


**Koch's Postulates & Isolation Techniques**

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**Koch's Postulates & Isolation Techniques**

**Koch's Postulates**  
**Aseptic Technique**  
– **sterilization methods**  
**Isolation Techniques**

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**Koch's Postulates**

→ **rules for proving pathogenicity**

1. The suspected pathogen is always found in association with the disease.
2. The suspected pathogen must be isolated, grown in pure culture, and described.

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### Koch's Postulates

- 3. A pure culture of the suspected pathogen must be used to inoculate healthy plants to produce the same disease.
- 4. The pathogen must be reisolated in pure culture and shown to be the same.

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### Koch's Postulates



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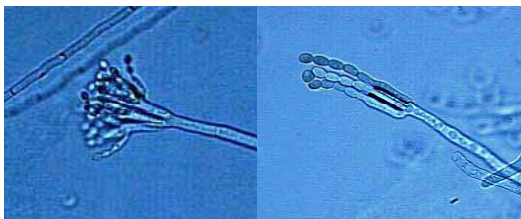
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### Koch's Postulates



*Penicillium expansum* *Penicillium digitatum*

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**Aseptic Technique**

**Sterilization**  
**Disinfection**  
**Decontamination**

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**Methods**

**Heat:**  
**Dry - 160-180°C for 1-2 hrs**  
**Moist**  
**Boiling**  
**Autoclaving = Pressure Cooking**  
**15 lbs - 15 min**

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**Methods**

**Chemical:**  
**Alcohol**  
**Hypochlorite**  
**Formaldehyde**  
**Phenol**  
**Quaternary ammonium compounds**

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## Methods

Chemical:

Fumigation

Methyl bromide

Chloropicrin

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## Methods

Filtration

Radiation

Gamma rays

Ultraviolet

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## Isolation Techniques

Direct: fungi

1. Select & remove tissue
2. Surface disinfection
3. Place on growth medium
4. Subculturing

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### Isolation Techniques - *Fungi*



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### Isolation Techniques

Dilution-streaking: bacteria

1. Select & remove tissue

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### Isolation Techniques - *Bacteria*



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## Isolation Techniques

### Dilution-streaking: bacteria

1. Select & remove tissue
2. Surface disinfection
3. Macerate tissue
4. Spread on growth medium

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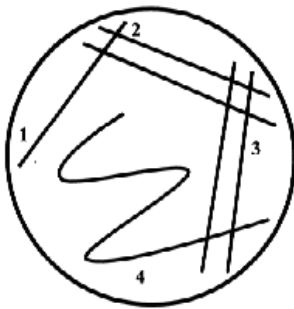
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## Dilution Streak



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## Isolation Techniques

### Dilution-streaking: bacteria

1. Select & remove tissue
2. Surface disinfection
3. Macerate tissue
4. Spread on growth medium
5. Subculturing

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## Soil Dilution-Plating

1. Mix soil with water & shake
2. Ten-fold dilution series
3. Spread on growth medium

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## Factors Affecting Growth

Medium composition  
synthetic vs. complex  
Temperature  
Oxygen  
Light

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