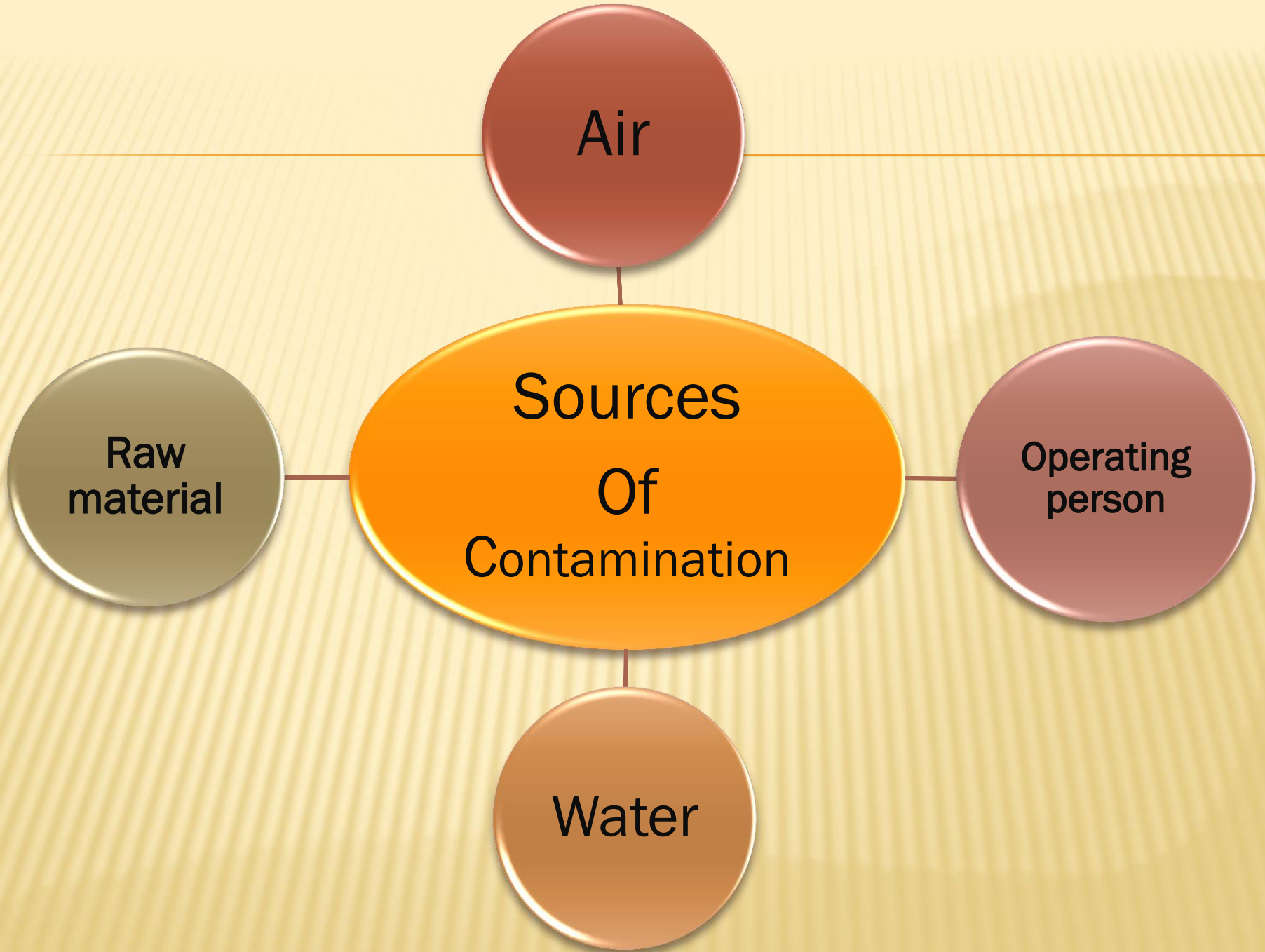


**PHARMACEUTICAL
MICROBIOLOGY**

Laboratory I

Sources of contamination of pharmaceutical products



Air

**Sources
Of
Contamination**

**Raw
material**

**Operating
person**

Water

OBJECTIVES :

- 1. To show the main possible sources of contamination of pharmaceutical products.
- 2. To show how that treatment of these sources may decrease or remove microbial contamination.

**(I) Air as a
source of
contamination**

Air isn't a natural environment for growth and reproduction of M.Os as it doesn't have the necessary amount of moisture and nutrients.

M.Os are suspended on dust particles and on droplets of moisture following talking , coughing or sneezing.

Decrease of air microbial contamination :

Chemical treatment

- Formaldehyde
- Irritant to mucosal membrane of nose and respiratory tract

UV radiation

- Active for short distance
- Harmful effect
- Low penetration power
- Not active against spores

Filteration

- HEPA filter
- Efficient
- Safe
- Low cost

EXPERIMENT

- 1- Remove the cover of a nutrient agar plate and leave it :
 - a- **On the bench**
 - b- **Near flame**
 - c- **In a laminar flow**
- 2- Close the plate , incubate at 37 ° C for 24 hrs.

(II) Water as a source of contamination

Types of water :

Tap H₂O:

for washing
of
equipments

Distilled H₂O:

Formulation of
oral & topical
preparations

Sterile H₂O:

Injection &
eye
preparation

Decrease of water microbial contamination

:

Chemical treatment

- Sodium hypochlorite & chlorine gas
- Residual effect (odor & flavor)

Filteration

- Require regular sterilization to prevent microbial colonization

UV radiation

- No odor or flavor problems
- No microbial colonization

EXPERIMENT

- 1- Transfer 0.2 ml of each type of water listed below to surface of agar plate:
 - a- **Sterile** H₂O (St.W)
 - b- **Fresh distilled** H₂O (FDW)
 - c- **Stored distilled** H₂O (SDW)
 - d- **Fresh tap** H₂O (FTW)
 - e- **Stored tap** H₂O (STW)

- 2- Spread using sterile glass rod , leave to adsorb then incubate at 37 ° C for 24 hrs.

RESULTS :

Microbial count in case of:

STW > **FTW** > **SDW** >

FDW > **St.W**

**(III) Raw material
as a source of
contamination**

Microbial contamination of :



**Natural Raw
material**

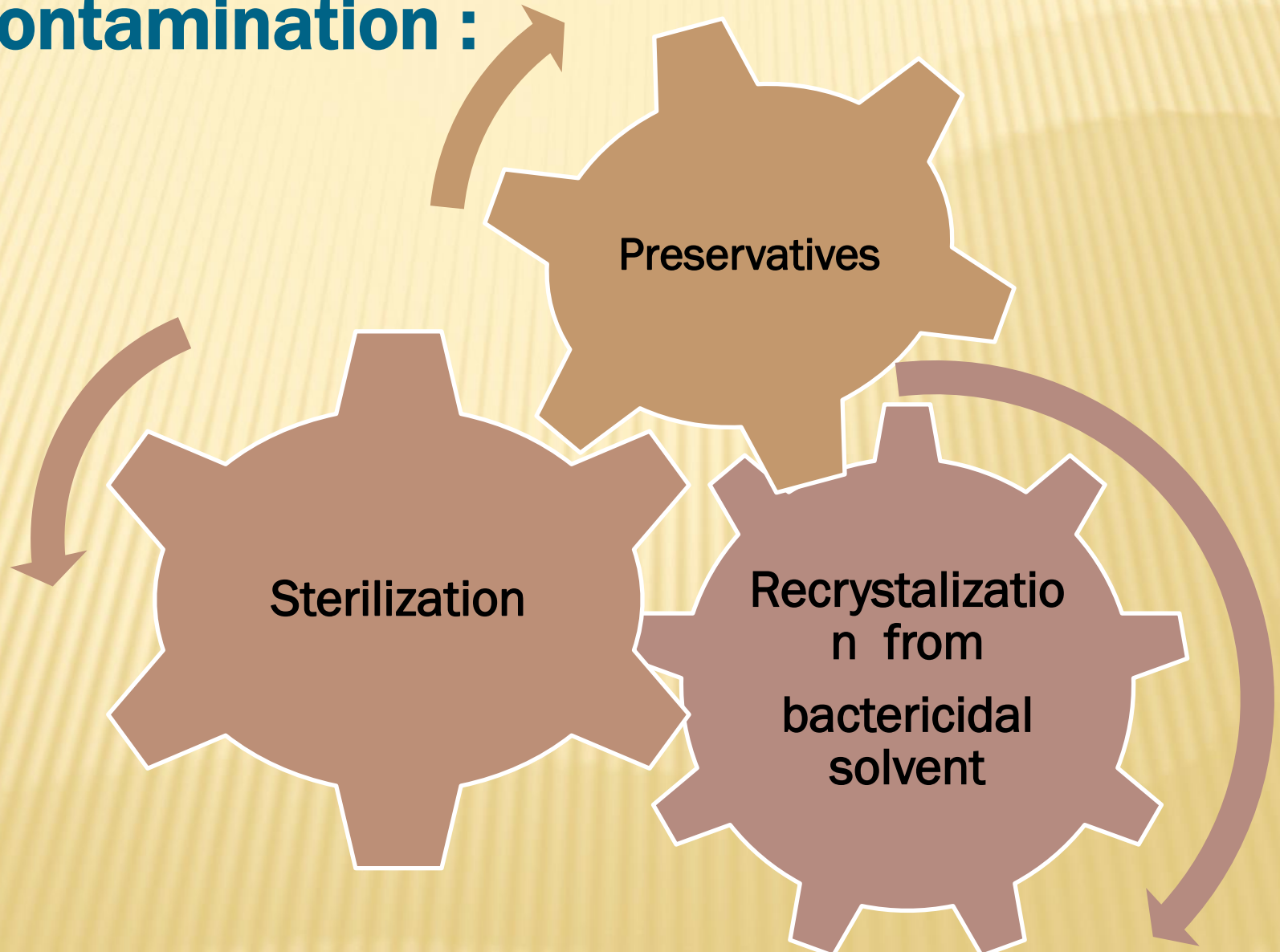
(starch , gum acacia)



**Synthetic Raw
material**

(Calcium carbonate)

Decrease of Raw material microbial contamination :



EXPERIMENT :

- 1- Transfer a powder in packet (CaCO_3 , starch) to T.T containing 5 ml of sterile saline.
- 2- Shake well for 5 minutes.
- 3- Allow the particle of powder to settle down.
- 4- Transfer 0.1 ml of clear saline to surface of nutrient agar plate.
- 5- Spread using sterile glass rod , leave to adsorb then incubate at 25°C for 24 hrs.

RESULTS :

Microbial count in case of:

Strach > **Calcium
carbonate**

**(IV) Operating person
as a source of
contamination**

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graph TD; A((Man as source of Contamination)) --- B((Breathing)); A --- C((Hair)); A --- D((Hands));
```

Breathing

**Man as
source of
Contamination**

Hair

Hands