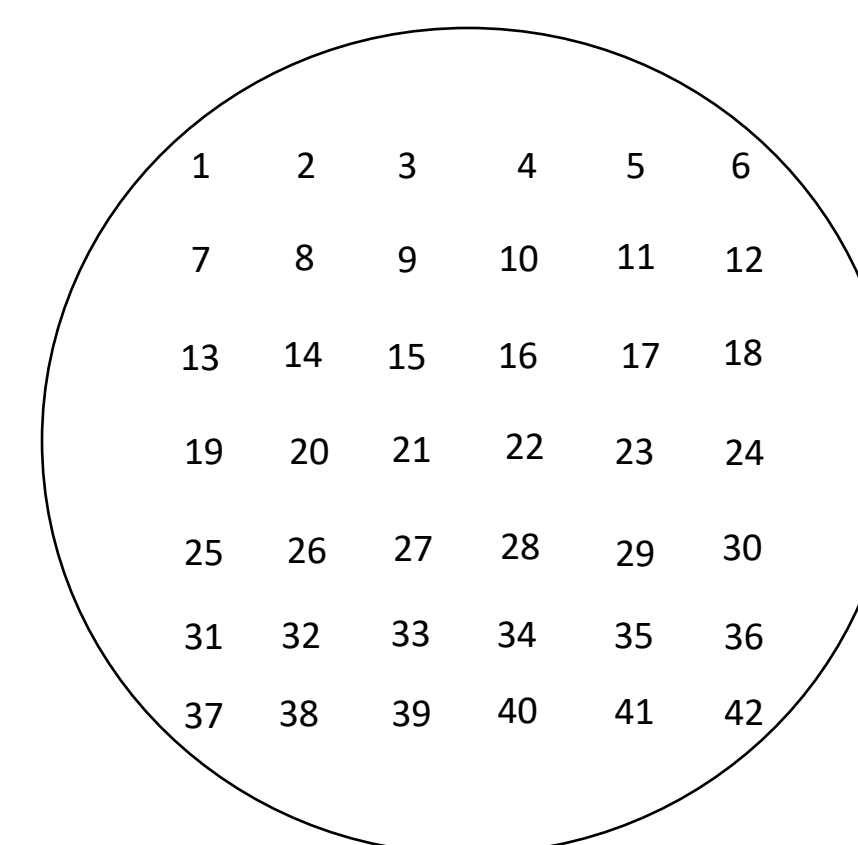
Future Work

Biochemical analyses

- The functioning capacity of microbes and microorganisms are limited in vitro.
- Although *E.coli* expression gives important biological information regarding the function of the gene, it does not fully reflect activity in the gene's original host.
- This raises the question as to whether *E.coli* is able to express foreign genes to their fullest potential.
- Further work includes protein purification for analysis of enzyme characteristics.

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A circle containing a 6x6 grid of numbers. The numbers are arranged in six rows and six columns, starting from 1 in the top-left corner and increasing sequentially to 42 in the bottom-right corner.

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42