Micro Consistency of Morphology Re-training

- In May-June of this year, you participated in the consistency of morphology on MTS
- The assigned quiz covered gram stains, sputum screening, & malaria smears
- The quiz was designed to not flag / alert you if your answer was different than the intended one. This allowed a true assessment of how consistent our lab staff is with identifying and reporting in Microbiology
- Answers were downloaded from MTS and assessed. The next slide show the findings -

Findings

Ques #	Intended Answer	# Techs Participating	# Techs who reported correctly
1	Yeast	59	59
2	Gram positive rods or GPR resembling diphtheroids	59	59
3	Gram positive rods	59	49
4	Gram negative rods	59	59
5	Gram positive cocci in clusters	59	59
6	Gram negative diplococci	59	59
7	Gram negative rods	59	58
8	Gram negative coccobacilli	59	57
9	Stain precipitate	59	58
10	Yes	59	55
11	Gametocytes	59	58
12	Malaria	59	59
13	True	59	52
14	Large platelet	59	57
	SUM	826	798

There were 28 instances where a wrong answer was given. The slides depicted in questions 3 & 13 had the predominant wrong answers.

Micro Consistency of Morphology Re-training

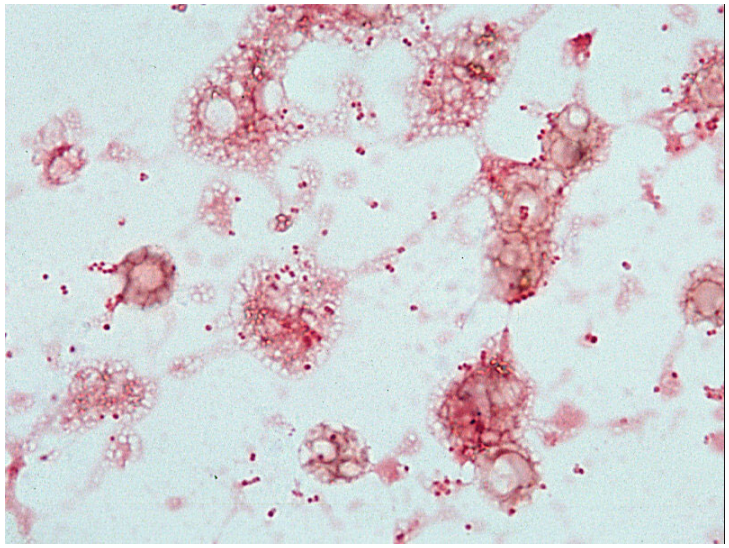
- The following presentation is a review intended to assist staff in proper identification
- After reviewing the material and slides, take the quiz.
  - The quiz is graded and will provide a score
  - If you do NOT score 100%, do NOT request a re-set. You must see your supervisor to receive additional hands-on training. You will be required to perform a competency as part of that training.

Gram Stain Interpretation

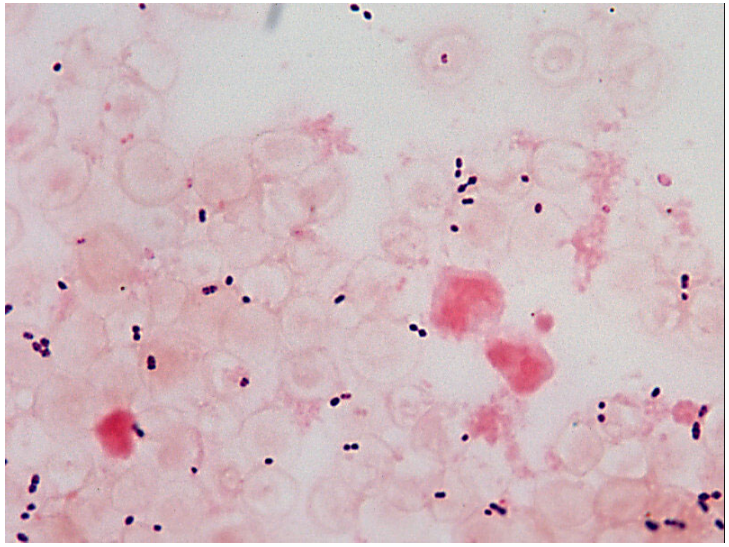
Organism

- Size
- Color
- Shape
- Arrangement

Cocci

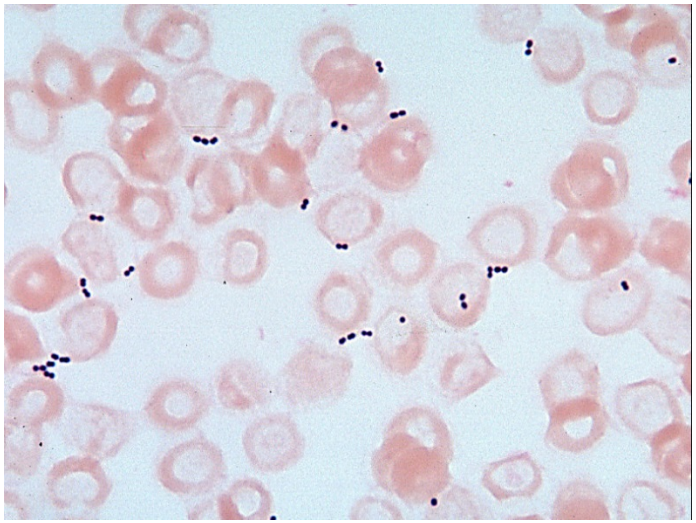


Morphology tips - cocci
Gram negative diplococci – kidney bean shaped, parallel longitudinal axis = Gram negative diplococci (most often Neisseria species)

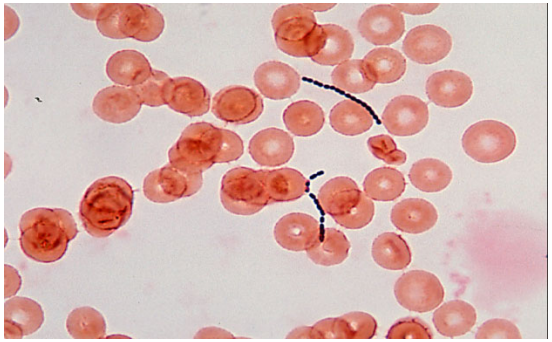


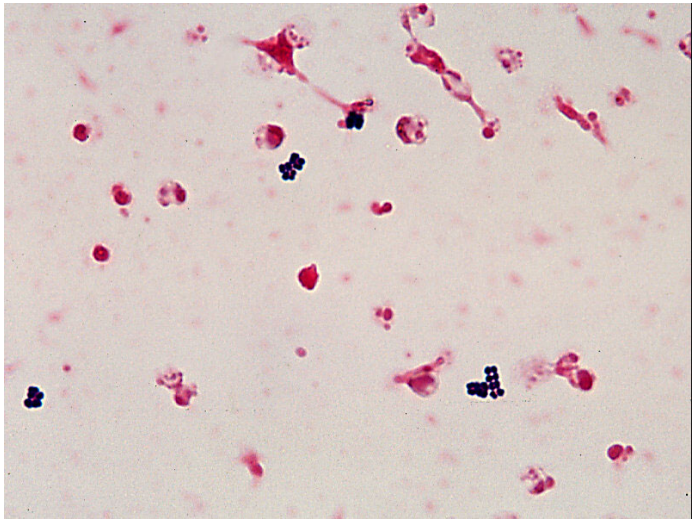
Gram positive diplococci – elongated, single longitudinal axis, may have pointed (lancet-shaped) ends = streptococci (may be Streptococcus pneumoniae)

Gram Positive Cocci



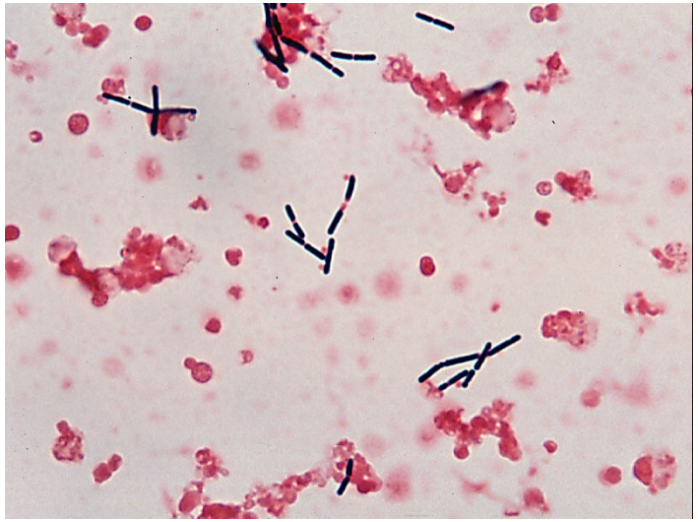
Gram positive cocci in pairs and chains – smaller, elongated, never in tetrads = streptococci



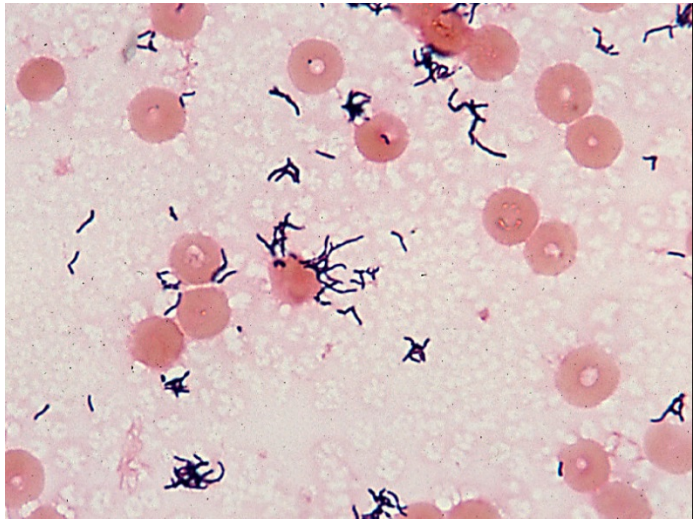


Gram positive cocci in clusters – usually very spherical, larger cells, not elongated, pairs OK, but not chains >4 cells long. May look Gram negative if overdecolorized, but CAN'T be Gram negative if not kidney-bean shaped

Gram positive bacilli

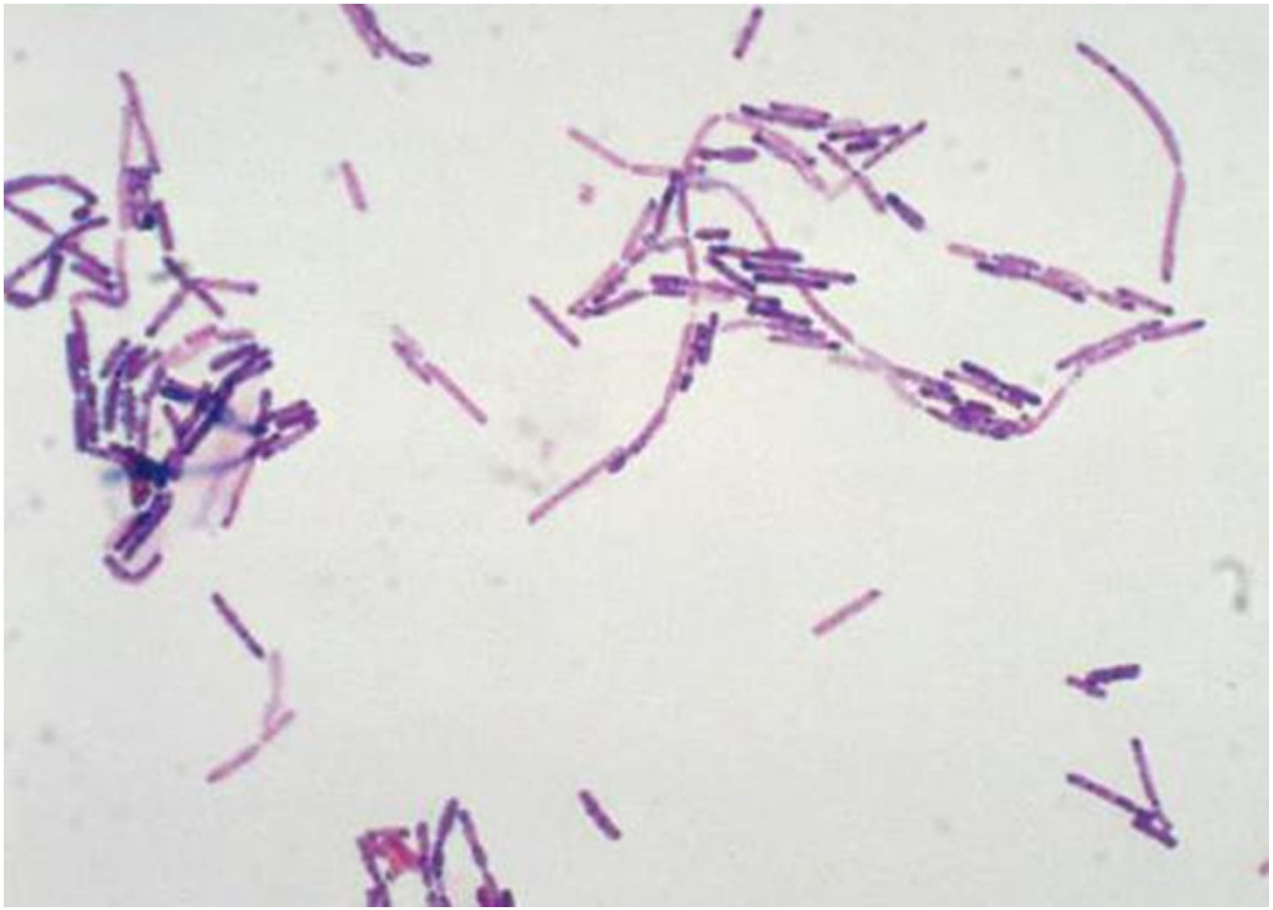


Gram positive rods can be regular. If large likely to be *Bacillus* – aerobic or *Clostridium* – anaerobic. These may chain. If smaller, Listeria, which would not chain, or Lactobacillus, which often chain.



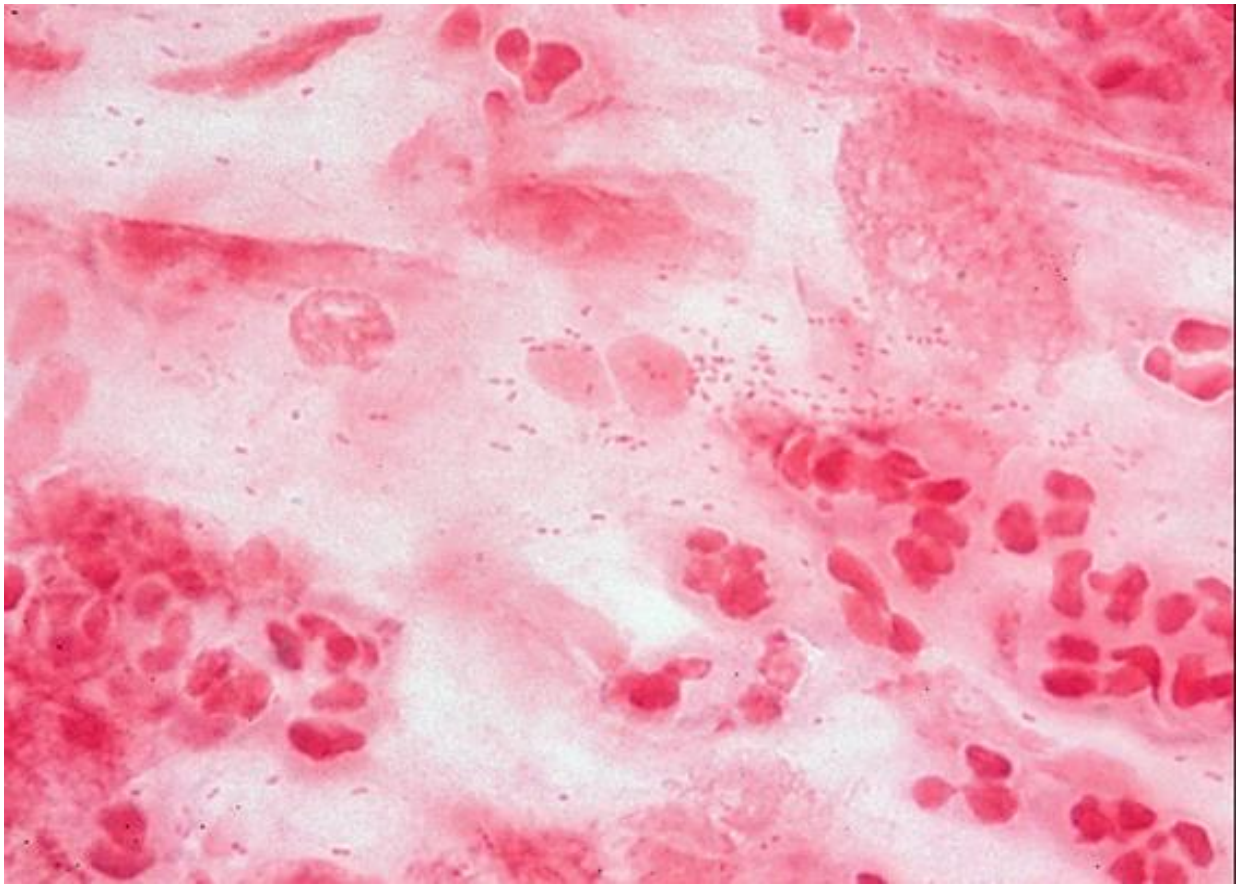
Gram positive irregular shaped rods (pleomorphic), one end wider than the other end. Tend to divide in snapping forms or line up sideways (palisading) – Coryneform rods or Diphtheroids.

Gram Positive Bacilli



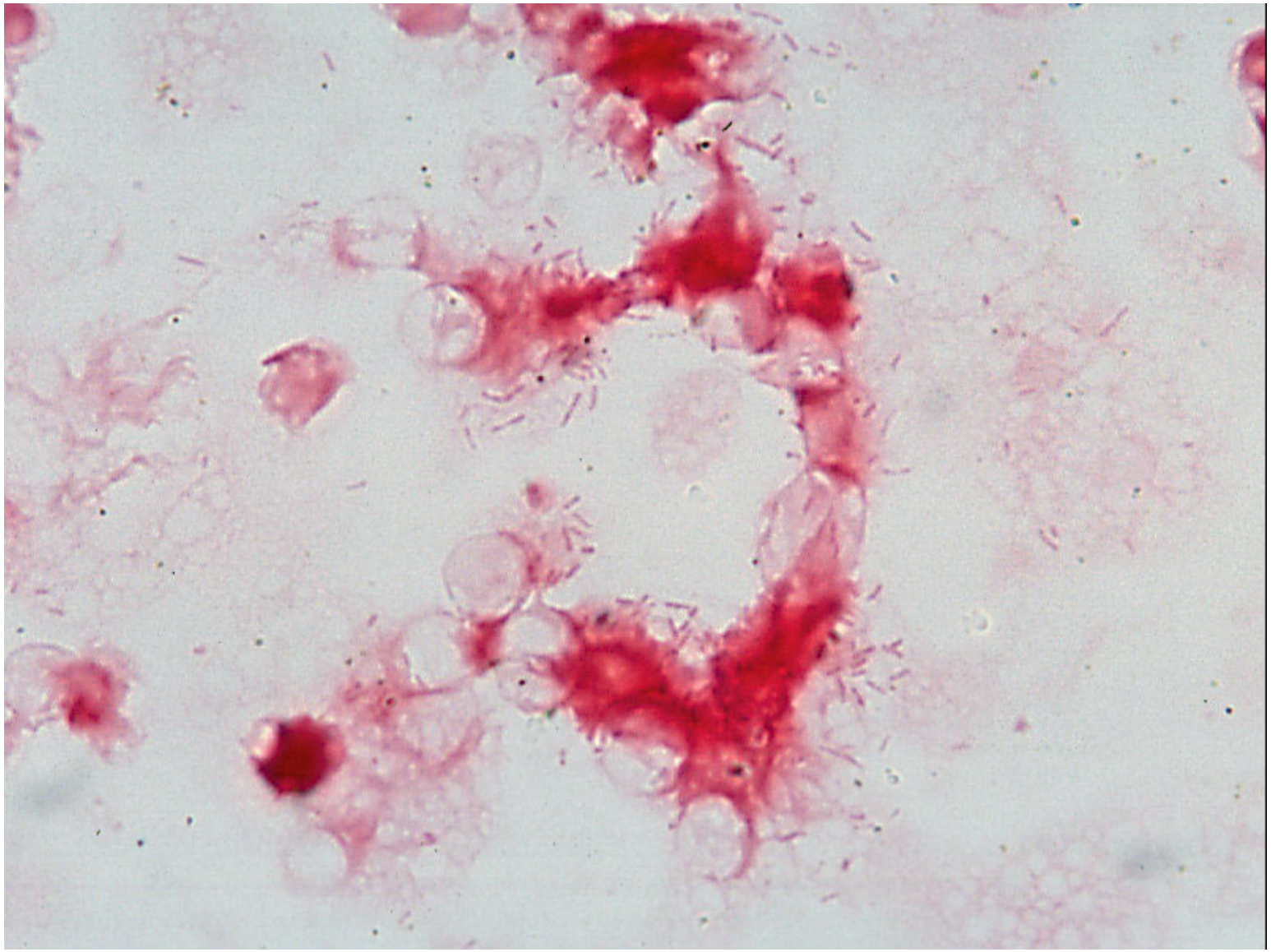
Bacillus sp. and *Clostridium* sp. decolorize easily. It is common to see a mix of gram positive and gram negative cells. Some cells may have a mottled appearance. The size, shape and arrangement of cells must be considered. Cells will be large, parallel-sided, and may form chains. Cells are longer than most gram negative rods.

Haemophilus influenzae



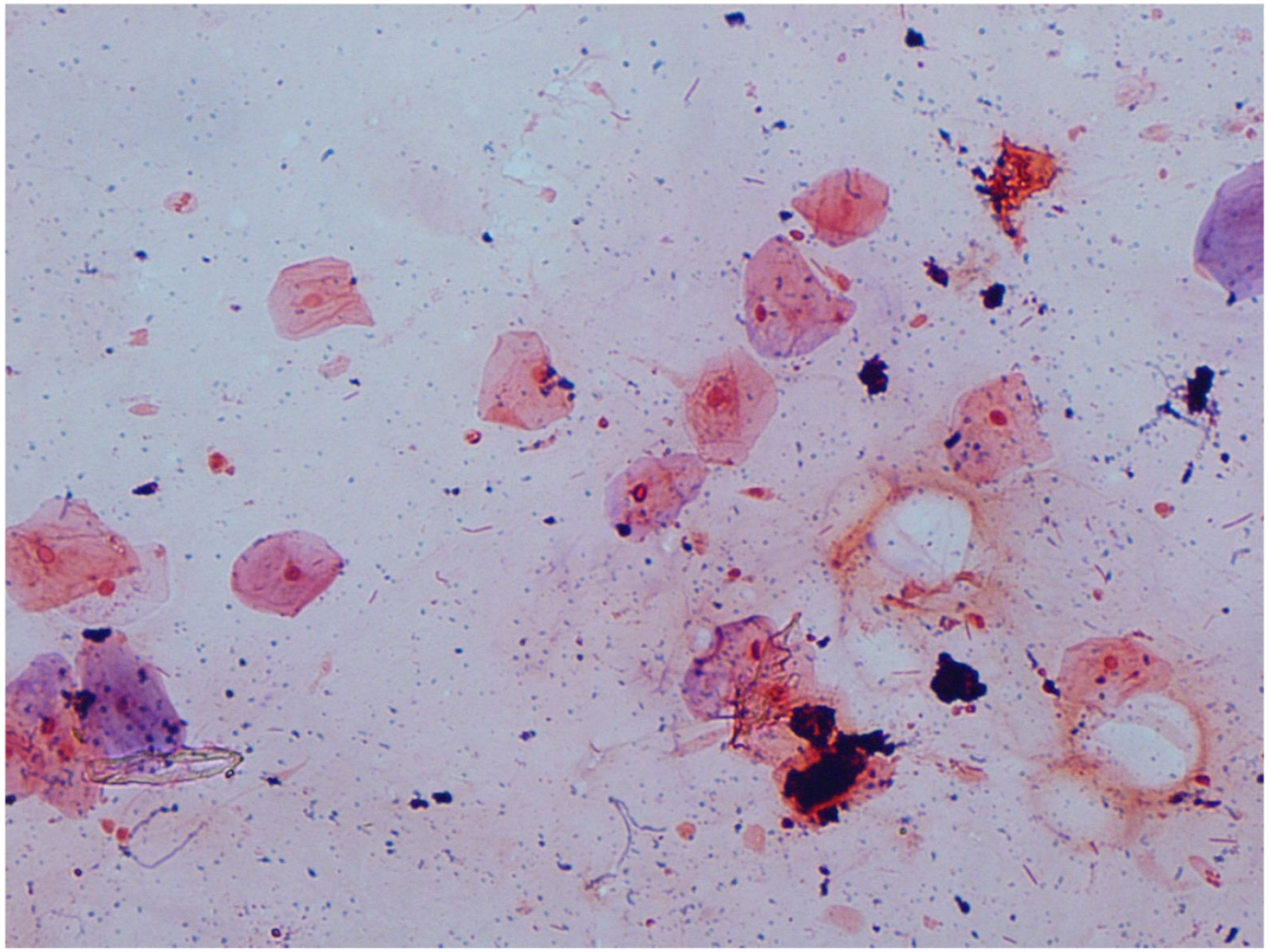
Haemophilus influenzae may be described as either pleomorphic gram negative rods or gram negative coccobacilli. Pleomorphism is variation in the length of the cells. They may be very short coccobacilli to long thin bacilli or a combination of long and short cells. This image shows predominantly short, coccobacilli.

Haemophilus influenzae

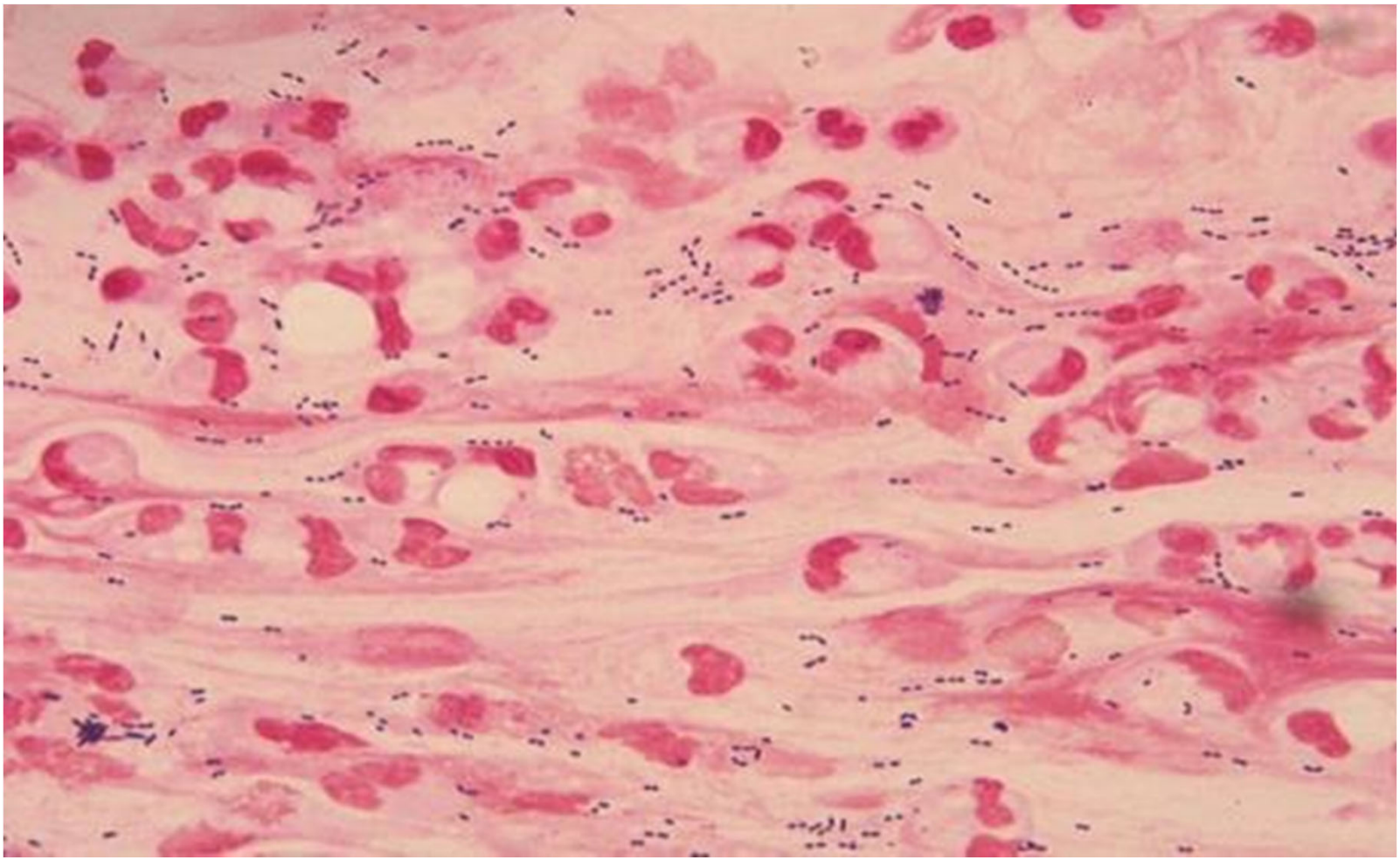


This image shows a mix of short and long, thin cells.

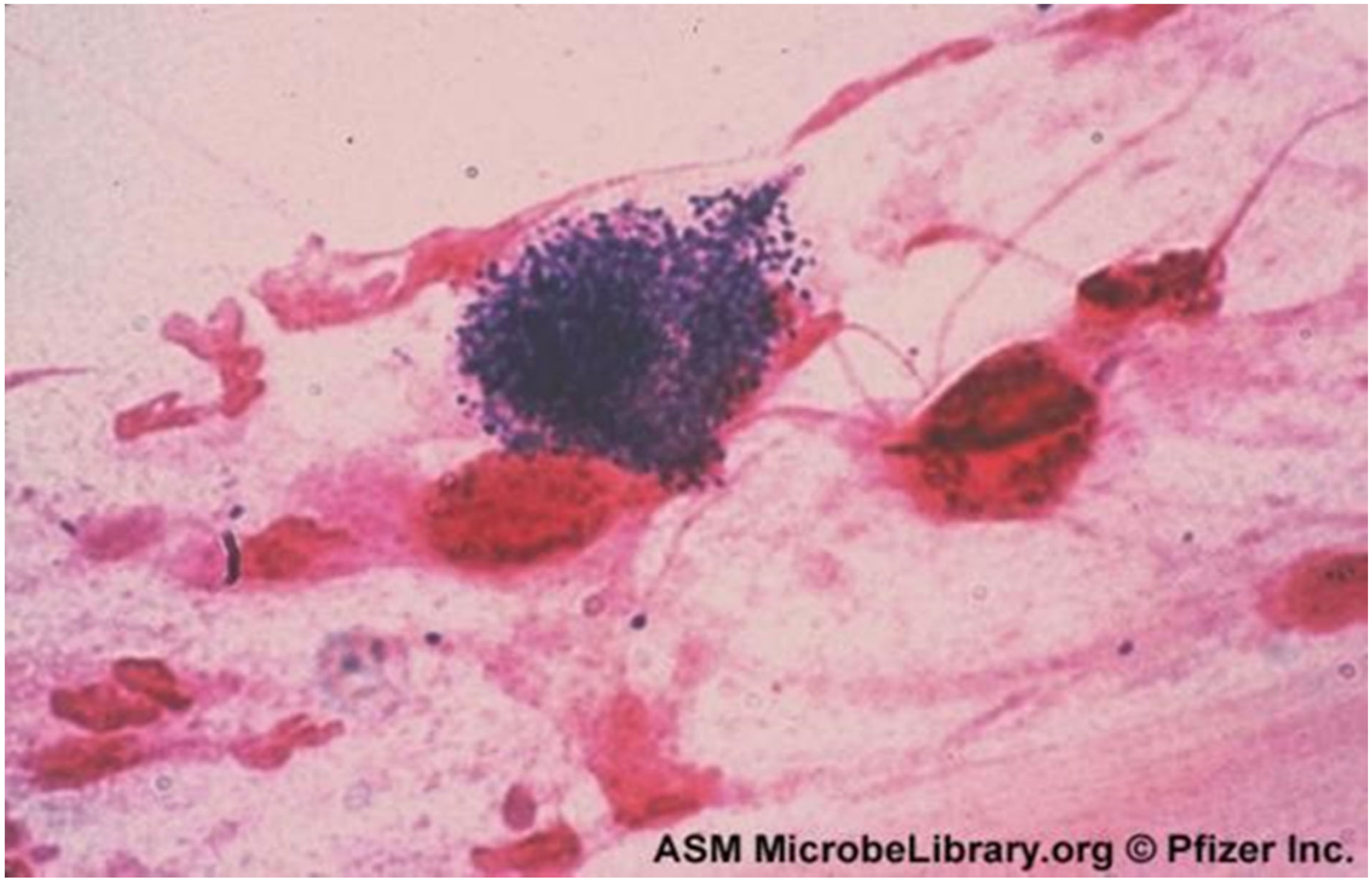
Sputum unacceptable for culture with many epithelial cells



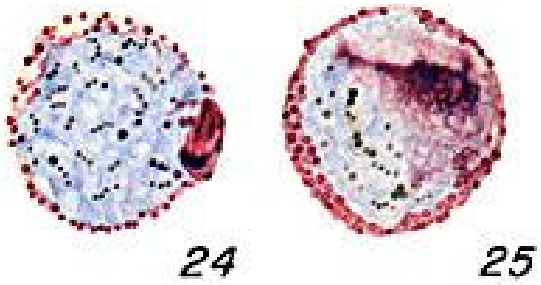
Sputum acceptable for culture with many WBCs and mucus strands and no epithelial cells

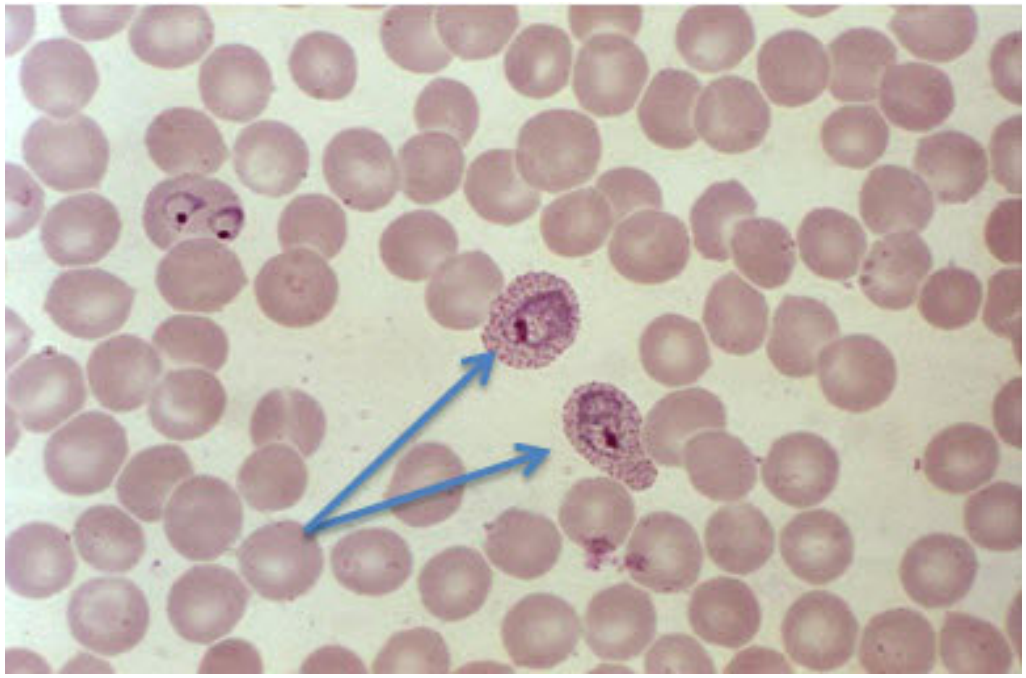


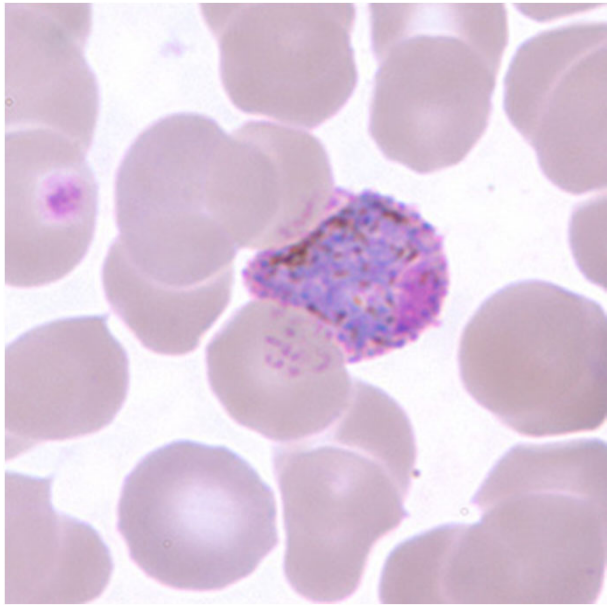
Stain precipitate
No structure to arrangement of blue dots and clumped on top of cells



Malaria gametocytes
Gametocytes of *P. malariae*, *P. vivax*, and *P. ovale* fill the entire red cell

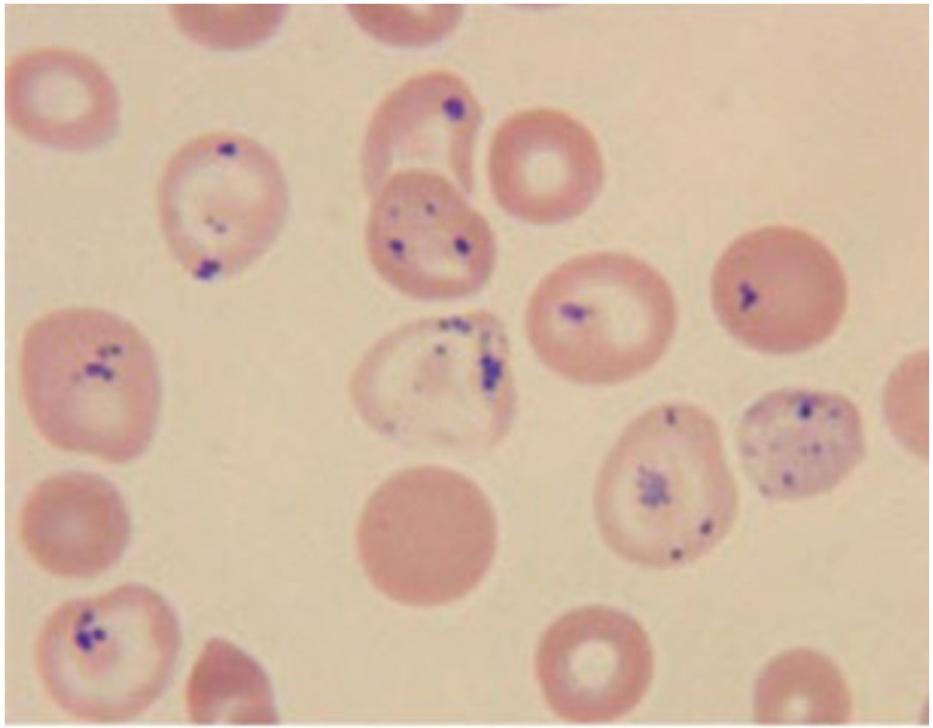






It is important to distinguish a true malarial parasite from red blood cell inclusions or artifacts

This slide represents Pappenheimer bodies and basophilic stippling. There is no blue cytoplasm in ring or trophozoite shape; there are widely varying shapes and sizes with uniform color for basophilic stippling



This slide represents malaria. Must see blue cytoplasm and 1 or 2 red chromatin dots per parasite. Malaria rings are uniform in shape