Cornell Guided Notes

Genetics of Disease (Medical Interventions) | 2027-02-24

Name	Period	Date	Lesson
		2027-02-24	

Lesson focus

Disk diffusion and MIC lab

Key words and questions	Prepared details and student notes
Essential question **What is today's target?**	Run a disk-diffusion test and connect zone of inhibition to minimum inhibitory concentration. Big idea: How does the size of a clear zone around an antibiotic disk tell you how effective that drug is against a bacterium? **My notes, examples, and questions**
Key words **What vocabulary unlocks the lesson?**	- antibiotic - bacteriostatic - bactericidal - MIC - zone of inhibition - resistance - plasmid **My notes, examples, and questions**

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Cornell Notes - Continued

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Must-know ideas **What should I understand by the end?**	- The Kirby-Bauer disk diffusion test measures antibiotic effectiveness by placing antibiotic-impregnated disks on a bacterial lawn and measuring the clear zone that forms. - The zone of inhibition is the area around the disk where bacteria could not grow; a larger zone indicates the antibiotic diffused farther and was effective at lower concentrations. - The minimum inhibitory concentration (MIC) is the lowest concentration of an antibiotic that prevents visible bacterial growth; a larger zone correlates with a lower MIC. **My notes, examples, and questions**
Process notes **What happens during class?**	- 0-8 min: Don goggles and gloves; confirm plate is labeled with the antibiotic abbreviation for each disk location - 8-22 min: Using aseptic technique, place antibiotic disks on the bacterial lawn at the labeled positions - 22-30 min: Set plate to incubate (inverted); write in notebook what a clear zone will indicate - 30-50 min: After incubation (or using pre-incubated plates): measure each zone of inhibition in millimeters with a ruler - 50-65 min: Rank antibiotics by zone size from largest to smallest; record in a data table - 65-80 min: Define MIC in notebook; write one sentence connecting larger zone to lower MIC and greater effectiveness **My notes, examples, and questions**

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Steps and evidence **What do I do and turn in?**	- Put on goggles and gloves and confirm your plate is labeled with each antibiotic disk. - Place antibiotic disks on the bacterial lawn using aseptic technique. - Set the plate to incubate and write what a clear zone around a disk will mean. - Once zones form, measure each zone of inhibition in millimeters. - Rank the antibiotics by zone size and relate larger zones to greater effectiveness. - Define MIC and explain how a larger zone hints at a lower MIC. Evidence: Data table - Disk-diffusion data table: antibiotic name, zone of inhibition measurement (mm), and effectiveness ranking; plus one sentence connecting zone size to MIC. **My notes, examples, and questions**
Checks for understanding **How do I know I got it?**	- You will be able to set up a disk-diffusion test safely. - You will be able to measure a zone of inhibition. - You will be able to relate zone size to MIC and effectiveness. **My notes, examples, and questions**

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Lab or safety notes
What must I handle carefully?

Safety:
- Goggles and gloves on before opening any bacterial culture material; keep on until cleanup is complete.
- Treat all bacterial materials as biohazardous: no contact with skin, eyes, or mouth.
- Open plate lids only briefly and only near the workspace; do not talk, sneeze, or cough over an open plate.
- Incubate plates inverted (lid down) to prevent condensation dripping onto the lawn.
- Before disposal: flood plates with 10% bleach solution and seal in a biohazard bag; autoclave if available.

Supplies:
- Pre-poured Mueller-Hinton agar plates with bacterial lawn (one per group)
- Antibiotic disks (at least three different antibiotics, labeled by class or abbreviation)
- Sterile forceps or disk dispenser for placing disks
- Incubator set to appropriate temperature (37C for common lab strains)
- Ruler or calipers for measuring zones of inhibition in millimeters
- Permanent marker for labeling plates
- Nitrile gloves (at least one pair per student)

My notes, examples, and questions

Summary

Today's lesson focused on Disk diffusion and MIC lab. The main target was: Run a disk-diffusion test and connect zone of inhibition to minimum inhibitory concentration. The evidence of learning is Data table: Disk-diffusion data table: antibiotic name, zone of inhibition measurement (mm), and effectiveness ranking; plus one sentence connecting zone size to MIC.. In my own words, the most important idea from today is:

My summary

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My final question or connection