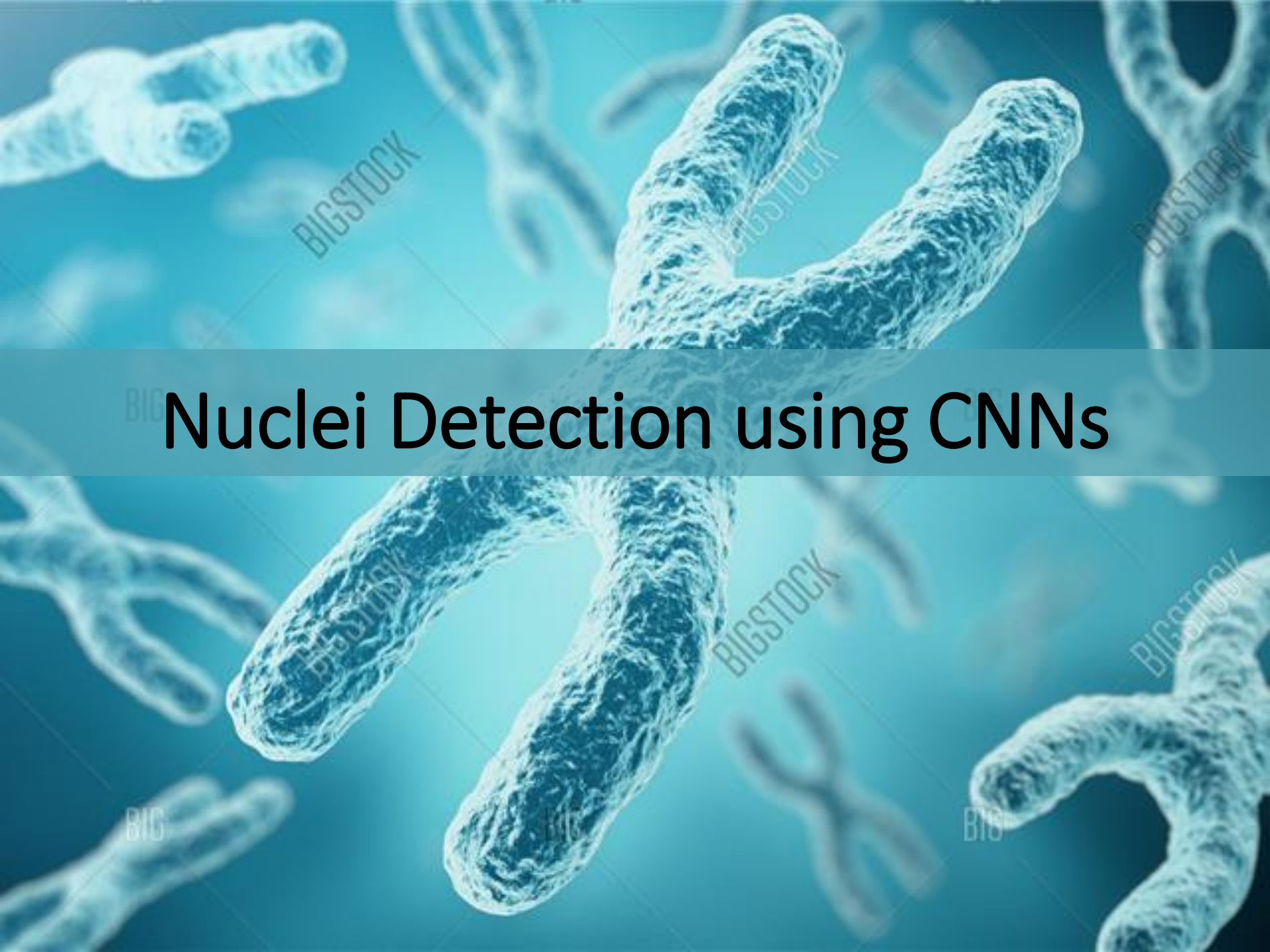
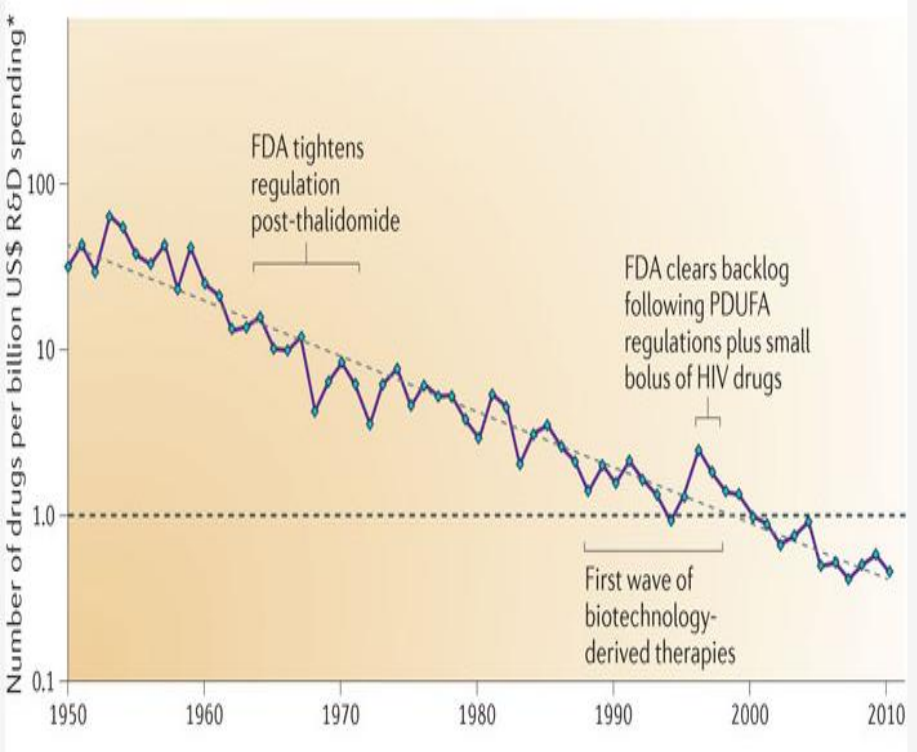

Nuclei Detection using CNNs

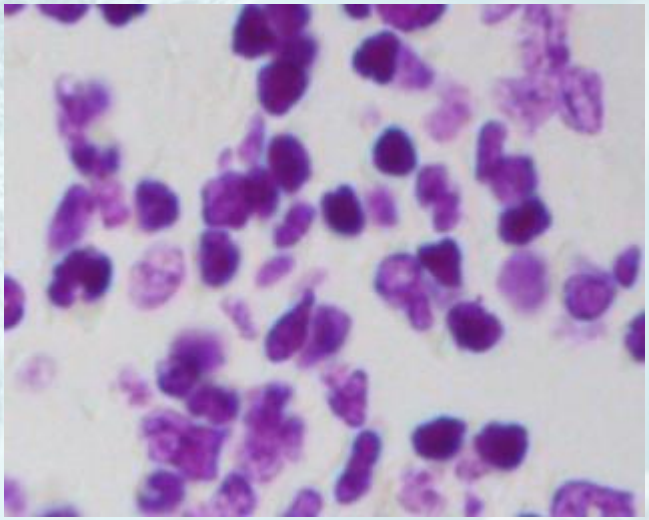
# Why Nucleus Detection?




- Spot Nuclei. Speed Cures
- Discovering new drugs involves testing various chemicals on human cells and observing their reactions.
- Major bottleneck is finding nuclei in microscopic images.

# Dataset Description

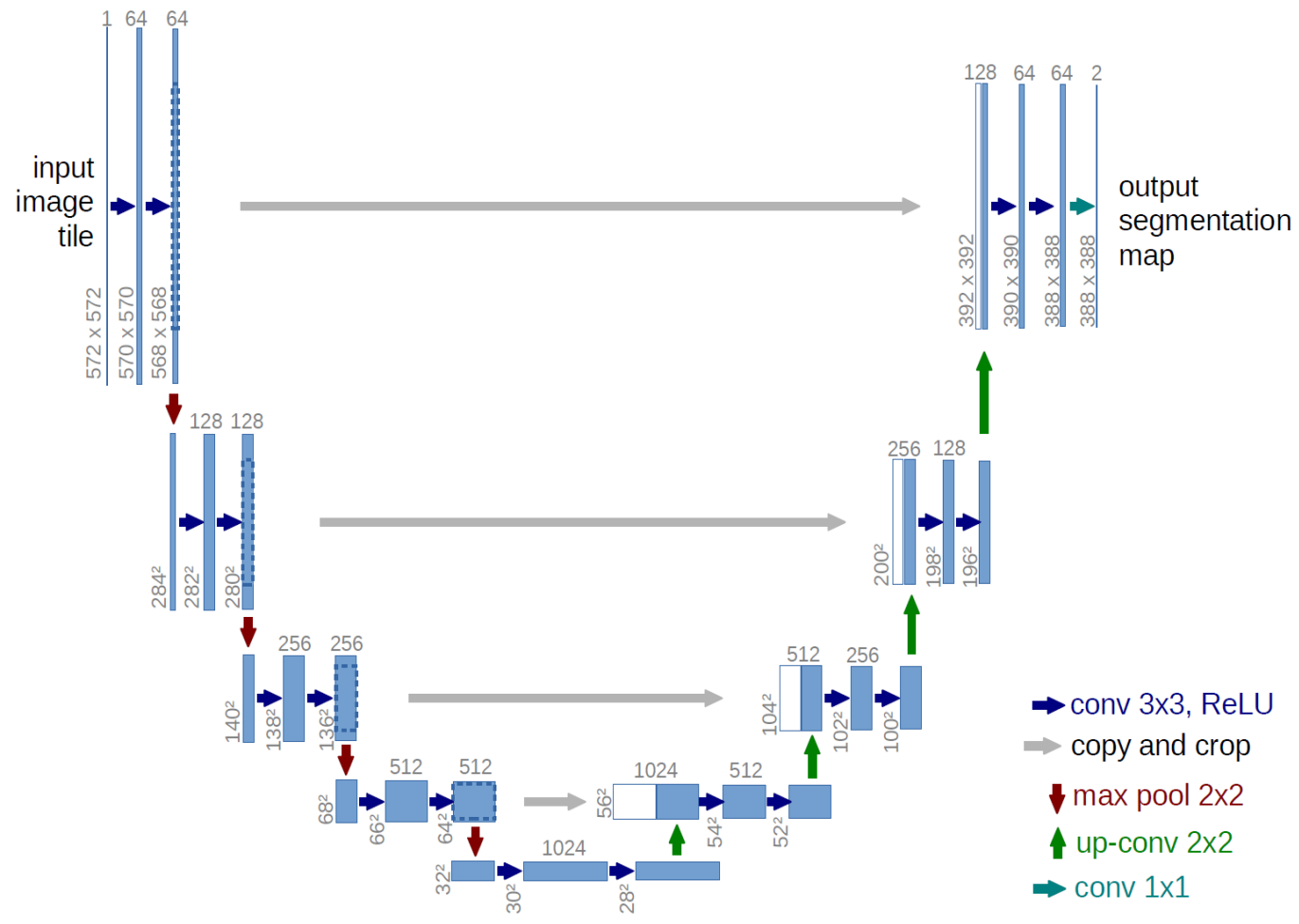
- Data Science Bowl : Kaggle
- It consists of 670 training images
- 600 images are used for training and 70 images are used for validation
- 65 test images are provided



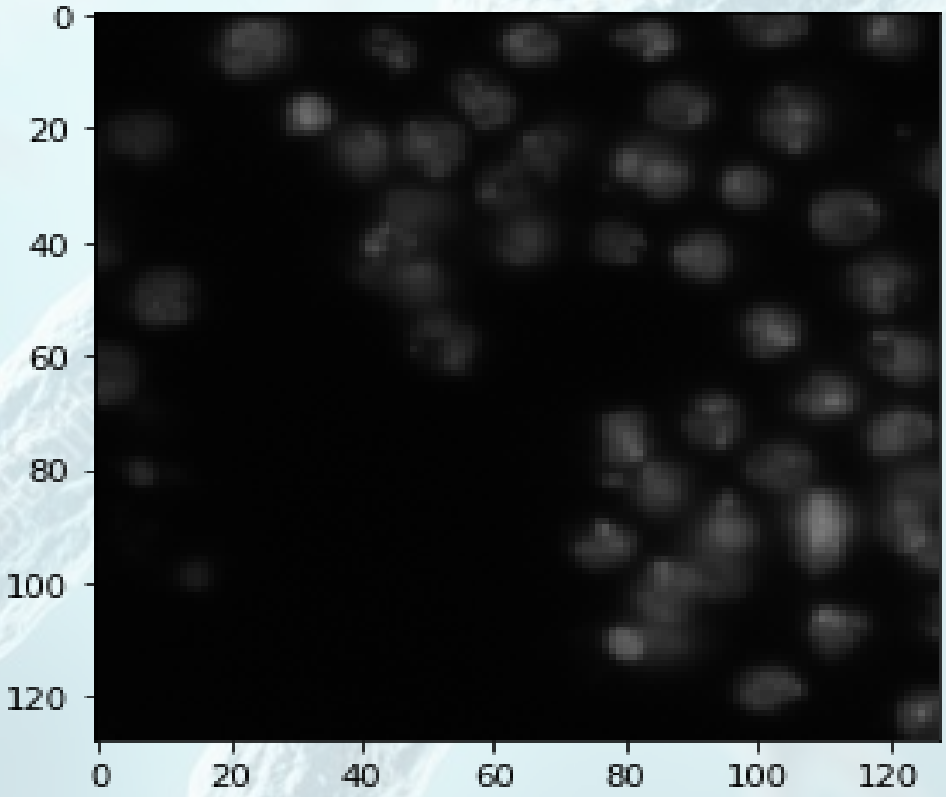
# Different CNN Architectures

- U-net : It is a U shaped CNN architecture with downsampling (context preservation) & upsampling (location preservation) layers
- LinkNet : It is an encoder-decoder type of Convolutional network architecture for fast and precise segmentation of images
- Mask R-CNN : Its an improvement over faster R CNNS, which includes pixel wise classification, thereby creating binary masks.

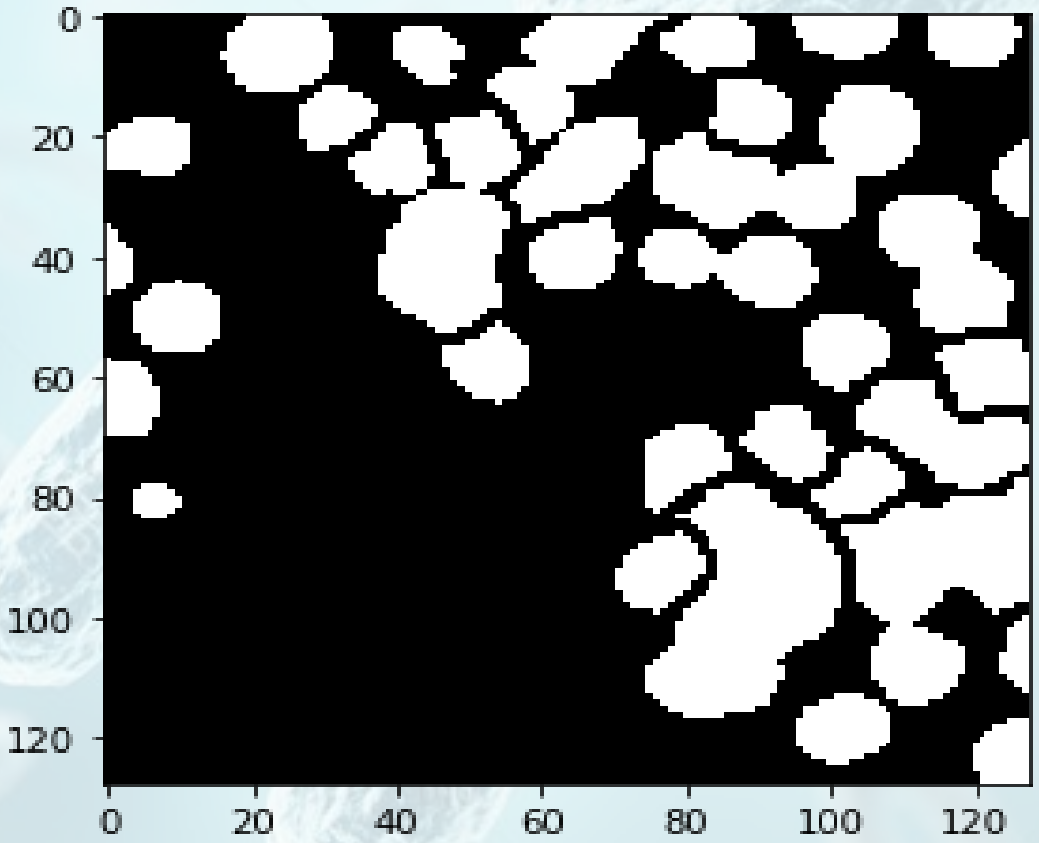
# U-Net Architecture



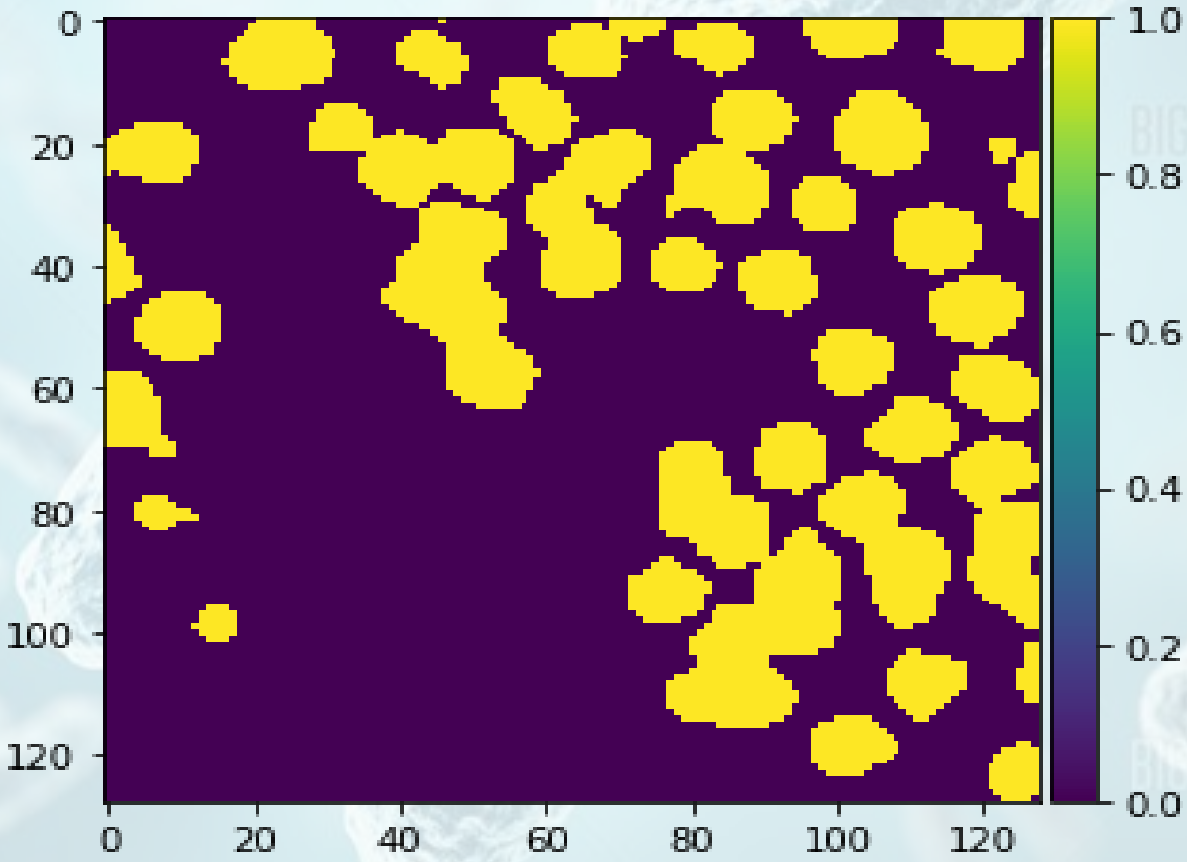
# Input Image to U-net



# Ground Truth Masks



# Predicted Masks



# LinkNet Architecture

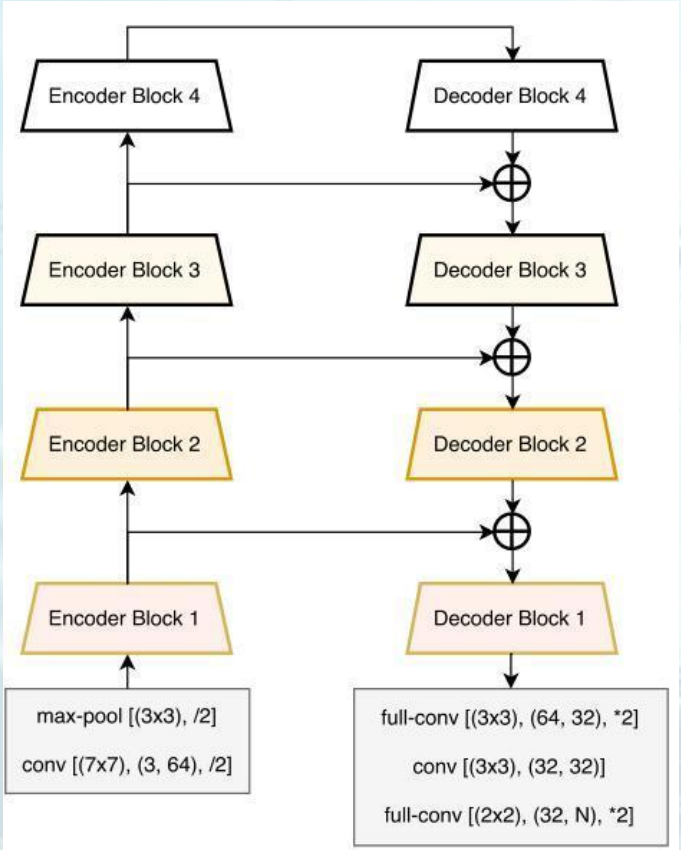
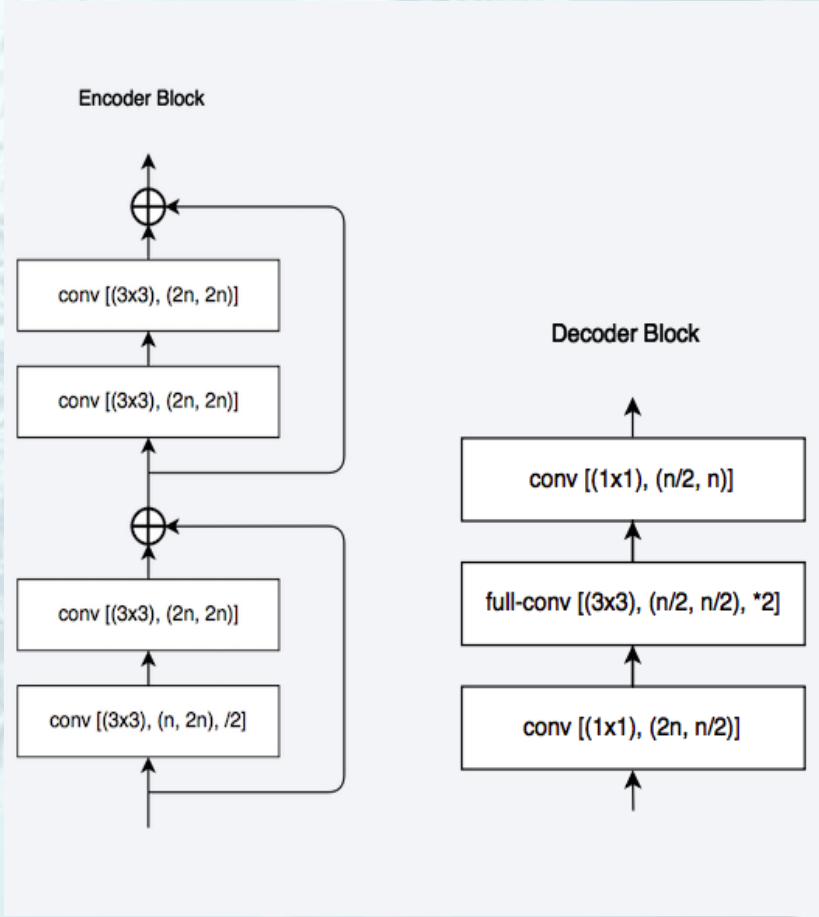



Fig. 1: LinkNet Architecture





# Conclusions

- There are a lot of parameters to experiment and a lot of optimization is needed for U –net and link net
- We will implement Mask R-CNN and see where it stands
- Maybe repeat building the models with increased image resolution.