December 2024

December 20-25: Brainstormed project ideas; finalized research topic on circadian rhythm and gut health.

December 26-30: Researched basic background information on circadian rhythm, gut microbiota, and metabolism.

January 2025

January 2-5: Research on circadian regulation and gut microbiota.

January 6-10: Researched meal timing on gut bacteria.

January 11-15: Collected data on the impact of circadian disruptions on metabolism.

January 16-20: Read existing studies on jet lag and effects of shift work on metabolism.

January 21-25: Completed hypothesis and defined major research questions.

January 26-30: Rough draft of methodology and research plan.

February 2025

February 1-5: Researched metabolic hormones (insulin, leptin, ghrelin) and circadian rhythm association.

February 6-10: Researched probiotic and dietary intervention research on gut function.

February 11-15: Researched change in gut microbiota due to circadian disruption.

February 16-20: Researched association between obesity, diabetes, and change in gut microbiota.

February 21-25: Wrote introduction and literature review for project report.

February 26-29: Began organizing data and findings into presentation format.

March 2025

March 1-5: Completed basic project info and intro and working on completing research portions.

March 6-10: Working on main research (body)

March 11-15: Finishing up towards the end of body, and starting conclusion

March 16-20: Last-minute adding information and completing declerations; completed project

BACKGROUND RESEARCH:

CIRCADIAN RHYTHM INFO -

Circadian Rhythm: Changes that occur in every living being's system, in the course of a 24 hour cycle. Every tissue/organ has its own circadian rhythm.

Influenced by: Stress, Light/Dark, Food, Physical activity, Temperature, Social environment

What CR influences: Sleep patterns, Hormone release, Appetite and digestion and Temperature.

How are CR's controlled? Through a **biological clock**.

Biological Clock: An organism's timing for certain activities throughout the day. Ex: Keep you awake, energized, when you feel drowsy, going to the bathroom. Made of proteins that interact inside the body. The clock creates circadian rhythm and is responsible for its timing.

Links:https://www.ncbi.nlm.nih.gov/books/NBK519507/#:~:text=Circadian%20rhythm%20is%20the%2024,Earth's%20rotation%20around%20its%20axis.

https://my.clevelandclinic.org/health/articles/circadian-rhythm#:~:text=What%20is%20circadian%20rhythm?,hormones%2C%20digestion%20and%20body%20temperature.

https://www.healthline.com/health/healthy-sleep/circadian-rhythm#:~:text=Your%20circadian%20rhythm%20is%20your%20body's%20natural%20way%20of%20keeping,reviewed%20on%20January%2022%2C%202025

3https://www.sciencedirect.com/topics/immunology-and-microbiology/circadian-rhythm#:~:text=Circadian%20rhythms%20are%20cycles%20of,temperature%20that%20pervade%20the%20biosphere.

4https://www.uclahealth.org/medical-services/sleep-medicine/patient-resources/patient-education/circadian-rhythms#:~:text=Circadian%20rhythms%20are%20regulated%20by,other%20parts%20of%20the%20brain.