

# On-Scene Detection of Semen

- Visually
  - White or cream-colored stains



# On-Scene Detection of Semen

- Alternate light sources (ALS)
  - UV, Omnichrome, Luma-Lite, Crimescope, CrimeLite

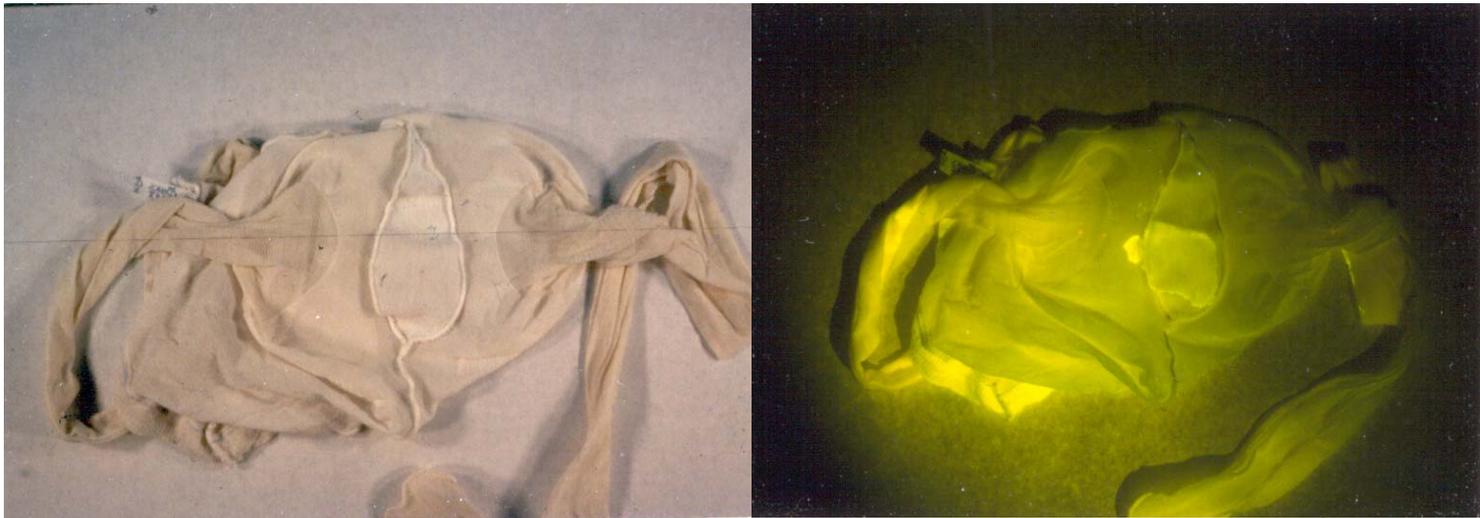


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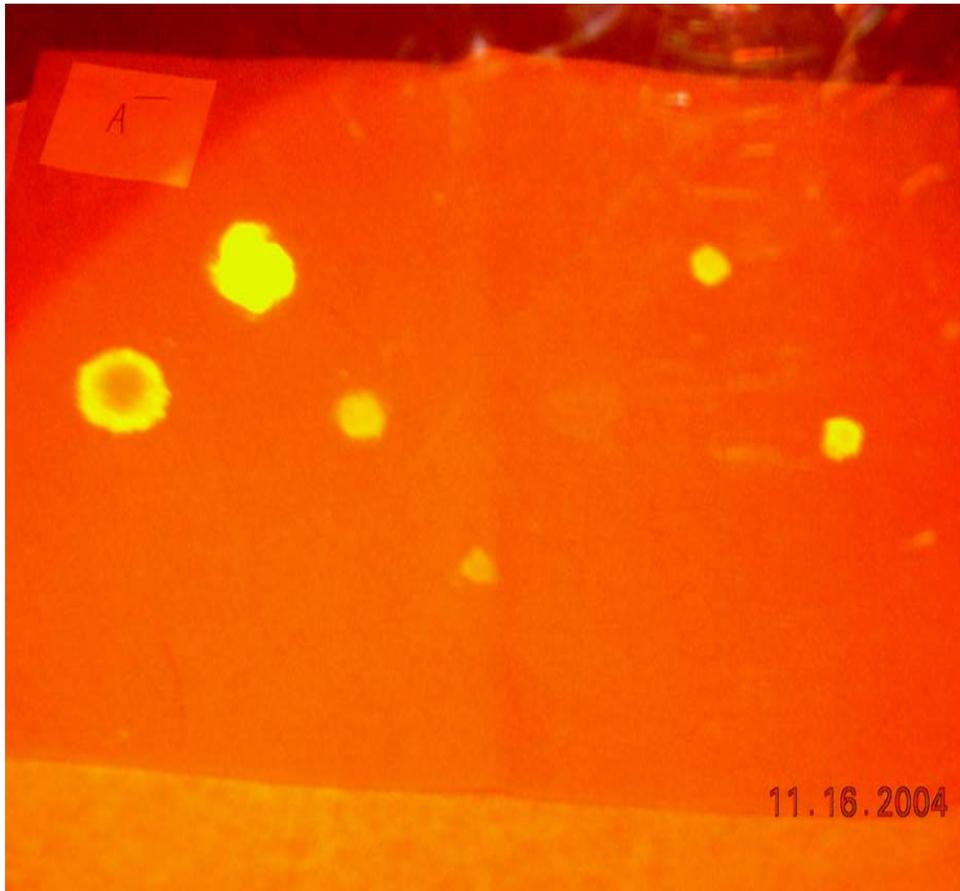
# ALS Principle

- Different substances react differently to light



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# Detectable Body Fluids



- Urine
- Semen
- Saliva
- Vaginal Secretions
- Sweat

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A diamond-shaped logo with a grey stippled background and the word "DNA" in white capital letters.

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# ALS Rules

- Semen stains reflect specific light differently than the background fabric
  - May be darker than the background
  - May be lighter than the background

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# Light Sources

- Location/screening use
  - Not confirmatory
  - Detection ability based on fluid & fabric
- All ALS stains NOT semen stains
- All semen stains NOT detected with ALS

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# False Positives

- Laundry detergents:
  - Contain phosphors  
(*appear brighter in sunlight*)
    - » Sunlight contains UV light making whites whiter
    - » Dark pigments absorb the UV light and don't glow



A diamond-shaped logo with a grid pattern and the letters "DNA" inside.

# What to Collect

- Anything to link suspect, victim, weapon, crime scene
- Anything to clarify what happened
- Known Standards
  - Blood or oral swab
  - Hair
- Control area

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# “Known” Standards

- Known victim, suspect, and elimination samples:
  - Eliminates the need for repeated analyses
  - Enables a more discriminating search of the data bank
  - Ensures that it's the *suspect's* profile being searched
  - Enables more discriminating statistics and conclusions

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# Control Swabs

- An unstained area near the stain collected
- Check with your laboratory regarding their preference for collecting control swabs



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# Small or Mobile Items

Collect and submit entire item

- Knife
- Shoe
- Hat



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# Large or Immobile Items

Submit portion of items



- **Cutting:** carpet, car seat
- **Swabbing:** linoleum
- **Lifting:** glass, counter top
- **Scraping:** cement wall
- **Absorbing:** wet blood

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# Probative Value

- DNA is a very stable molecule and can remain intact for many years
- Not every item at a crime scene should be considered probative evidence

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# Probative Value

- The best evidence occurs
  - When a victim's or suspect's DNA is found where it is not supposed to be

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A logo featuring a red diamond shape with a white grid pattern inside, containing the letters "DNA" in white. To the left of the diamond is a vertical red DNA double helix with green and blue horizontal rungs.

DNA

# Packaging of Evidence

- Dry items should be packaged in porous containers such as paper bags, envelopes, boxes

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# Packaging of Evidence

- Wet items should be allowed to air dry prior to packaging
- Very wet items can be transported in plastic containers but should be air-dried as soon as possible

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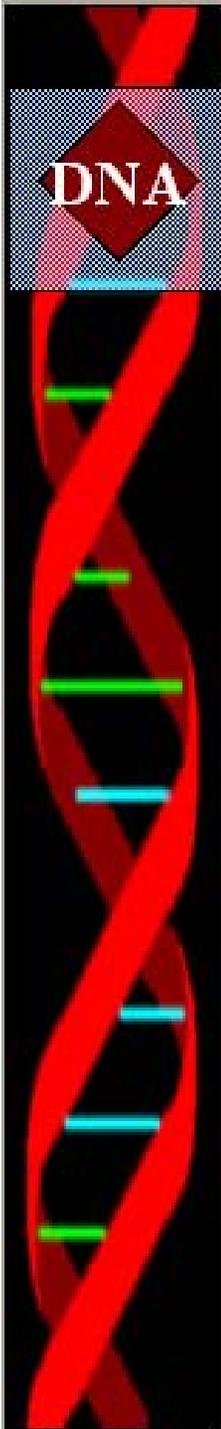
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# Chain of Custody

- Key to the proper resolution of a criminal investigation
- All the work in the lab is meaningless if the chronological history of the evidence is not maintained

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A vertical graphic on the left side of the slide depicts a DNA double helix. The two strands are red, and the base pairs are represented by horizontal bars in green, cyan, and blue. At the top of this graphic, a red diamond shape contains the word "DNA" in white, set against a grey grid background.

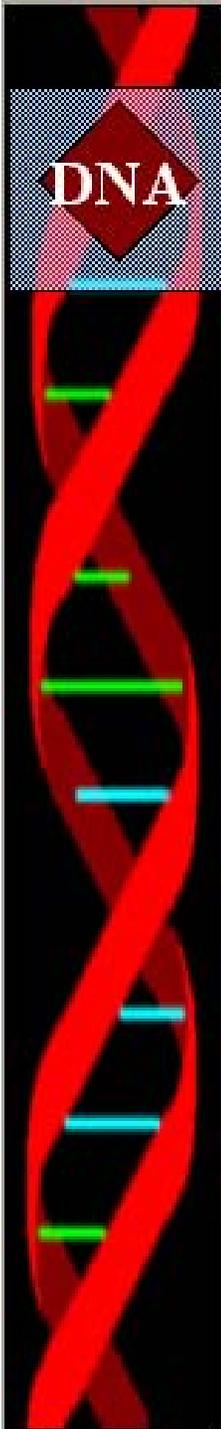
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# Transportation of Evidence

- Extended exposure to heat or humidity causes degradation to biological evidence
- Packaged items from the crime scene need to be moved to a suitable storage facility as soon as possible

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A vertical graphic on the left side of the slide featuring a red DNA double helix. The helix is composed of two red ribbons twisted around each other, with horizontal bars in green, cyan, and blue connecting them. At the top, a red diamond shape contains the word "DNA" in white, set against a grey grid background.

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# Transportation of Evidence

- Liquid samples should be transported in refrigerated or insulated containers
- Evidence should be stored in a temperature controlled facility

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# Evidence Storage

- The hallmarks of proper evidence storage include:
  - Paper packaging
  - Items are “sealed”
  - Items from a single case are kept together when possible
  - Items are kept away from heat sources
  - Chain of Custody is current



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# Collection of Evidence

## Proper Collection, Packaging & Preservation of DNA Evidence

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# Rule of “Thumb”

- It’s better to collect it and not submit it than to not have collected it at all!
- Keep lines of communication open between you and the laboratory

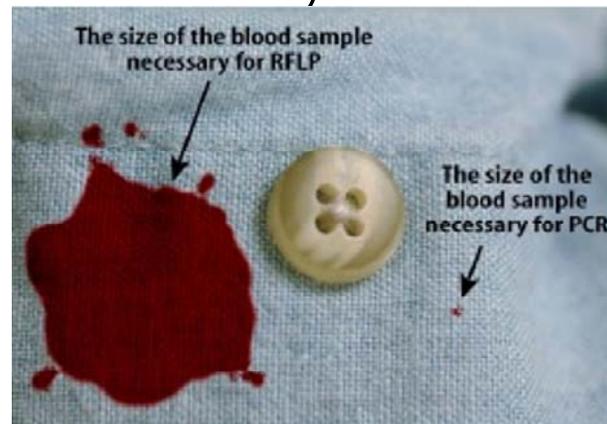


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# Amount to Collect

- Early DNA - Size of quarter
- Serology - Size of dime
- Current DNA - If you can see it, we can try



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# Collection of Blood

- Evaluate the item/stain and its probative value
- Swab the stain (works best on non-absorbent surfaces)
- Scrape the stain
- Cut the stain from the item
- Collect the item



# Swabbing the Stain

- Lightly moisten the swab (distilled or sterile water)
- Rub swab over the stain, rotating swab
- Use 2 - 4 more swabs



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# Swabbing the Stain

- Concentrated!!
- Better to collect it and not use it rather than to lose the sample altogether
- Don't sacrifice other exams!!  
(latents!)

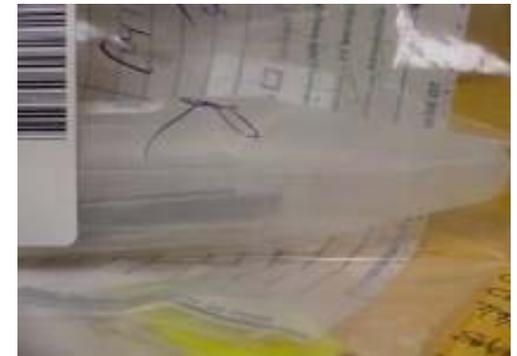


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# Collecting the Item

- Recommended
  - When staining pattern is important
  - Item is difficult to swab
  - Item requires multiple exams
- Make sure the item is dry
- Package to ensure integrity (glass, sharps, breakables)



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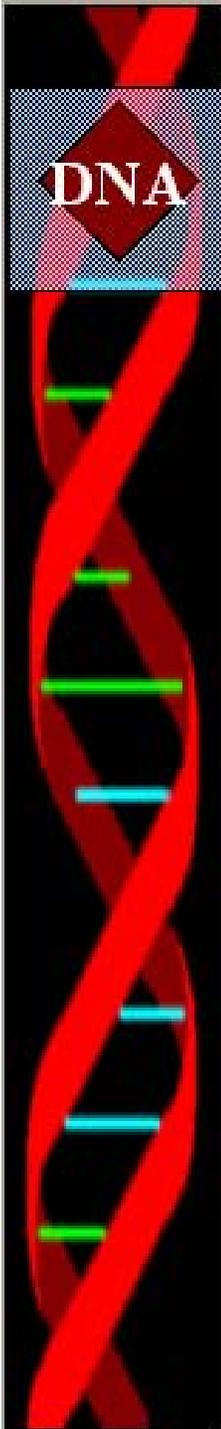
# Collection of Semen

- Evaluate the stain and its probative value
- Swab the stain
  - Works best on non-absorbent surfaces
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A vertical graphic on the left side of the slide. It features a red DNA double helix against a black background. At the top, a red diamond shape contains the word "DNA" in white. Below the diamond, the DNA helix is shown with horizontal rungs in green and cyan. The entire graphic is set within a grey grid pattern.

DNA

# Possible Victim Vaginal Fluid

- From suspect pubic area or fingers
  - Lightly moisten the swab (distilled or sterile)
  - Swab the entire area, rotating the swab
  - Use no more than 2 swabs

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# Victim Sexual Assault Kit

- Standardized kit to collect pertinent biological evidence from the body of the victim
- Contact your local laboratory to determine which kit they use



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# Suspect Standard Kit

- Standardized kit to collect pertinent biological evidence from the body of the suspect
- Contact your local laboratory to determine which kit they use

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# Collection of Hairs/Fibers

- Post-It notes placed into envelope or Ziploc bag
  - Straight into Ziploc bag **NOT** recommended due to static electricity
- Gloves or forceps to transfer hair/fiber(s) into a glassine envelope
- **Vacuum is generally not recommended**
- Talk to YOUR laboratory!

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# Collection of Saliva

- From a bitemark:
  - Moisten one swab and swab area of mark
  - Follow with a dry swab to collect any remaining moisture on skin
  - Allow swabs to air dry and package together
- From Suspect Pubic Area
  - Refer to vaginal fluid instructions

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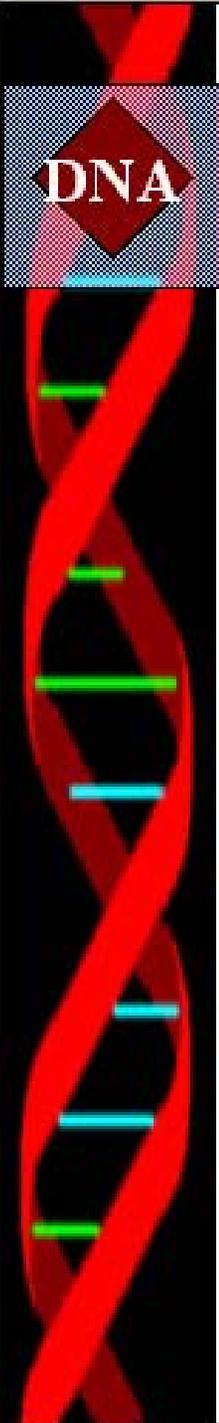
# Known Saliva (Buccal) Swabs

- Known standard
- Swab the inside of the cheek area using 2 swabs
- Rotating them during collection
- Allow swabs to air dry (or place in swab box) and package together



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# Fingernail Scrapings/Clippings

- Collect only when indicated
- Clip nails into clean paper with a clean clipper
- Separating left and right nails

**OR**

- Scrape the underside of each nail onto a clean paper
- Package the scrapers inside this paper

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# Bone

- Co-mingled remains, mass graves, skeletal remains, exhumations, airplane crashes
- Marrow is where blood is made
- Good to use if no blood is available
- Best to collect rib bone or vertebrae
- Place in jar and freeze

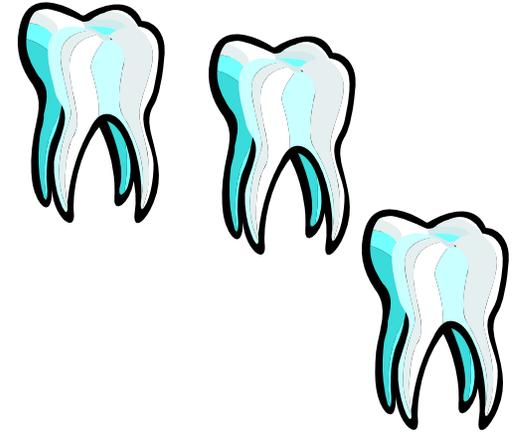
The logo for the Community Oriented Policing Services (COPS) program. It features the word 'COPS' in a large, bold, blue sans-serif font. A white five-pointed star is positioned to the right of the letter 'S'. Below the main text, there is a thin red horizontal line, followed by the words 'COMMUNITY ORIENTED POLICING SERVICES' in a smaller, blue, all-caps sans-serif font, and 'U.S. DEPARTMENT OF JUSTICE' in an even smaller, red, all-caps sans-serif font at the bottom.

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# Teeth

- DNA is in the dental pulp
- Very resistant to decay
- Obtained from teeth of mummies
- Saved baby teeth can be used as secondary DNA standard in missing person cases
- Collect into pill box



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# Organs/Tissue

- Collect if no blood is available
- Collect liver or spleen
- Place in jar and freeze



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# Data Bank Samples

- Follow your state or local protocol for collecting samples from arrestees and/or convicted offenders

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A logo for DNA, featuring a red diamond shape with the letters 'DNA' in white, set against a black background with a white grid pattern.

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# Knowledge into Practice

- Look at the following items and determine the best way to handle the object

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# Knowledge into Practice



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# Knowledge into Practice

- For the following items, indicate how you would collect the evidence

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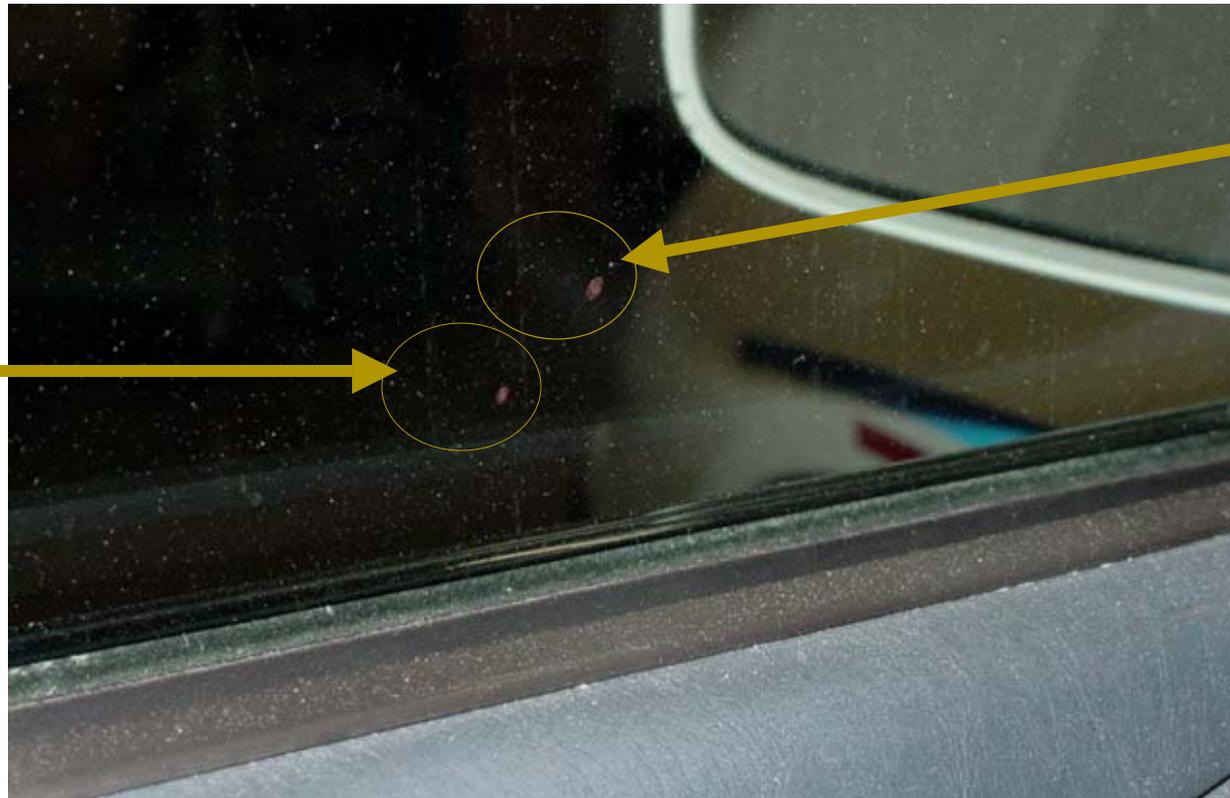


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