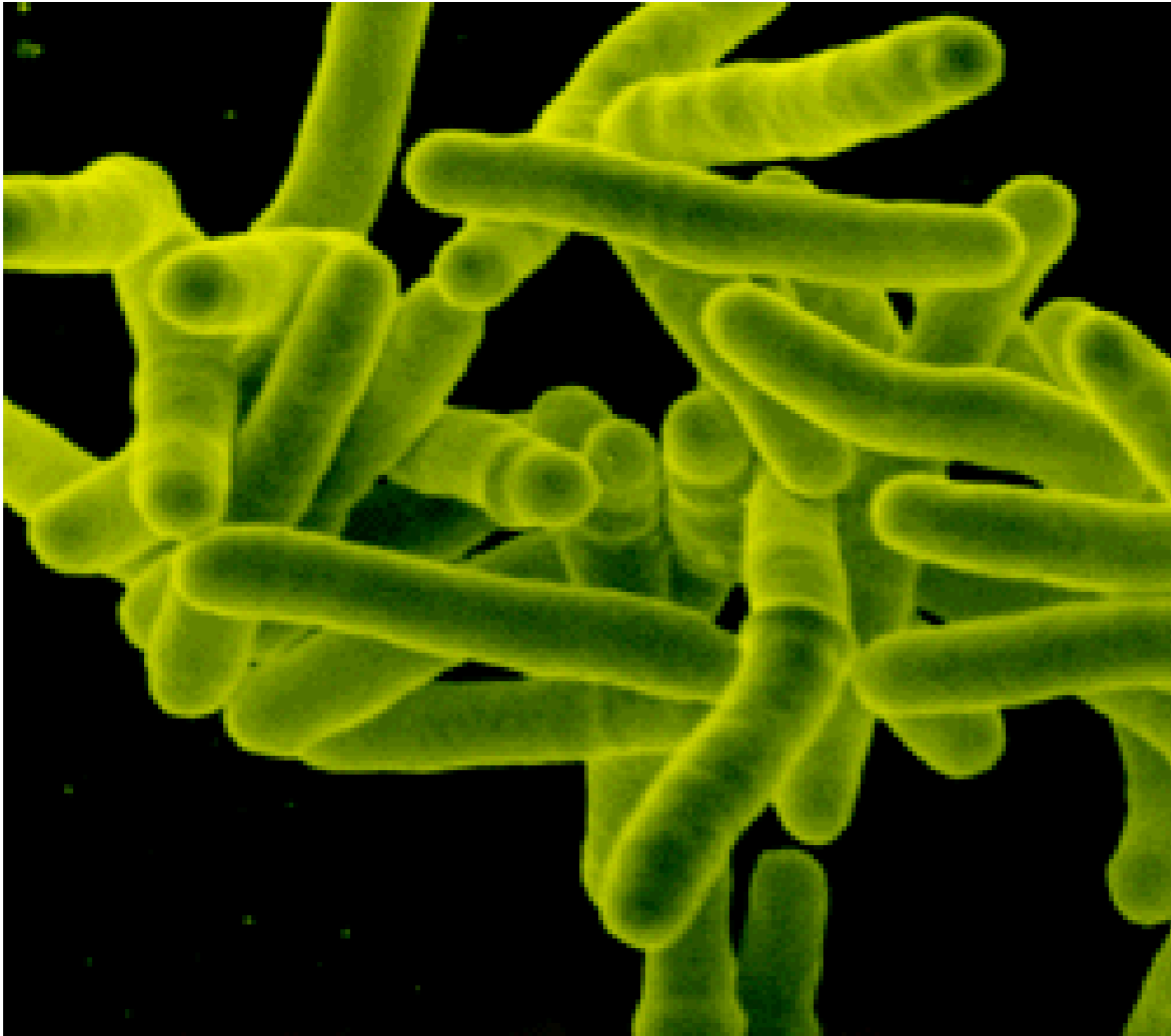
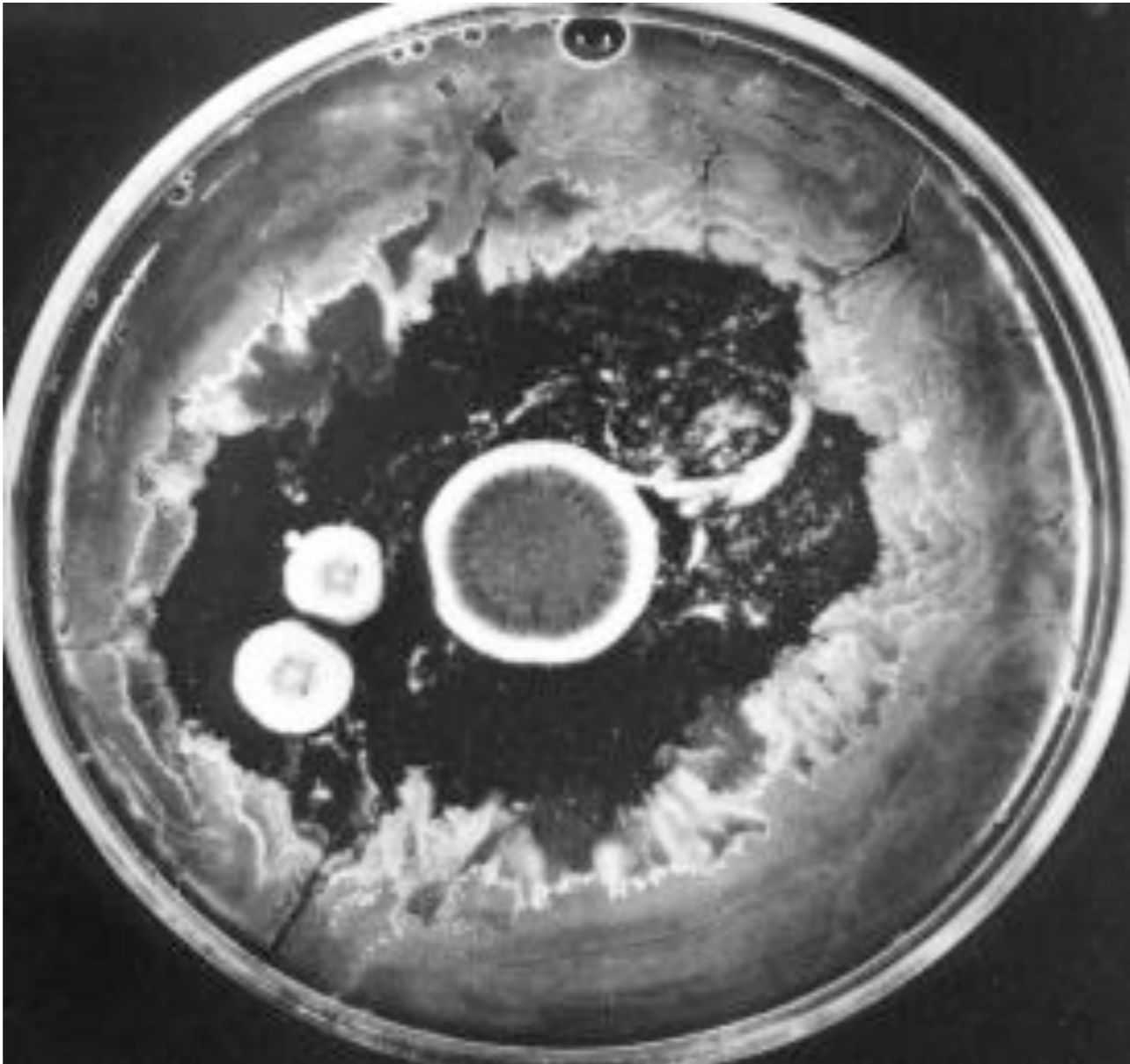


# Scanning electron micrograph of *Mycobacterium tuberculosis*







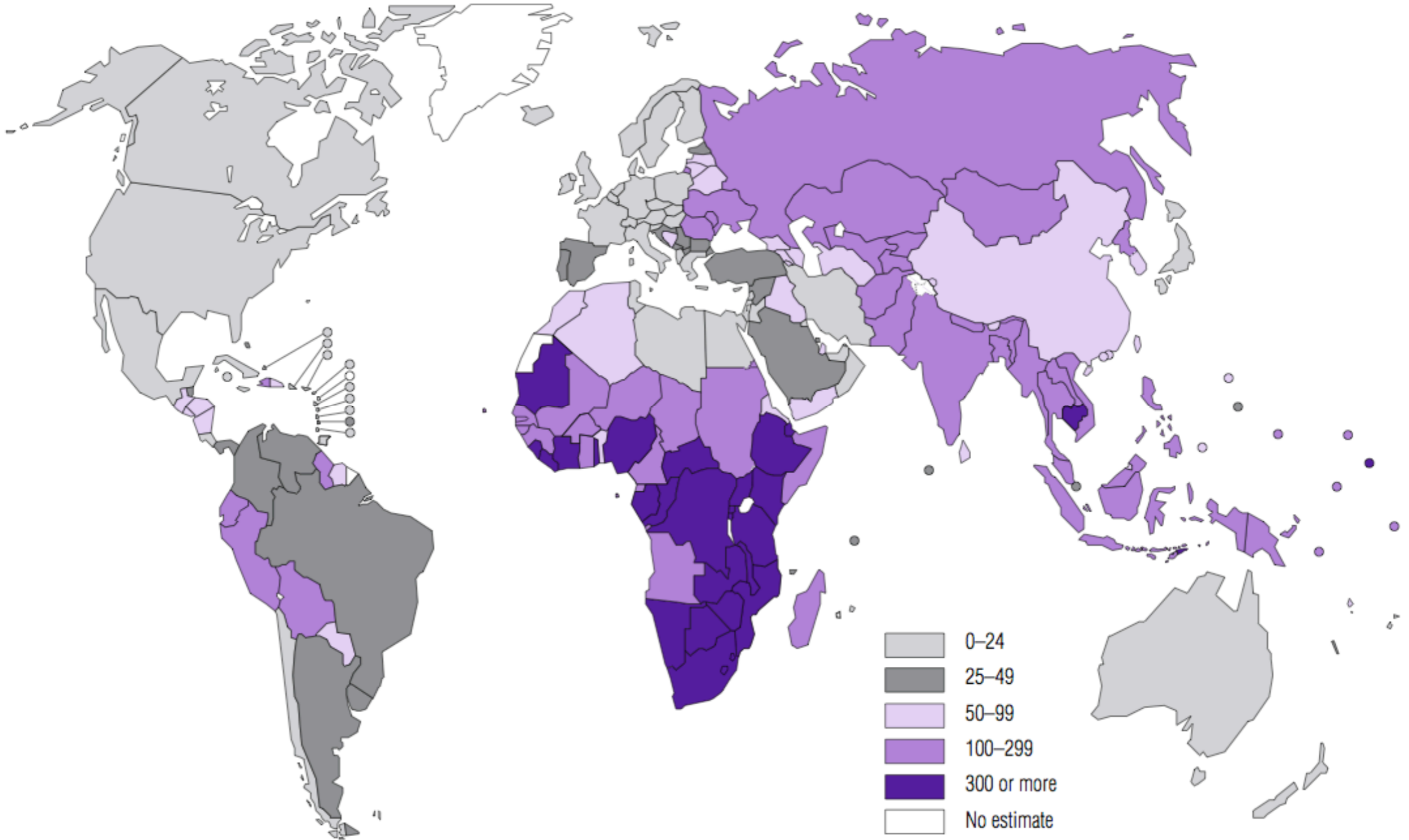
**Sarah Stanley**



**Deb Hung**

# Tuberculosis

1.7 million deaths/year  
9.2 million new cases/year

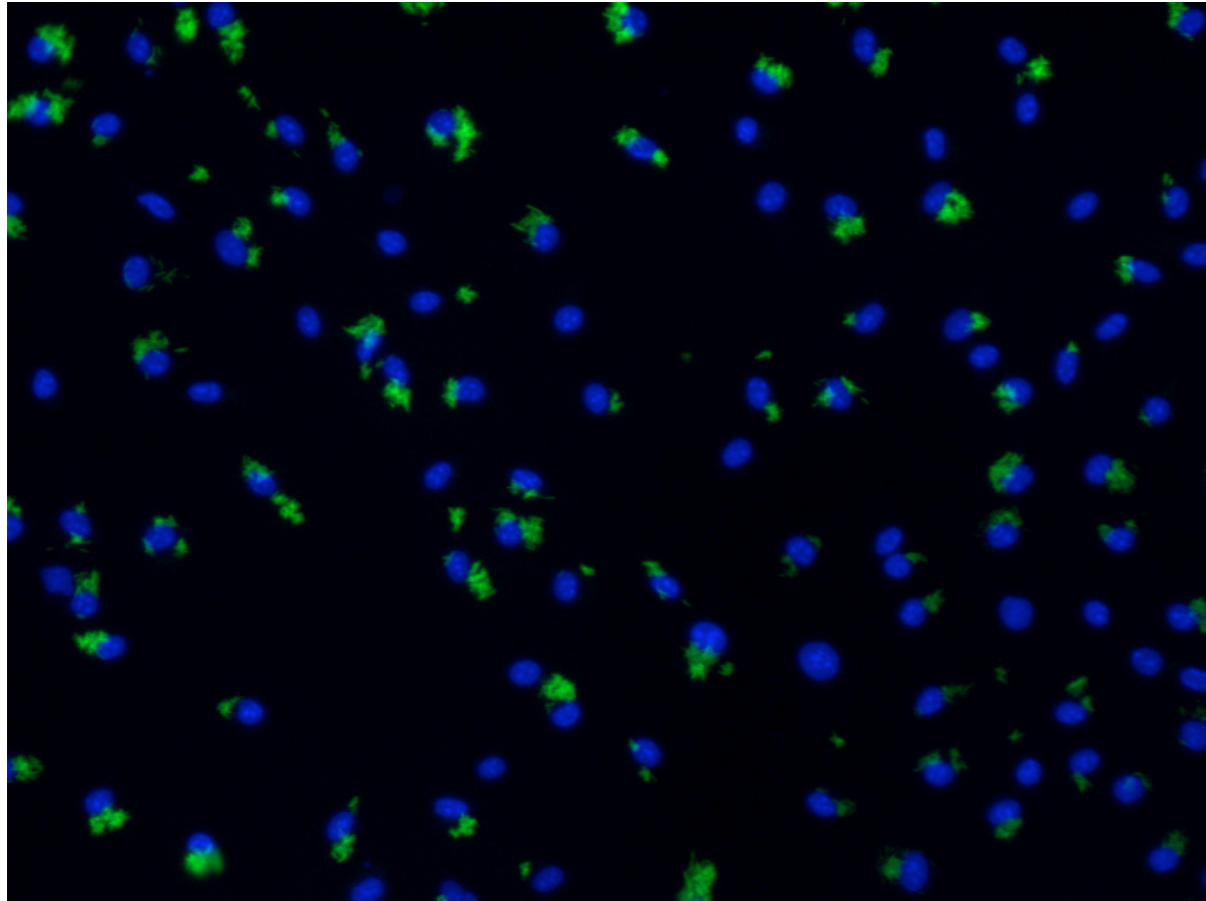


WHO report, 2008

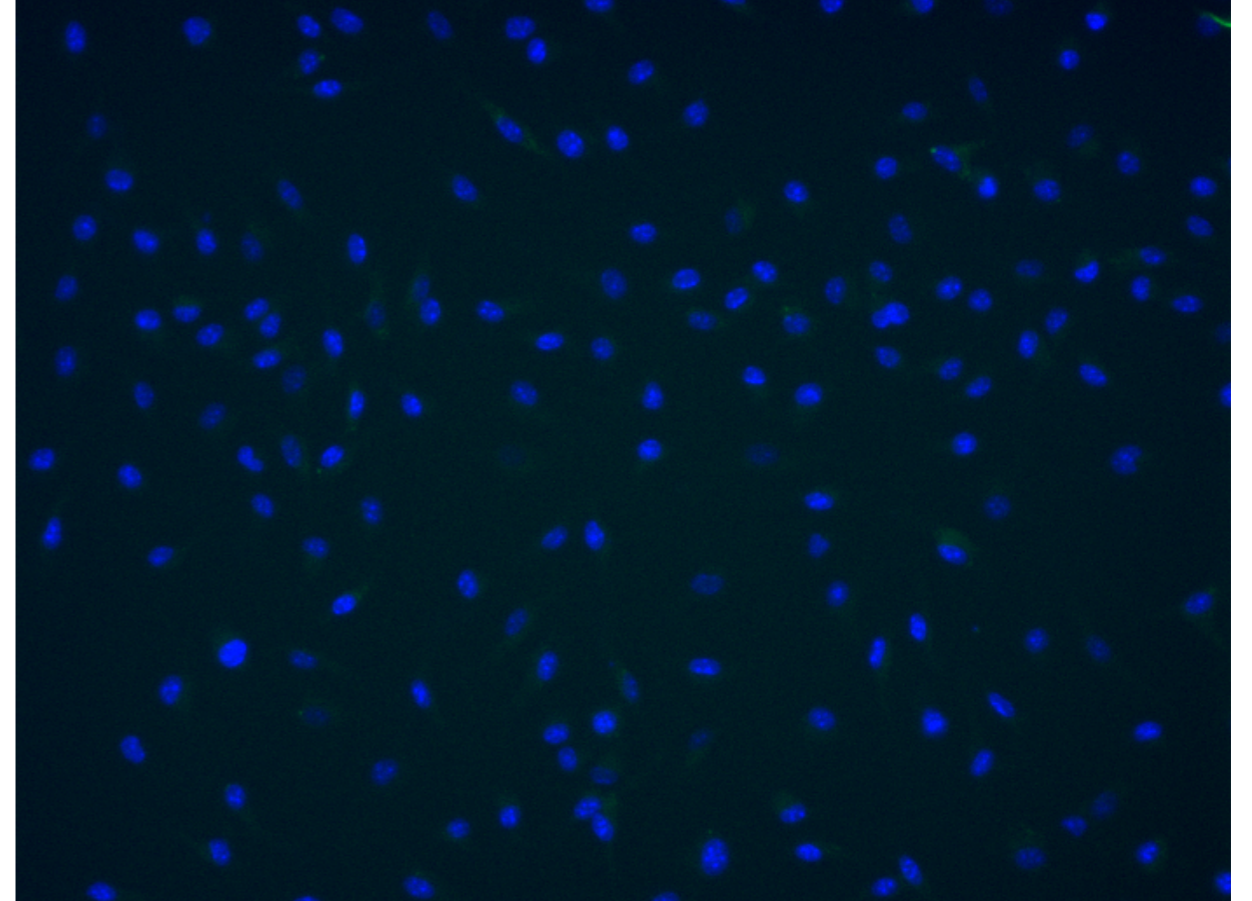
Estimated new TB cases  
per 100,000 population

# Search for tuberculosis treatments

Without drug



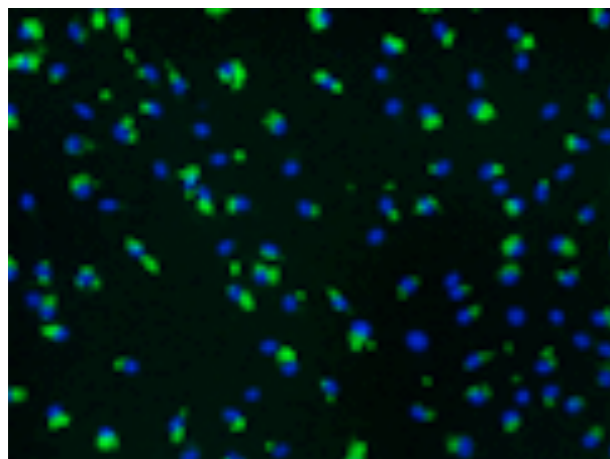
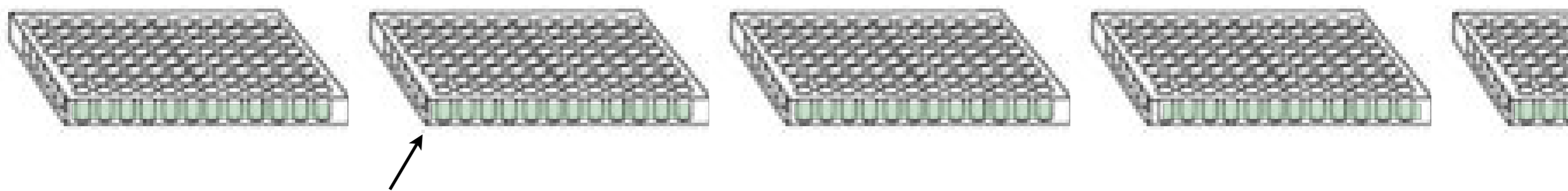
With drug



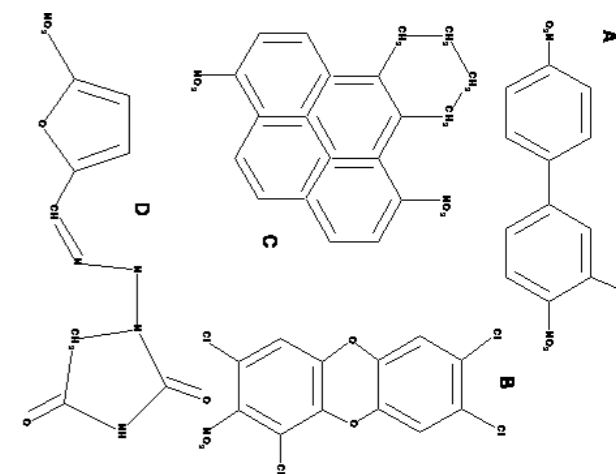
blue = human cells

green = tuberculosis bacteria

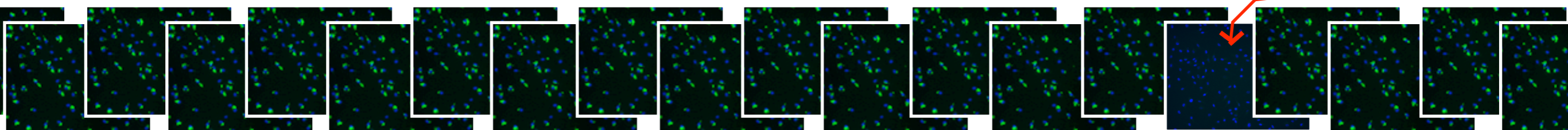
Put **bacteria** and **cells** in individual wells of multi-well plates

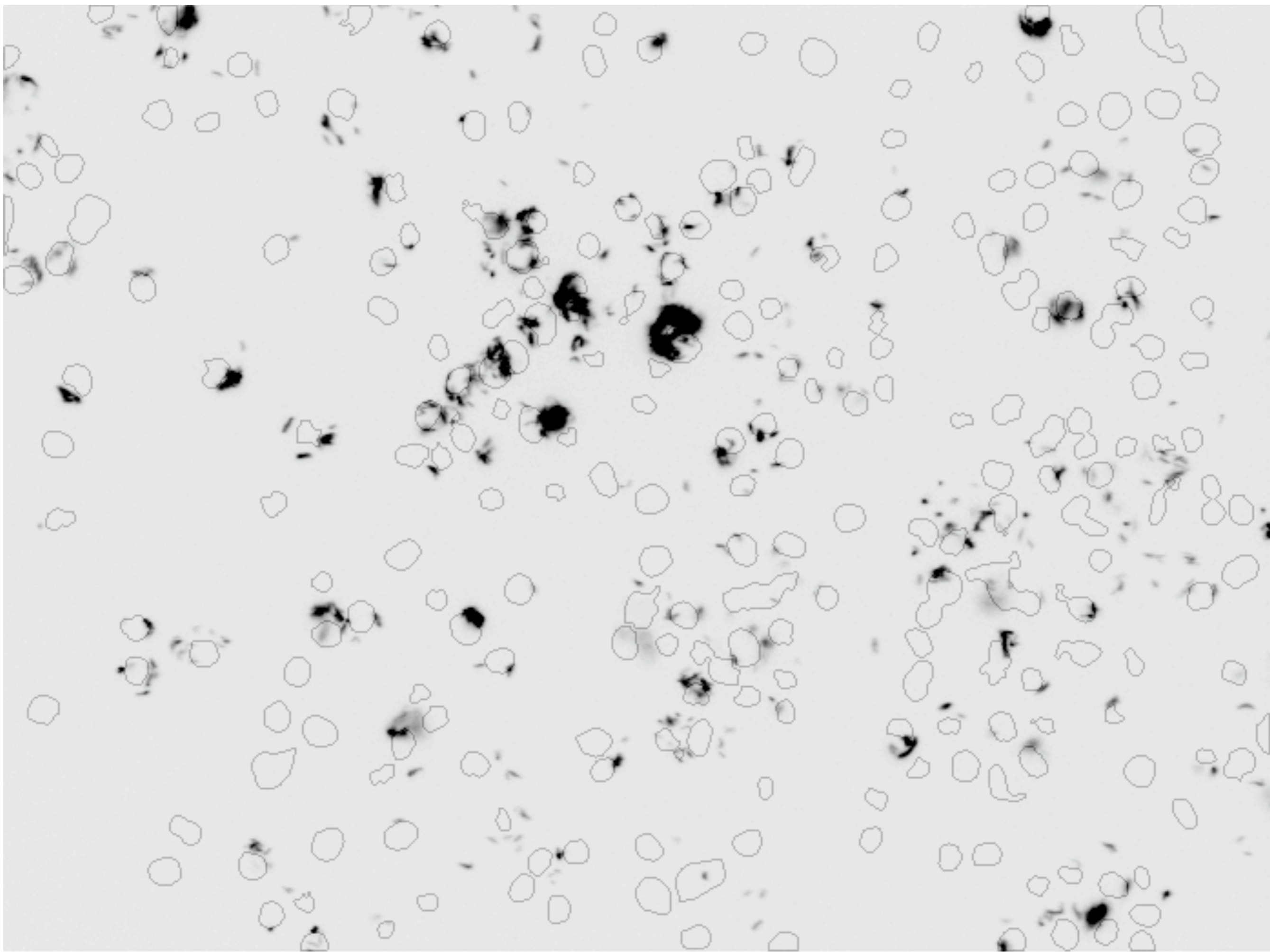


Add thousands of test chemicals, each chemical in a different well



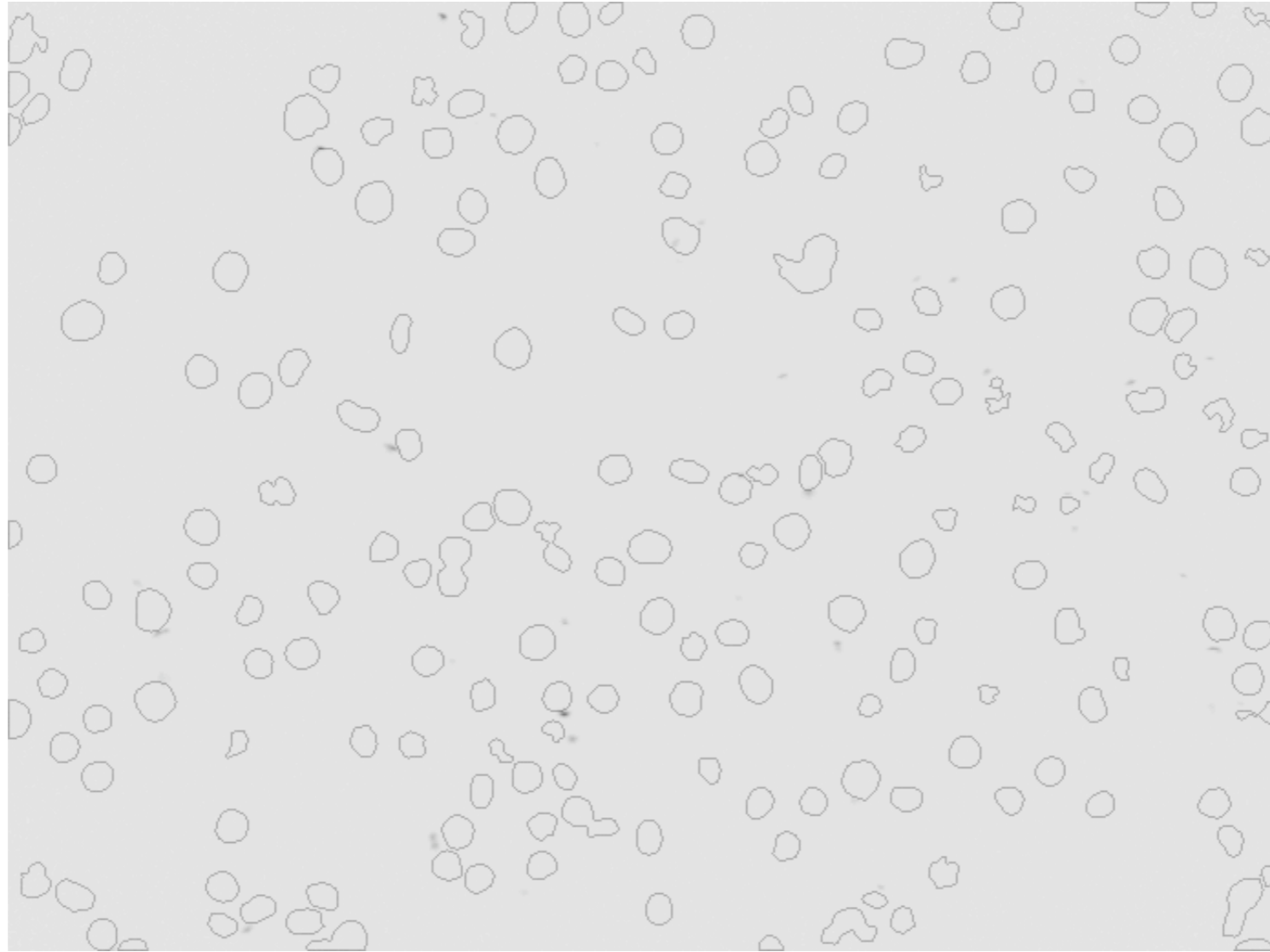
Automated microscope








# Rifampicin - positive control



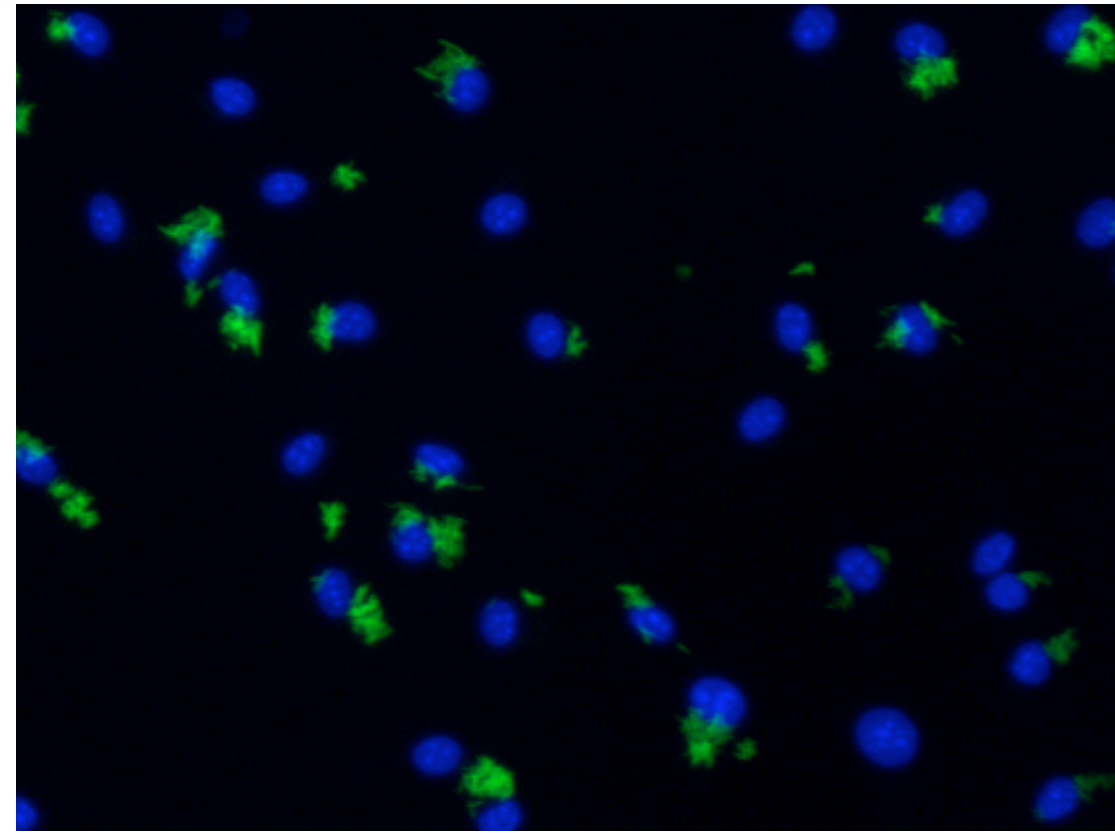
Number of bacteria : 15

Number of human cells : 211

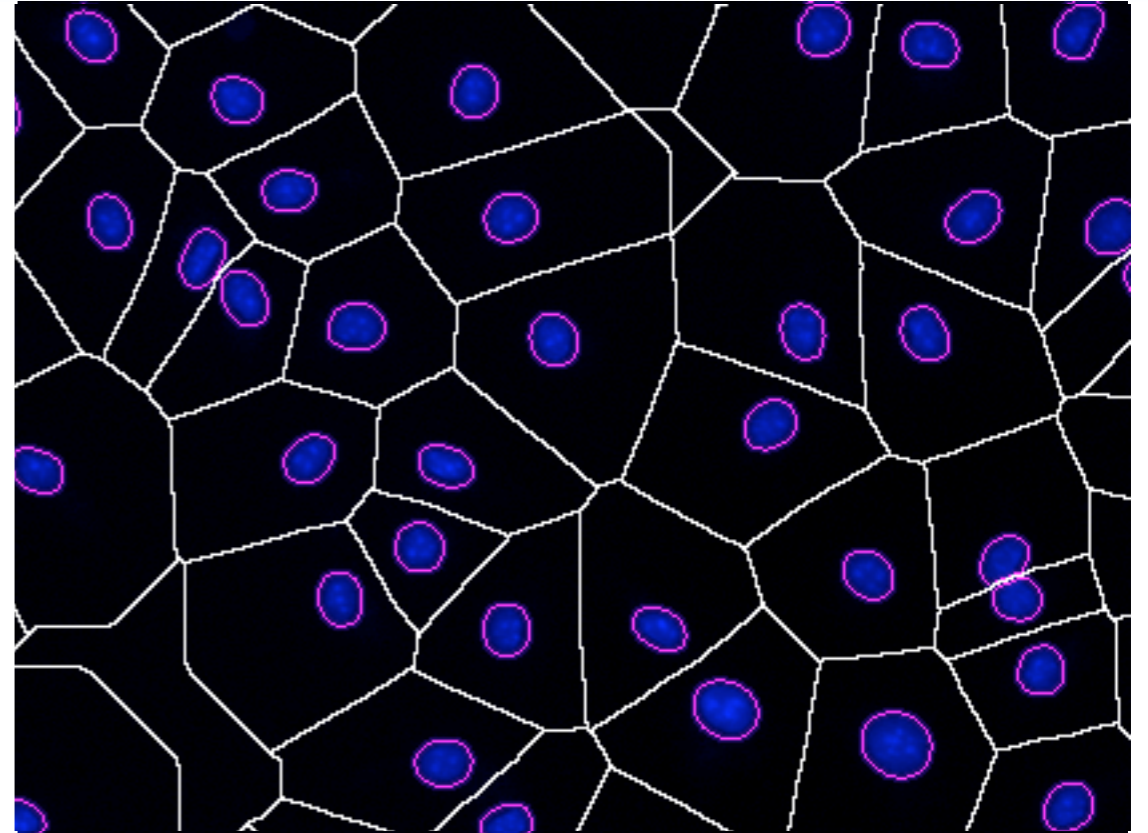
Average roundness of human cells (choose a score = 10,9,8,7,6,5,4,3,2,1):

10 = round  5  irregular = 1

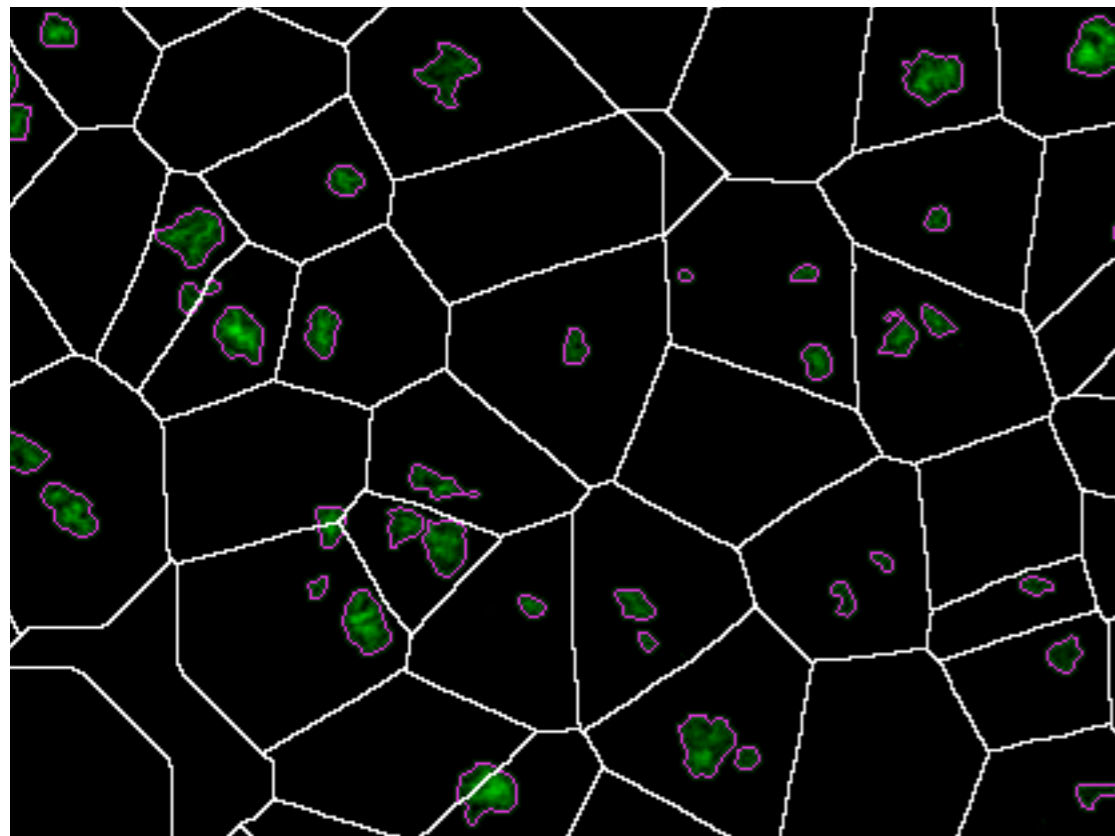
# Computerized image analysis



Find  
cells



Find bacteria

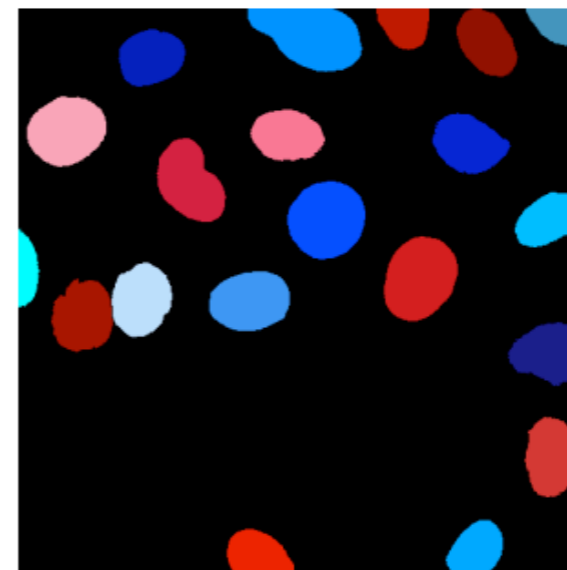
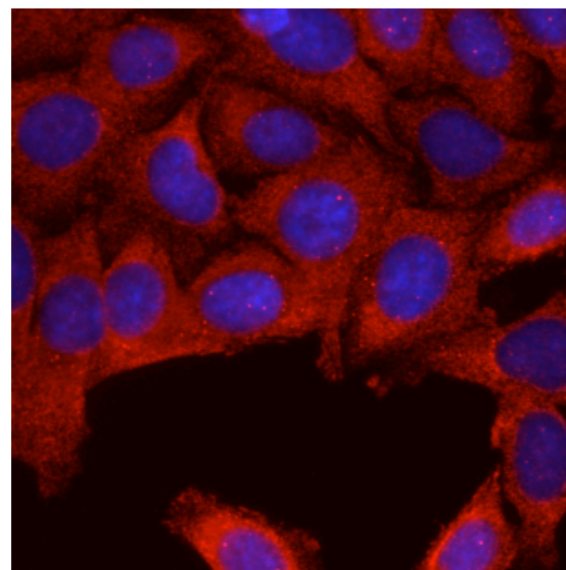


Count the number of  
bacteria per cell





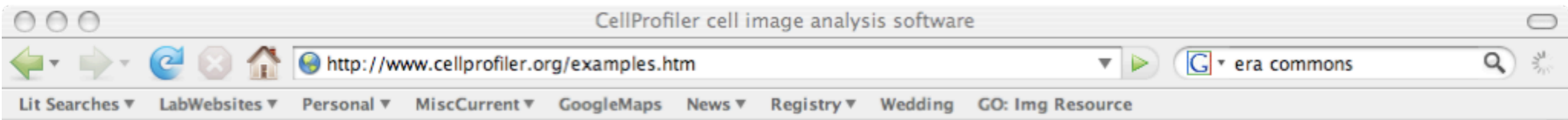
[www.CellProfiler.org](http://www.CellProfiler.org)



Cell  
measurements

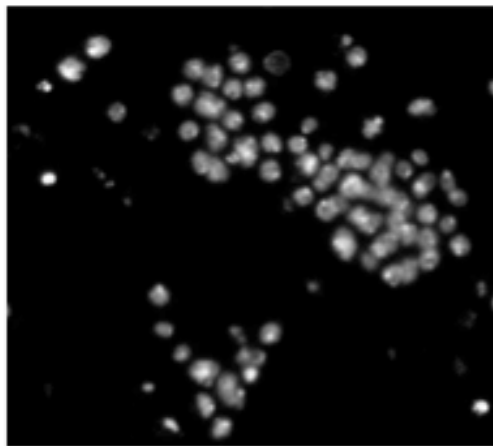


Remaining slides go along with the teacher's video guide

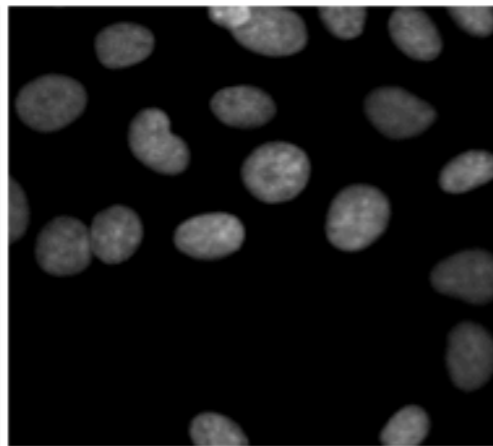


## How do I get started?

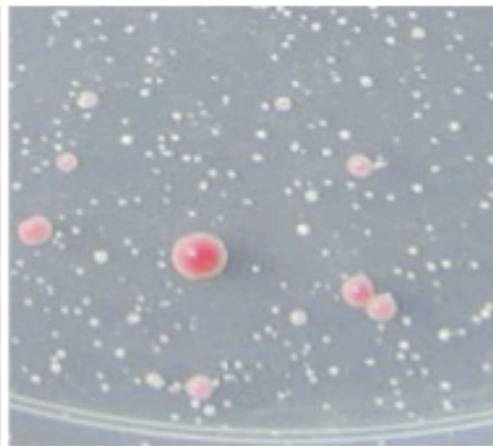
1. Select an example where the cell type (or object type) resembles yours. Mouse over the images for examples of CellProfiler analysis.



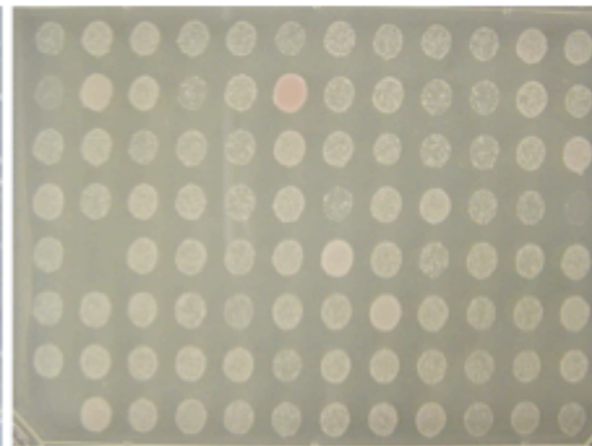
Fruit Fly example cells are highly textured and clumpy.



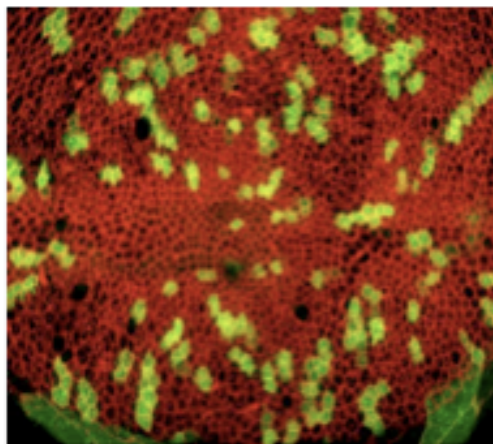
Human example cells are fairly smooth and elliptical.



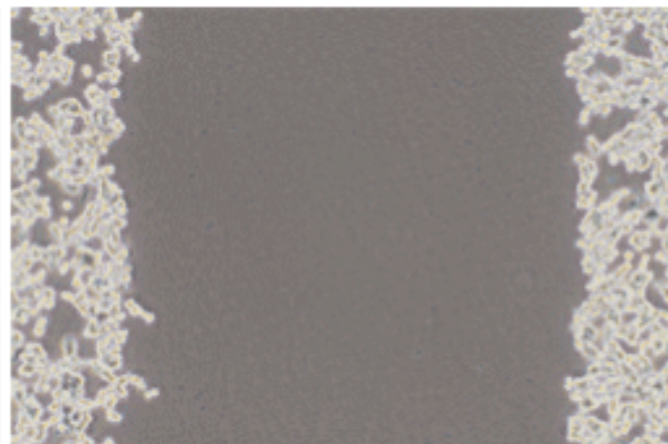
Colonies are very uniformly round.



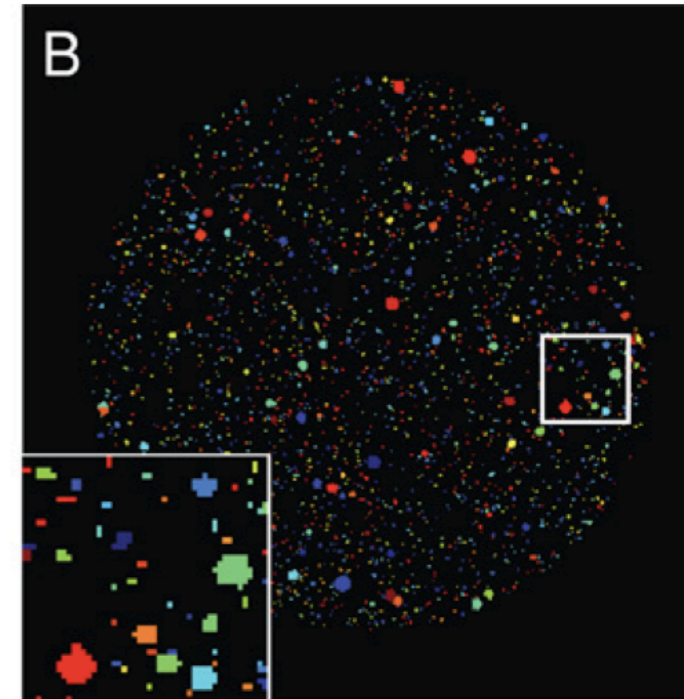
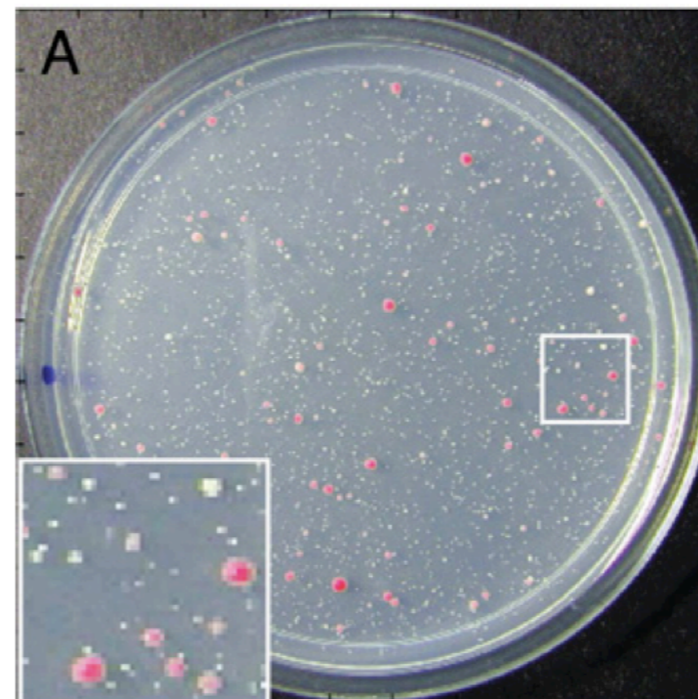
Grid of spots



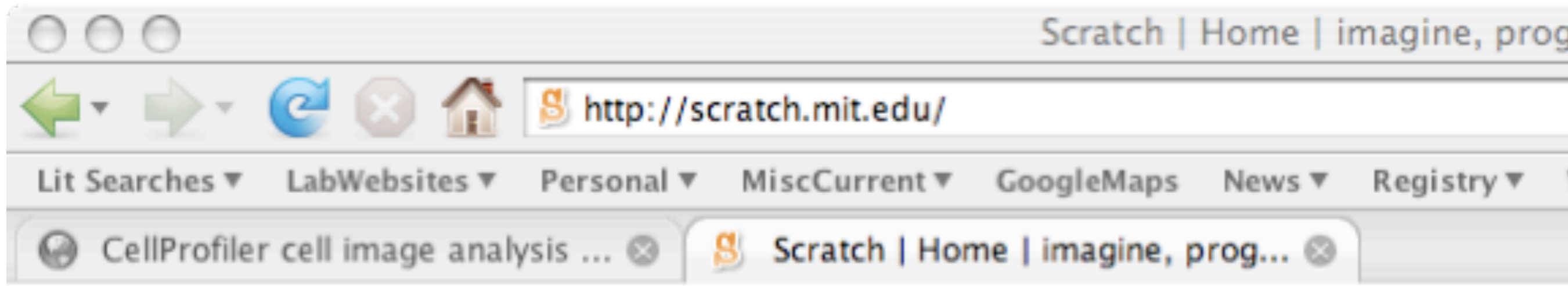
Tissue samples contain cells that are irregularly shaped with adjacent edges.



For Wound Healing assays, the cell monolayer is identified as a whole, rather than as individual cells.



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