Beta-lactamase Detection Test

**Principle:** Beta-lactamases are enzymes that hydrolyze the beta-lactam ring component of a beta-lactam molecule and destroy the antimicrobial activity of the compound.

Particular chromogenic cephalosporins (i.e., a beta-lactam antimicrobial agent) change color when their beta-lactam ring has been hydrolyzed by the beta-lactamase enzyme produced by the organism being tested. The cephalosporin Nitrocefin (yellow) changes color (red) when its beta-lactam ring has been hydrolyzed.

**Procedure:**
1. Hydrate nitrocefin disk with sterile water.
2. Rub organism to be tested on the hydrated Nitrocefin disk.
3. Interpret:
   - Pink color development – organism produces a beta-lactamase enzyme
   - No color development – organism does not produce a beta-lactamase enzyme

Reaction time is dependent on organism (range is 30 seconds to 60 minutes)

**Examples of clinical uses – beta-lactamase positive:**
- *Haemophilus influenzae:* = resistance to ampicillin
- *Neisseria gonorrhoeae:* = resistance to penicillin
- *Staphylococci:* = resistance to penicillin