4. GENUS CORYNEBACTERIUM and LISTERIA – MEDICAL RELEVANT BACTERIA

Genus	Corynebacterium		Listeria
Species	***Corynebacterium* diphtheriae**	***Corynebacterium* pseudodiphtheriticum**	***Listeria* monocytogenes**
Distinguishing Features	**1. Motility (-)** **2. Sugar fermentation** - Mal: (+) - Suc: (-) - Glu: (+) **3. Nitrate Reduction (+)** **4. Urease (-) – NO Pink** **5. Definintive diagnosis requires testing for toxicgenicity by guinea pig injection OR Elek Test**	**1. Motility (-)** **2. Sugar fermentation** - Mal: (-) - Suc: (-) - Glu: (-) **3. Nitrate Reduction (+)** **4. Urease (+) orange→ pink**	**1. Motility (+) – umbrella motility** **2. Sugar fermentation** - Mal: (+) - Suc: (-) - Glu: (+) **3. Nitrate Reduction (-)** **4. Urease (-) – NO pink**
Transmission and Inhabitant	**1. Upper respiratory Tract flora**	**Upper RTflora**	**1. Common environmental organism:** - usually outbreak is due to food contamination.
Diseases caused	**(**Only phage infected lysogen strain cause disease with its toxin that inhibits protein synthesis.) **1. Upper respiratory tract cell necrosis:** - pseudomembrane formation.(can peel off causing suffocation) **2. Systemic Infection:** - Toxin enter bloodstream and distributed systemically causing life threatening damage to organs: e.g. Heart damage. **Vaccine:** Toxoid(inactivated toxin with formalin-inactivated**)**		**1. Meningitis and sepsis →more worried than diarrhea(usually mild)-not checked)** - **Population at risk (Neonates, pregnant, immunocompromised)**

<table>
<tr>
<td>Clinical Specimen and Laboratory Identification</td>
<td><u>Sputum:</u>

1. <u>Motility (-)</u>
2. <u>Sugar fermentation</u>
3. <u>Nitrate Reduction (+)</u>
4. <u>Urease (-)</u>
5. <u>Classical symptoms</u>
6. <u>Color depends on media</u>:
- BA – opaque white<u>(may or may not be hemolytic)</u>:
- BA w/Tellurite – Black same for other coryneforms normal flora) non-coryneforms flora are inhibited by Tellurite.(some staph, strep, listeria can)
7. <u>Loefflers Slant</u>: Growth of C.diphtheriae and C.spp favored so predominates after 16 hrs.
8. <u>Methylene blue for Polyphosphate</u>
9. <u>Elek Test</u>
10. <u>GPR pleomorphic</u></td>
<td><u>Media</u>

<u>BA</u>→ white colony
<u>Blood Tellurite</u> → Greysih black
<u>Loeffer Slant</u> → metachromatic granules aka volutin aka polyphosphate→ Purple read-pink beads in the cell</td>
<td><u>CSF or Blood:</u>
<u>(If have GPR must R/O Listeria found in CSF or Blood.)</u>

1. <u>Motility (+)</u>
2. <u>Sugar fermentation</u>
3. <u>Nitrate Reduction (-)</u>
4. <u>Urease (-)</u>
5. <u>Color depends on media:</u>
- BA – <u>Small, translucent colony (narrow zone of B-hemolytic)</u>:

8. <u>No Methylene blue for Polyphosphate</u>
9. <u>GPRODS</u></td>
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<td><u>Morphology (what you see from Plate and Stain)</u></td>
<td colspan="2"><u>General to Genus:</u>

1. <u>Gram Positive Rods (pleomorphic) – Palisades Chinese letters</u>
2. <u>Non-sporulating</u>
3. <u>Non-motile</u>
4. <u>Gram Stain irregulary(pink or purple)</u>
5. <u>May Contain polyphosphate granules (present in C.diph)</u></td>
<td><u>Species properties:</u>

1. <u>Gram positive Rods</u>
2. <u>Non-sporulating</u>
3. <u>MOTILE</u>
4. Color depends on media:
- BA – <u>Small, translucent colony (narrow zone of B-hemolytic)</u>:</td>
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	<u>Species Properties:</u> **1. <u>Colony Color depends on media</u>:** **- BA – opaque white** **- BA w/Tellurite – Black same for other coryneforms normal flora)<u>non-coryneforms flora</u> are inhibited by Tellurite**.(some staph, strep, listeria can) **2. <u>Loefflers Slant</u>:** Growth of C.diphtheriae and C.spp favored over non corynebacterium throat flora so predominates after 16 hrs.	**<u>Species Properties:</u>** **BA w/Tellurite – Grey Black**	**5. <u>No Methylene blue for Polyphosphate</u>**
Metabolic Properties and Growth Condition	**1. <u>Facultative Anaerobe (Genus contain strict aerobes too)</u>** **2. <u>Catalase Positive – common to genus.</u>** **3. <u>All medium 35oC except motility (RT)</u>**		**<u>Species Properties:</u>** **1. Facultative Anaerobe** **2. <u>Catalase positive(common to genus)</u>** **3. <u>All medium 35o except Motility - RT</u>**
OTHERS	**<u>Other Corynebacterium spp:</u>** **1. Diphtheroids or coryneforms** =Other species, many are normal flora. (Corynebacterium spp are found in many places in nature including soil and humans flora(URT) **<u>Biochemical interpretation:</u>** **1. Nitrate Reduction Test:** - **NO3- → NO2-→→→ N2** - **(+)If NO2- present (pinkish red) after reacting with A+B, if no Pink-red can be die to 2 possibilities: Maybe reduced to N2 or other intermediate, if N2 is made no pinkish red but still NO3-(+), if see bubbles in the inverted vial** - **If <u>No GAS, No Color change</u>, make sure its negative, Add Zinc Dust to reduce NO3 to NO2 which will show up as pinkish RED (- NO3 reduction) <u>confirmation.</u>**		.