UnMICST Paper

* Earliest segmentation via Otsu thresholding and watershed.
* Neural nets like Unet and Resnet supplanted machine learning which supplanted Otsus\
* UnMICST is built on the back of 3 DL networks. uNet, Mask-R-CNN and PSPNet (all diff versions of it)
* To enhance nuclear segmentation, DAPI alongside nuclear envelope markers are encouraged against lamins and the nuclear envelope protein NUP98.
* A white rectangular object with black text

  Description automatically generated
* Adding defocused images as well as saturated images improves segmentation model building better than augmentation via gaussian blurring.
* In dataset they acquired with a 20x, 0.75NA objective and +-3 microns for defocused. For DAPI, 60ms was exposure and 150ms was saturated exposure (70-80% pixels saturated)
* To produce the training set, each image was cropped into 64 × 64 patches, normalized to use the full dynamic range, and further augmented using 90-degree rotations, reflections, and 20% upscaling
* UNet was selected for its prior success in the biomedical domain, Mask R-CNN was selected for its ability to perform both object detection and mask generation, and PSPNet was selected for its capacity to integrate image features from multiple spatial scales.