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Overview: Manual Plating Process

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# **OVERVIEW: Manual Plating Process**

### **Plating Process:**

- •Pour glass beads onto bioassay plate.
- •Pipette solution onto bioassay plate.
- •Stack 4-5 plates together.
- •Shake and rock the plates until the beads evenly spread the solution across the agarose gel on the plate.
- •Remove the glass beads.

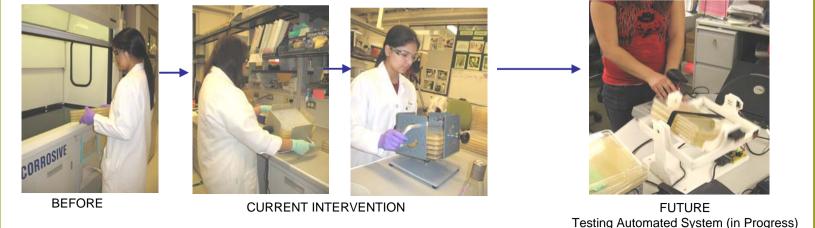
#### **Evolution of Shake'n Plate**

## **Purpose of Plating:**

•"Sub-clone sheared fragments" which means to grow millions of copies of bacterial colonies

### **Plating Stats:**

- •9"x9" bioassay plates
- •Weight: 1.2lbs/plate (low profile) or 1.4lbs/plate (high profile)
- •40 plates per batch
- •4-5 plates per cycle
- •1-2 minute shake time per cycle
- •Approx. 100 efforts/minute
- •Total processing time 40 minutes



- Manual process "plating" is a high risk task (Strain Index = 60.8).
- Solutions were initiated by production line operators' participation in the Ergonomics Working Group.
- These solutions eliminated sustained gripping of the sample plates, reduced the Strain Index to a 'safe' score of 2.3, and increased throughput by 25%.



# **BEFORE: Manual Plating Process**

#### **Problem**

- •Risk Factors:
  - High grip force when handling 5 plates/cycle
  - Wide (4") grip span (low profile)
  - •Grip Force 30-41% of maximum voluntary contraction: Moore-Garg Strain Index = 40.5
- Musculoskeletal Problems:
  - •Awkward hand and wrist postures to repeatedly tilt and rotate the plates for 40 min/batch
  - •Reports of discomfort and fatigue in operators in upper extremities, shoulders, and back.
- •Workstation Layout:
  - Conducted at a fume hood in a high traffic walkway
  - •Does not accommodate a sitting workstation due to the lack of leg clearance.
- •Process Efficiency:
  - •4 plates per cycle manually, limited by weight (8-10lbs) & awkward grip of plates





