

The Wipe on the Wall

Presented by:

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Metrex Infection Prevention Advisor



FYI's... and CE Credit Info

- There will be a Q&A at the end of the course, so be sure to write down your questions!
- We will provide the link to the Metrex Survey at the end of the presentation.
- To receive CE credit, you must complete the Metrex Survey by next **Friday - June 16, 2023.**
- After completing the Metrex Survey, your internet browser will automatically redirect you to our CE provider's google doc, which you will need to fill out to request your CE credit.

FYI's... and CE Credit Info

- Upon completion of the google doc, Terri Goodman & Associates (CE provider) will send an email (with the email provided) which contains a link to complete the post-class evaluation & then you may download your CE Certificate.
- This presentation has been approved for 1.0 contact hours by Terri Goodman & Associates, CE Provider # CEP 16550 as an approved provider by the California Board of Nursing.
- **All queries about CE credit should be directed to:
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SPEAKER DISCLOSURE



- “The Wipe on the Wall”
- Sharon Ward-Fore, MS, MT(ASCP), CIC, FAPIC
- Independent Infection Prevention Consultant – SWF Consulting
- Paid Consultant for Metrex Research, LLC., an Envista Holdings Corporation
- This presentation makes no clinical recommendations but does reference recommendations pertaining to current practices.

Objectives

- Explain the importance of disinfectants.
- Explain why no disinfectant wipe can have every organism on its label.
- Describe how antibiotic resistance differs from resistance to disinfectants.
- Determine the best disinfectant for your facility using a Questionnaire and Risk Assessment.







Disinfectants & Surface Disinfection

Disinfectants & Surface Disinfection

A chemical substance that destroys or inactivates various life forms (bacteria and viruses) on inanimate surfaces, but not necessarily spores.

ection - a
ivate pathogens
usually hard, non-
S.

Surface disinfectants
treated as
pesticides.



HAIs are the #1 preventable cause of death

Cleaning

Cleaning - the process of using water and a product like soap or detergent to remove debris from a surface.



Cleaning should include the **mechanical action of scrubbing the object.**

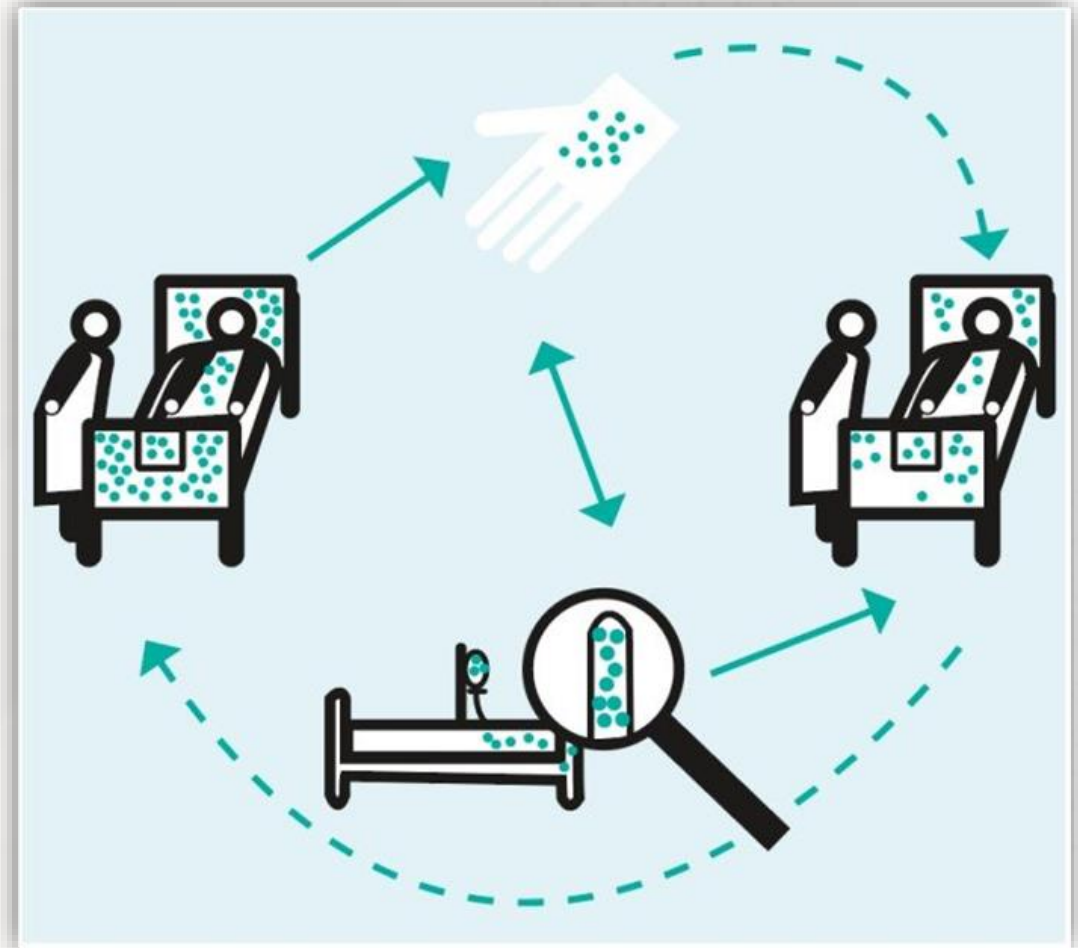
Cleaning needs to take place before disinfection can happen.

How Surfaces Transmit Organisms

Surfaces can become contaminated with microorganisms and potential pathogens from patients/staff/visitors.

The transfer of pathogens from environmental surfaces is largely due to hand contact with the surface (frequently touched surfaces).

Touching a contaminated surface can lead to cross contamination of patient care items, other environmental surfaces, self-contamination, and possible infection if you touch your face, mouth, or eyes.



Organism Survival on Surfaces



- Healthcare surfaces are often contaminated with pathogens that can serve as a pathway for cross-contamination.
- Pathogens can survive on surfaces from hours to months.
- A 2008 study evaluated surfaces at 36 acute care hospitals and found that about 48% of all environmental surfaces were effectively cleaned.

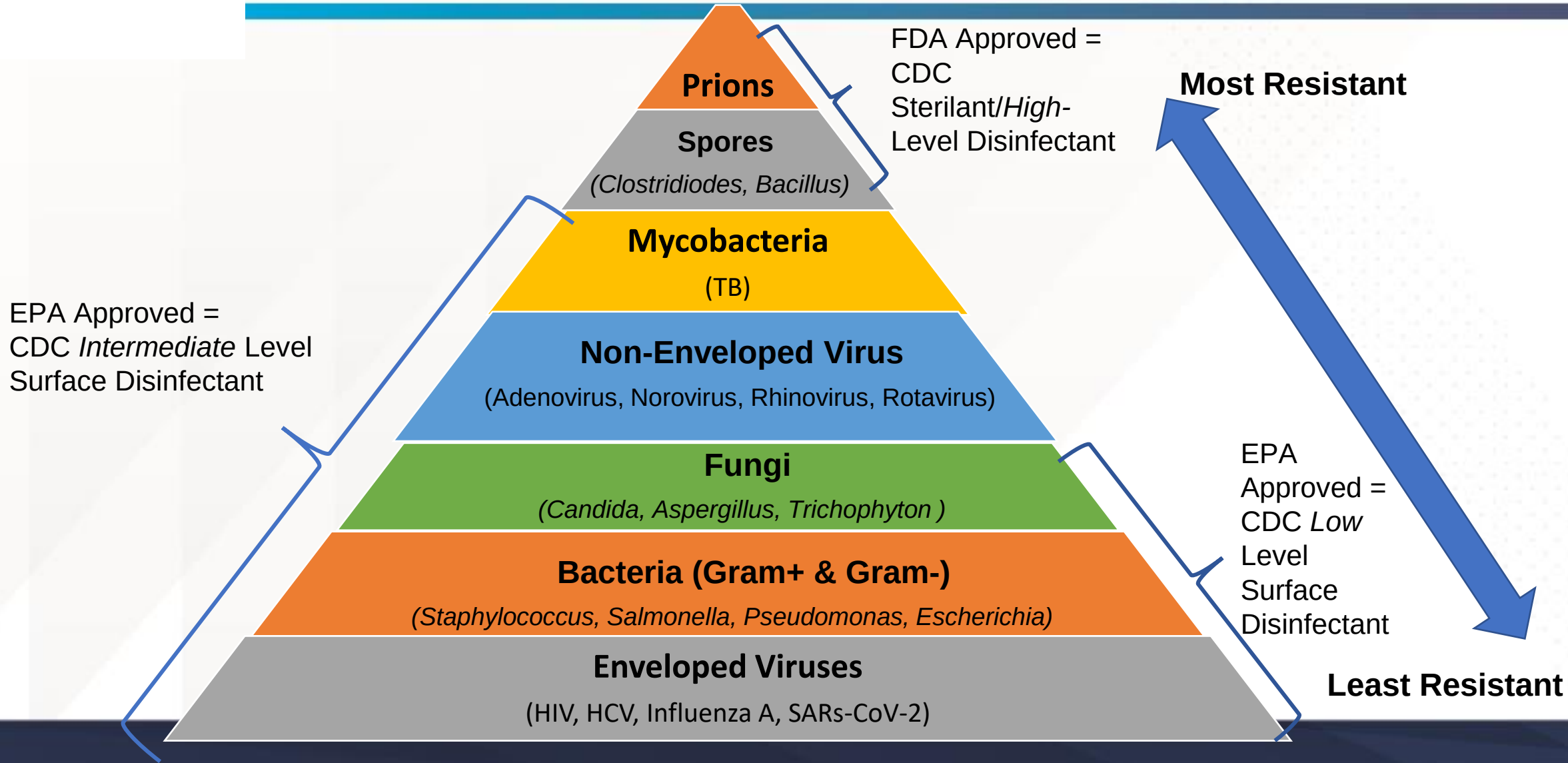


Surface Disinfection Levels

Spaulding Classification Determines Disinfection Level

Patient Contact	Examples	Device Classification	Minimum Disinfection Level
Intact Skin		Non-Critical	Low Level or Intermediate Level Disinfection
Mucous Membranes or non-intact skin		Semi-Critical	High Level Disinfection
Sterile areas of the body, vascular system		Critical	Sterilization

Spaulding Hierarchy of Organism Resistance to Disinfectants



Methods for Disinfection of Patient-Care Items and Environmental Surfaces

DEVICE CLASSIFICATION	PROCESS	LEVEL OF MICROBIAL INACTIVATION	METHOD	EXAMPLES WITH PROCESSING TIMES	HEALTHCARE APPLICATION EXAMPLES
NON-CRITICAL	Intermediate-Level Disinfection	Destroys vegetative bacteria, mycobacteria, most viruses, most fungi but not bacterial spores	Liquid contact	EPA-registered hospital disinfectant with tuberculosis activity label claim contact time	Noncritical patient care item (ex. BP cuff) or surface (ex. bedside table) with visible blood
NON-CRITICAL	Low-Level Disinfection	Destroys vegetative bacteria, some fungi and viruses but not mycobacteria or bacterial spores	Liquid contact	EPA-registered hospital disinfectant with no tuberculosis activity label claim contact time	Noncritical patient care item (ex BP cuff) or surface (ex. bedside table) with no visible blood



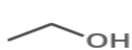
Disinfectant Chemistries

Disinfectants/Antiseptic Chemistry Summary

Key: USED FOR ANTISEPSIS USED TO DISINFECT SURFACES USED FOR STERILISATION (E.G. MEDICAL INSTRUMENTS) USED FOR PRESERVATION

ALCOHOLS

USED IN ALCOHOL-BASED SANITARY HAND GELS PRESENT IN HOSPITALS



ETHANOL



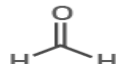
ISOPROPANOL



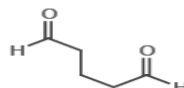
Kill many bacteria and fungi, and some viruses, when used at suitably high concentrations (usually 60-90% solution). Slow-acting, and evaporate easily, so lack residual action. Can't be used to sterilise.

ALDEHYDES

MAINLY USED FOR DISINFECTION & STERILISATION OF MEDICAL INSTRUMENTS



FORMALDEHYDE



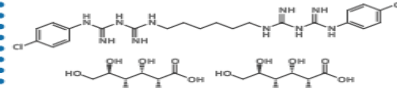
GLUTARALDEHYDE



Show broad activity against bacteria, fungi, and viruses. Not used for general antiseptics, due to their high toxicity. Due to the relatively long contact times required to disinfect, other agents are often preferred.

BIGUANIDES

USED IN CREAMS & FOR SKIN ANTISEPSIS IN SURGICAL PROCEDURES



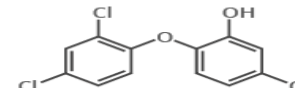
CHLORHEXIDINE DIGLUCONATE



Slow-acting, but don't evaporate easily like alcohols, so provide some residual activity. Active against most bacteria, and show some activity against fungi and viruses. Combination with alcohol increases efficacy.

BISPHENOLS

TRICLOSAN IS COMMONLY USED IN ANTISEPTIC SOAPS



TRICLOSAN



Effective against bacteria, though more so against gram-positive bacteria. There are concerns surrounding triclosan's use in soaps due to its effects on the skin, and also due to its accumulation in the environment.

DIAMIDINES

MAINLY USED FOR THE TOPICAL TREATMENT OF WOUNDS



PROPAMIDINE



Less commonly used than the other featured compounds; halogenated derivatives of these compounds can also be used. Unlike some other agents, they still work in the presence of organic matter.

HALOGEN-RELEASING

MAINLY USED FOR SURFACE DISINFECTION; FOUND IN HOUSEHOLD BLEACH



SODIUM HYPOCHLORITE



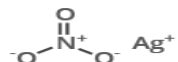
IODINE



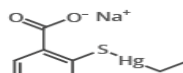
Affect bacteria, viruses, and fungi. Usually chlorine and iodine-containing compounds, with the halogens acting as oxidising agents on micro-organisms. Iodine solutions can cause irritation and staining.

METAL DERIVATIVES

RARELY USED FOR DISINFECTION, BUT CAN BE USED FOR VACCINE PRESERVATION



SILVER NITRATE



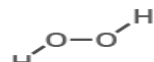
THIOMERSAL



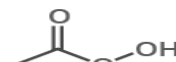
Silver salts are strongly bactericidal, and can be used to halt bacterial growth in burn wounds. Thiomersal is used as a preservative in some vaccines, and there are no causative links to any harmful effects.

PEROXYGENS

SUITABLE CONCENTRATIONS CAN BE USED FOR STERILISATION & ANTISEPSIS



HYDROGEN PEROXIDE



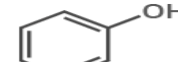
PERACETIC ACID



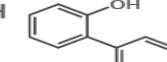
Widely used and environmentally friendly, as they decompose into safe by-products. Most solutions need stabilisers to prevent decomposition. Broad spectrum of activity. Peracetic acid is the more potent.

PHENOLICS

USED FOR SURFACE DISINFECTION IN HOSPITALS AND LABORATORIES



PHENOL



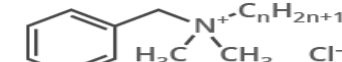
o-PHENYLPHENOL



Phenol is no longer used as it is corrosive and carcinogenic. A number of derivatives are widely used, often for sterilising surfaces. They're partly responsible for the characteristic smell of hospitals.

QUATERNARY AMMONIUM SALTS

USED IN MANY ANTISEPTIC CREAMS AND KITCHEN SURFACE CLEANERS



BENZALKONIUM CHLORIDE



Low toxicity, so can be used to disinfect surfaces in food-handling areas. Work against gram positive bacteria and gram negative bacteria, though gram negative bacteria growth in solutions is possible.



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Comparison of Different Chemistries

Chemistry	Quat-high-alcohol	Quat-low-alcohol	Quat-alcohol-free	Oxidation chemistry	Oxidation chemistry
Formulation	Quaternary ammonium >50% EtOH or IPA Neutral or high pH	Quaternary ammonium <25% EtOH or IPA Neutral or high pH	Quaternary ammonium No EtOH or IPA Low or high pH	Bleach Low or high pH	Hydrogen Peroxide Low or high pH
Applications	Sanitization Disinfection	Sanitization Disinfection	Sanitization Disinfection	Sanitization, Disinfection	Sanitization, Disinfection
Advantages	Broad spectrum Fast acting Noncorrosive	Broad spectrum Excellent cleaning Mild chemistry	Good cleaning Mild chemistry	Fast acting Broad spectrum Sporicidal	Fast acting Broad spectrum
Disadvantages	Non-sporicidal Poor cleaning Evaporate quickly Irritative	Non-sporicidal Various contact times	Non-sporicidal Limited efficacy	Poor cleaner Corrosive Inactivated by organic material	Can be unstable Odor



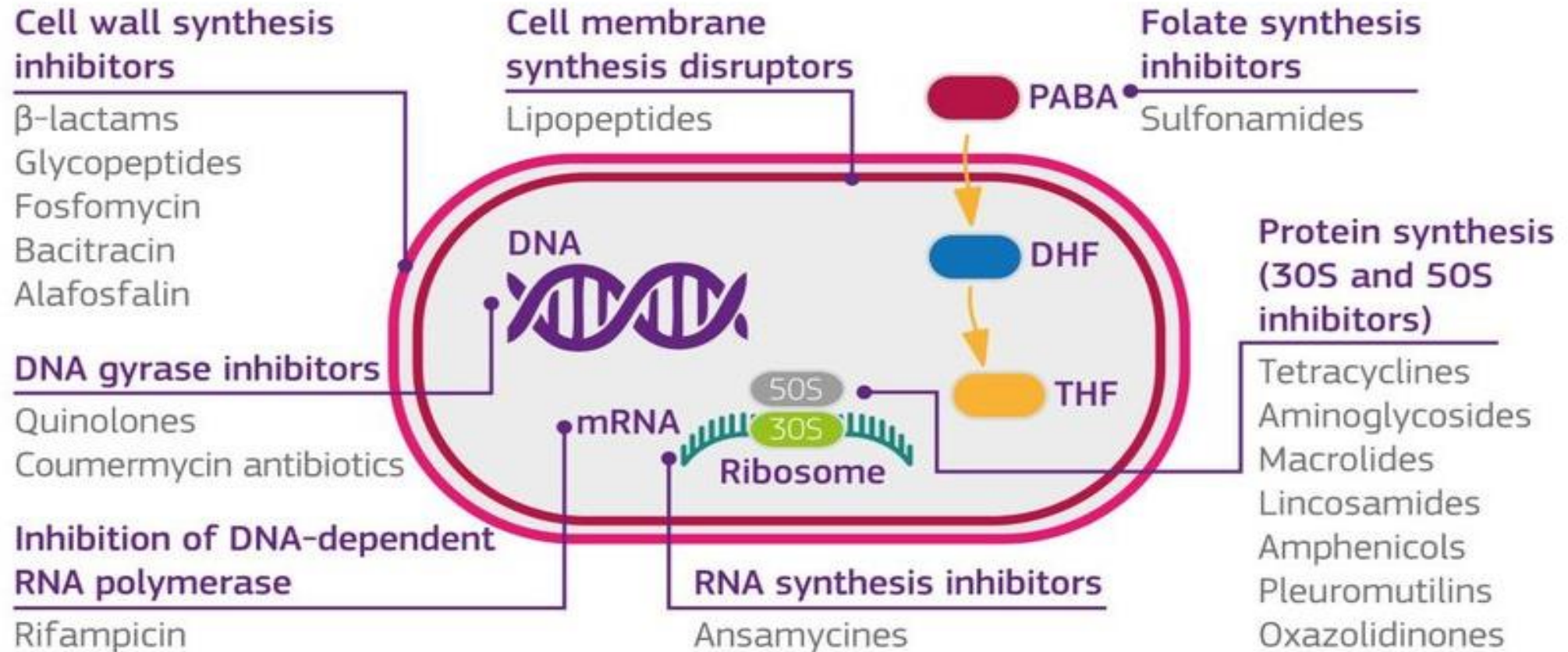
Antimicrobial Resistance

What Is Antimicrobial Resistance? (AMR)

- Antimicrobial resistance - when microorganisms (bacteria, viruses, fungi and parasite) change in ways that make the medications used to cure the infections they cause ineffective.
- 2 main ways bacterial cells acquire resistance:
 - through mutations that occur in the DNA of the cell during replication.
 - through horizontal gene transfer, where an organism gives a piece of itself to another organism.



Antibiotic Modes of Action on Bacteria



Antibiotics are selectively toxic - have a single target site in bacteria, inhibiting a specific process

How Bacteria Fight Back Against Antibiotics

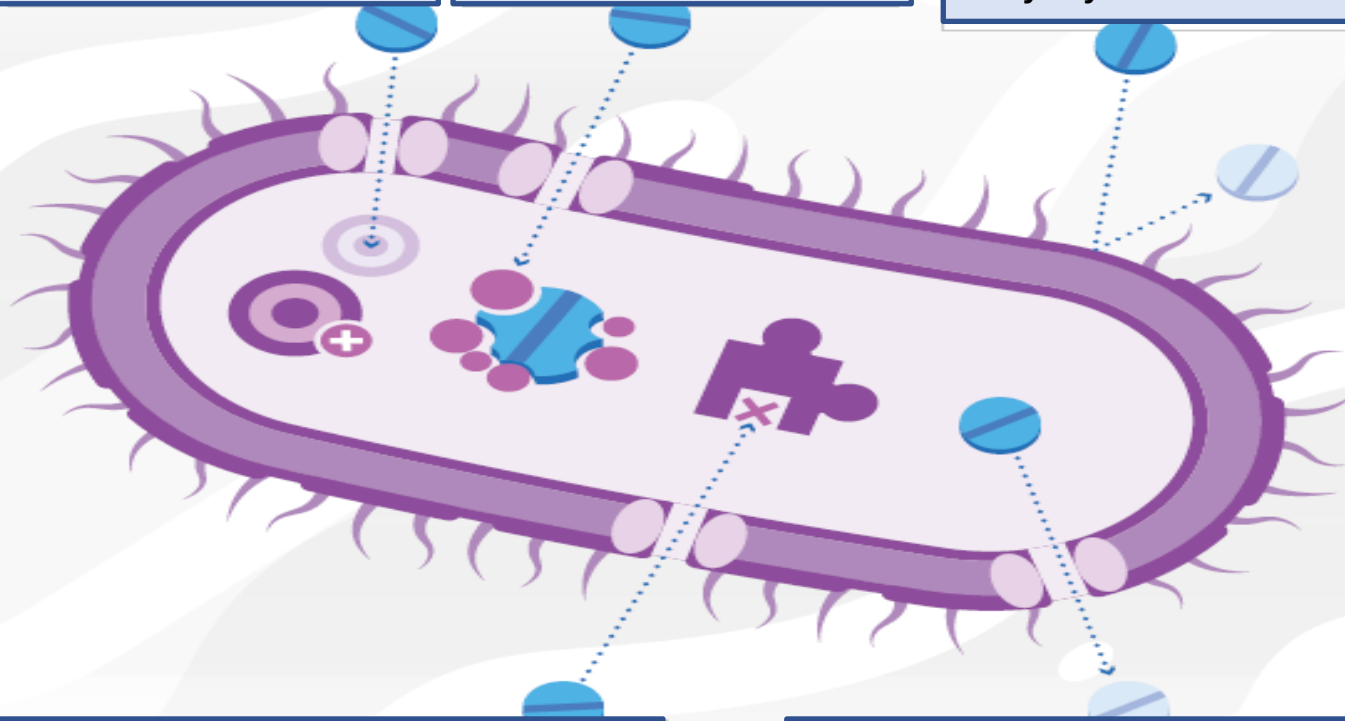
Bacteria develop new cell processes that avoid using the antibiotic's target

Bacteria change or destroy the antibiotics with enzymes – proteins that break down the drug

Bacteria restrict access by changing the entryways or limiting the number of entryways

Bacteria change the antibiotic's target so the drug can't fit and do its job

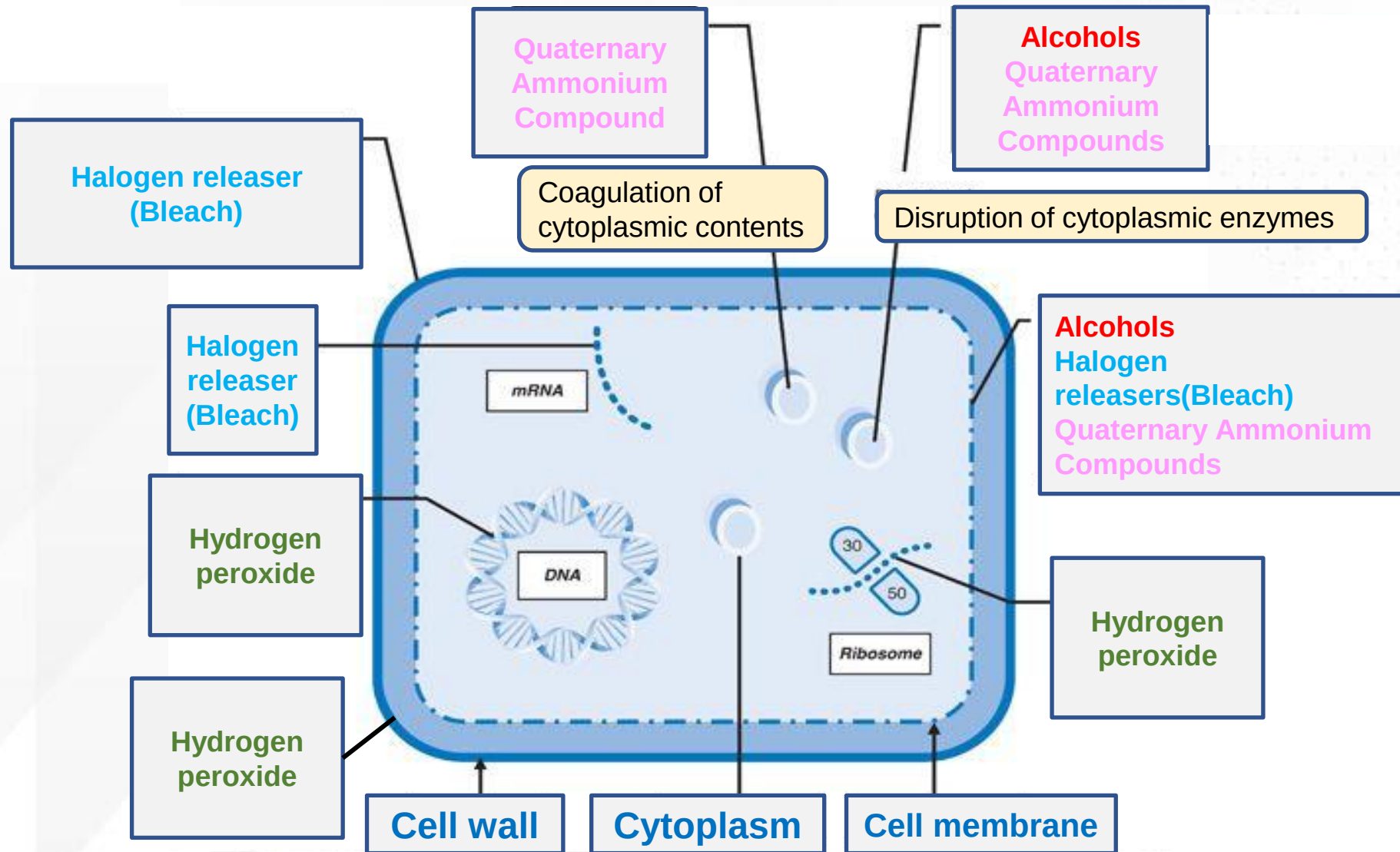
Bacteria eliminate the antibiotic by using “efflux” pumps





Disinfectant Tolerance

Cellular Targets of Disinfectants

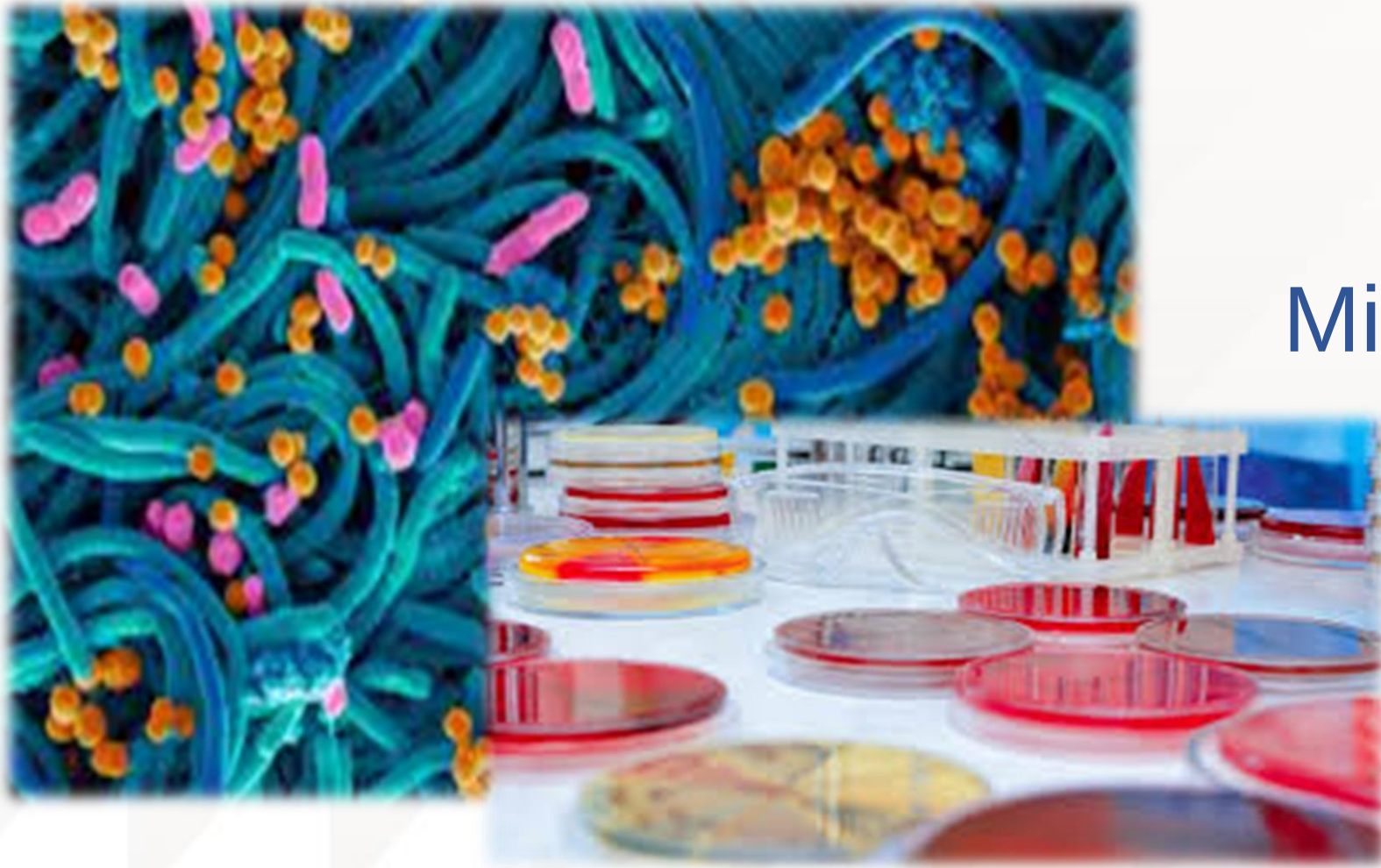


Disinfectants are *nonspecific antimicrobials* - have a variety of bacterial toxic-effect mechanisms or target sites

Summary: Disinfectant Tolerance

- Antimicrobials are selectively toxic - have a single target site in bacteria,
- Disinfectants are nonspecific antimicrobials - have a variety of bacterial toxic-effect mechanisms or target sites.
- Bacteria do not become resistant to disinfectants in the same way they do to antimicrobials.
- Common disinfectants are used at concentrations that far exceed the required minimum concentration to achieve rapid microbicidal action.
- A small increase in disinfectant tolerance, critically important to an antimicrobial, is not relevant to the effectiveness of a disinfectant.
- No data are available that show *antibiotic-resistant* bacteria are less sensitive to disinfectants than *antibiotic-sensitive bacteria*.

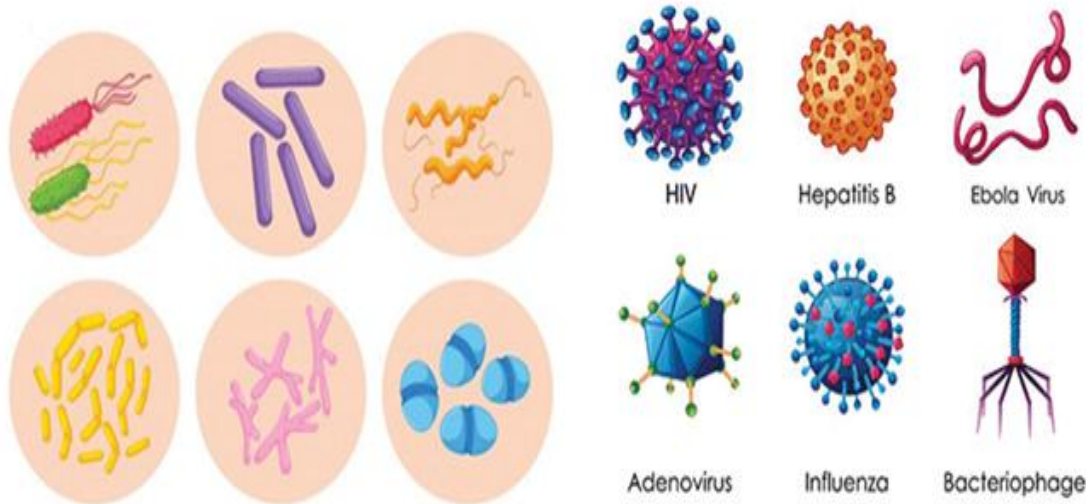




Microbiology

Basic Differences Between Bacteria and Viruses

Bacteria **VS** Virus



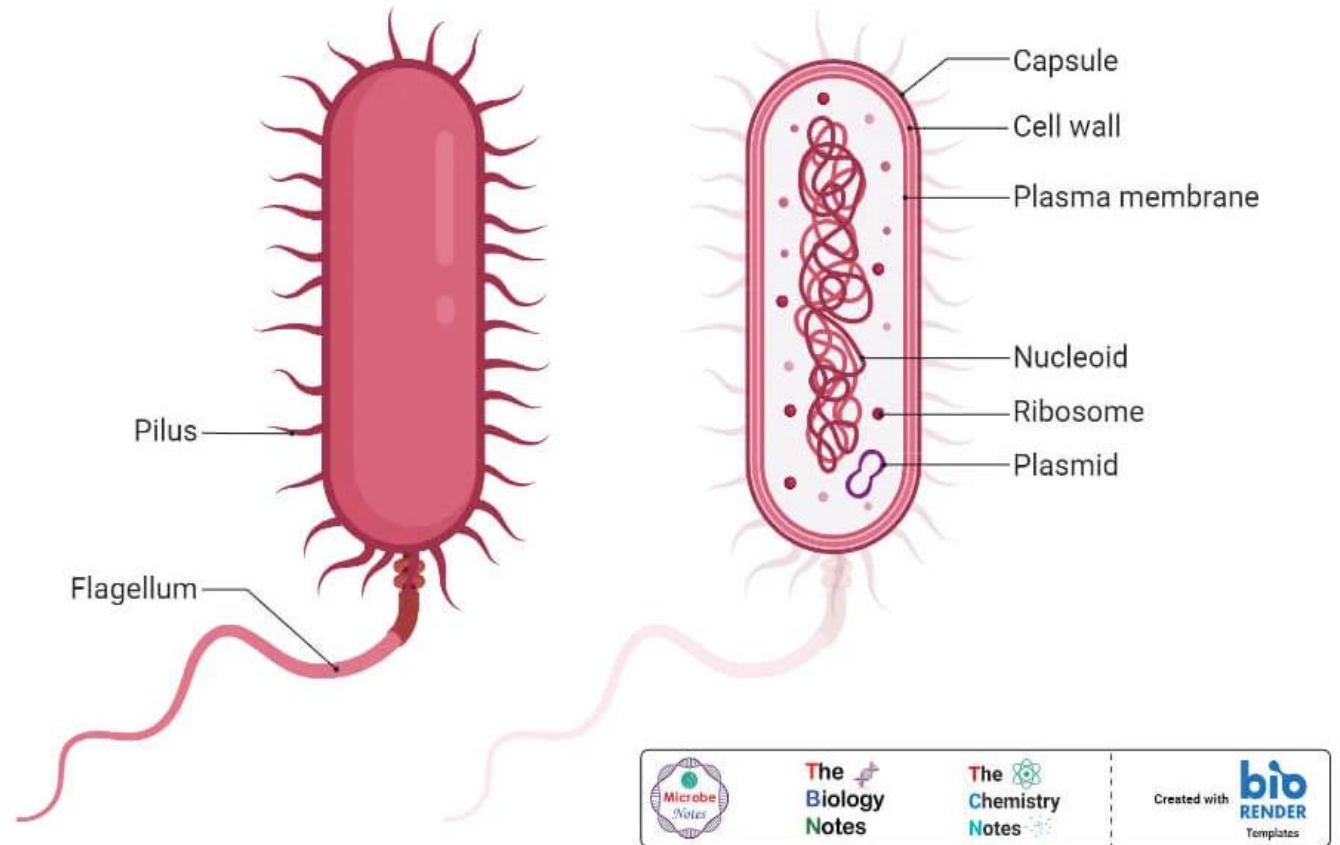
	BACTERIA	VIRUS
Cell Type	Prokaryotic	Acellular
# of Cells	Single-celled	No cell
Size	Larger than viruses (0.3-2 microns)	Minute (0.02-0.3 microns)
Shape	Cocci, bacilli, spiral, vibrio	Helical/cylindrical, Spherical, polyhedral, complex
Cell Wall	Peptidoglycan, lipopolysaccharide	No cell wall
Genome	DNA & RNA	DNA or RNA
Reproduction	Can reproduce by itself	Need a living host to reproduce

Bacterial Cell

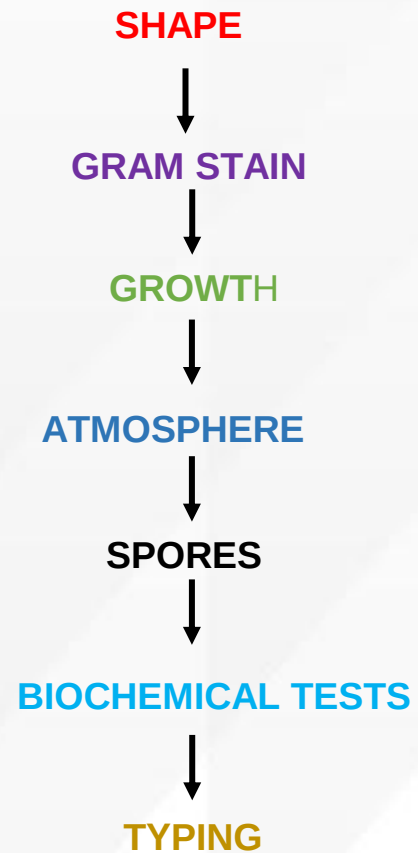
Bacteria are Prokaryotes – single cell organisms that lack membrane-bound structures like a nucleus.

Prokaryotic cells tend to be small, simple cells.

Cell wall is the outer-most layer of the cell & comes in direct contact with the environment.



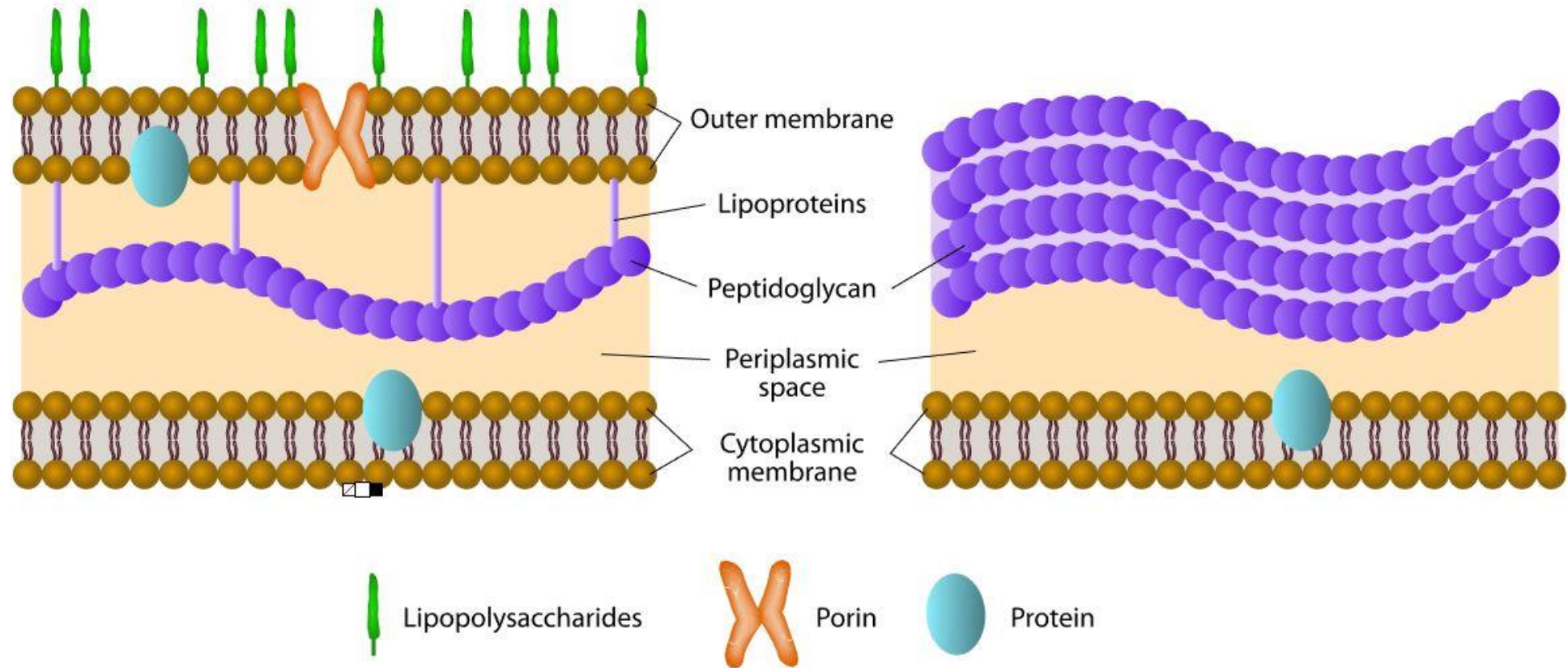
Bacterial Classification



Bacterial Cell Wall

GRAM-NEGATIVE

GRAM-POSITIVE



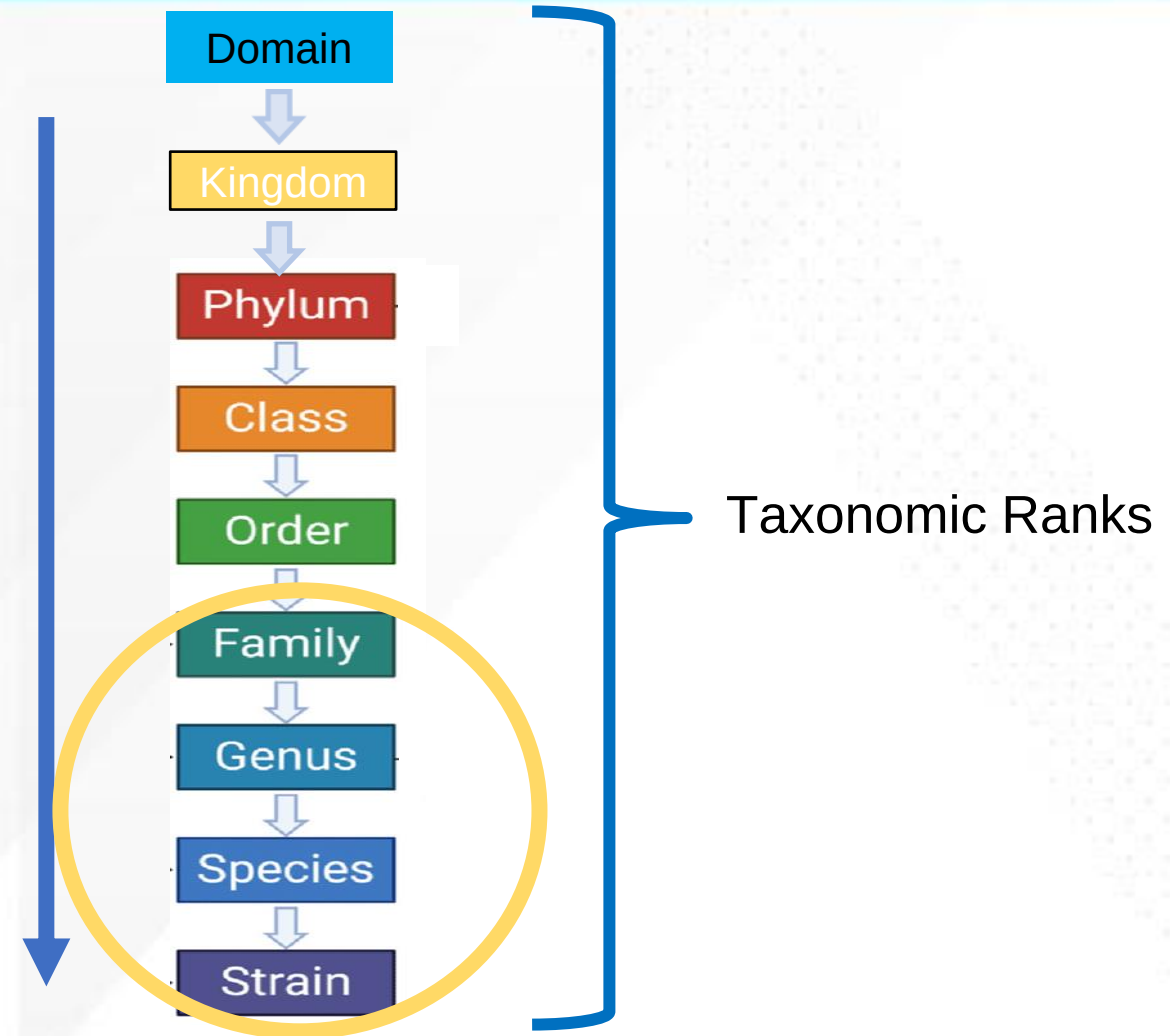
Bacterial Taxonomy

Bacterial Taxonomy – the scientific study of naming, defining and classifying groups of biological organisms based on *shared characteristics*.

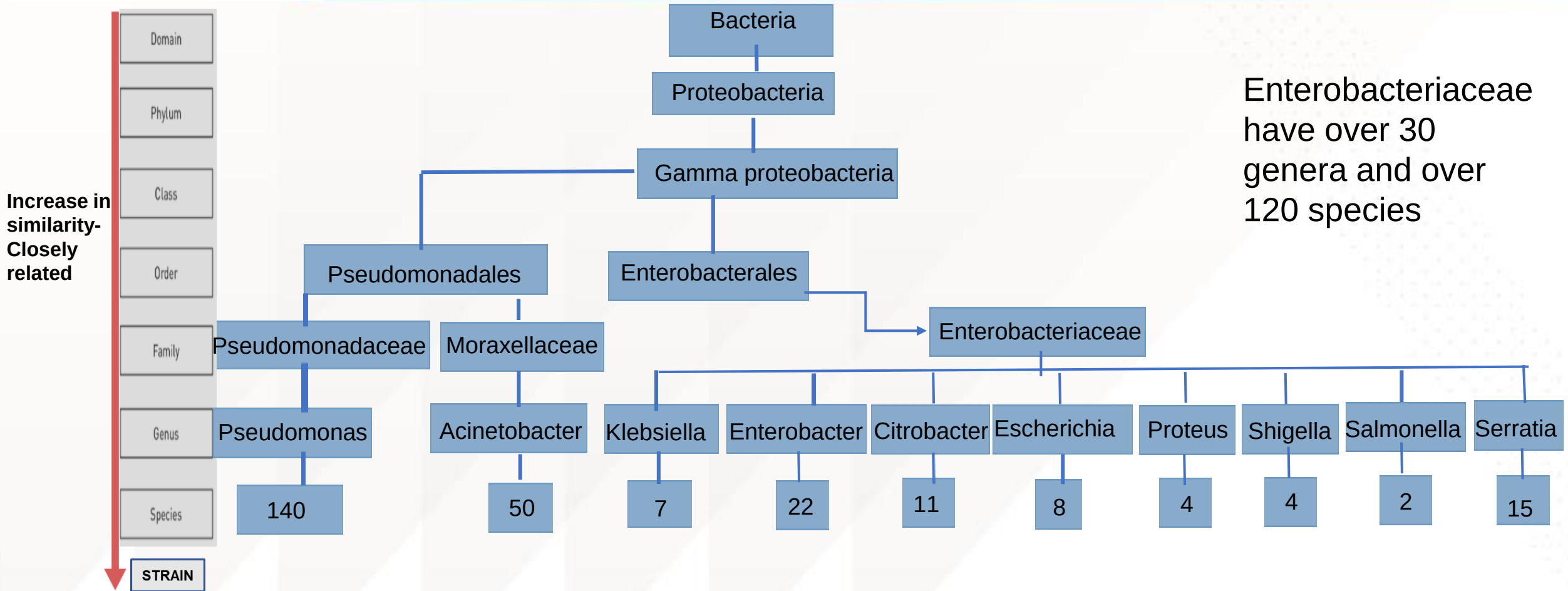
3 Components of Bacterial Taxonomy:

- Nomenclature
- Classification
- Identification

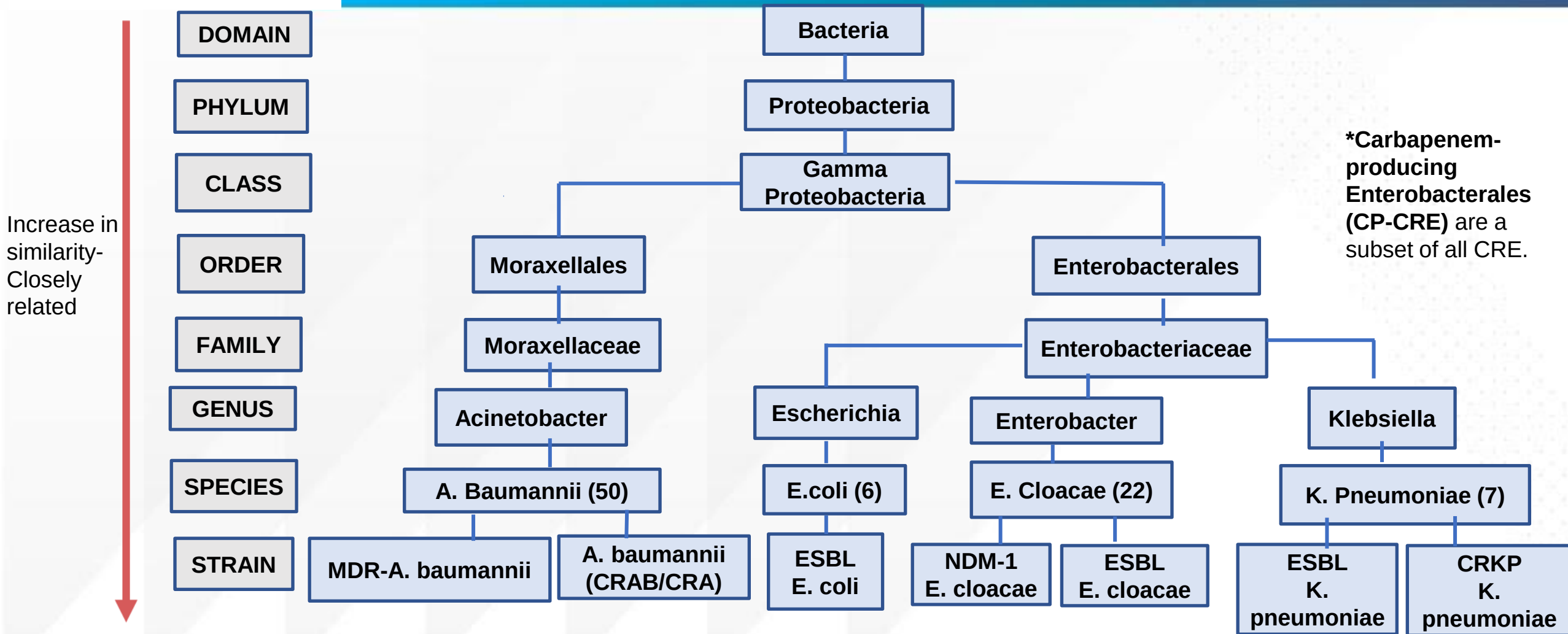
Increase in
similarity -
Closely
related



Gram Negative Bacterial Taxonomy - Example

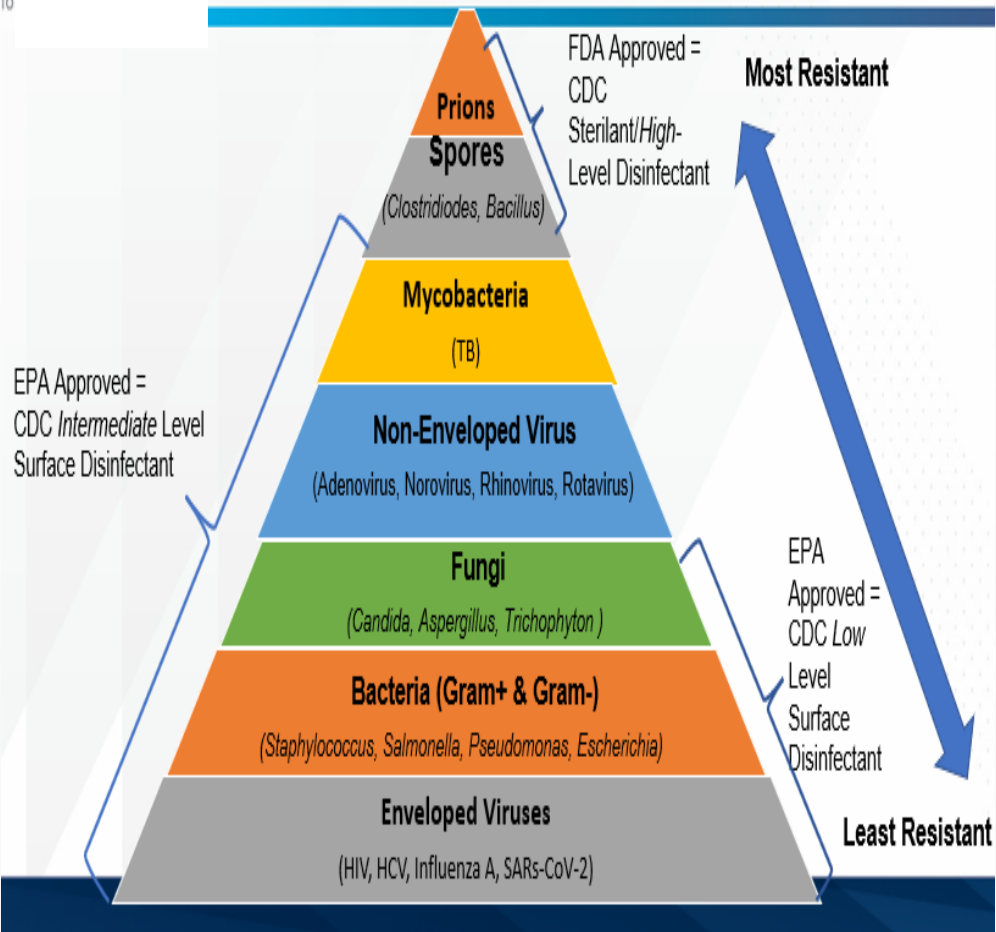


Multi-Drug Resistant Bacterial Taxonomy - Example



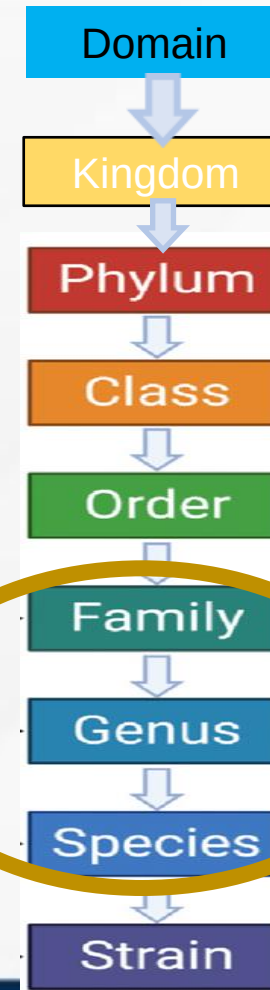
More Alike Than Different

Spaulding Hierarchy of Organism Resistance to Disinfectants

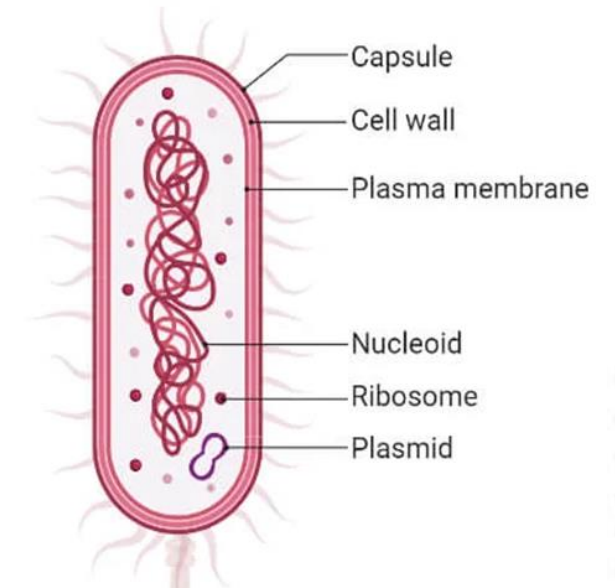


Bacterial Taxonomy

Increase in similarity - Closely related



Bacterial Cell



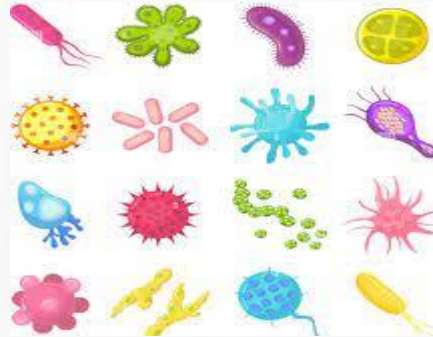
Ex .Enterobacteriaceae have over 30 genera and over 120 species



Selecting a Surface Disinfectant

Disinfectant Wipe Properties to Consider

Broad spectrum
Contact time
Remains wet
Safety-flammability; toxicity
Surface compatibility
Easy to use
Acceptable odor
Good cleaner



Broad spectrum



Good cleaning properties



Contact time



Compatibility and Aesthetics



Safety

Some Key Questions to Ask When Selecting the Ideal Disinfectant for Your Facility

*Click on this link for an
[editable copy:](#)
[SWF_Disinfectant_Risk_Assessment.xlsx](#)
[\(live.com\)](#)

CRITERIA	Question to Ask	Score (1–10) 1= lowest; 10=highest	Comments
Kill claims	Does the product kill the most prevalent healthcare pathogens, including those that:		
	• Cause most HAIs?		
	• Cause most outbreaks?		
	• Are of concern in your facility?		
Kill and wet-contact times	How quickly does the product kill the prevalent healthcare pathogens?		
	Does the product keep surfaces visibly wet for the kill times listed on the label?		
Safety	Does the product have an acceptable toxicity rating?		
	Does the product have an acceptable flammability rating?		
	Is a minimum level of personal protective equipment required?		
	Is the product compatible with the common surfaces in your facility?		
Ease of use	Does the product have an odor?		
	Is the product odor considered acceptable?		
	Does the product have an acceptable shelf life?		
	Does the product come in convenient forms to meet your facility's needs (eg, liquids, sprays, refills, multiple wipe sizes)?		
	Does the product work in the presence of organic matter?		
	Is the product water soluble?		
	Does the product clean and disinfect in a single step?		
	Are the directions for use simple and clear?		
	How and where will the product be used?		
Other factors	Does the supplier offer comprehensive training and ongoing education, both in person and virtual?		
	Does the supplier offer 24-7 customer support?		
	Is the overall cost of the product acceptable (considering product capabilities, costs of infections that may be prevented, and costs per compliant use)?		
	Can the product help standardize disinfectants used in your facility?		
	Is the product EPA registered?		
Total			

AAMI TIR 68 Low and Intermediate Level Disinfectant Risk Assessment- Example

*Click on this link for an
 editable copy:
[SWF_AAMI_Disinfectant_Risk_Assessment.xlsx](https://www.socienue.com/wp-content/uploads/n_internacionales/ni20.pdf)
 (live.com)

Risk Question	Benefit	Risk
If the patient care item is being used directly on patients, does it leave a residue?	None.	A residue can result in harm to a patient.
Is the use consistent with the written IFU from the disinfectant manufacturer?	Following the written IFU from the disinfectant manufacturer ensures the efficacy of the disinfectant.	Not following the written IFU may compromise the disinfection process. Not following the written IFU can damage the equipment.
Is the disinfectant consistent with the written IFU from the equipment/device manufacturer?	Using the disinfectant recommended for the equipment reduces damage to the equipment.	Using a disinfectant not recommended for the equipment can damage the equipment which can increase costs or the damaged equipment may have a negative impact on patient care.
Does the disinfectant release noxious fumes that could be hazardous to personnel or patients?	None.	Irritating fumes can be harmful.
Does the healthcare facility have the ability to store and use the disinfectant at specific storage conditions?	Storing the disinfectants according to the IFU will assure the disinfectant will be effective.	Failing to appropriately store the disinfectants can render the disinfectant ineffective or may cause an unsafe condition.
Is it possible to follow the wet contact time as required in the labeling?	None.	The disinfectant may evaporate quickly thus not having adequate contact time, or require re-application. Parts of the equipment may be difficult to reach or non-wetting.
Is a spill kit available to safely clean up the spilled disinfectant?	Having the correct type of spill kit available will provide the correct type of chemicals to remove the spilled chemical.	Not cleaning up or removing spilled chemicals can result in personnel or patient injury.

The Wipe on the Wall – Should be the **Best** Wipe Available

- An EPA-registered hospital disinfectant.
- Effective against pathogens that are the most common causes of HAIs, and relevant to outbreaks, unit closures, and the unique pathogens in YOUR facility.
- Consider the properties of YOUR ideal disinfectant when evaluating the wide variety of available disinfectant wipes.
- Spaulding Disinfectant Hierarchy and Bacterial Taxonomy can provide an understanding of “similarity” among bacteria, since no surface disinfectant manufacturer can test their product against all organisms.
- No data are available that show that antibiotic-resistant bacteria are less sensitive to disinfectants than antibiotic-sensitive bacteria as long as you’re following the IFU correctly.
- Bacteria do not become resistant to disinfectants in the same way they become resistant to antimicrobials.





**Thank you for
attending this
presentation.**

Any Questions?

Metrex Survey

- To be eligible for CE credit, you must complete the Metrex Survey by **Friday, June 16, 2023.**
- After completing the Metrex Survey, your internet browser will automatically redirect you to our CE provider's google doc, which you will need to fill out to request your CE credit.
- If your browser doesn't redirect you, please contact Nicole Gilbert at nicole.gilbert@envistaco.com
- Copy the link or scan the QR code to access our survey:
https://1.az1.qualtrics.com/jfe/form/SV_5b6kYspwrqwgz6S

Metrex Survey



APIC 2023 ORLANDO
ANNUAL CONFERENCE & EXPOSITION
June 26-28

Come see us at **Booth 450** to discover how
CaviWipes™ can be as **Easy as 1-2-3** for all
your disinfection needs.



CaviWipes™ HP



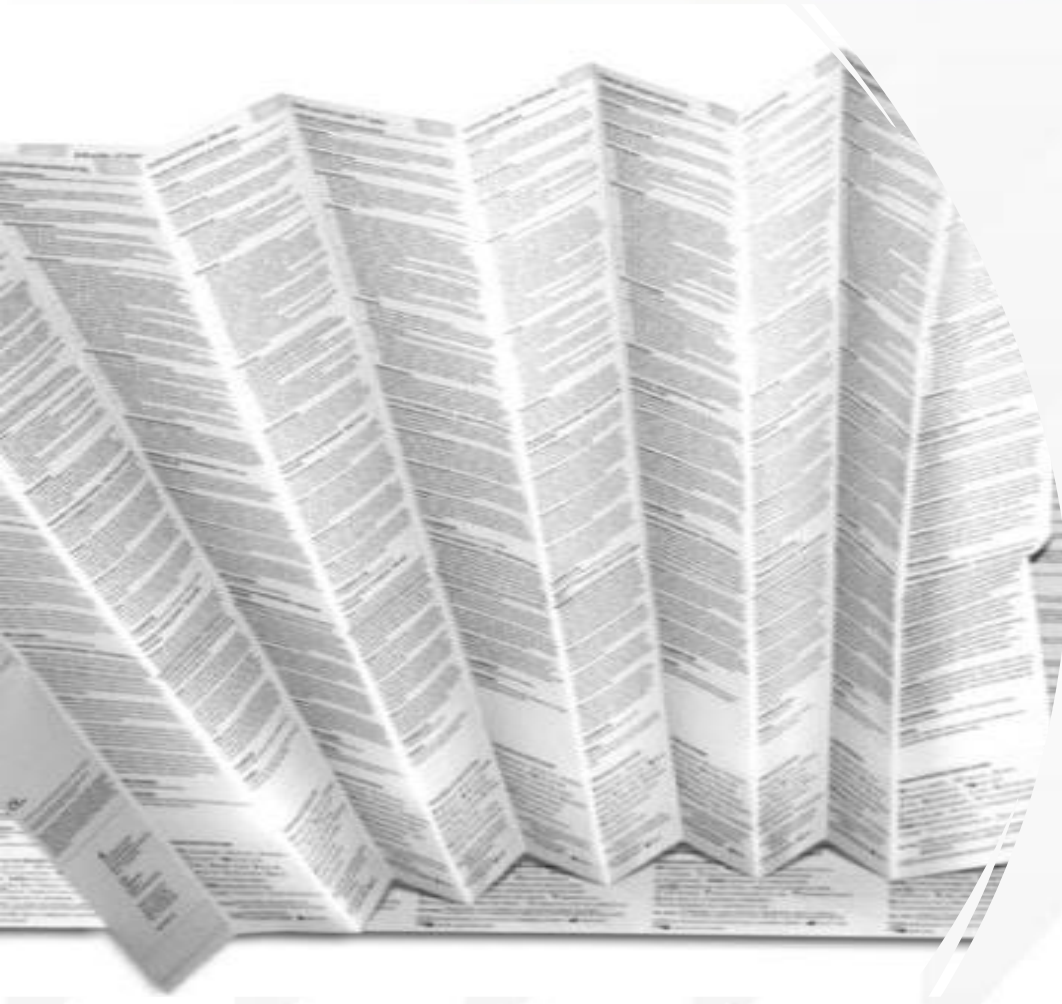
CaviWipes™ 2.0



CaviWipes™ Bleach



Visit us at Booth 450 to spin the
Metrex Wheel of Disinfection and you
can win some exciting prizes!



The FYI on IFU's

- August 25, 2023
- 12pm – 1pm EDT*
- Registration to open soon!

*Daylight Savings Time

The Wipe on the Wall-

**You're simply
the best**

**better than all the
rest**



VEED.IO

Tina Turner
RIP