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**ARCS Scholar Northside Hospital Award**

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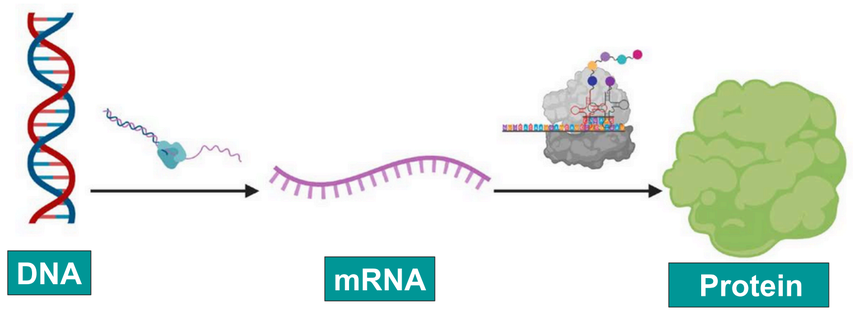
# A Structural Snapshot of the Thiostrepton-Resistance Methyltransferase (Tsr) Bound the 70S Ribosome

I am using cryogenic electron microscopy (cryo-EM) to define the molecular interactions between the ribosomal RNA (rRNA) methyltransferase Tsr and the 70S ribosome. Tsr causes resistance to the antiobiotic thiostrepton, so understanding the molecular basis for rRNA methylation by Tsr brings us one step closer to combatting antibiotic resistance.

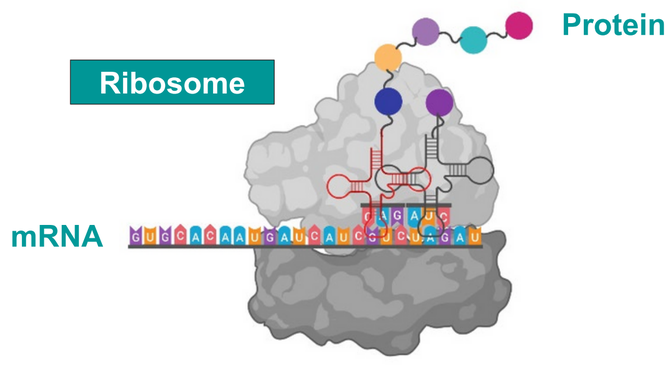
Genetic information is converted into functional products through a process called **gene expression**.



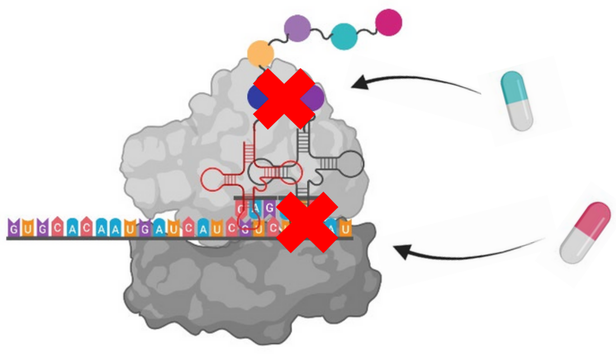

which includes

**Enzymes**

During gene expression, the information stored in mRNA is converted into a protein by the **ribosome**

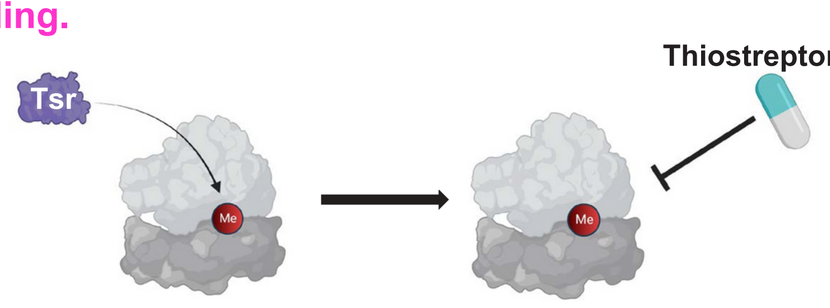



More than **half** of current **antibiotics** target the ribosome.



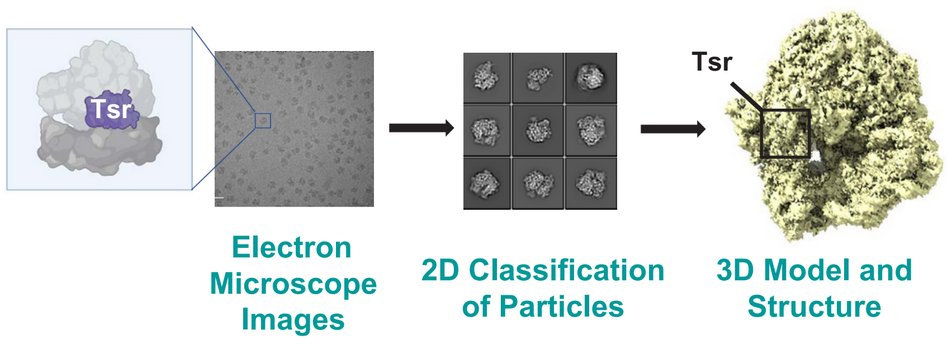
By interfering with **protein synthesis** or **mRNA decoding**, antibiotics effectively kill bacteria.

Bacteria can develop**resistance** to antibiotics by modifying the ribosome at sites that **block antibiotic binding.**

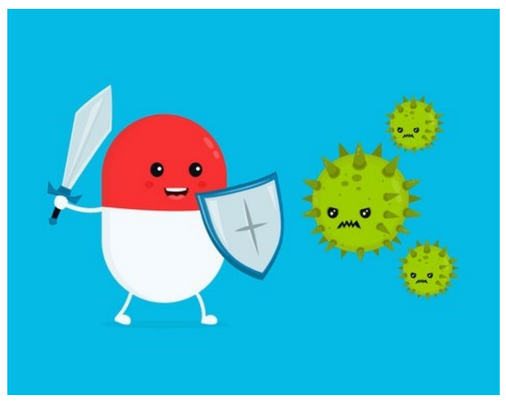



These modifications are placed by enzymes that modify ribosomal RNA, including **thiostreptonresistanceRNA methyltransferase (Tsr)**

We use structural biology approaches, including cryogenic electron microscopy (**cryo-EM**) to get a **structural snapshot** of how rRNA methyltransferases, including **Tsr**, interact with the ribosome.




Understanding how the rRNA methyltransferases interact with the ribosomal RNA brings us one step closer to **breaking resistance**caused by these modifications.

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**Scholar Awards Celebration**
**November 17, 2022**