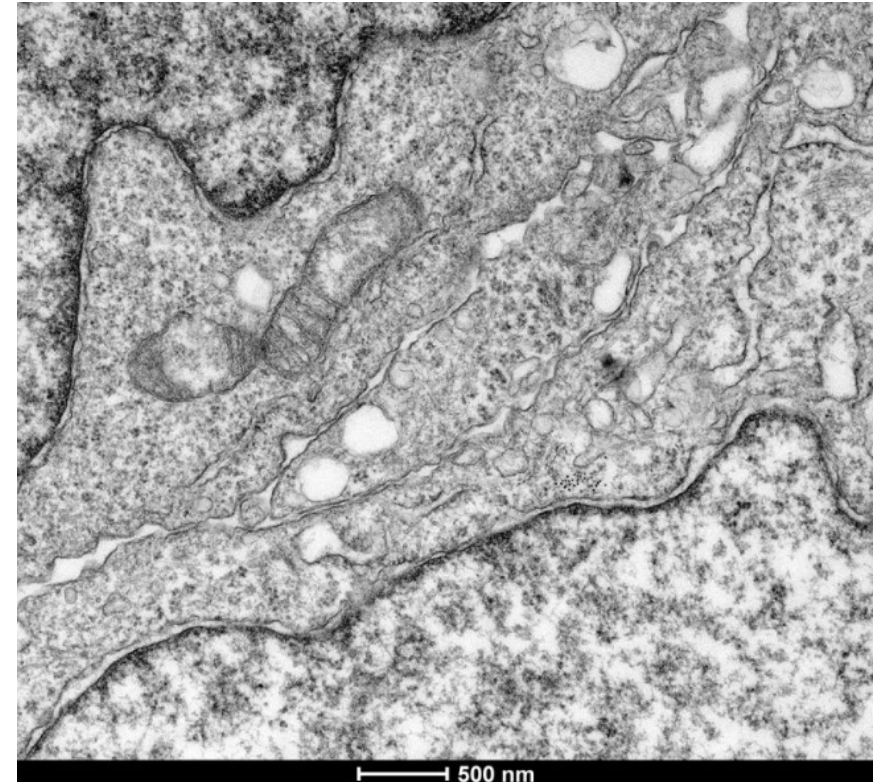


**UA-Zero: Non-Radioactive,
Uranium-Free Staining**



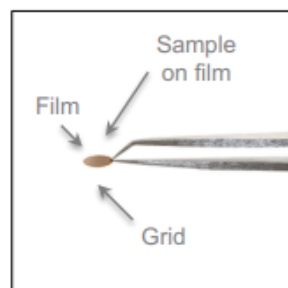
Introduction to UA-Zero®

- ◆ UA-Zero® EM Stain is a trouble-free solution developed as a direct substitute for Uranyl Acetate
- ◆ Non-radioactive
- ◆ Uranium free
- ◆ Non-Hazardous
- ◆ No handling, storage or disposal restrictions
- ◆ Image contrast results as good as Uranyl Acetate, if not better
- ◆ No additional processing required
- ◆ Direct replacement for Uranyl Acetate without changing standard user protocols
- ◆ Independently tested and verified by University of Bristol; UK

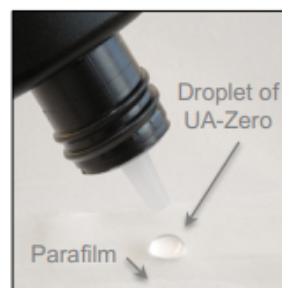


Application of UA-Zero®

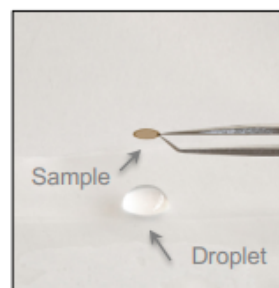
- ◆ Uranyl Acetate
- ◆ Widely used as an EM negative stain
- ◆ Most negative staining EM procedures for biology require the use of uranyl acetate
- ◆ Advantage of UA is that it produces the highest electron density and image contrast
- ◆ UA enhances image contrast by interaction with lipids and proteins
- ◆ Drawbacks include UA being highly photo-sensitive; radioactive & toxic
- ◆ UA-Zero®
- ◆ Patented solution developed as a direct replacement for Uranyl Acetate
- ◆ Includes no radioactive material and is non-toxic.
- ◆ No changes to standard user protocols
- ◆ Stored in normal laboratory conditions away from direct sunlight or 4°C for longer term use
- ◆ Ideal as a staining solution for life science TEM sample preparation



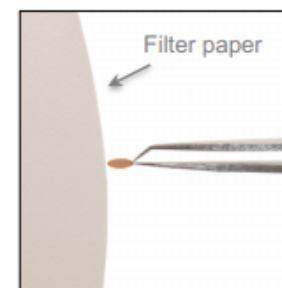
Sample loading.



A drop of UA-Zero EM Stain on Parafilm (AGG398).



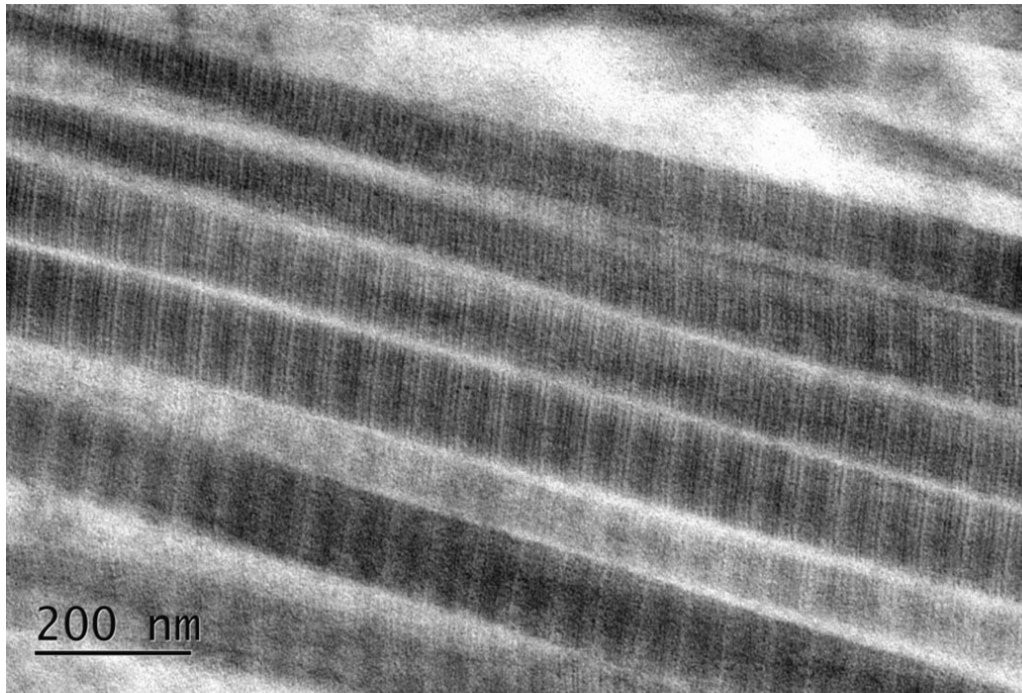
Sample staining. Sample in contact with staining solution only.



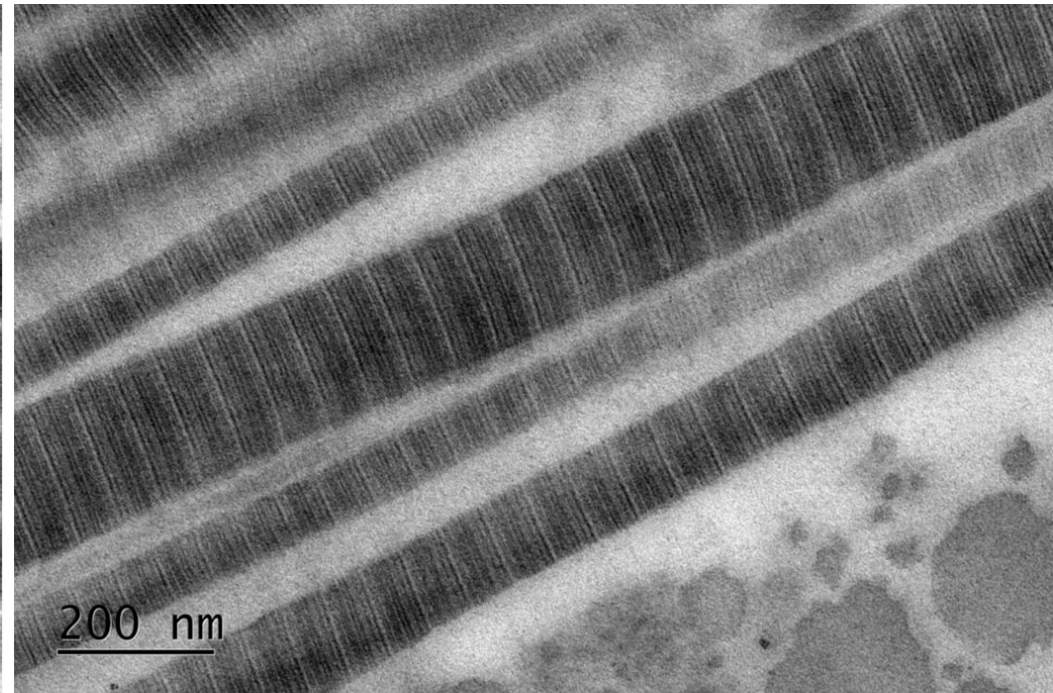
Drain with filter paper.

Case Study #1: Human Scera Collagen Fibrils

- ◆ Dr. Robert Young; University of Cardiff studied a contrast comparison Uranyl Acetate vs UA-Zero
- ◆ Contrast “equally clear with both stains – possibly slightly better with UA-Zero!”
- ◆ Conclusive evidence - UA-Zero a safe alternative to Uranyl Acetate with no compromise on image contrast



Human scera collagen fibrils 20 Kx, Uranyl Acetate, 15 mins



Human scera collagen fibrils 20 Kx, UA-Zero, 15 mins

Case Study #2: Ultrastructural insight into SARS-CoV-2

- ◆ Dr Andreia Pinto – Royal Brompton Hospital
- ◆ Study of SARS-CoV-2 infection within human airway epithelium cells
- ◆ Fixation via use of 2.5% glut in 0.05M Sodium Cacodylate buffer
- ◆ UA-Zero used for en bloc staining of cells as direct replacement for Uranyl Acetate

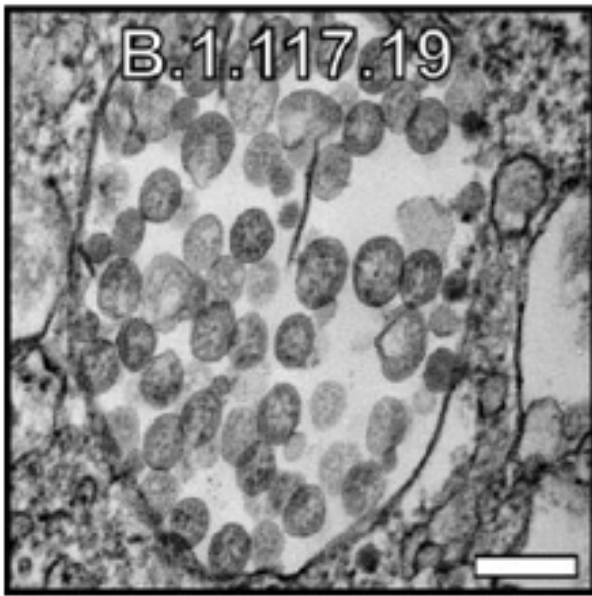


Figure 1 Intracellular non-coated virus

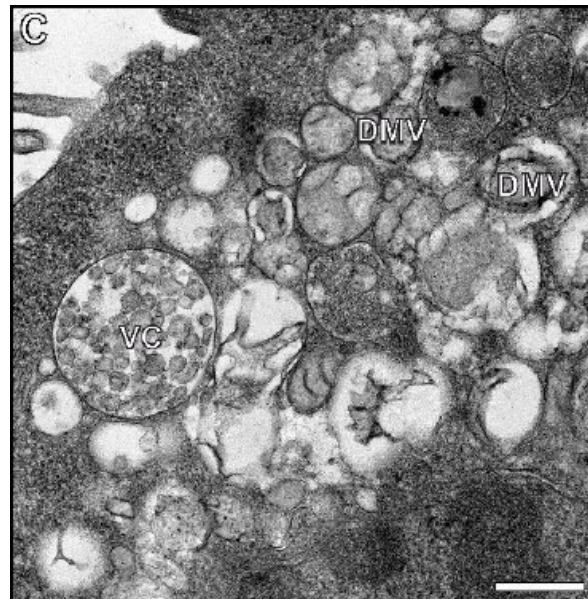
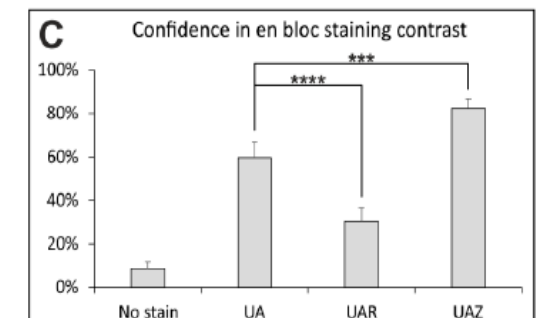
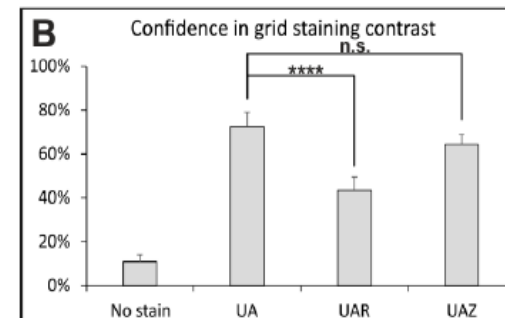
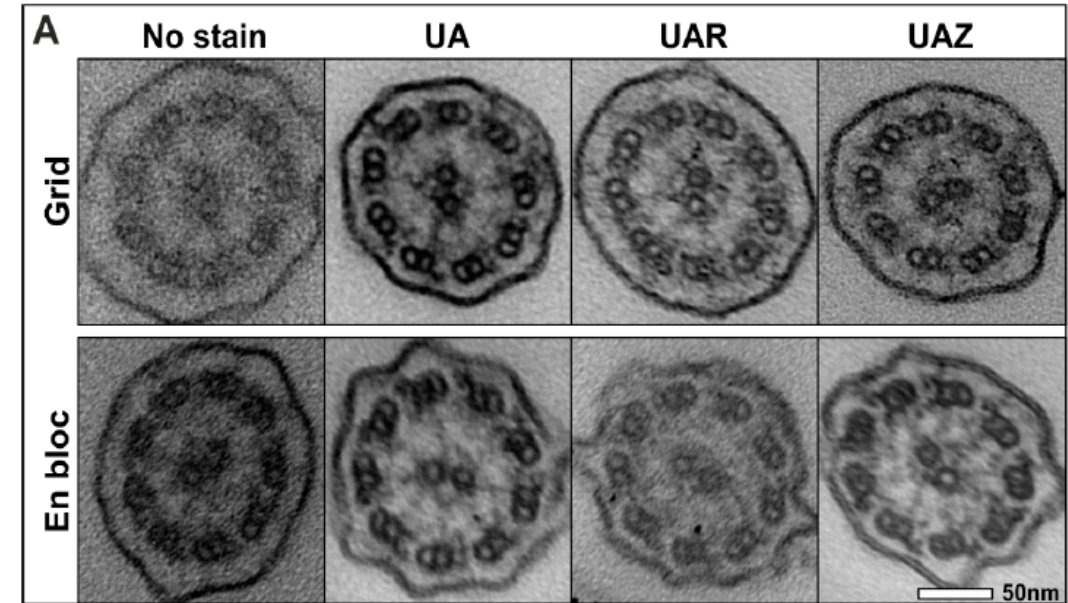


Figure 2 demonstrates clear distinction between VCs and DMVs (double membrane vesicles)

- ◆ Viral compartments (VC's) detected by TEM imaging
- ◆ Effective contrast vital to identification of VC's plus other cell parts (incl. DMVs)
- ◆ Contrast quality offered by UA-Zero key to validation of results

Case Study #3: Diagnosis of Primary Ciliary Dyskinesia by TEM

- ◆ Dr Andreia Pinto – Royal Brompton Hospital
- ◆ Direct staining comparison between UA; UA-Zero & direct competitor UAR-EMS (Electron Microscopy Sciences)
- ◆ 20 images per staining condition were analysed by 10 electron microscopists
- ◆ Conclusions showed “UA-Zero provides a promising and safer alternative to UA and, when used in the diagnostic pathway, has similar results to UA staining.”



If you have any questions regarding this powerpoint or UA-Zero, please contact us at sales@agarscientific.com

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