

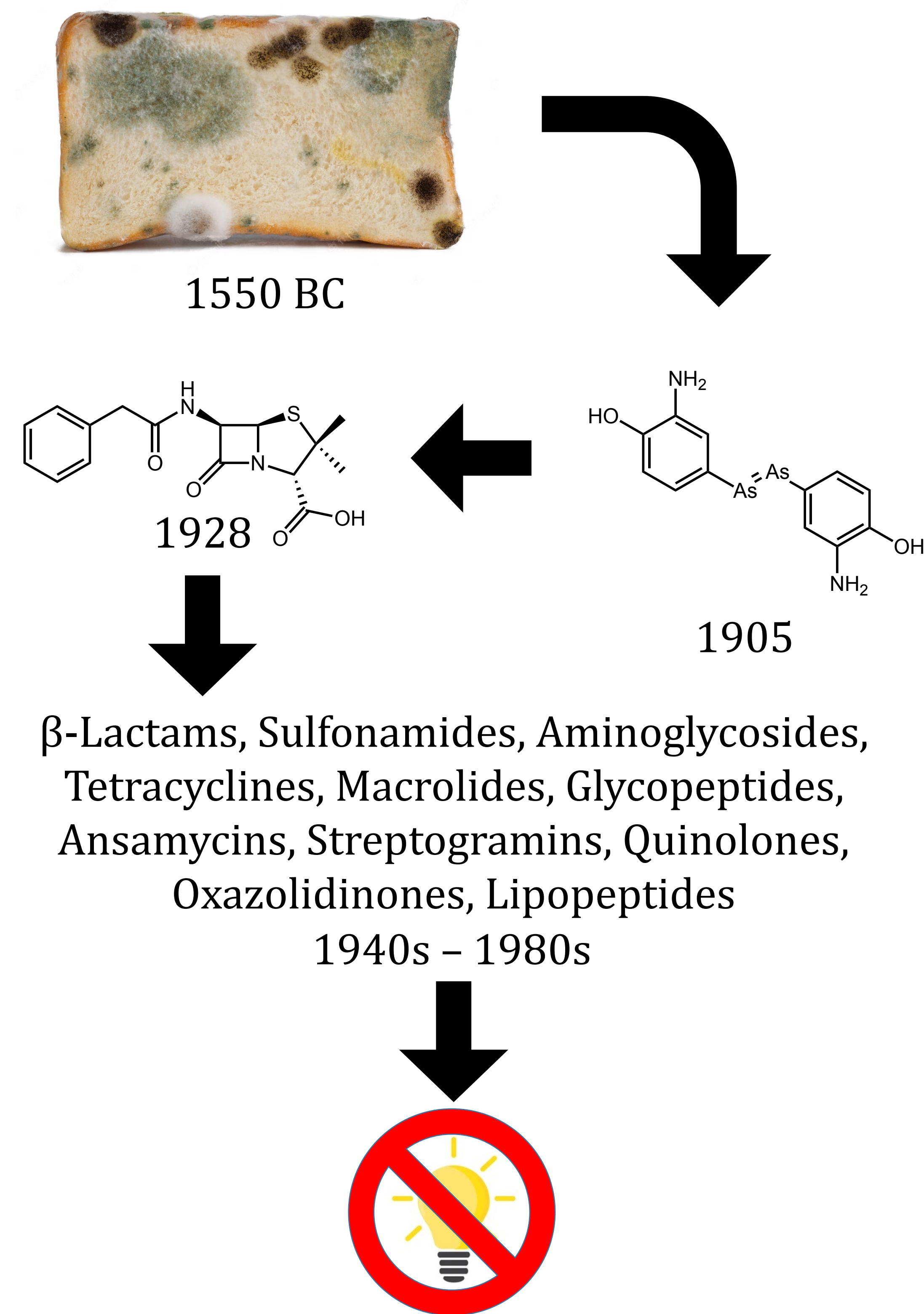
How Tacos and Tortillas can Shape Antibiotics

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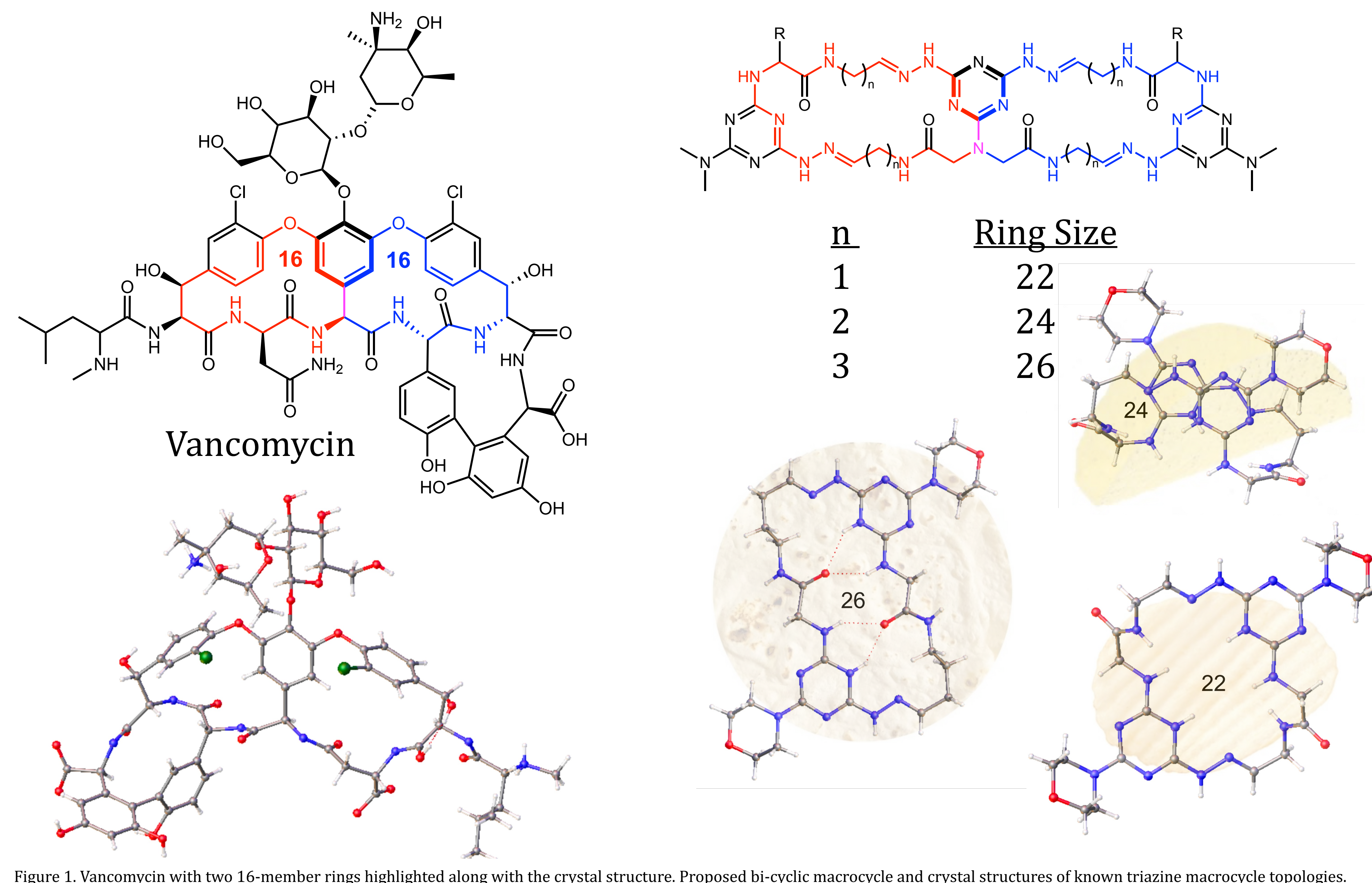
History of Antibiotics¹



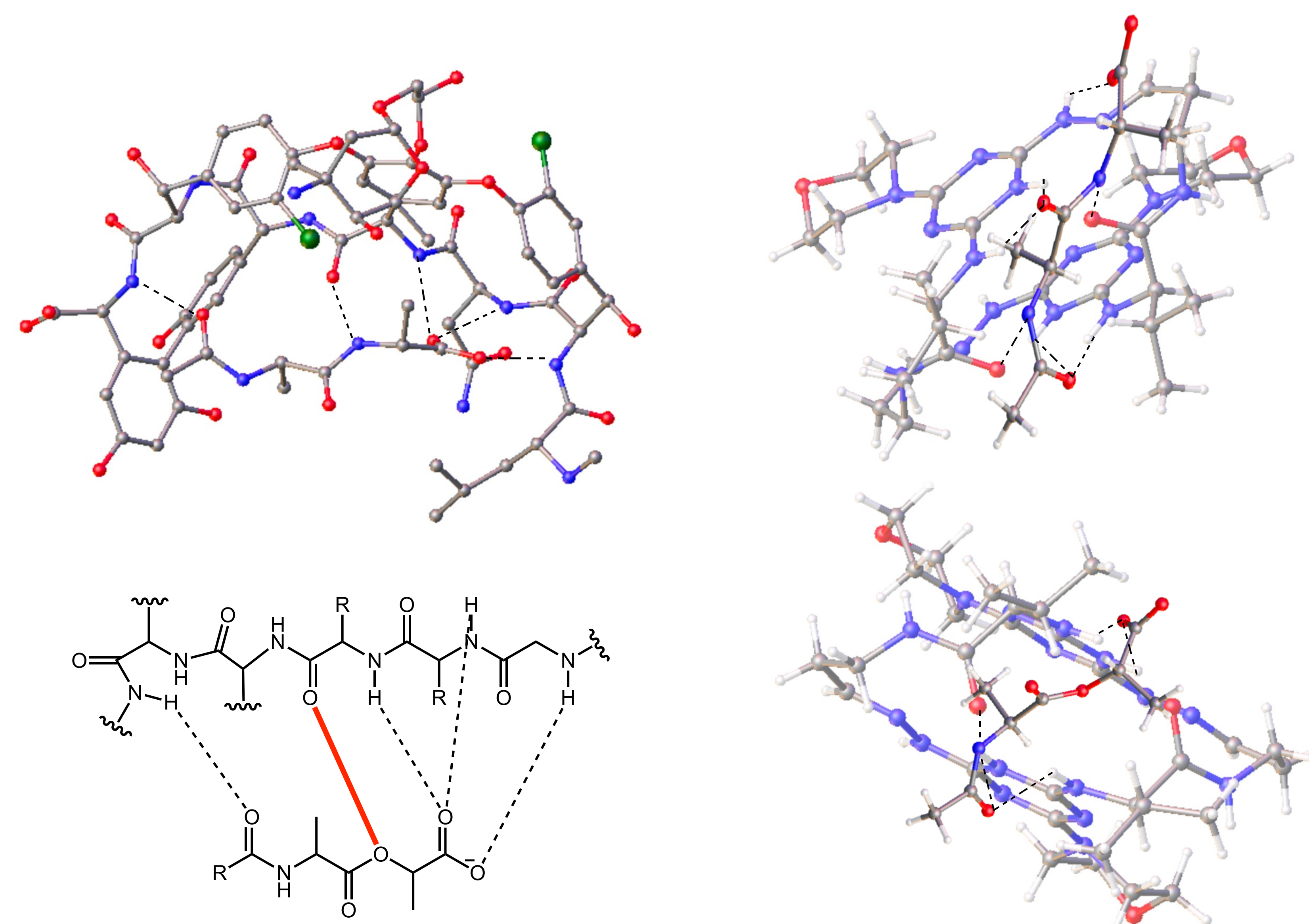
Causes of Antibiotic Resistance

- 55% of antibiotics developed in 1930s to 1960s were all from one genus: actinomycete natural products
- Last class of antibiotics discovered in 1980
- Patients often do not finish treatments allowing bacteria to evolve
- Vancomycin has high binding affinity with D-Ala-D-Ala in peptidoglycan with 5 hydrogen bonds
- When peptidoglycan terminates in D-Ala-D-Lac, only four hydrogen bonds exist with lone-pair repulsion preventing binding

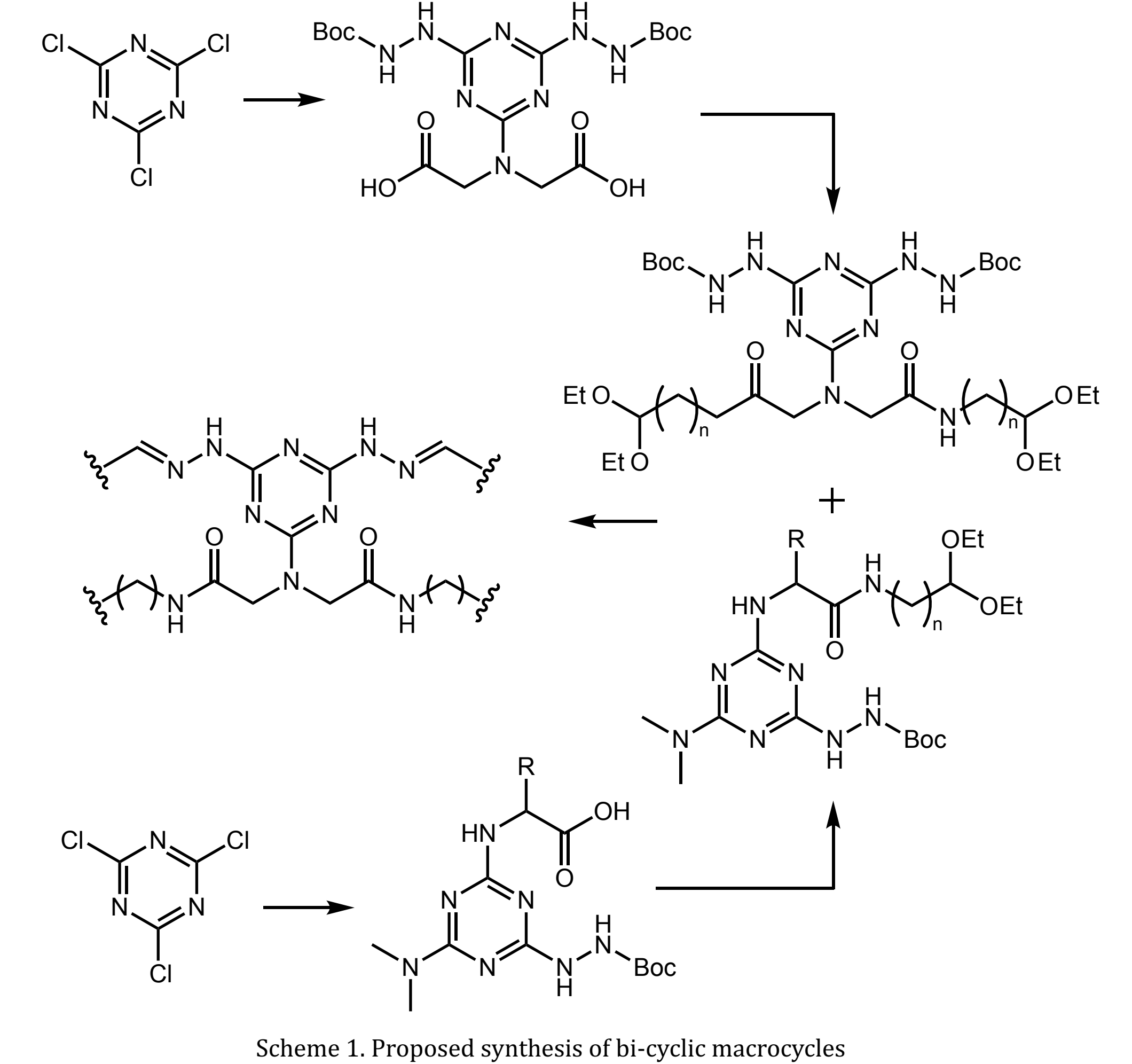
Topology Driven Research^{2, 3}



Targeting Antibiotic-Resistant Bacteria



Synthesis of Bi-cyclic Macrocycles



Future Work

- Synthesize Bis-hydrazine core
- Determine solution and solid-state structures via NMR and XRD experiments
- Perform docking of peptidoglycan termini

Acknowledgements

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References

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