Introduction

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Workshop Components

- Slide Review
  - Informal questions
  - Video microscopy
- Mini-lectures
- Unknown/Challenge Cases

Slide Resources

- 79 JHH Slides (labelled JH-XX)
- 114 Methodist Slides (labelled HXXX)

- Divided Into Categories:
  - NILM/Benign/Reactive
  - ASC-US/LSIL
  - HSIL/ASC-H/Squamous Cell Carcinoma
  - Glandular Atypia and Neoplasia

Slide Resources

- Teaching (Study) Packets
  - 104 JHH Packets (GYN-XXX)
  - 7 Methodist Packets

- Available throughout the workshop
- More information and histologic follow up
- May take more time
- Will not be combined with other slides

Adequacy Assessment
Benign and Reactive Findings

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Table I. Technical Differences Between LBP and Conventional Smears

Features	*ThinPrep*	*SP*	*Conventional smear*
Cost	Expensive	Expensive	<Expensive
Sample collection	Uniform Head of sampling device is discarded	Uniform Head of sampling device is submitted	Variable Head of sampling device is discarded
Sample transfer	Almost entire	Entire	<80%
Fixation	Immediate	Immediate	Varies
Transport	Easy	Easy	Easy to difficult
Slide preparation	Fully automated	Partial automation	Manual
Number of cells	~50,000	~50,000	>300,000
Slide evaluation	Easy Cells in a well-defined 20-mm diameter area	Easy to difficult Cells in a defined 13-mm diameter area	Tedious Cells diffusely smeared in a 25 × 75 mm area
Image-guided screening FPGS	Yes, TIS	Yes, FPSP and FPGS	Yes, FPSP and FPGS
Cell preservation	Good	Good	Variable
Obscuring factors	None	None	Usually present
Air drying	None	None	Usually present
Screening time	Reduced by 60% compared to CPS	Reduced	Always long
Reproducibility	Yes	Yes	No
Ancillary studies	Possible	Possible	+/−

LBP: Why so different?

- Fixation in solution vs. on slide
  - Preserved 3D architecture
  - Smaller cell size
  - “Rounding up” of cells
- Size selection
  - Reduced background
  - Reduced single cells
  - Reduced large fragments (TP > SP)

Table II. General Cytologic Features on LBP and Conventional Smear

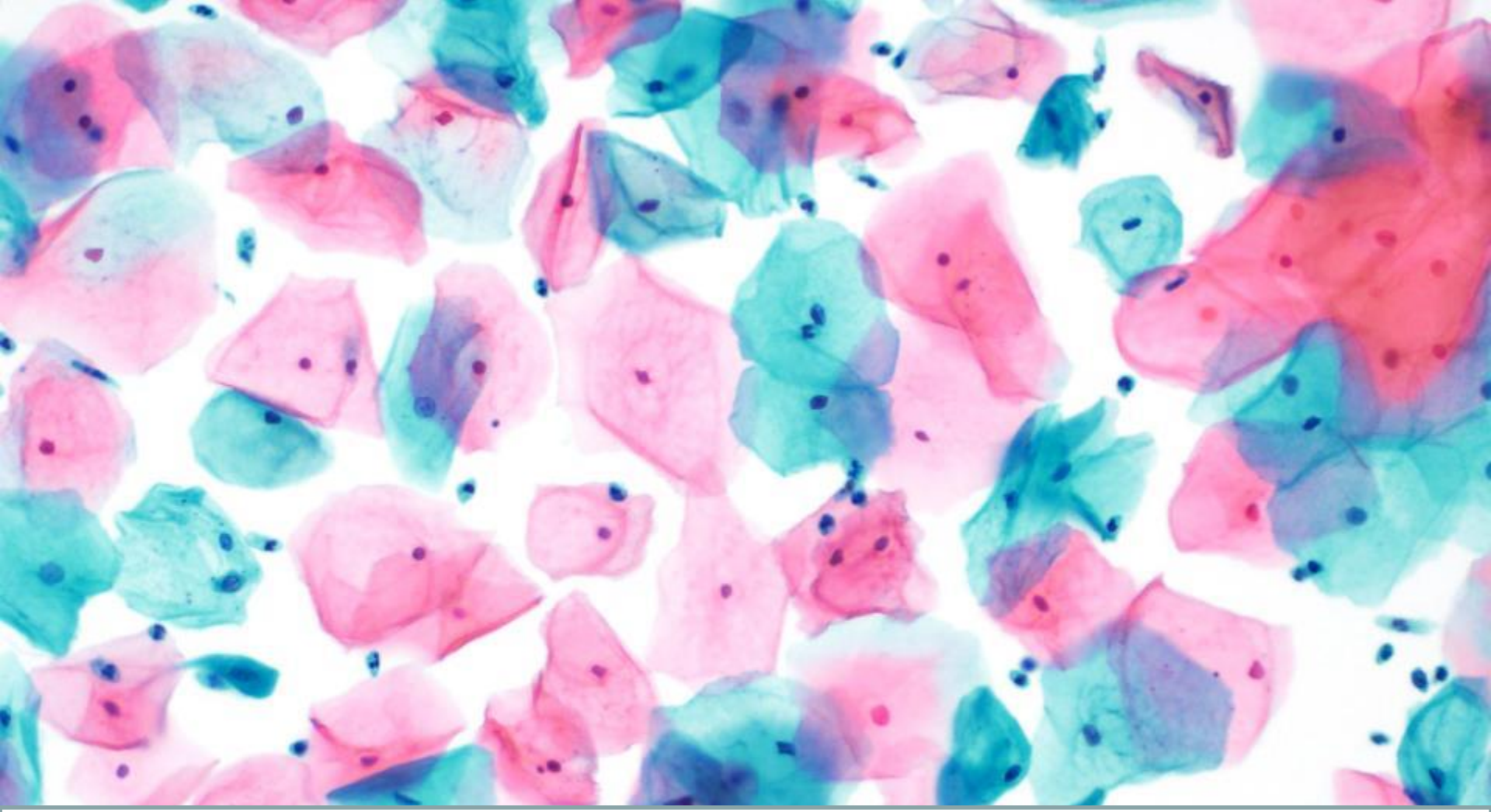
Features	*ThinPrep*	*SP*	*Conventional smear*
Quality	Enhanced	Enhanced	Variable
Background			
Clean	Yes	Yes	No
RBC	Reduced	Reduced	Present/usually obscure
Neutrophils	Reduced	Reduced	Present/usually obscure
Necrosis	Clumped	Clumped	Diffuse/usually obscure
Cellularity	Lower	Lower	Higher
Cell distribution	Uniform One plane of focus	Uniform Different planes of focus	Uneven, thick
Cell size	Smaller	Small	Larger
Architecture	Less Preserved	Less Preserved	Preserved
Cytomorphology	Preserved	Preserved	Preserved +/−
Extracellular material[a]			
Quantity	Reduced	Reduced	—
Mitoses	Preserved	Preserved	Preserved

[a]Extracellular material is altered in quality. Please see specific sections for pertinent alterations. Modified from Michael et al.[11]

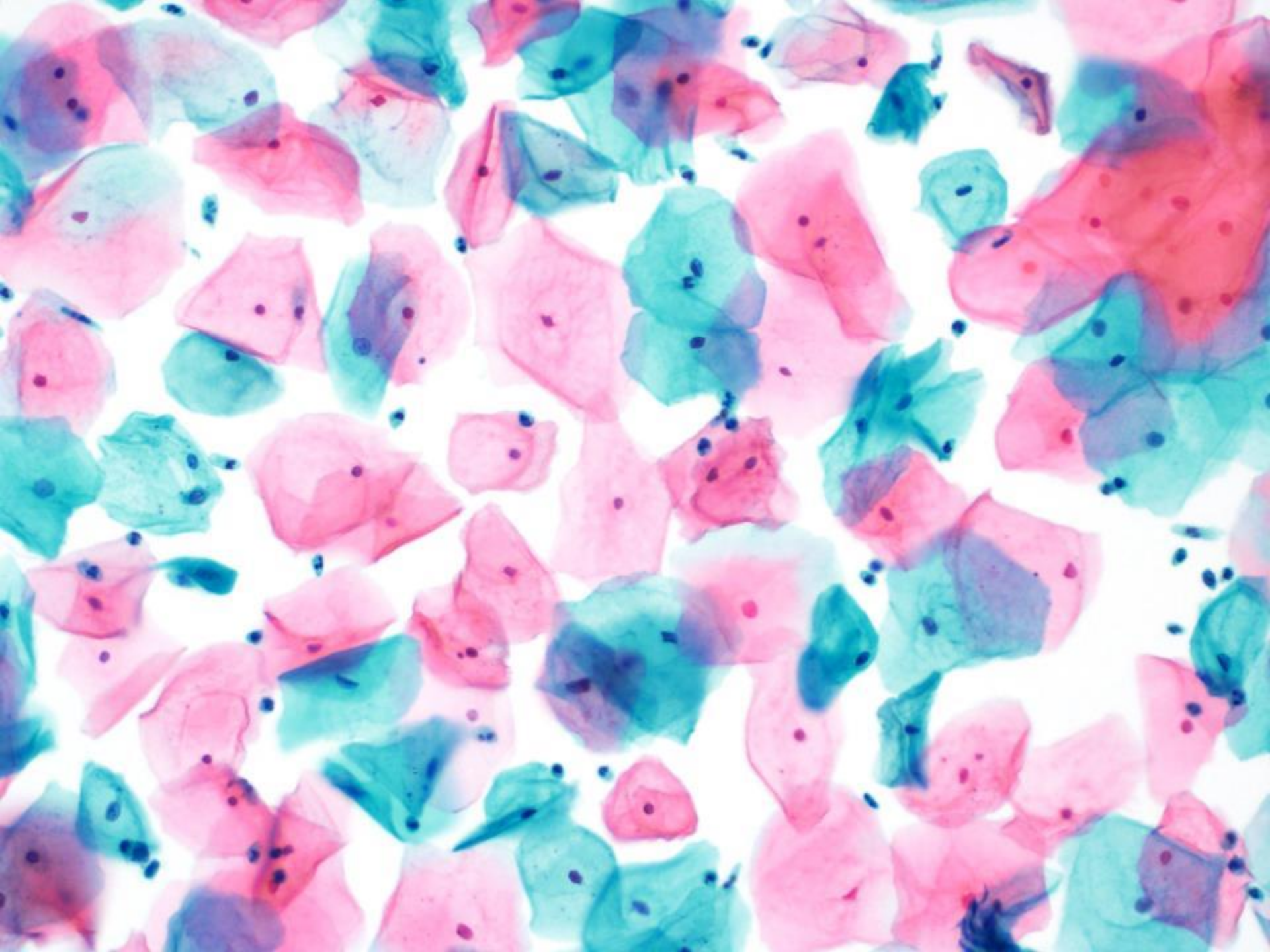
Table III. Specific Cellular Features LBP and Conventional Smear

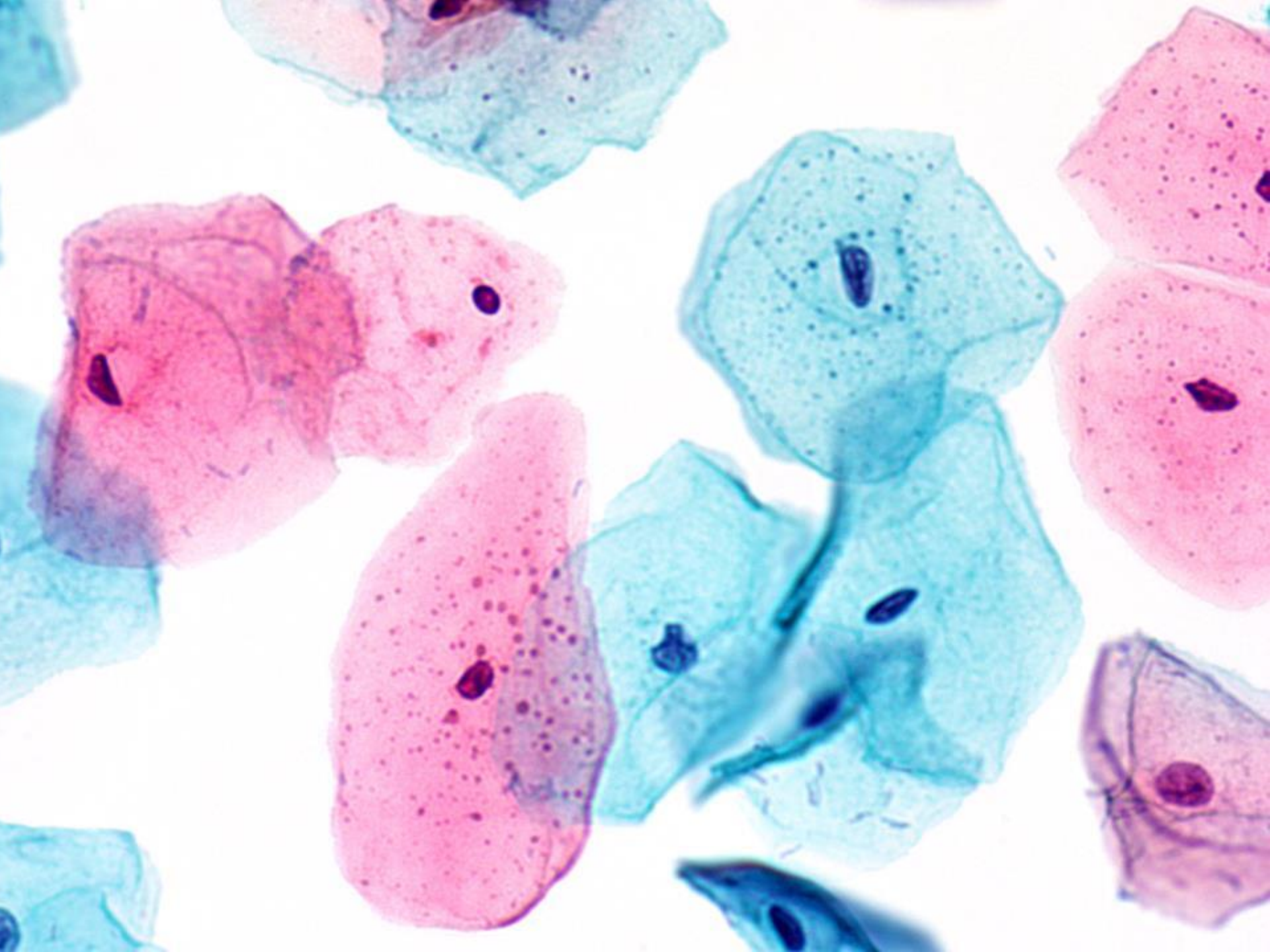
Features	*ThinPrep*	*SP*	*Conventional*
Architecture			
Distortion	+	+	—
Fragmentation	++	+	—
Monolayer cells	+	—	N/A
Cell clusters	+, Thin	++, Thick, 3D +	+
	Smaller	>Depth of focus	Larger
	>Cohesive	Small	More open
	Minimal overlap	>Cohesive	Overlap
		More overlap	
Single cells	+	+++	+
Pseudostartified strips	+	+++	+
Flattening	+	—	+[a]
Cellular morphology			
Cellular elongation	—	+	+/–
Shape	More rounded	Less rounded	Retained
Nucleus			
Detail	Enhanced	Enhanced	usually good
Contour changes	Retained	Retained	retained
Chromatin detail	Enhanced	Enhanced	preserved
Hyperchromasia	**Retained**	**Less**	**Retained**
Nucleoli	Prominent	Preserved	Preserved
Cytoplasm			
Detail	May be denser	May be denser	Good
Shape	Retained	Retained	Retained
Folding of borders	+	+	+/–
Elements[b]	Preserved	Preserved	Preserved

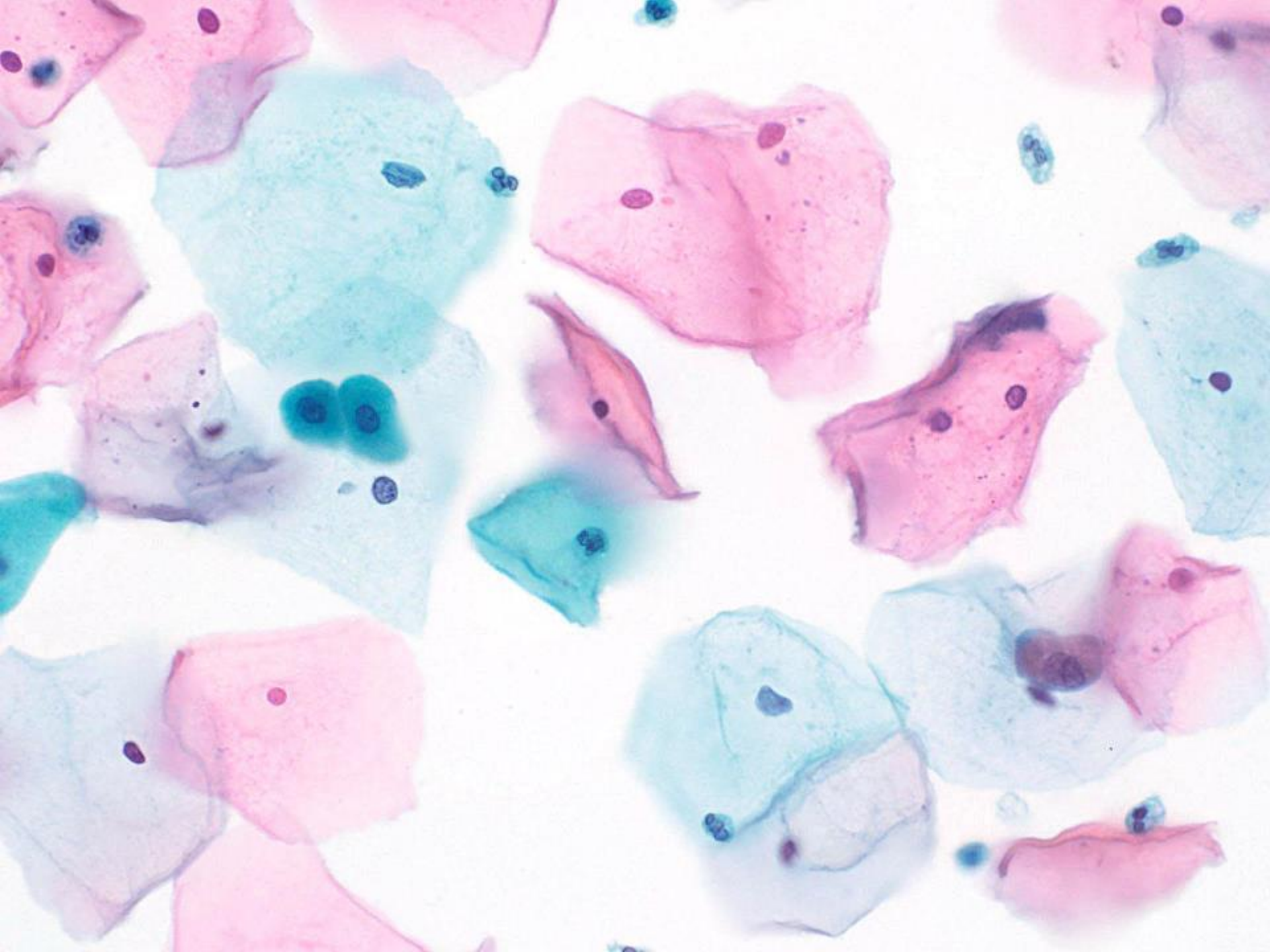
[a]Particularly in air-dried slides;
[b]Cytoplasmic elements include: vacuolations, pigment, and polymorphonuclear leucocytes.

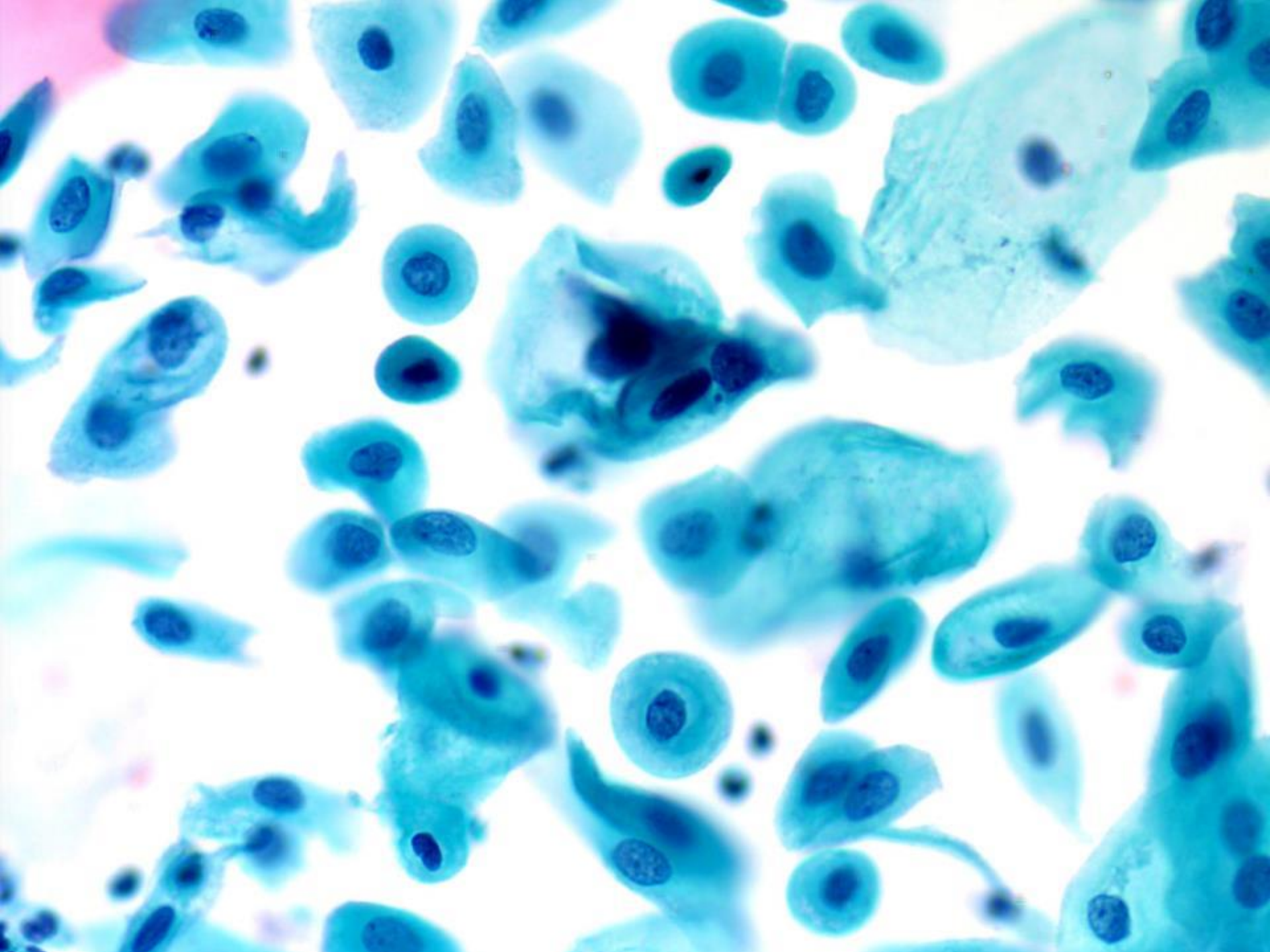


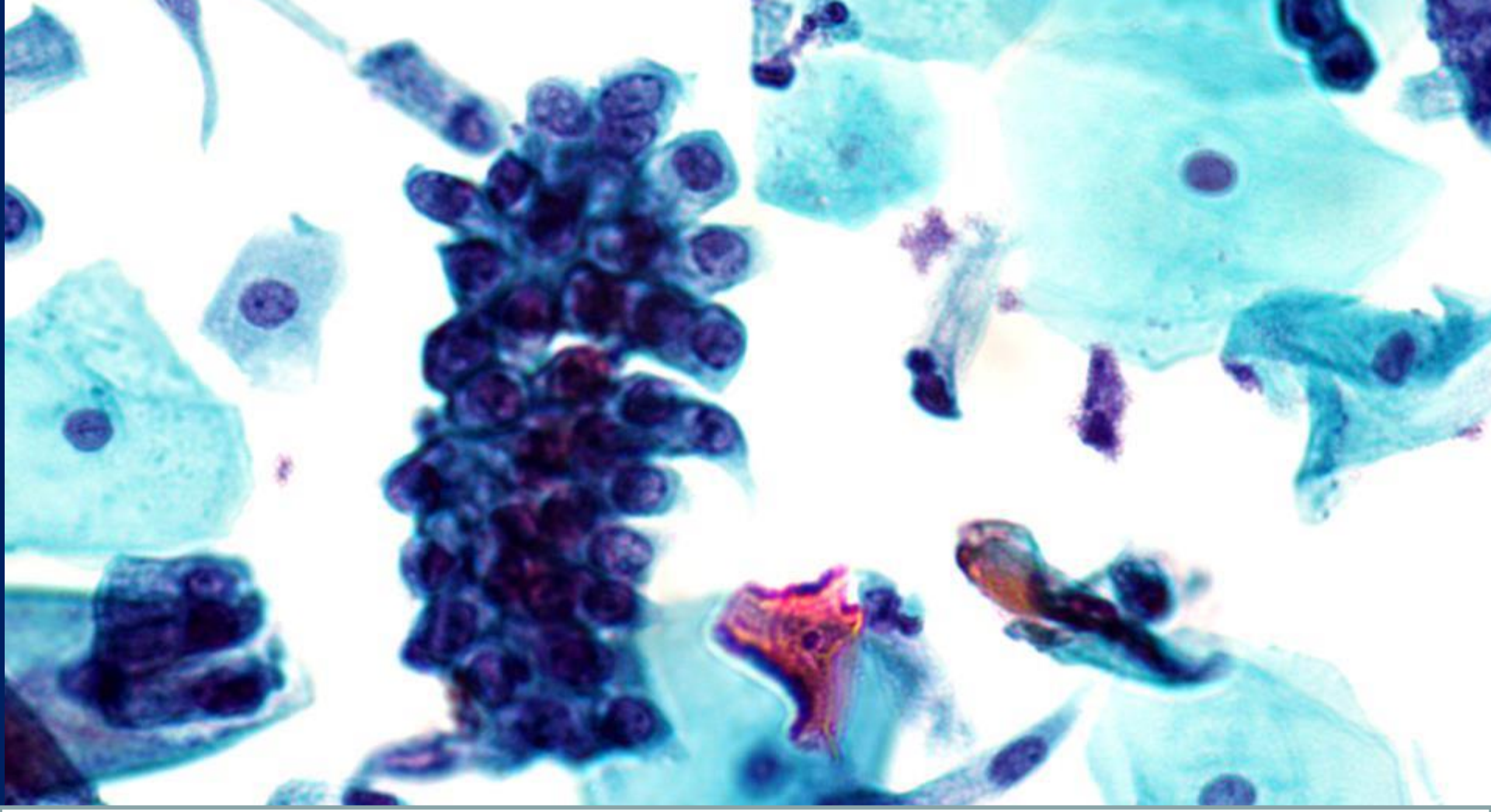
BENIGN SQUAMOUS CELLS



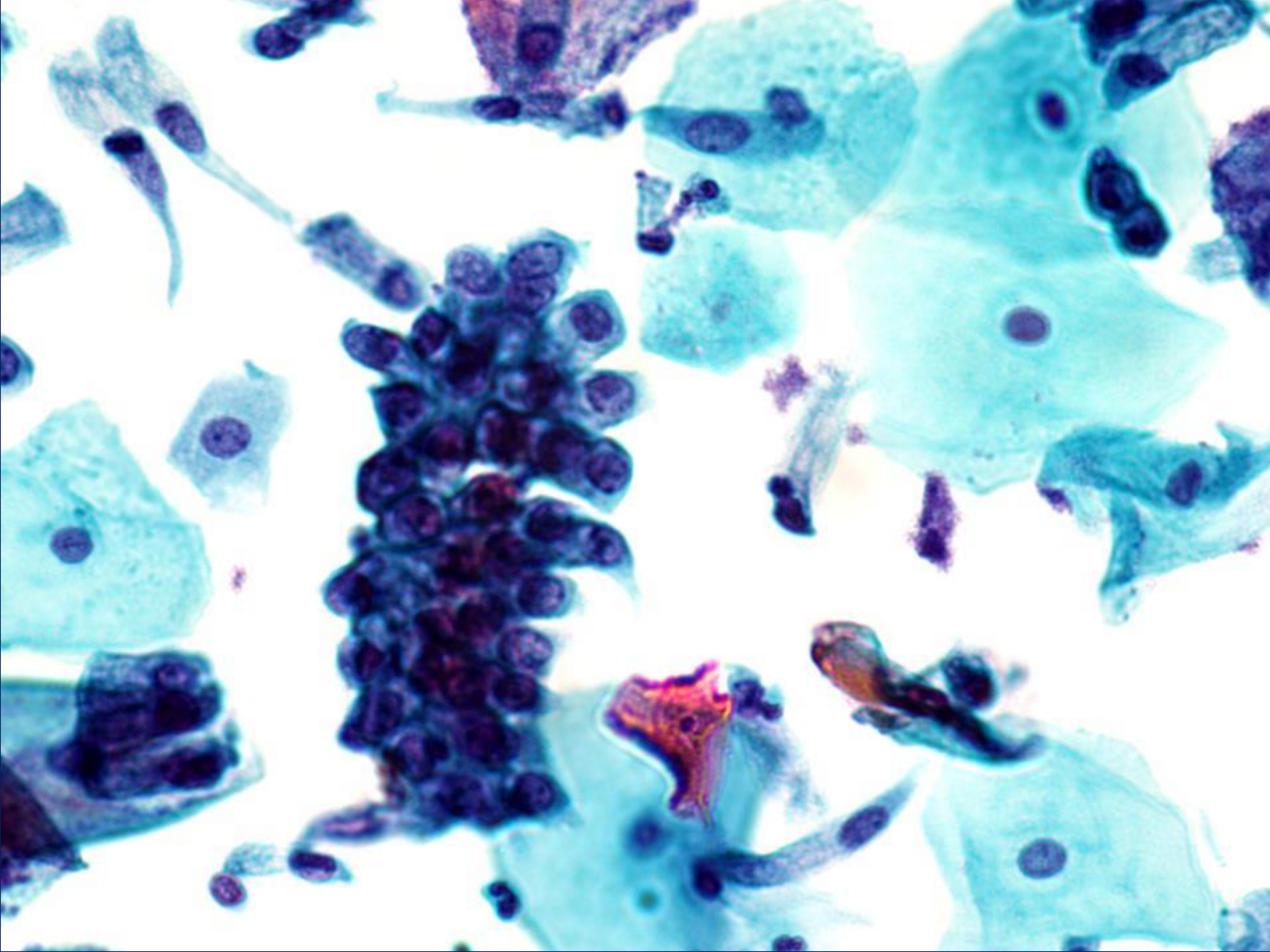


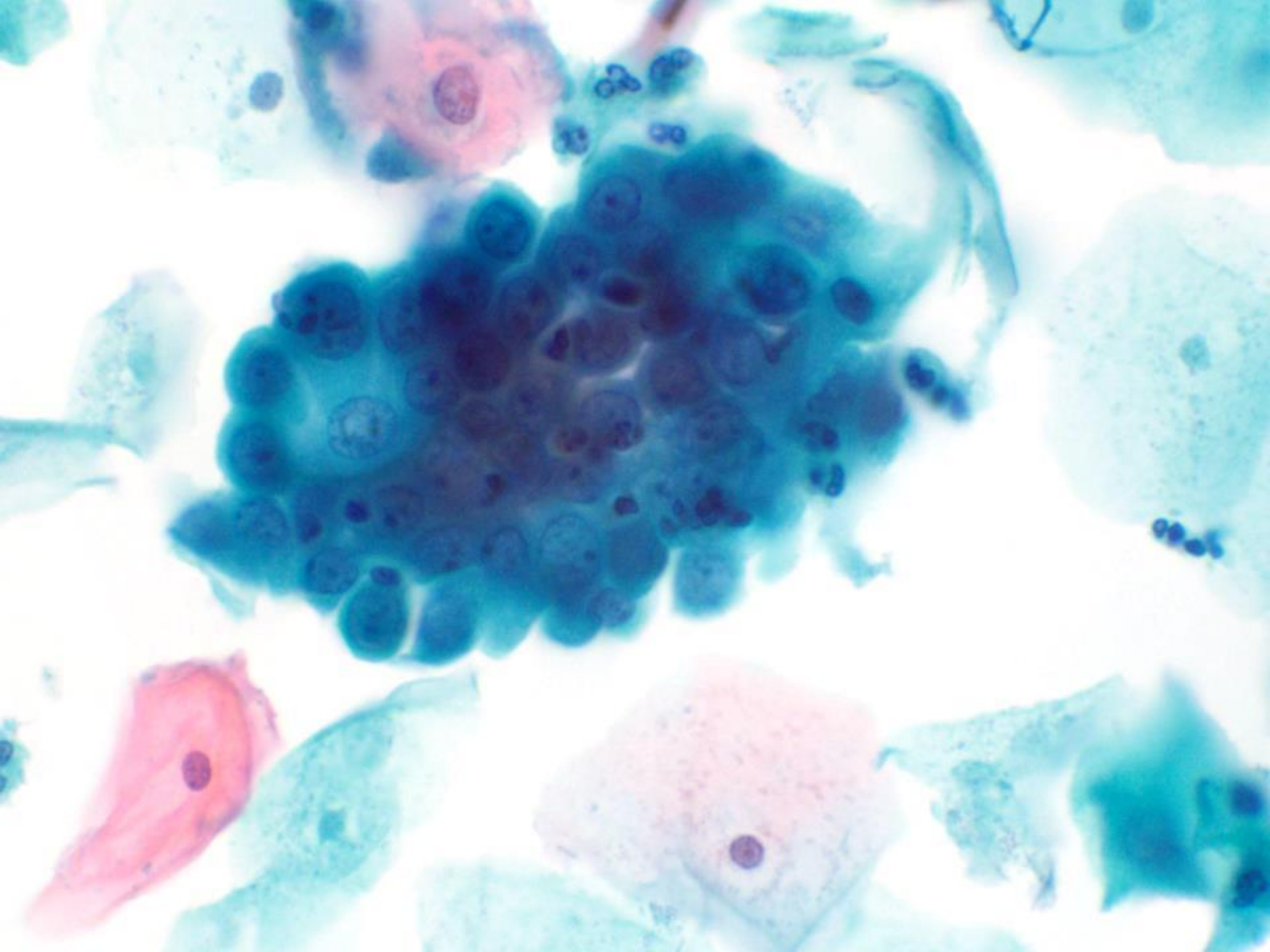


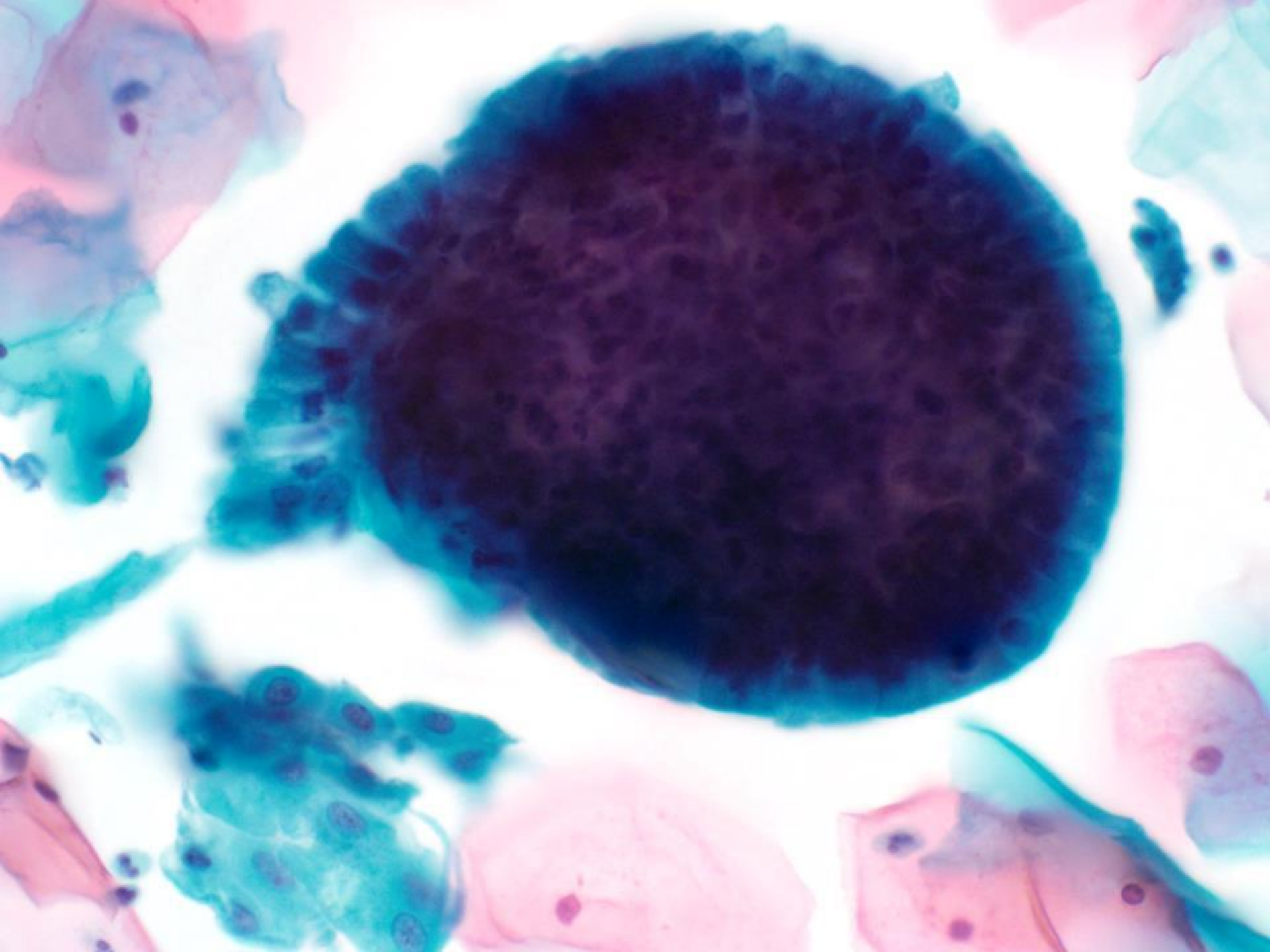


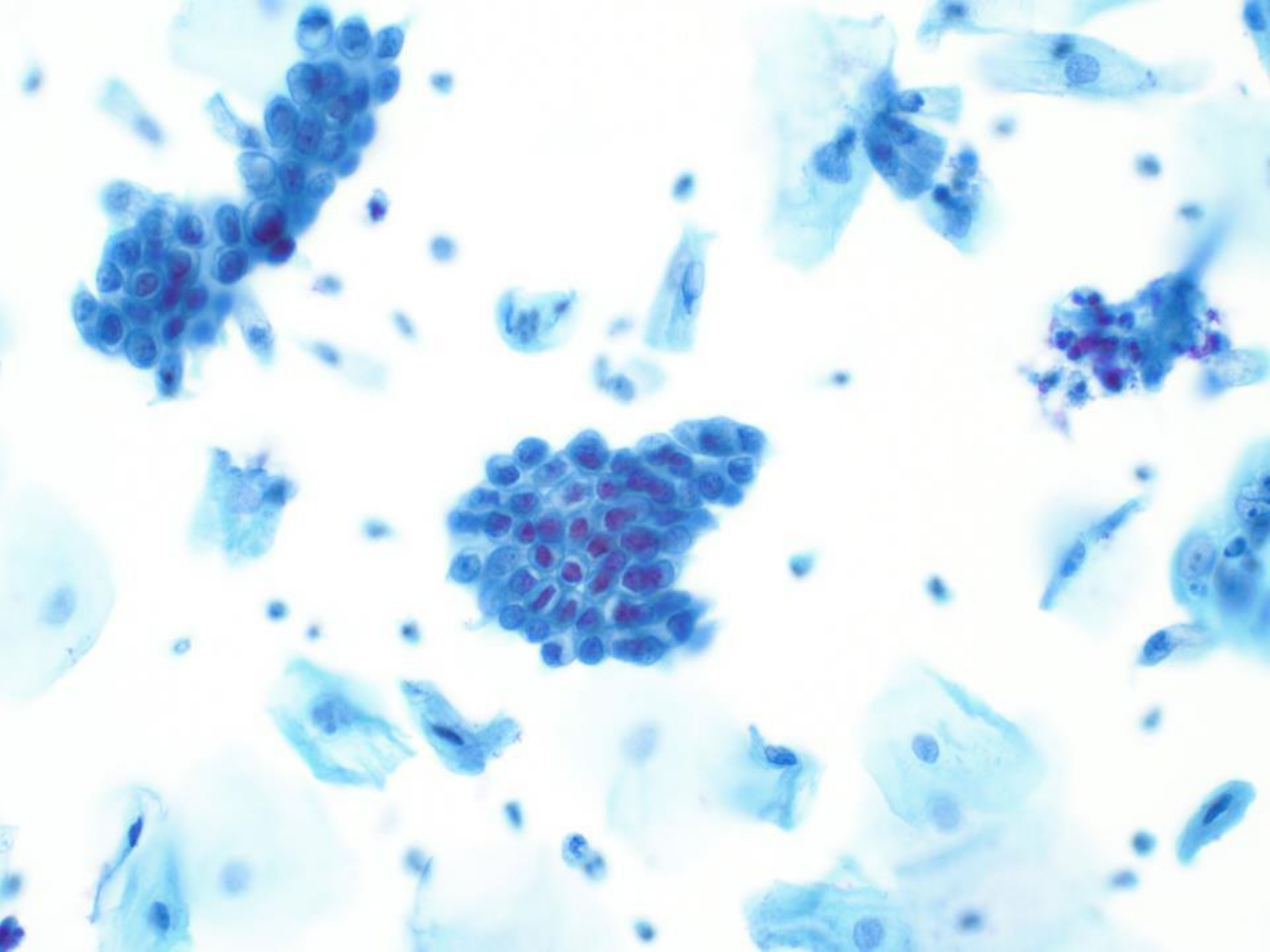


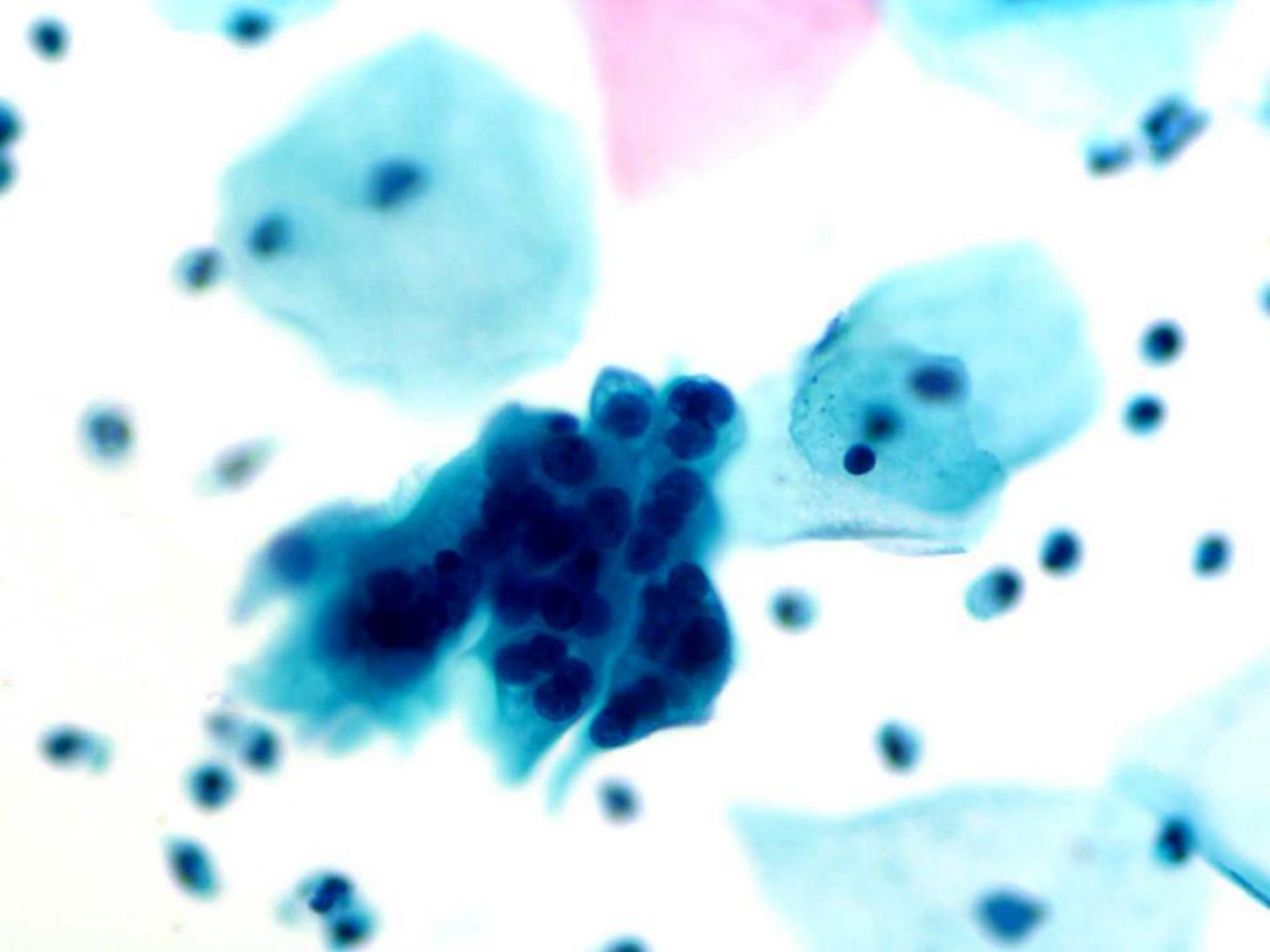
BENIGN ENDOCERVICAL CELLS

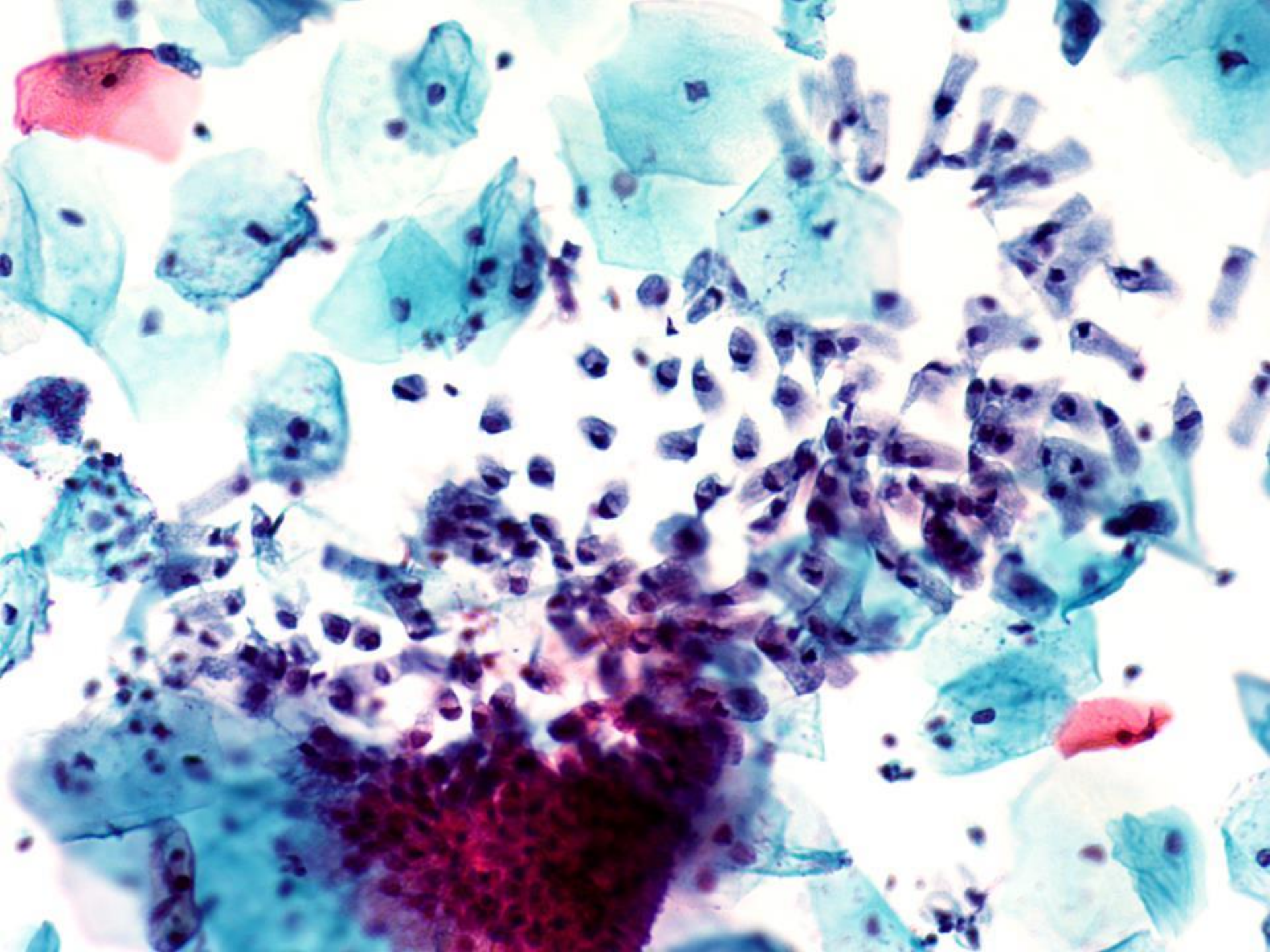


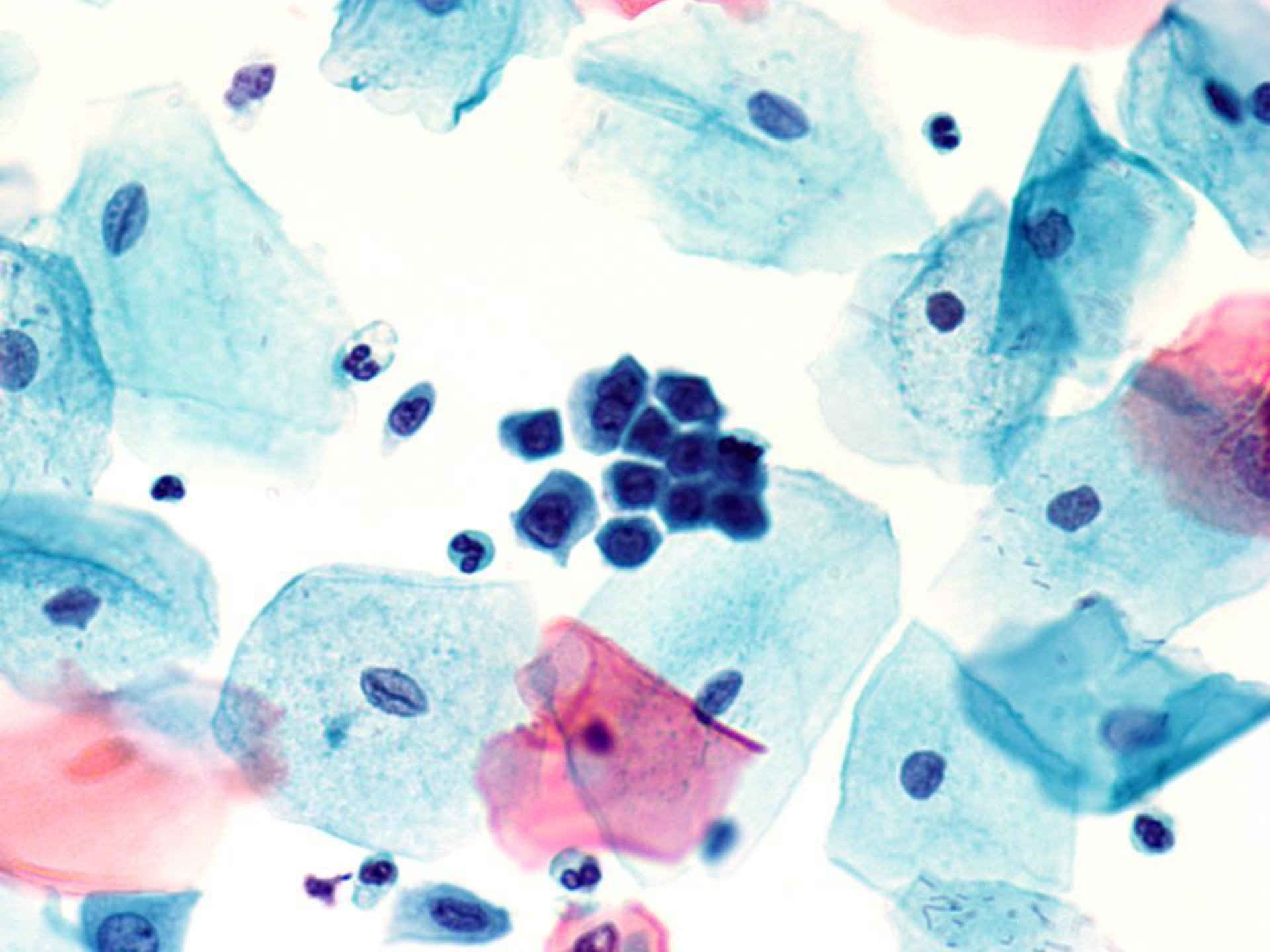


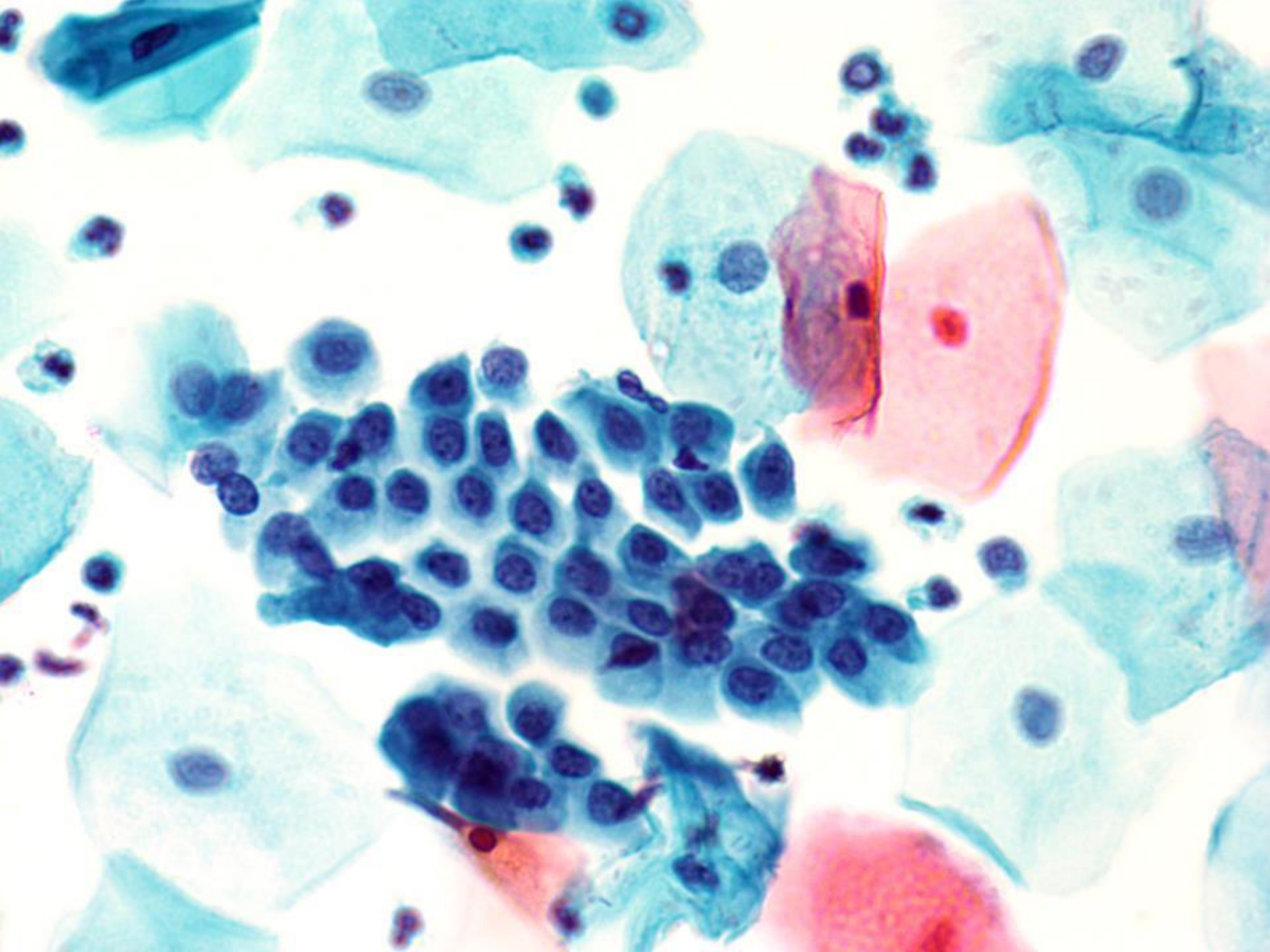


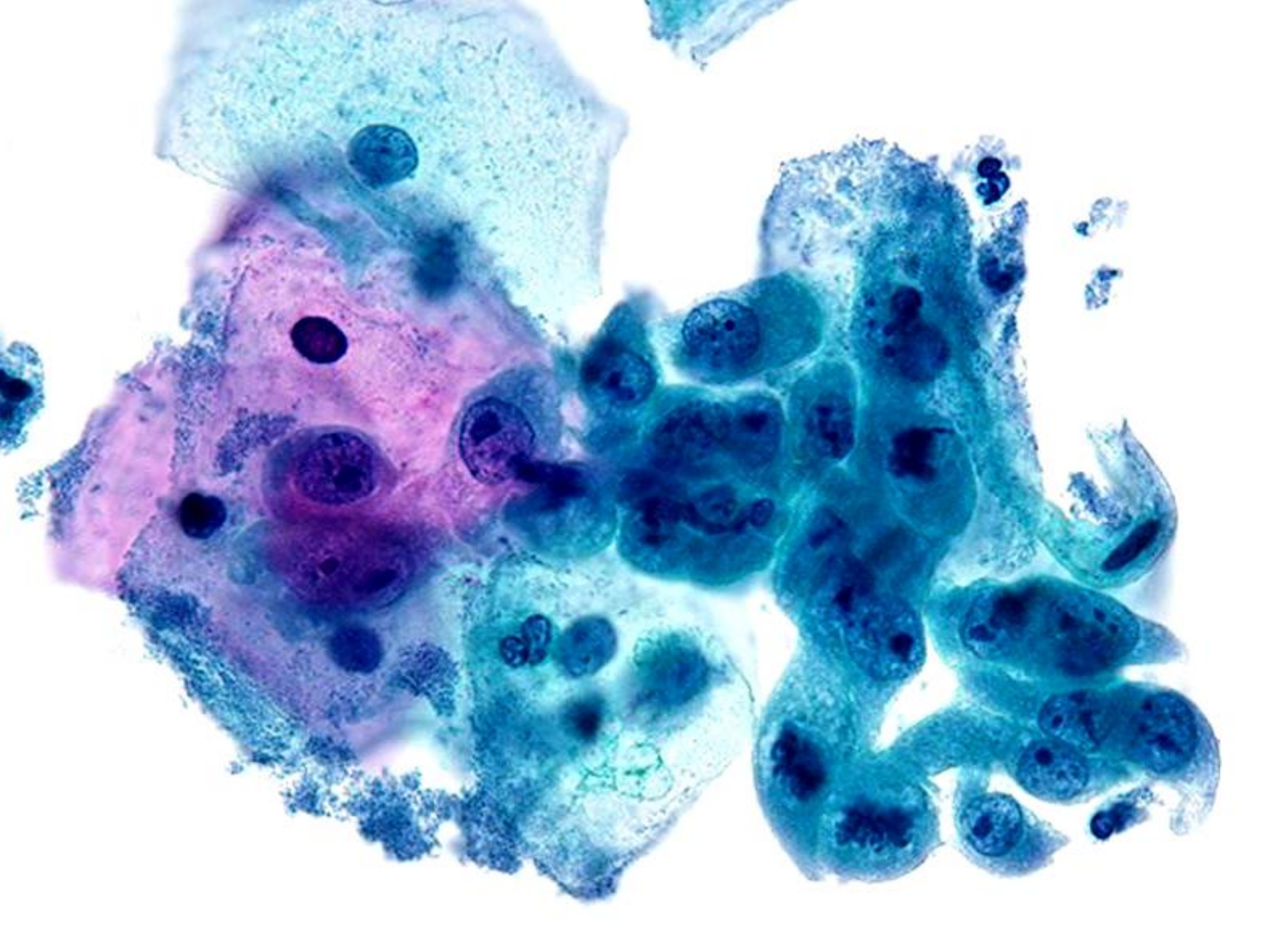






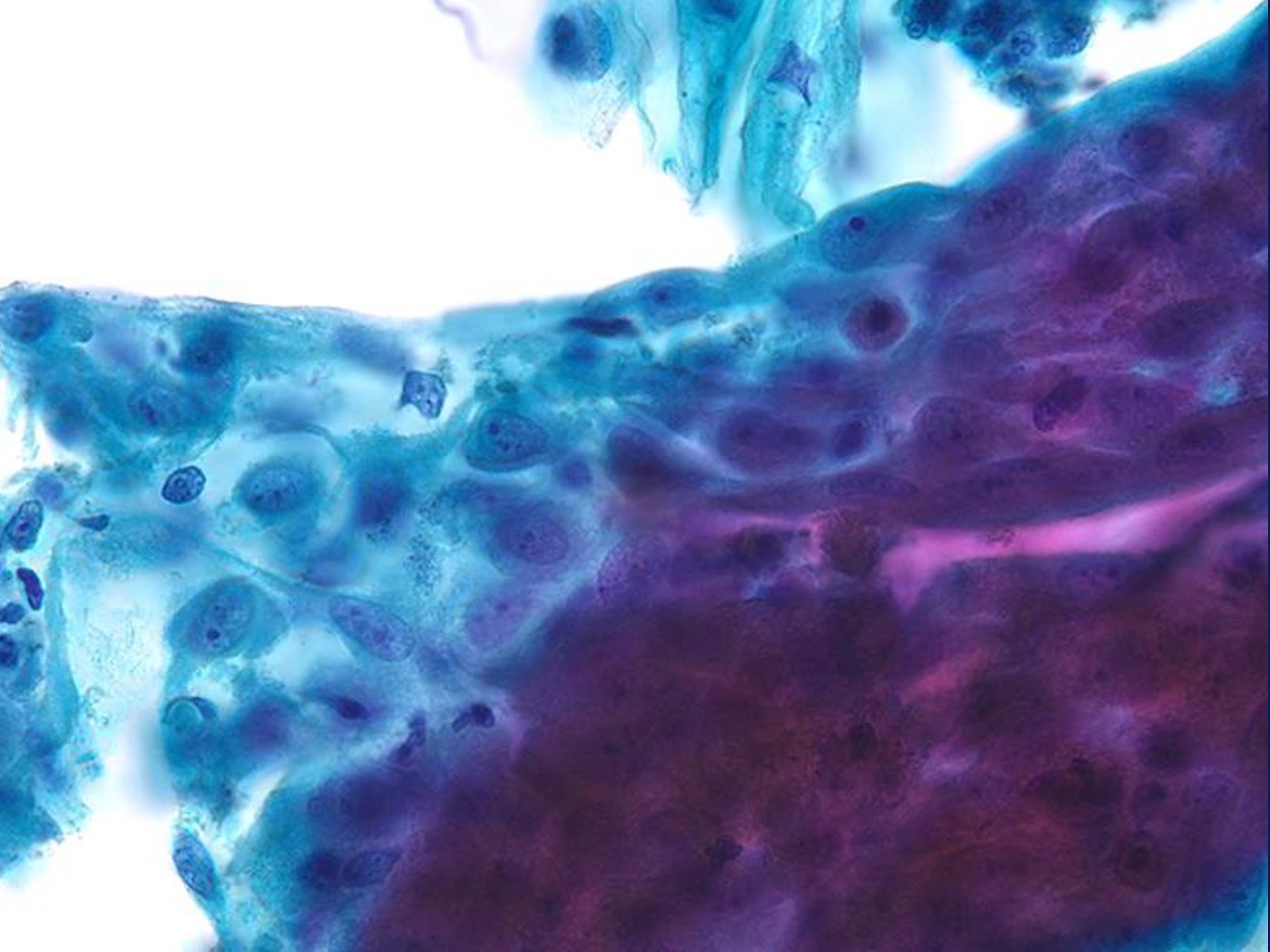


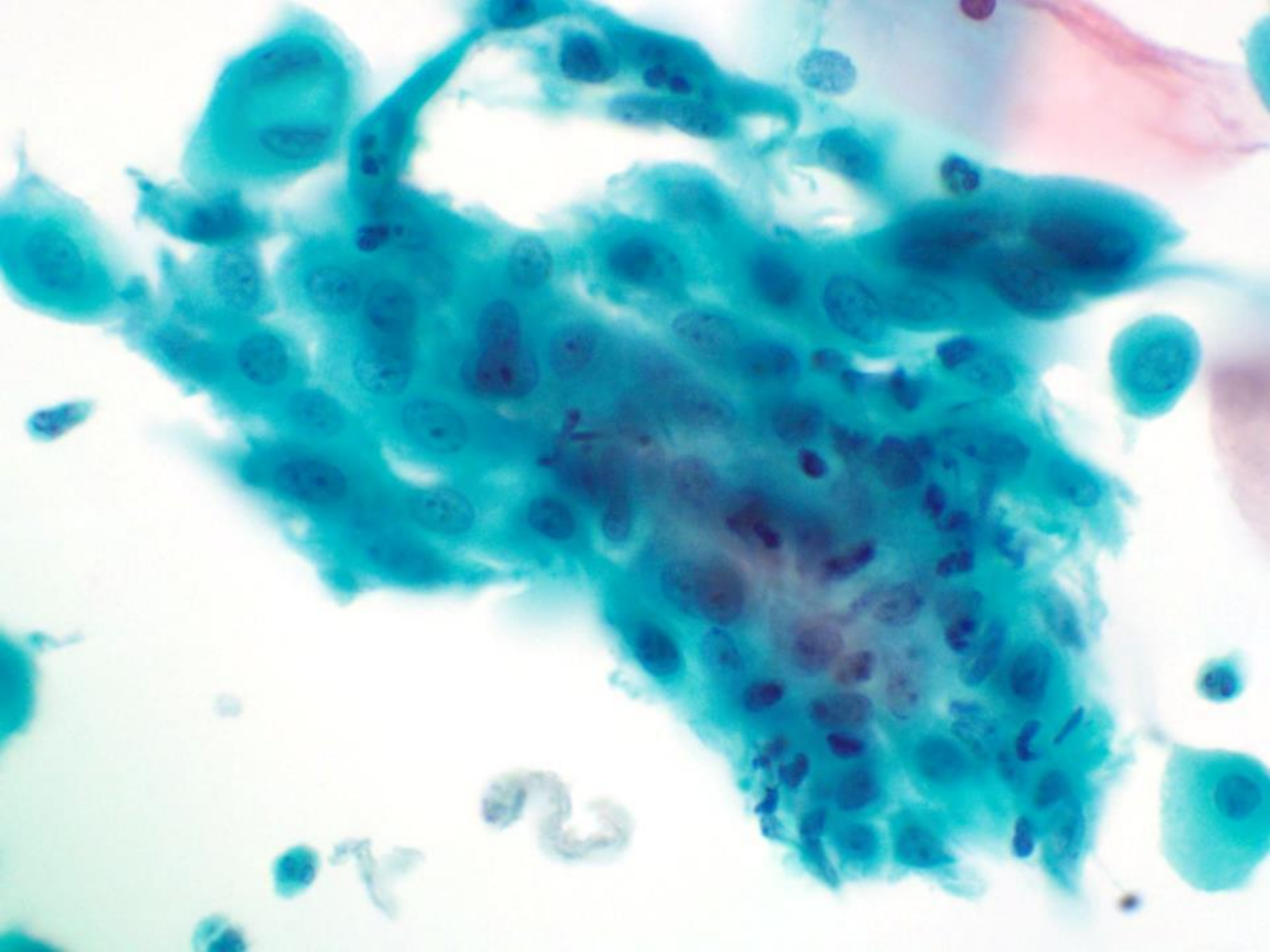


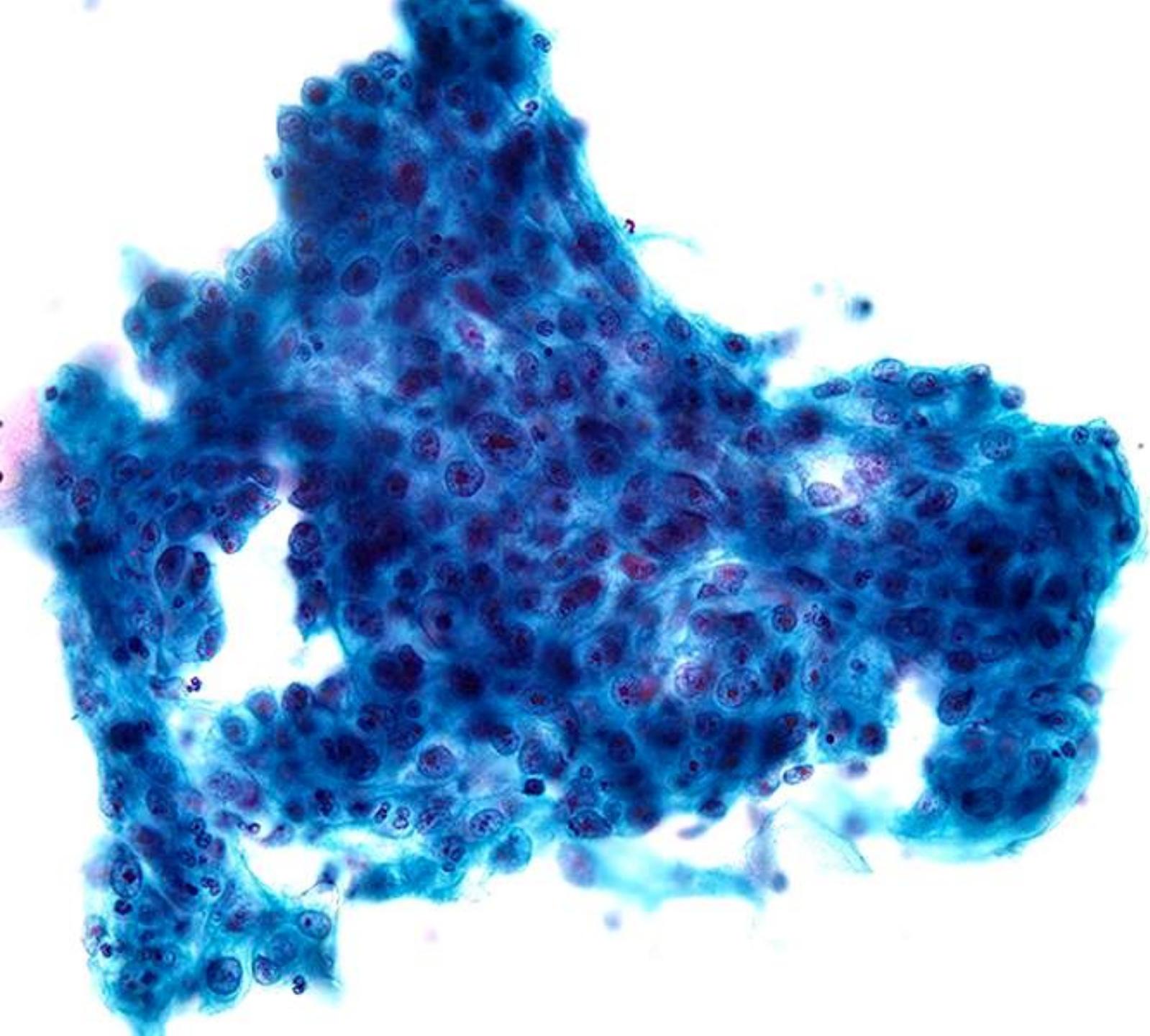


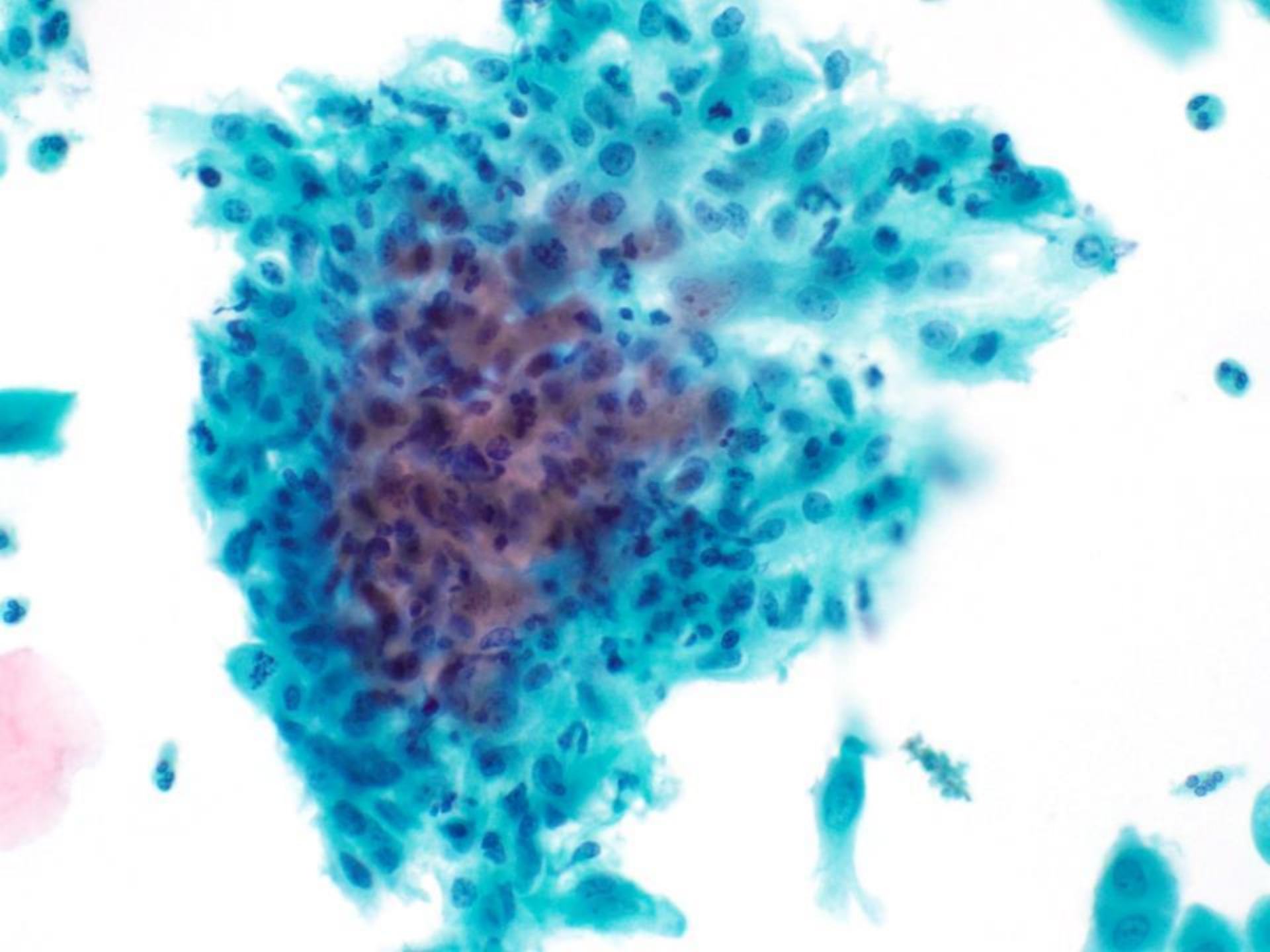
REPARATIVE CHANGES ("REPAIR")

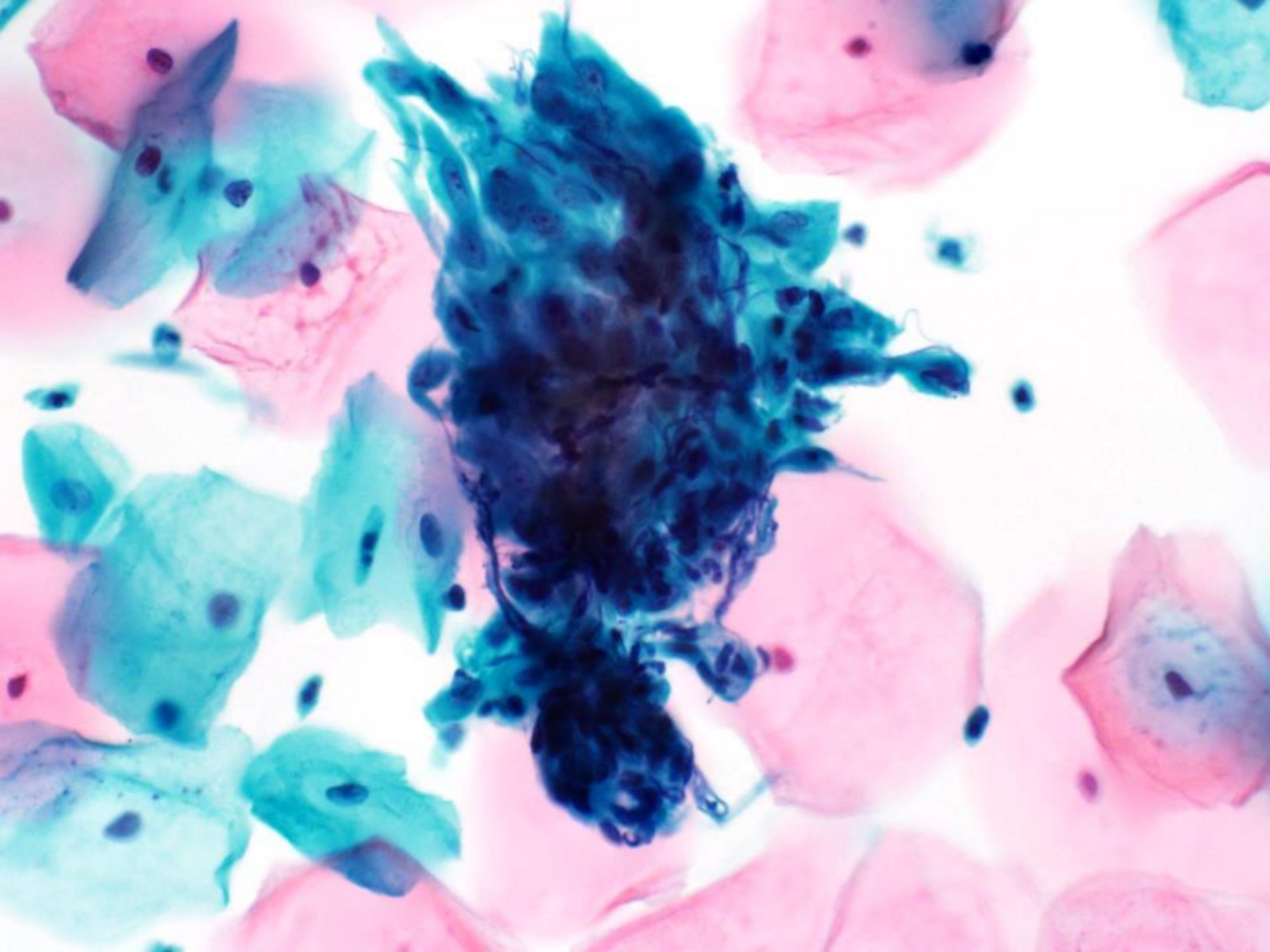
- Repair
  - Darker groups due to rounded cells and preserved three-dimensionality
  - Rounded cell borders
  - Reduced “streaming” effect at edges
  - More uniform staining with less polychromasia

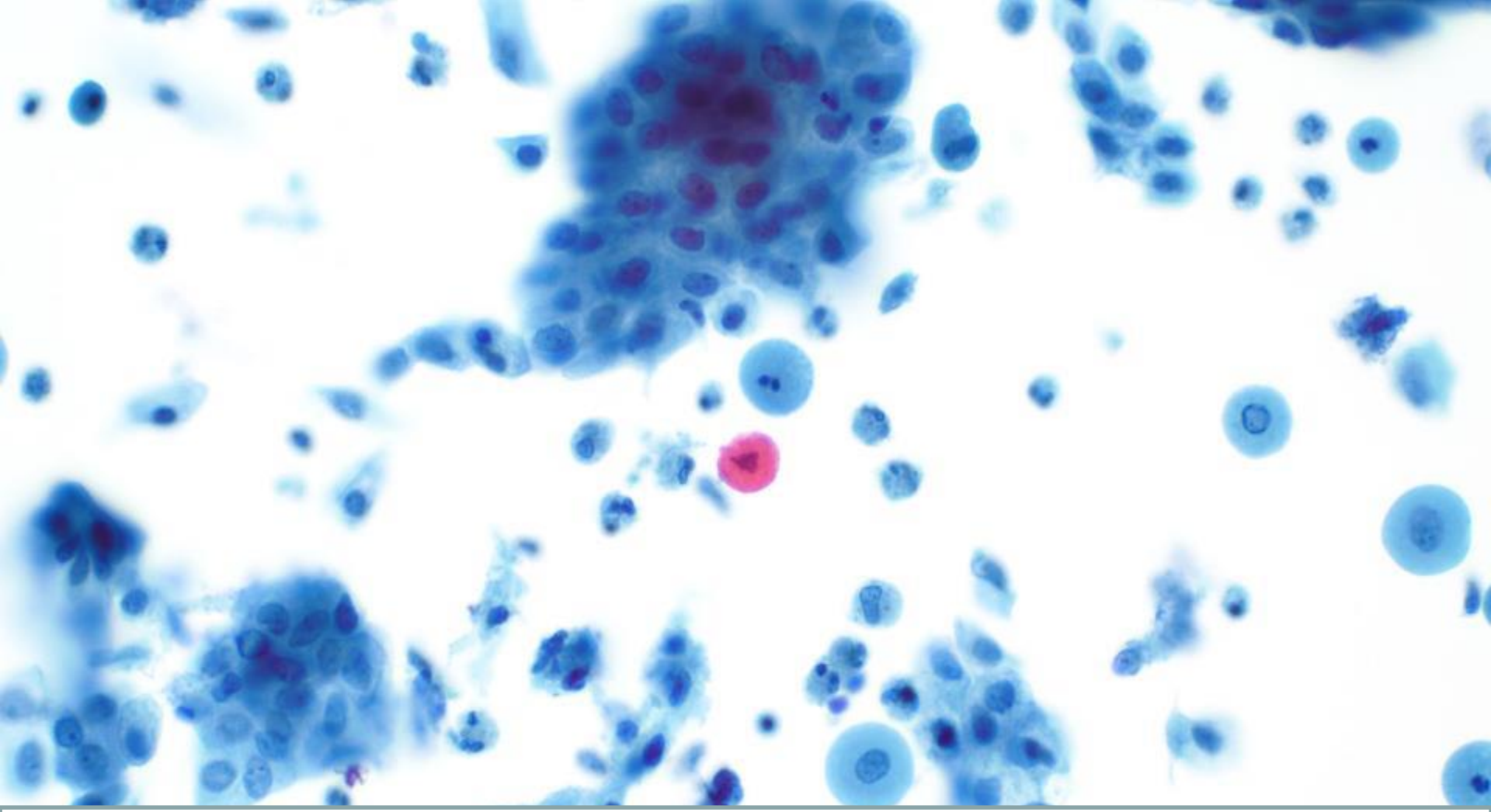






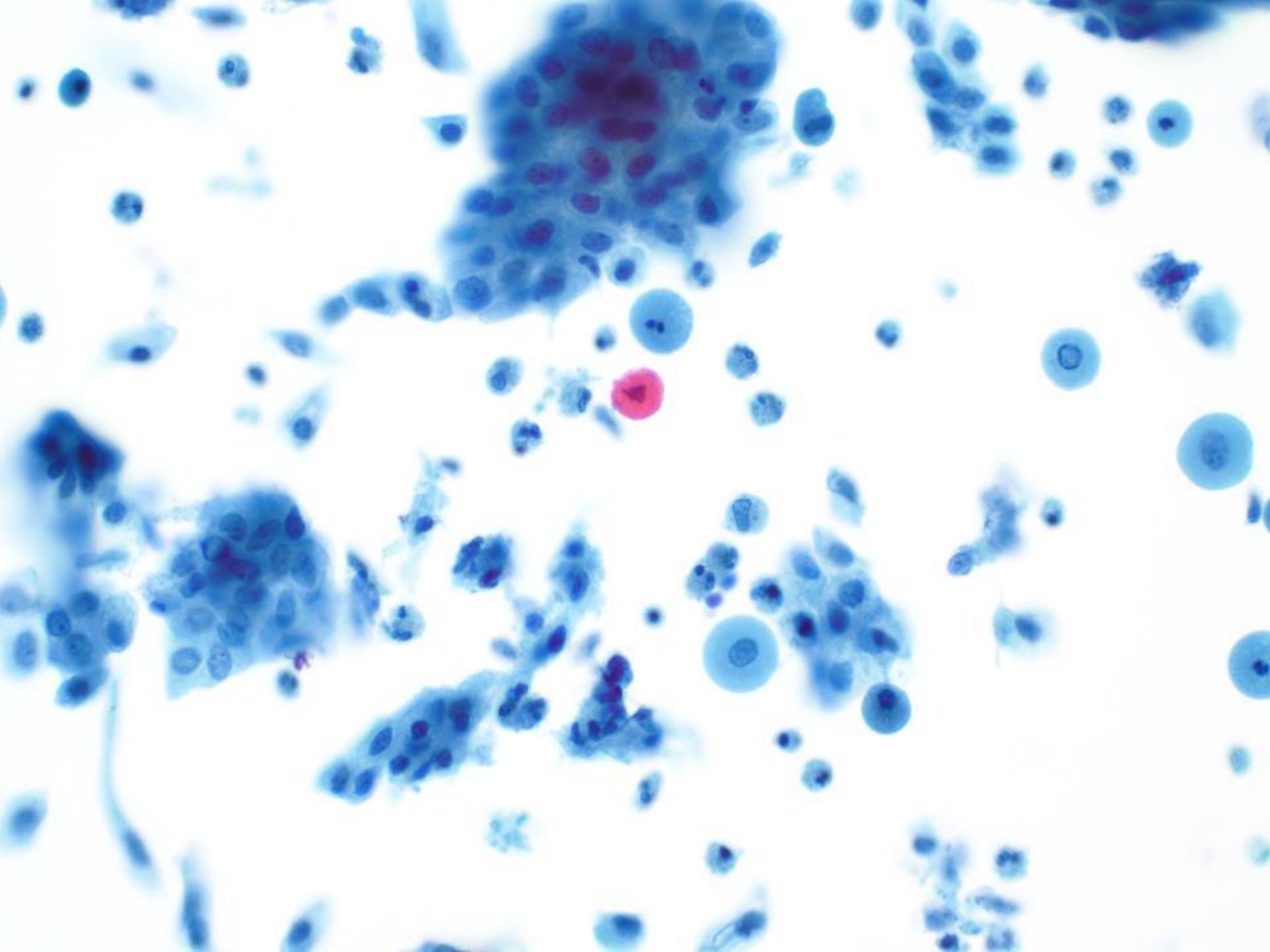


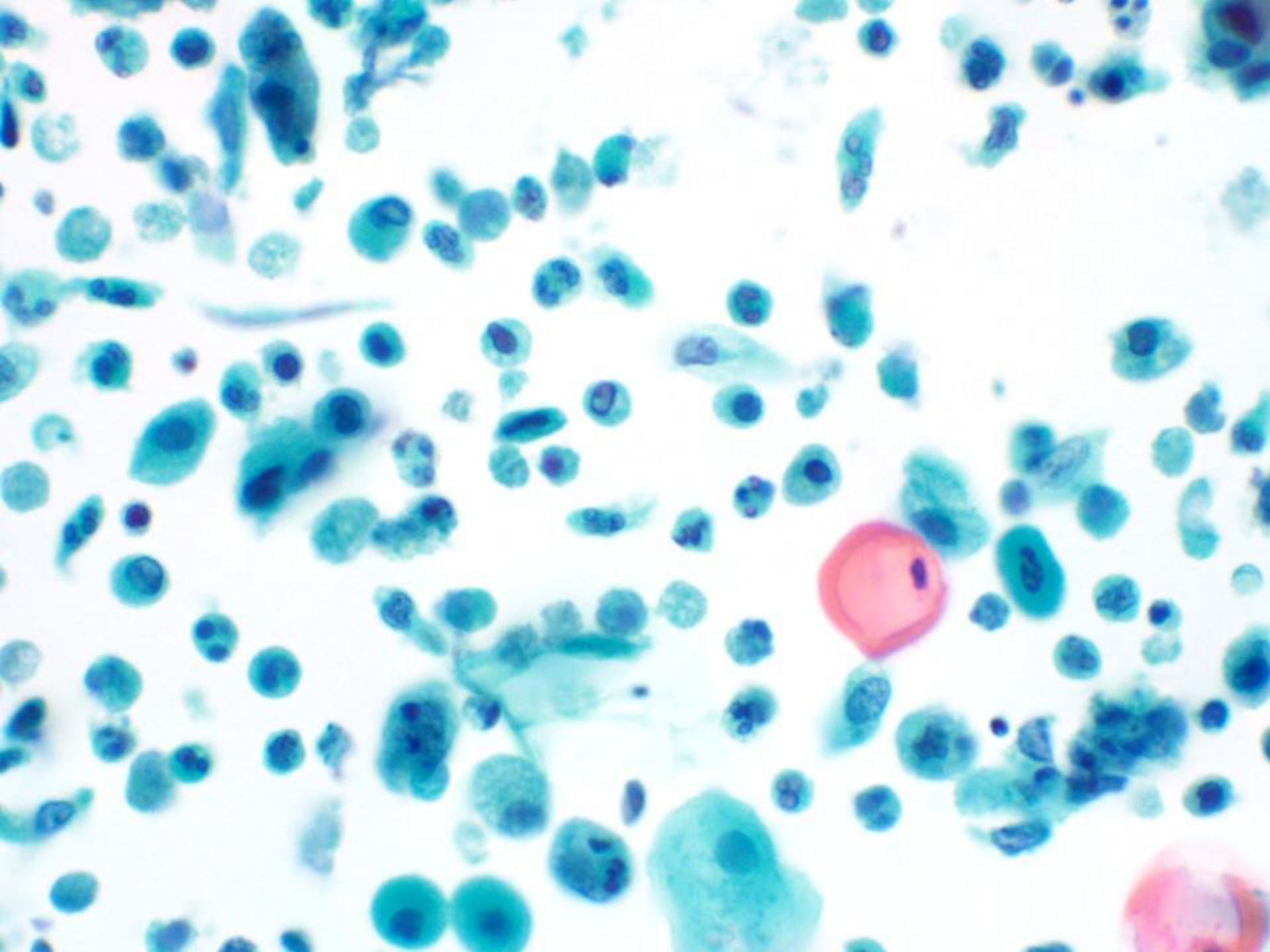


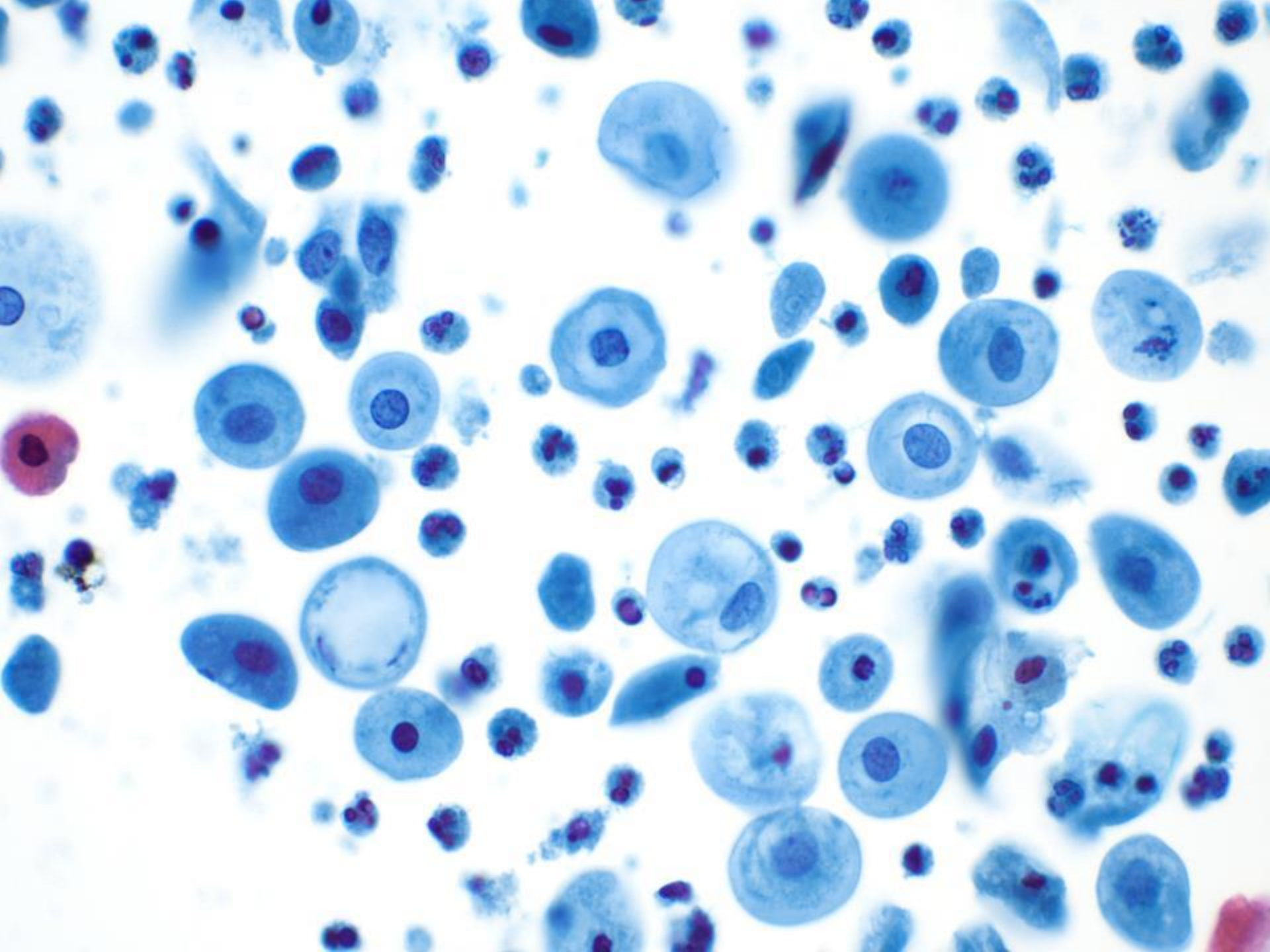


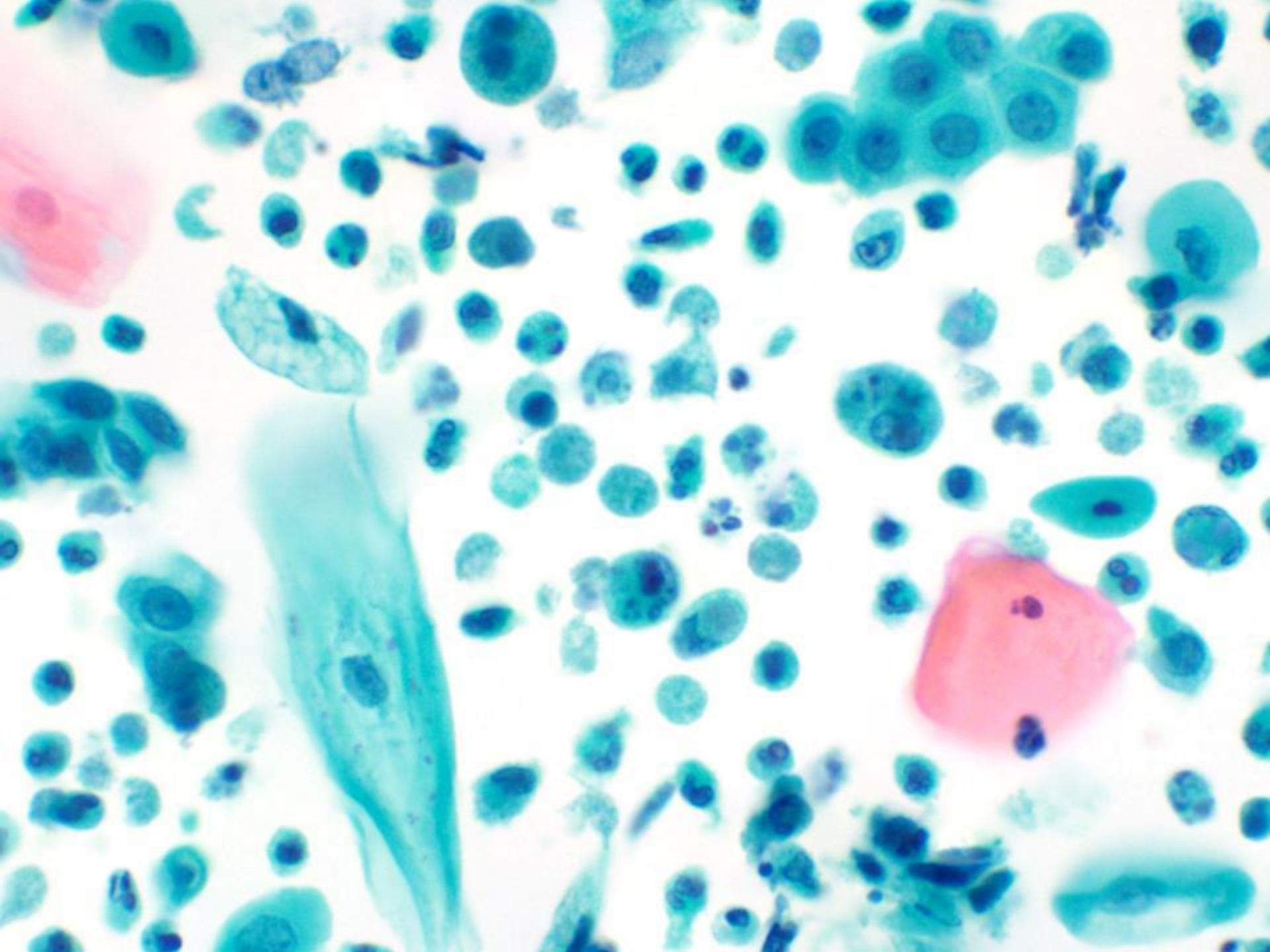
ATROPHY

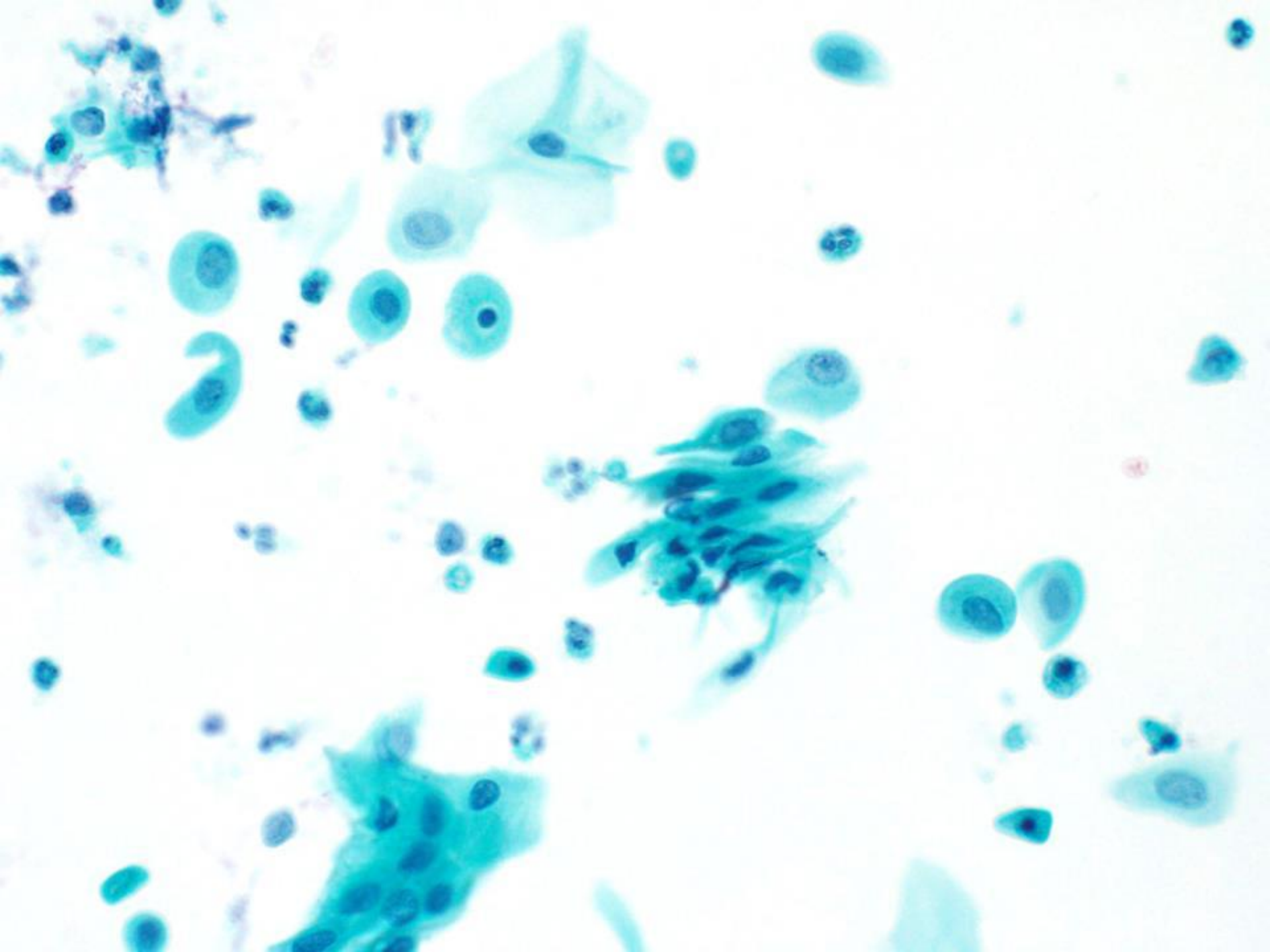
- Atrophy
  - Increased dissociation of basal cells
  - Less nuclear enlargement
  - Reduced number of naked nuclei
  - Decreased granular debris and “blue blobs”

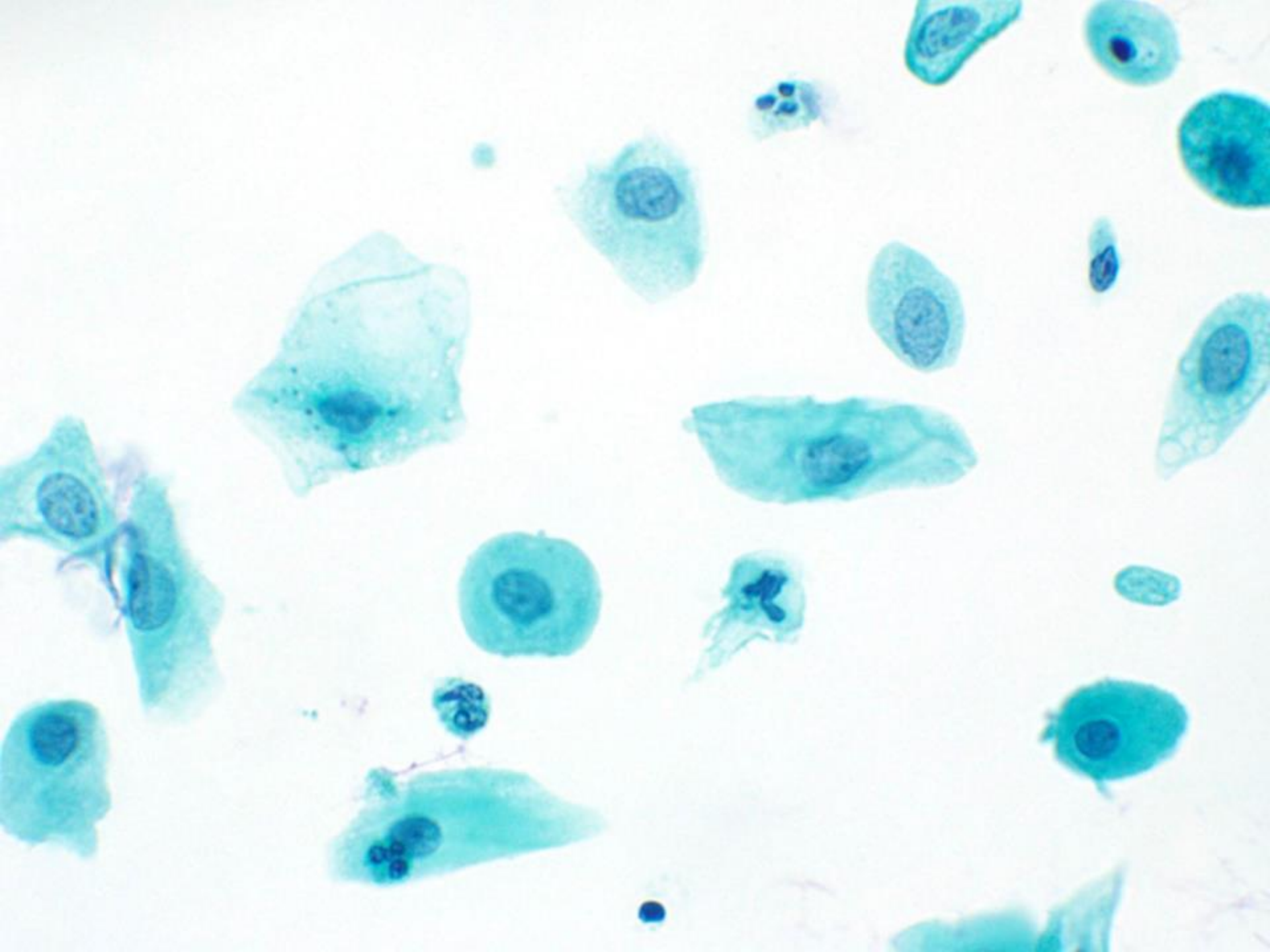


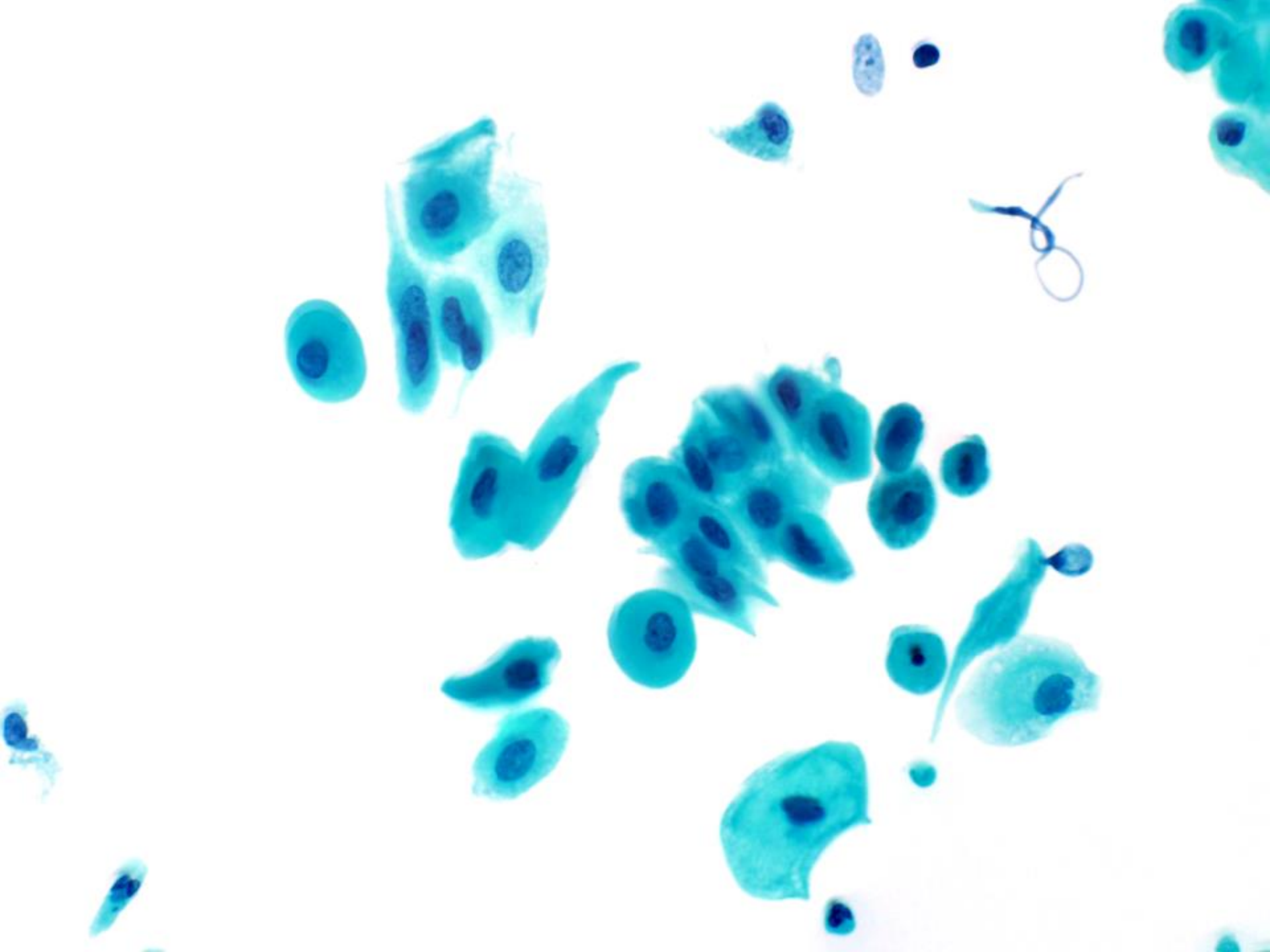


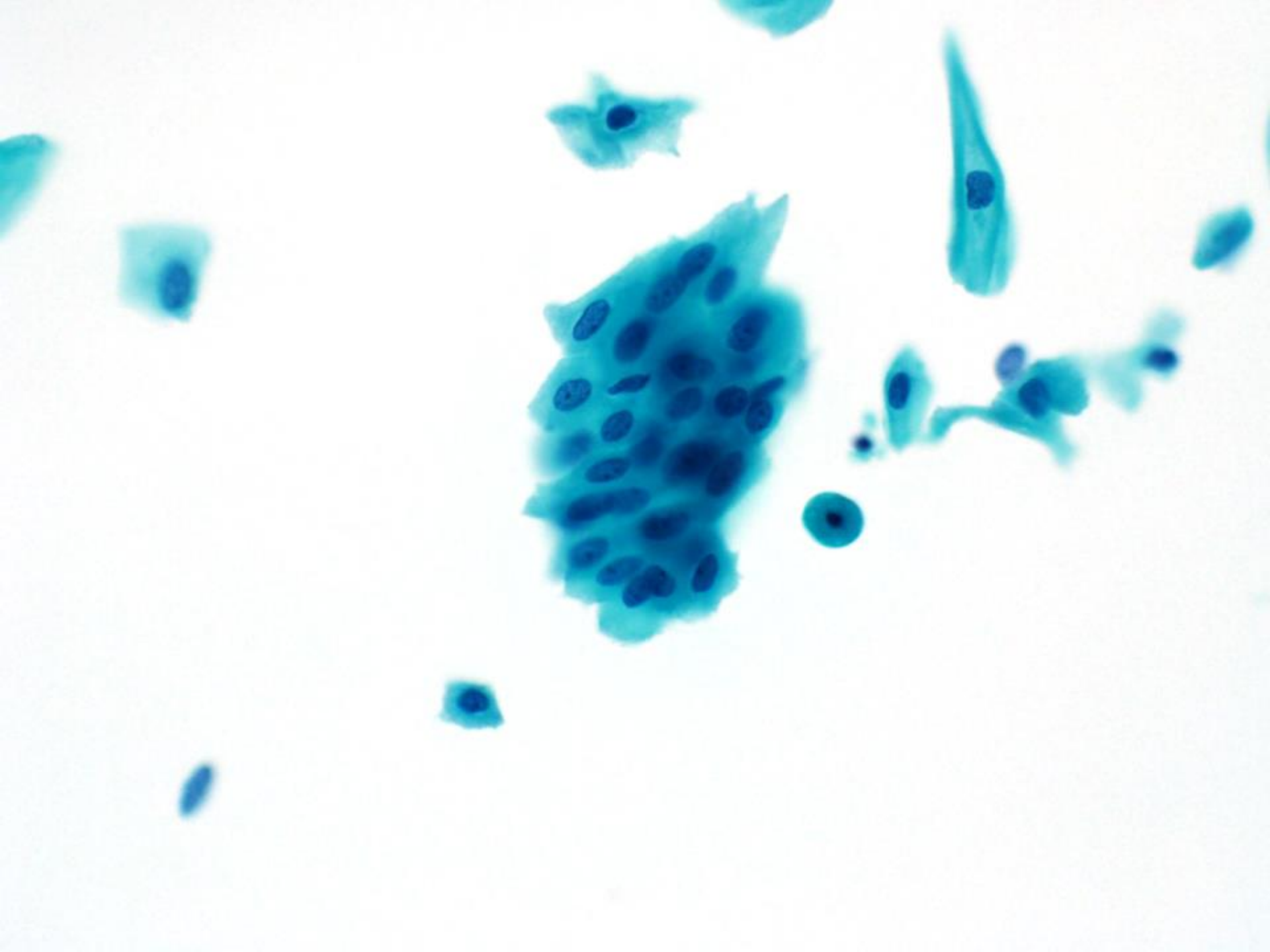


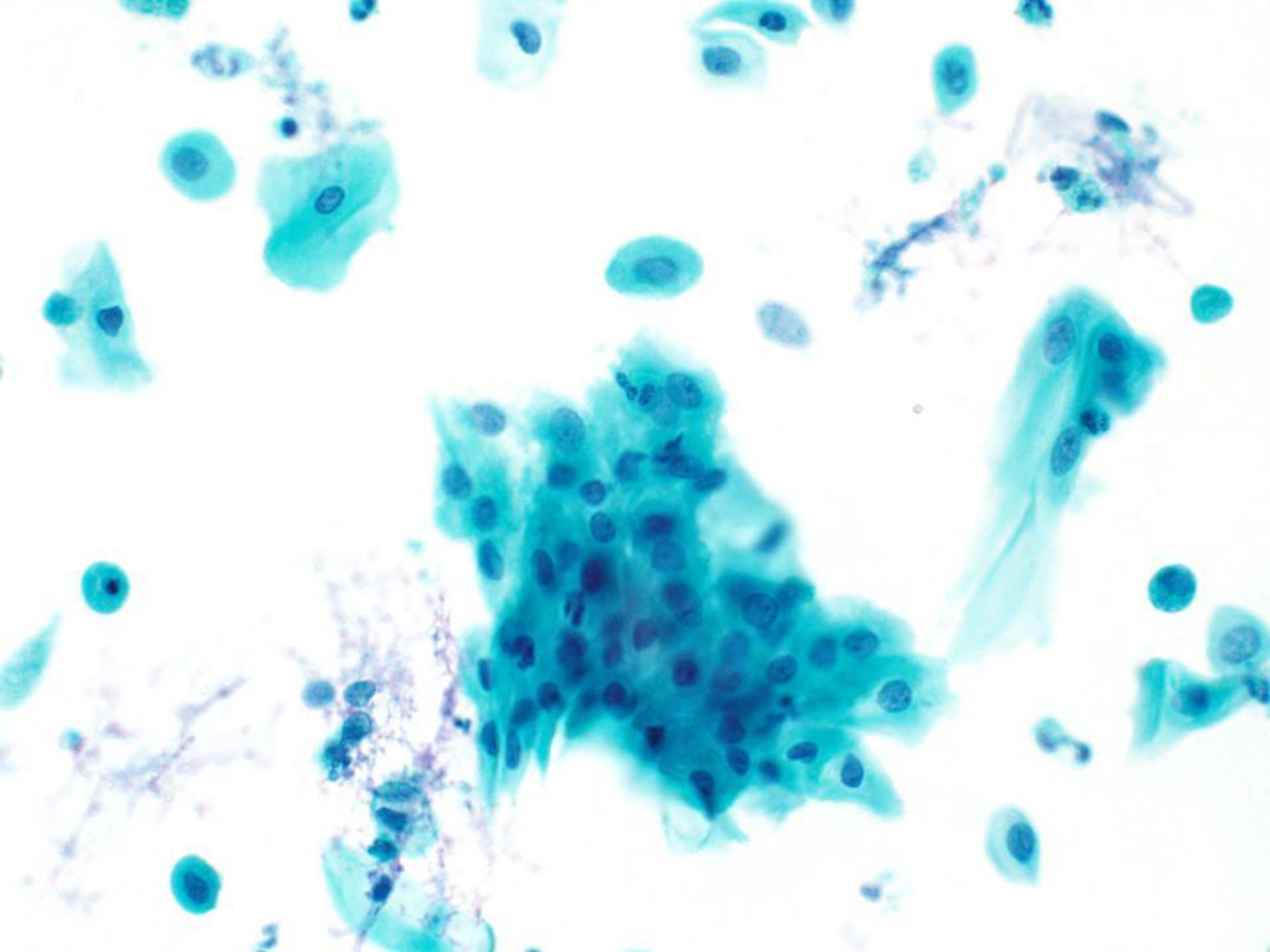




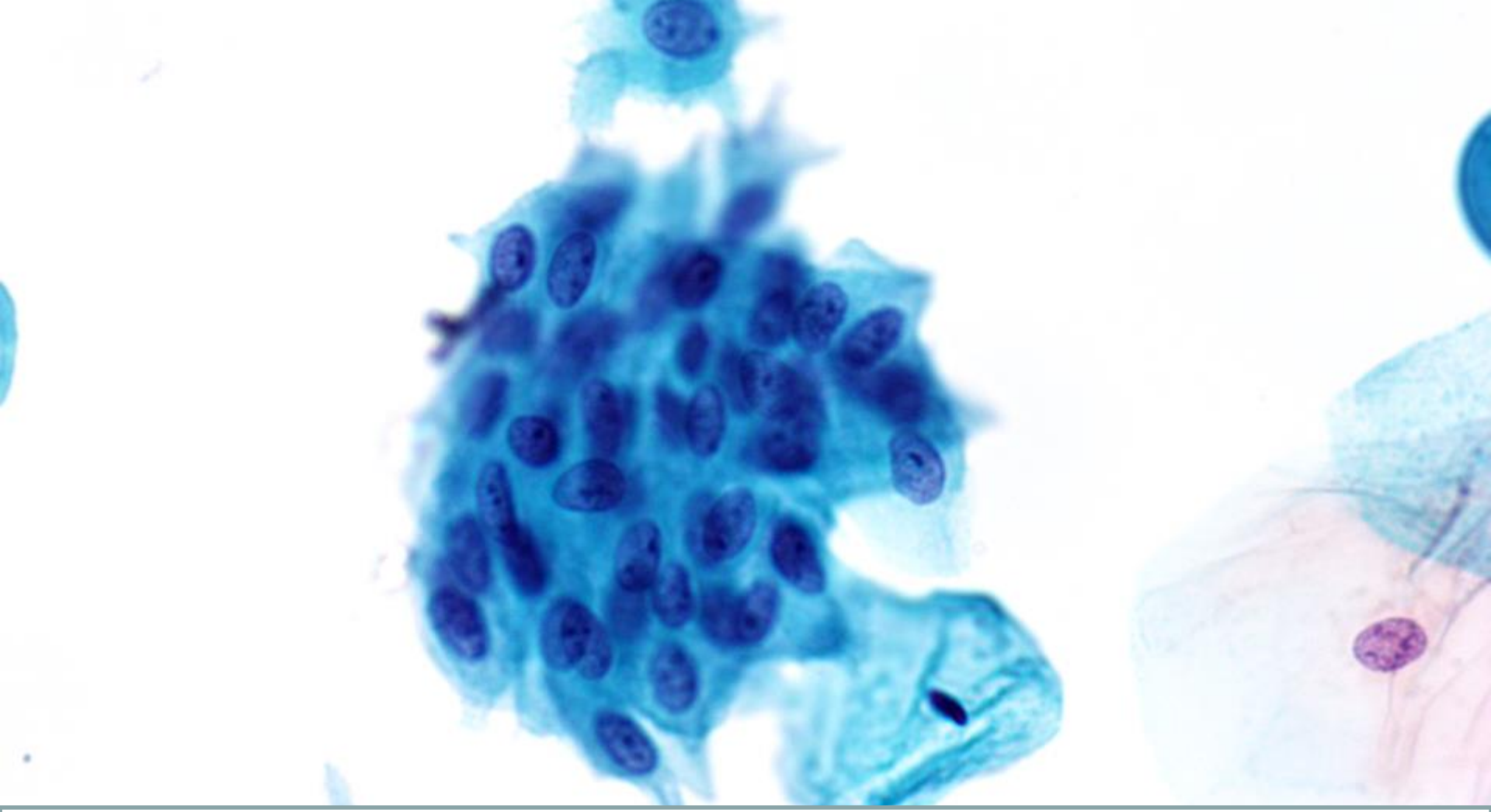






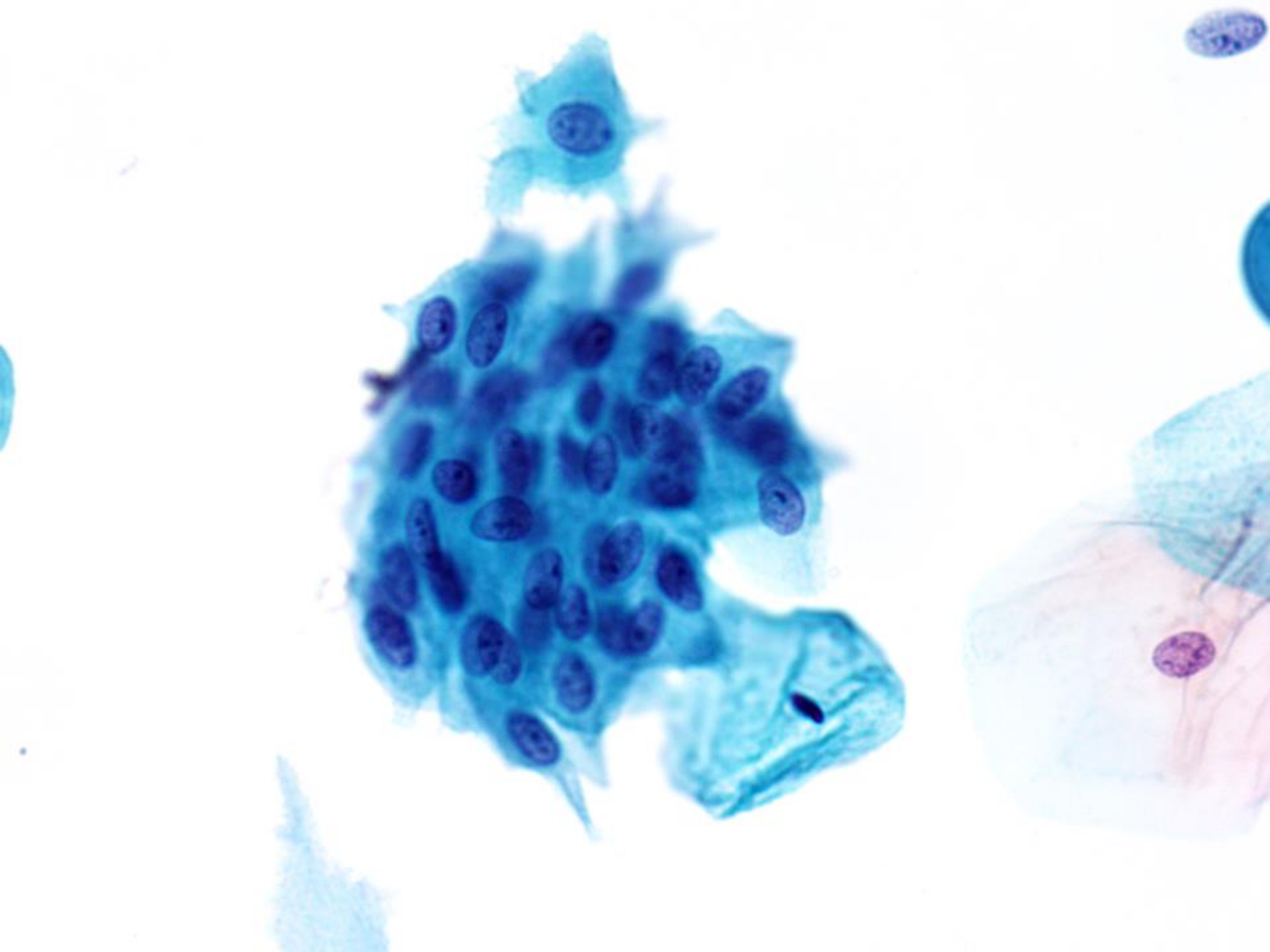


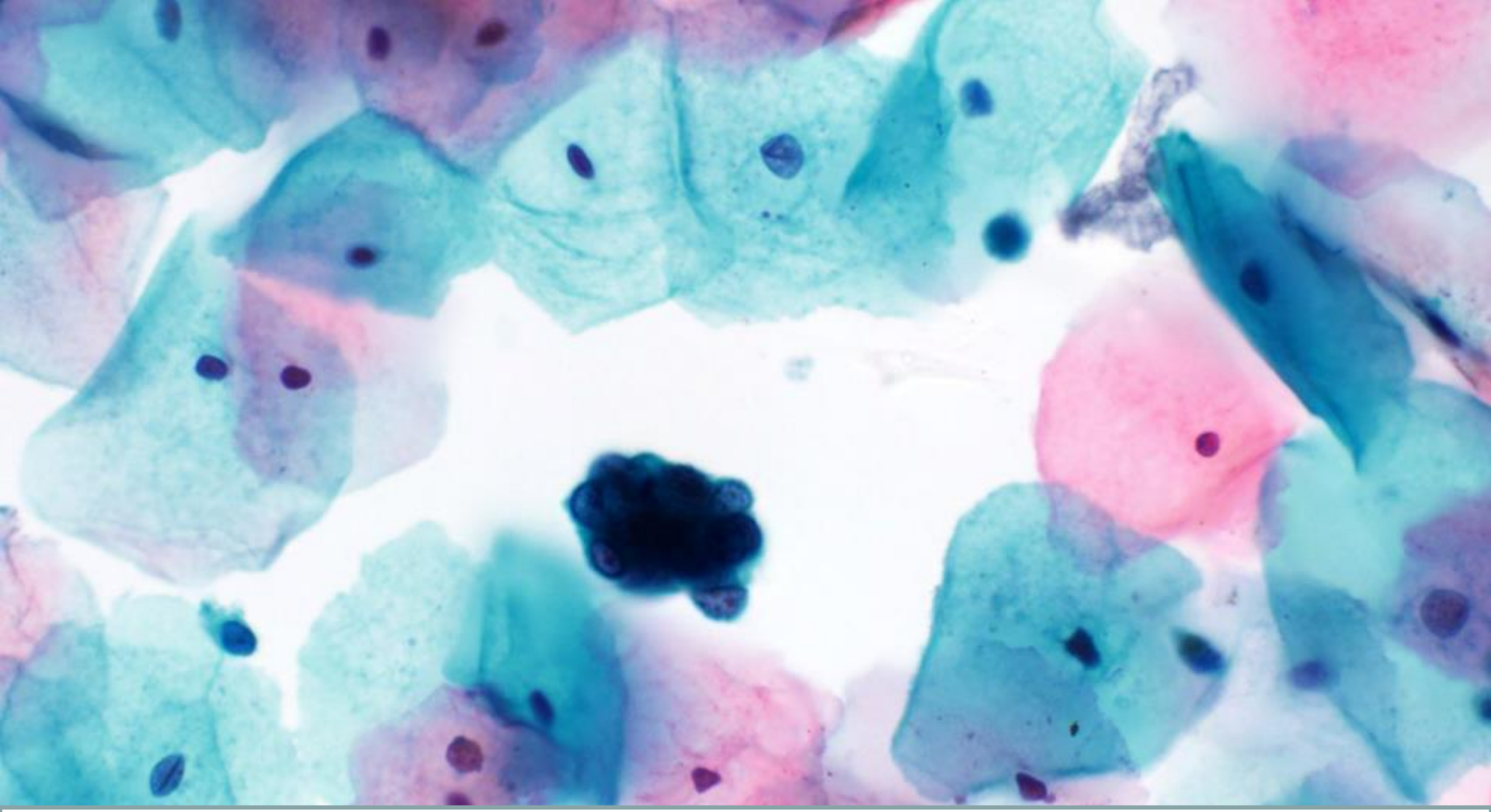
This is HSIL!



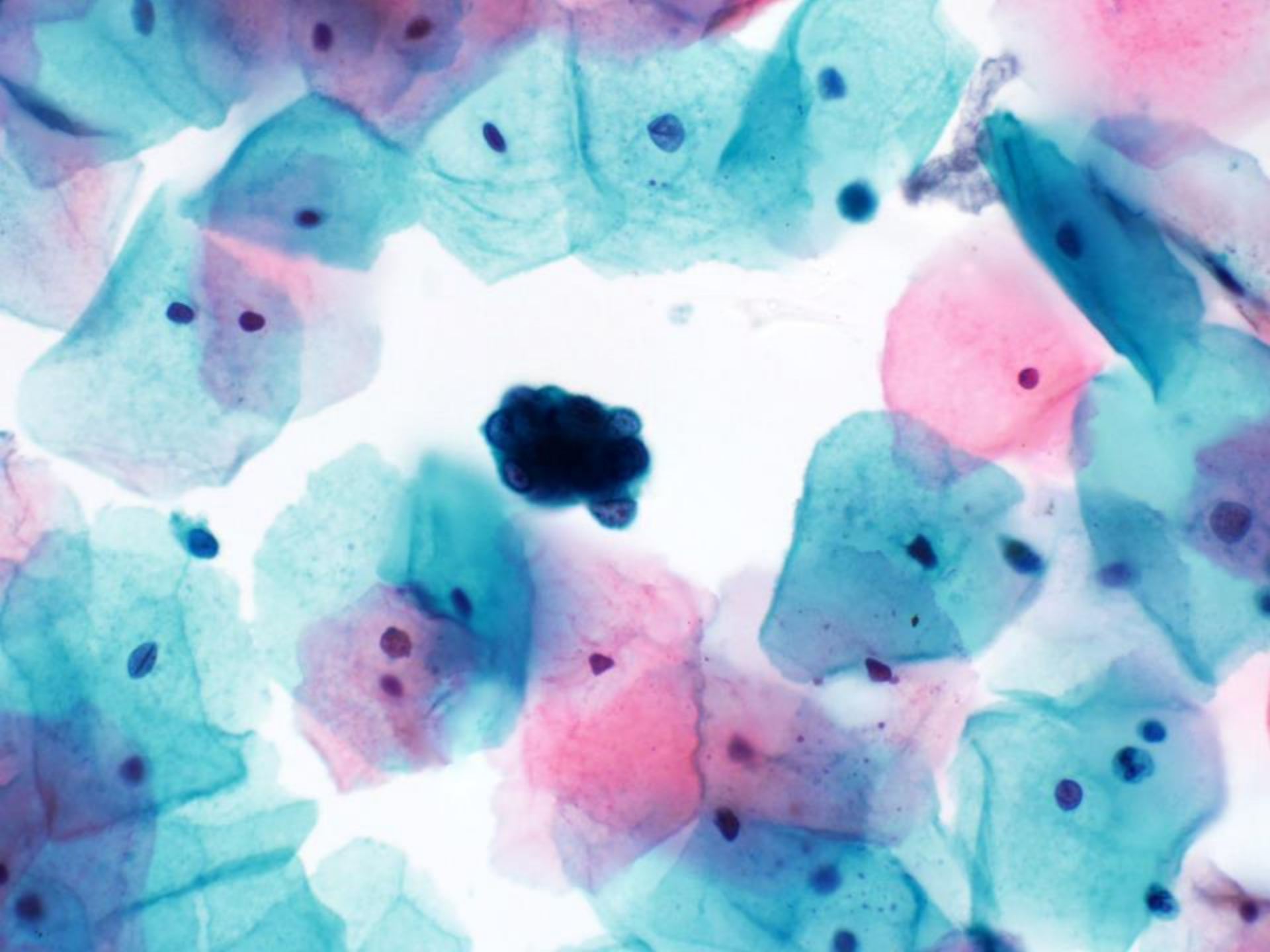
SQUAMOUS METAPLASIA

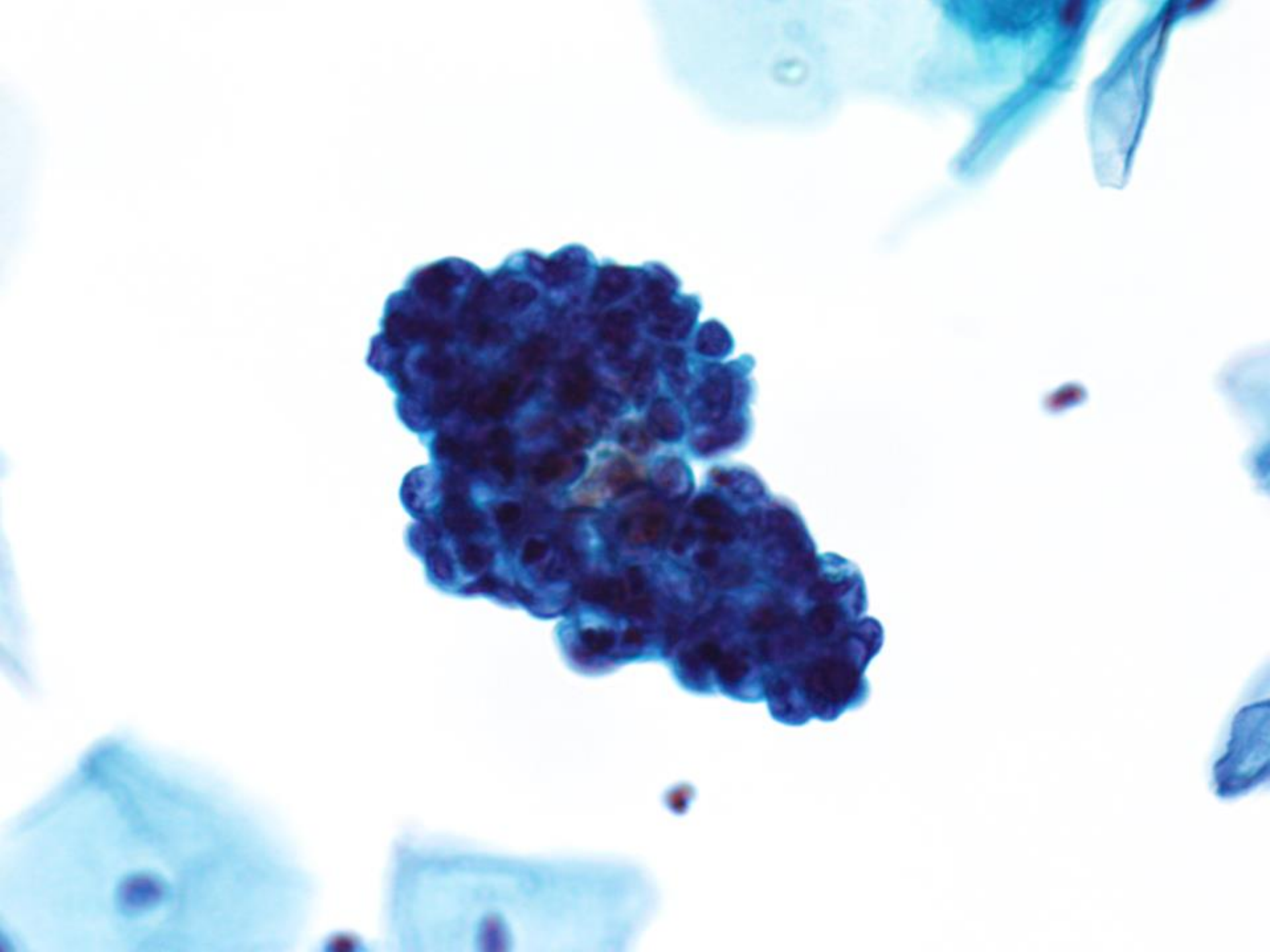
- Squamous Metaplasia
  - Decreased number of “spider cells” compare to conventional smears

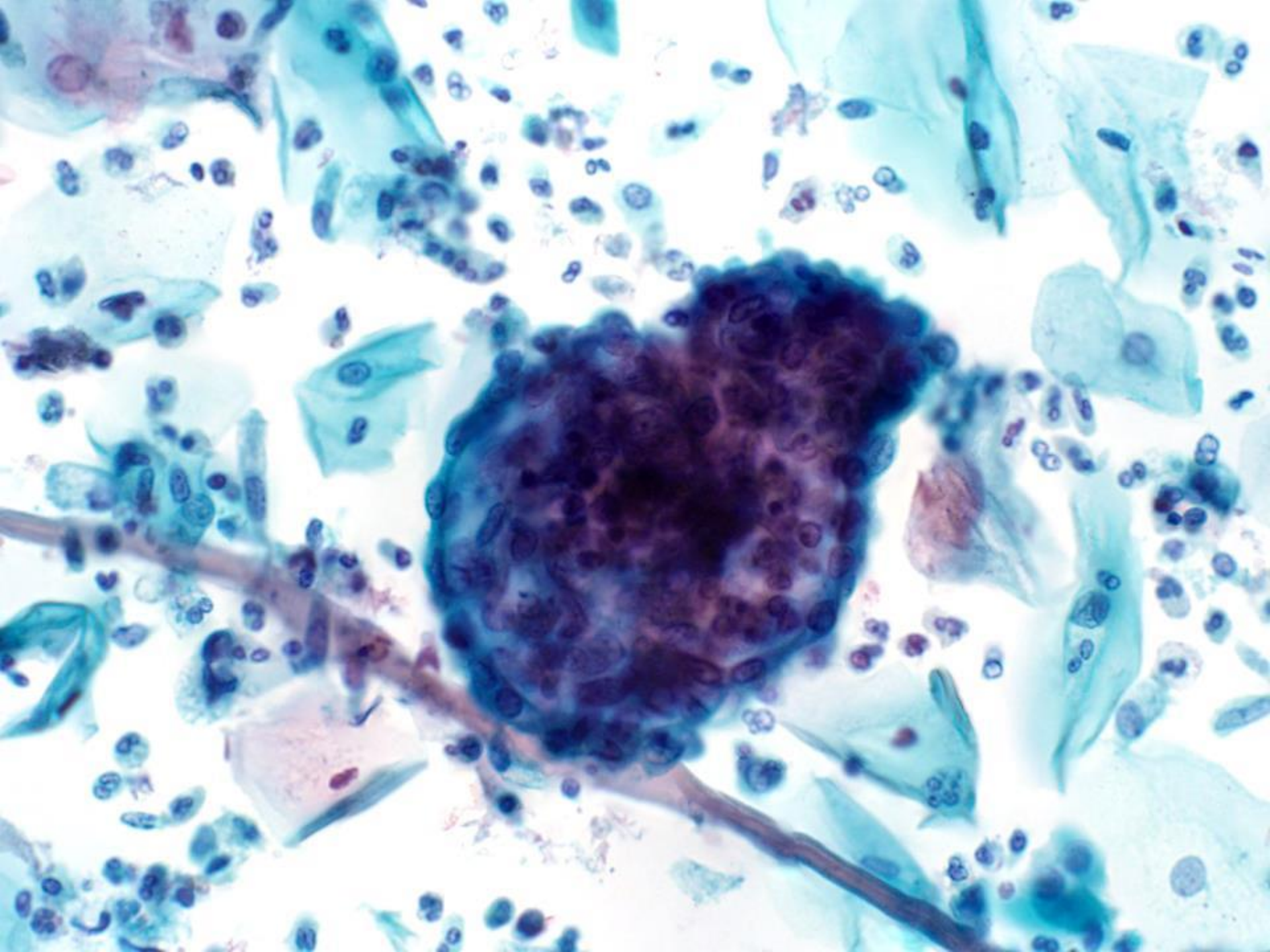


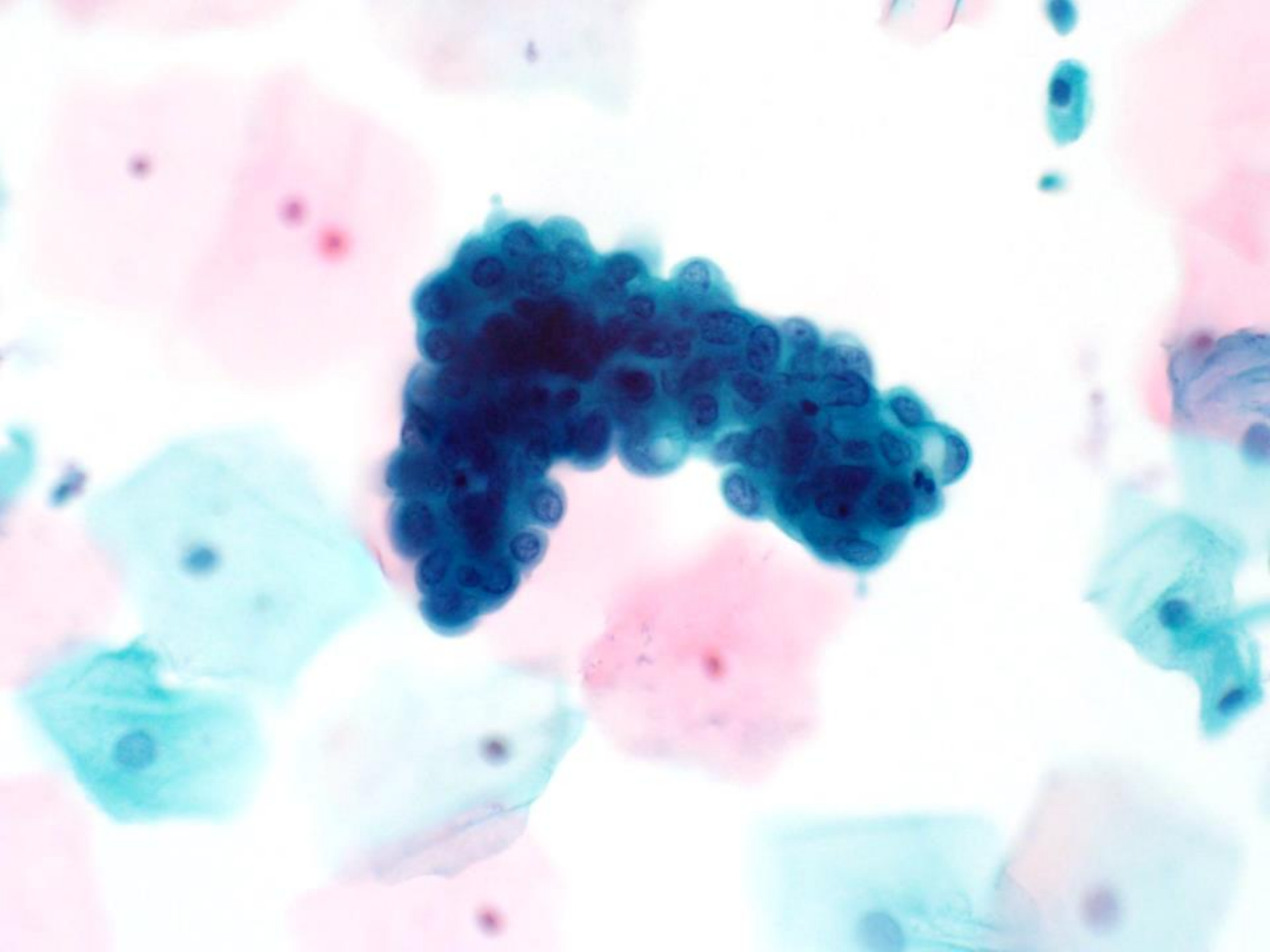


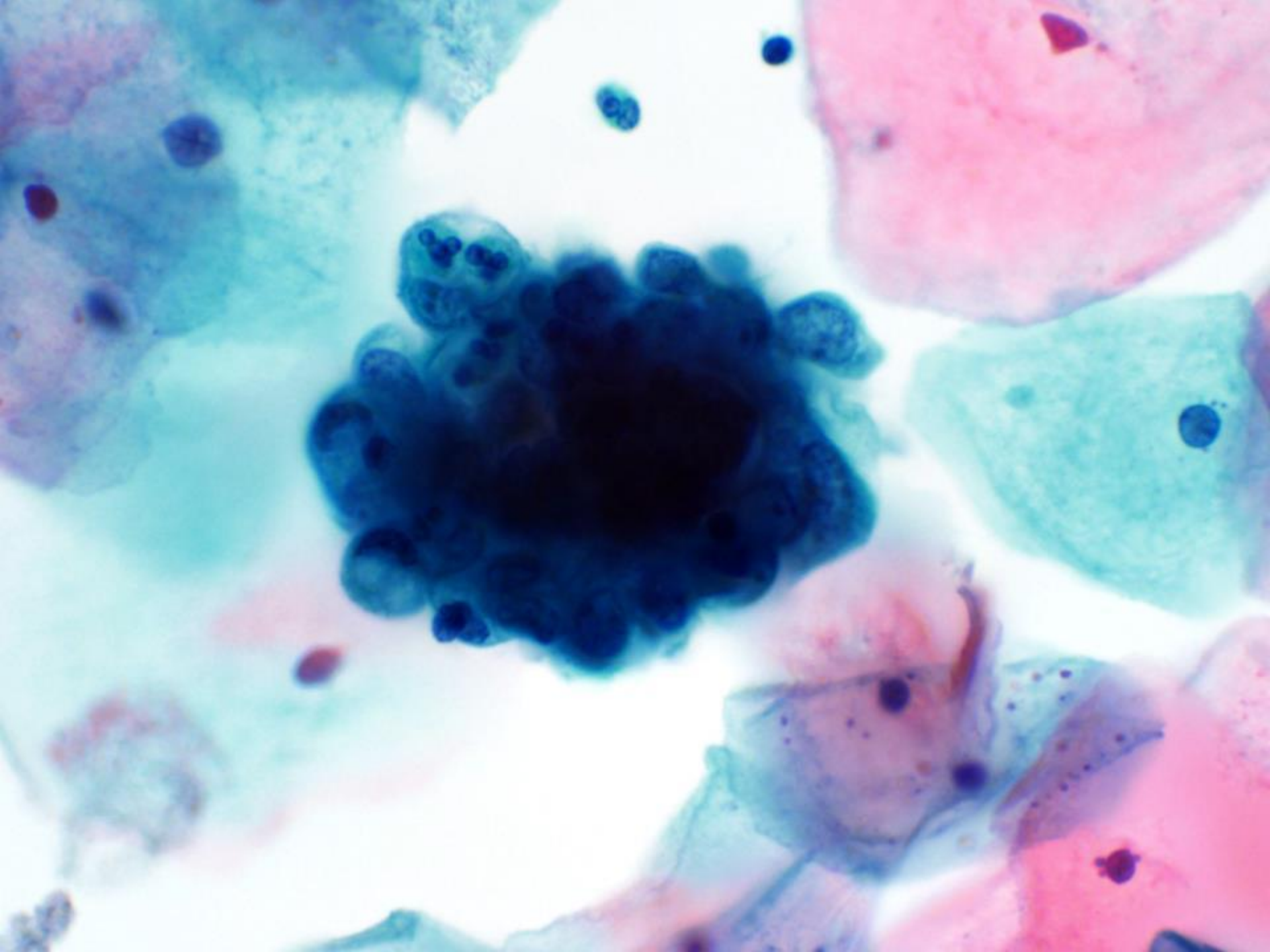
BENIGN ENDOMETRIAL CELLS

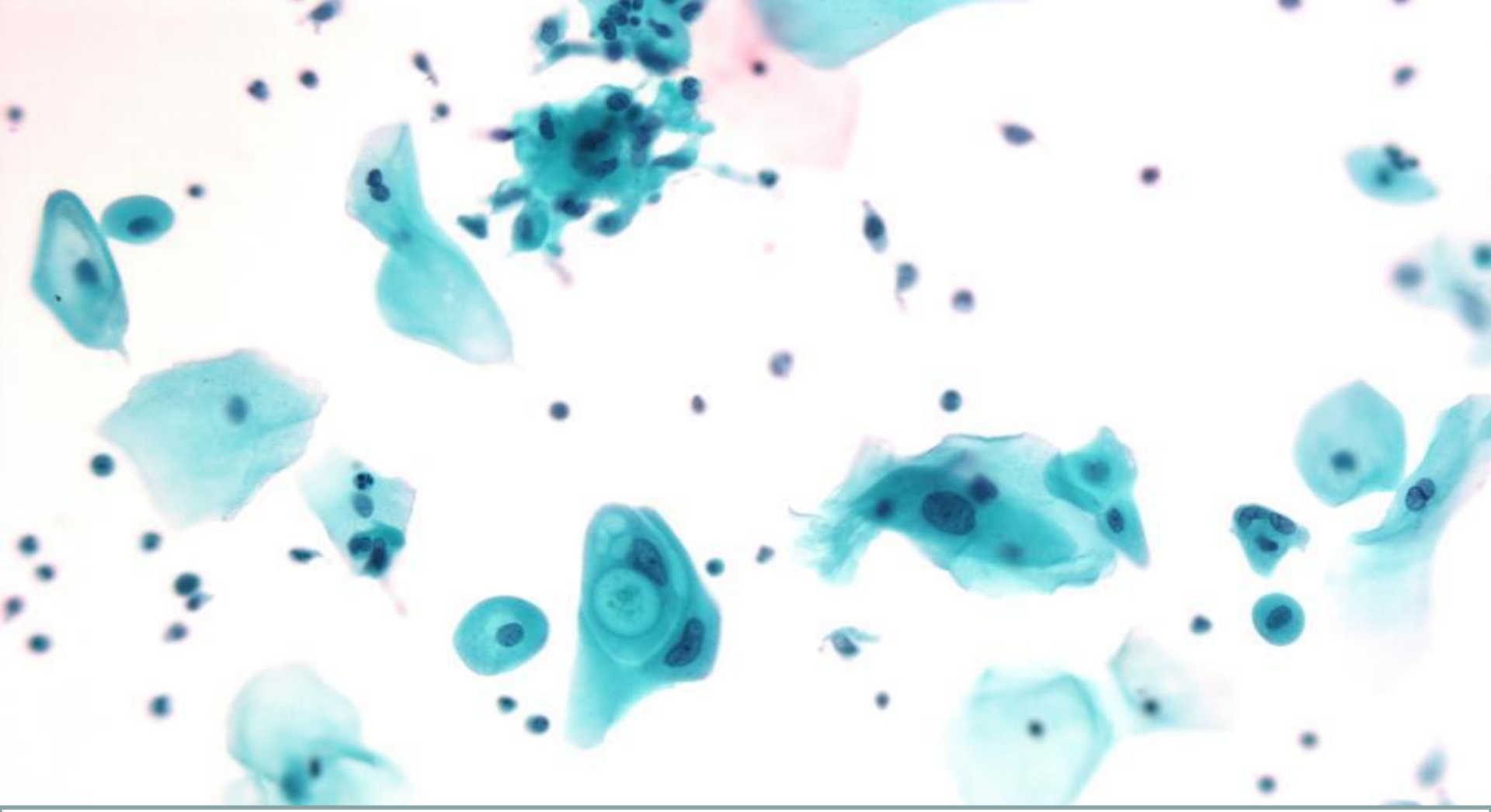






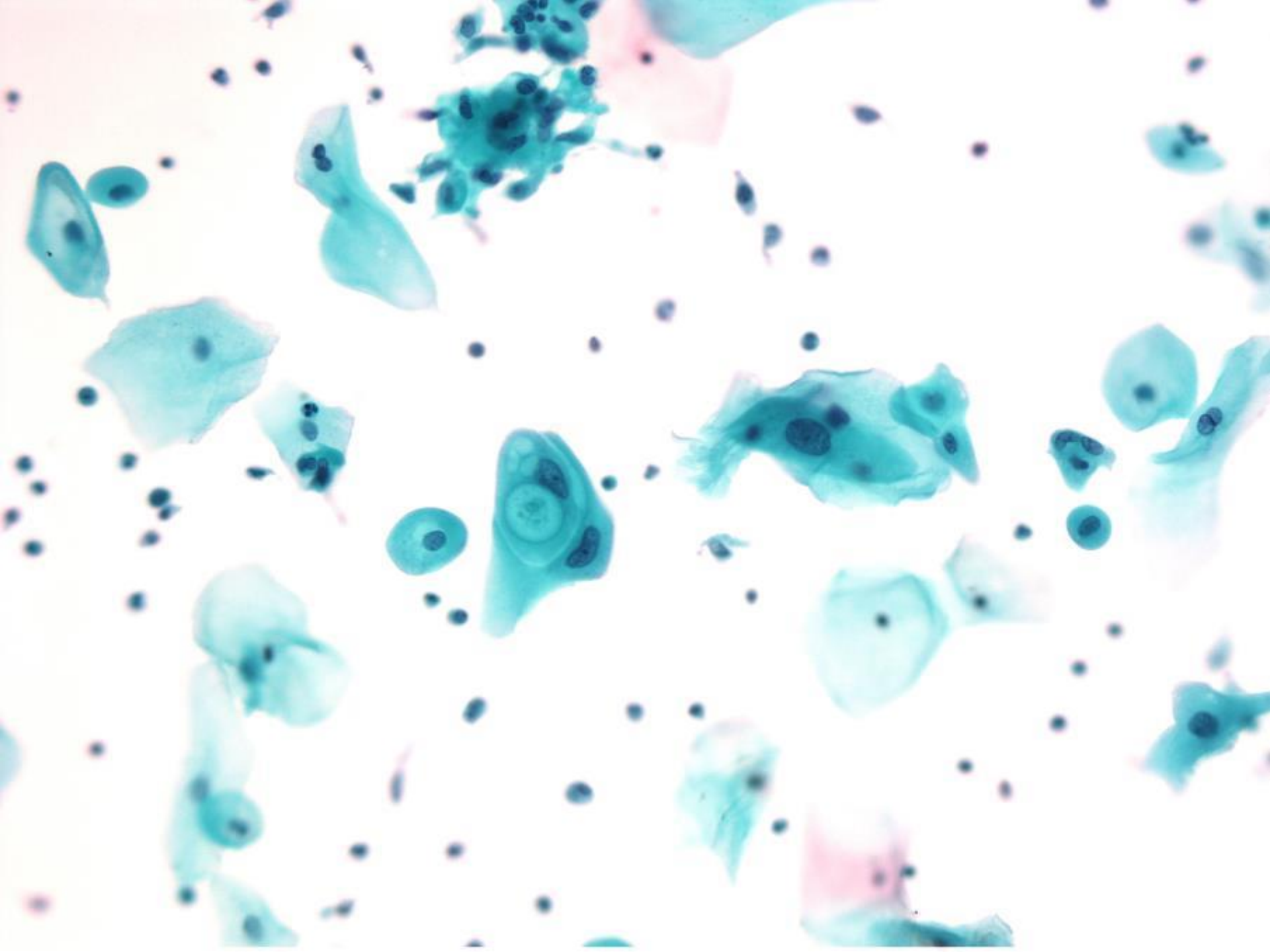


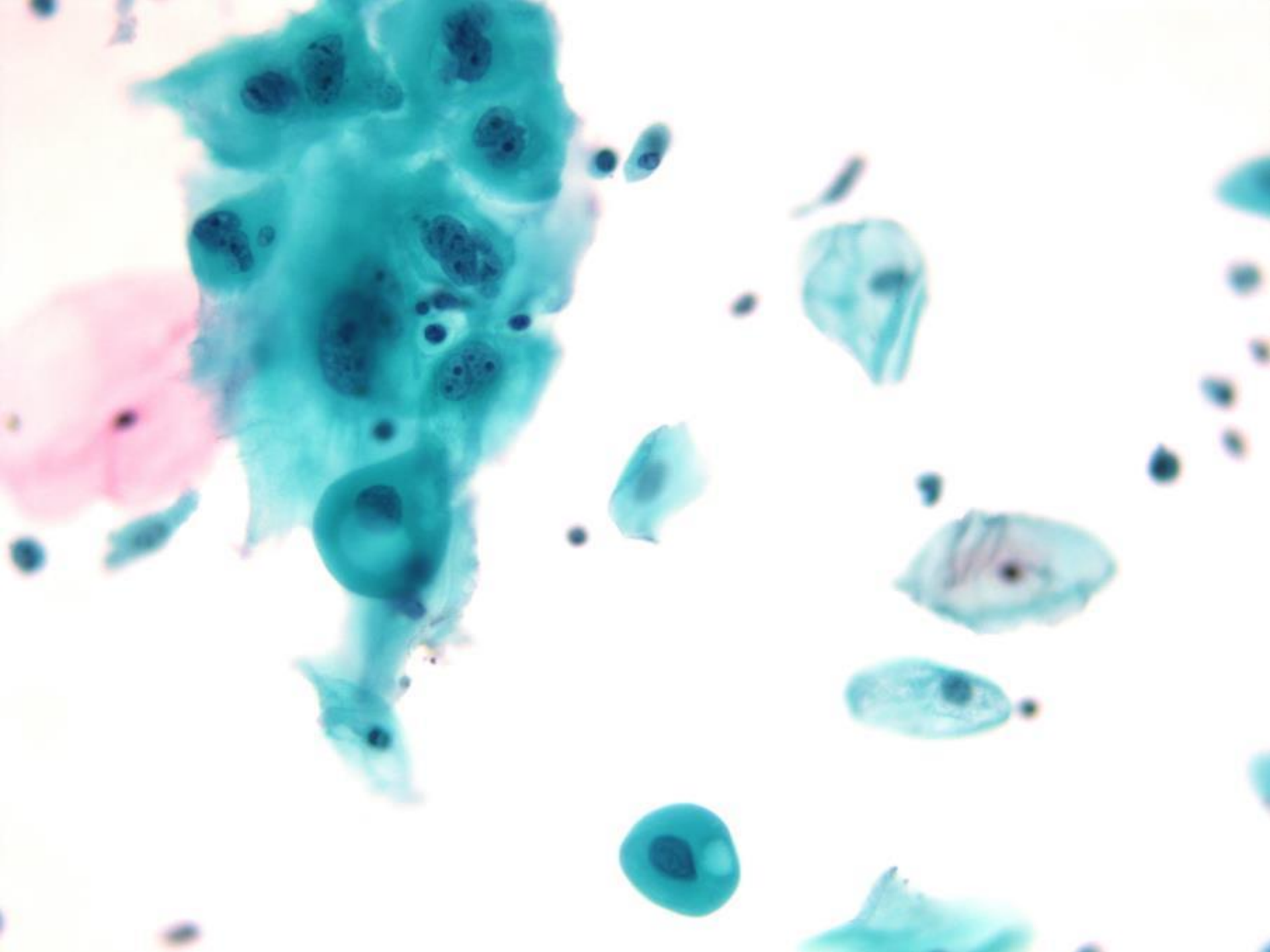


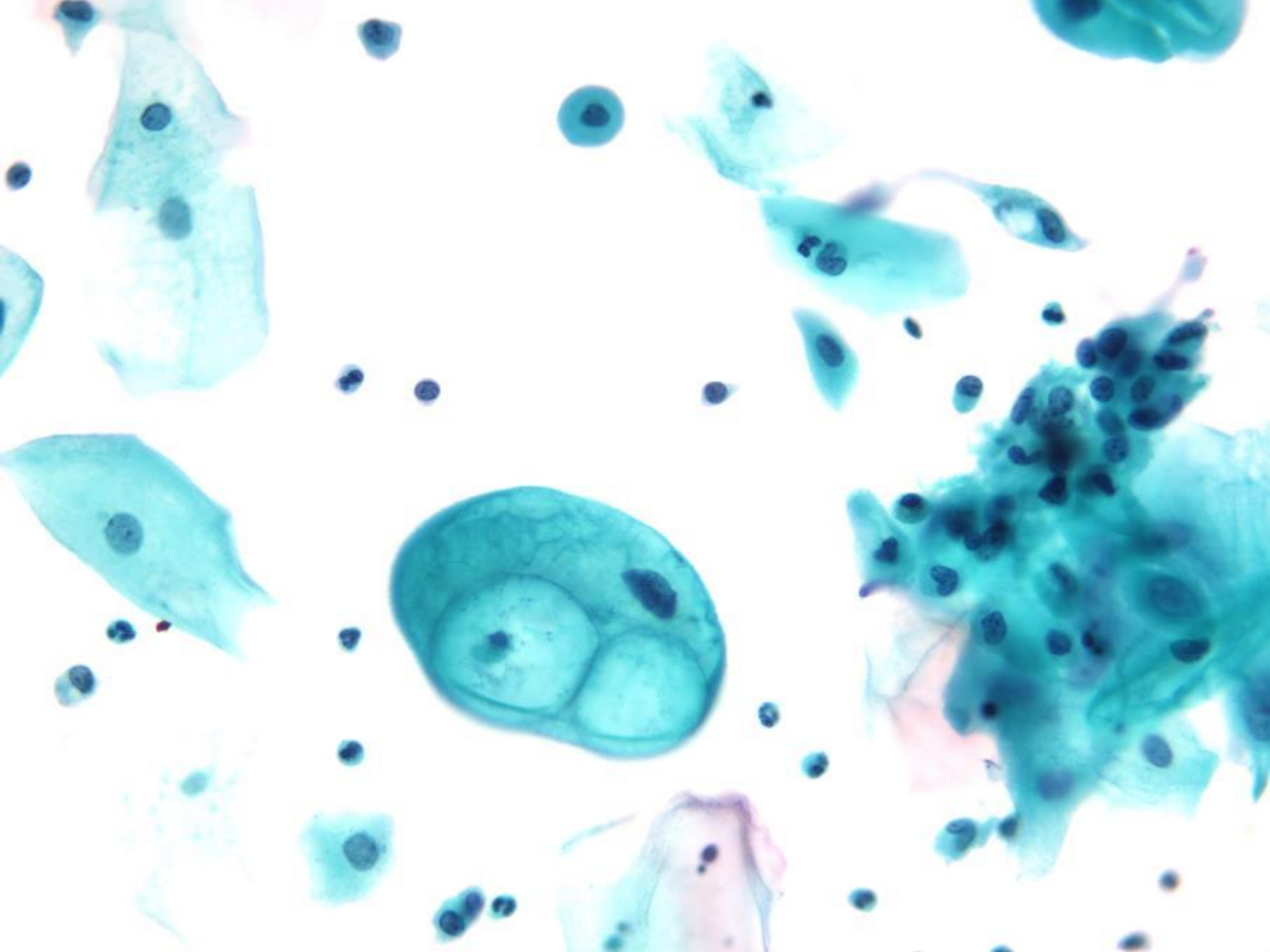


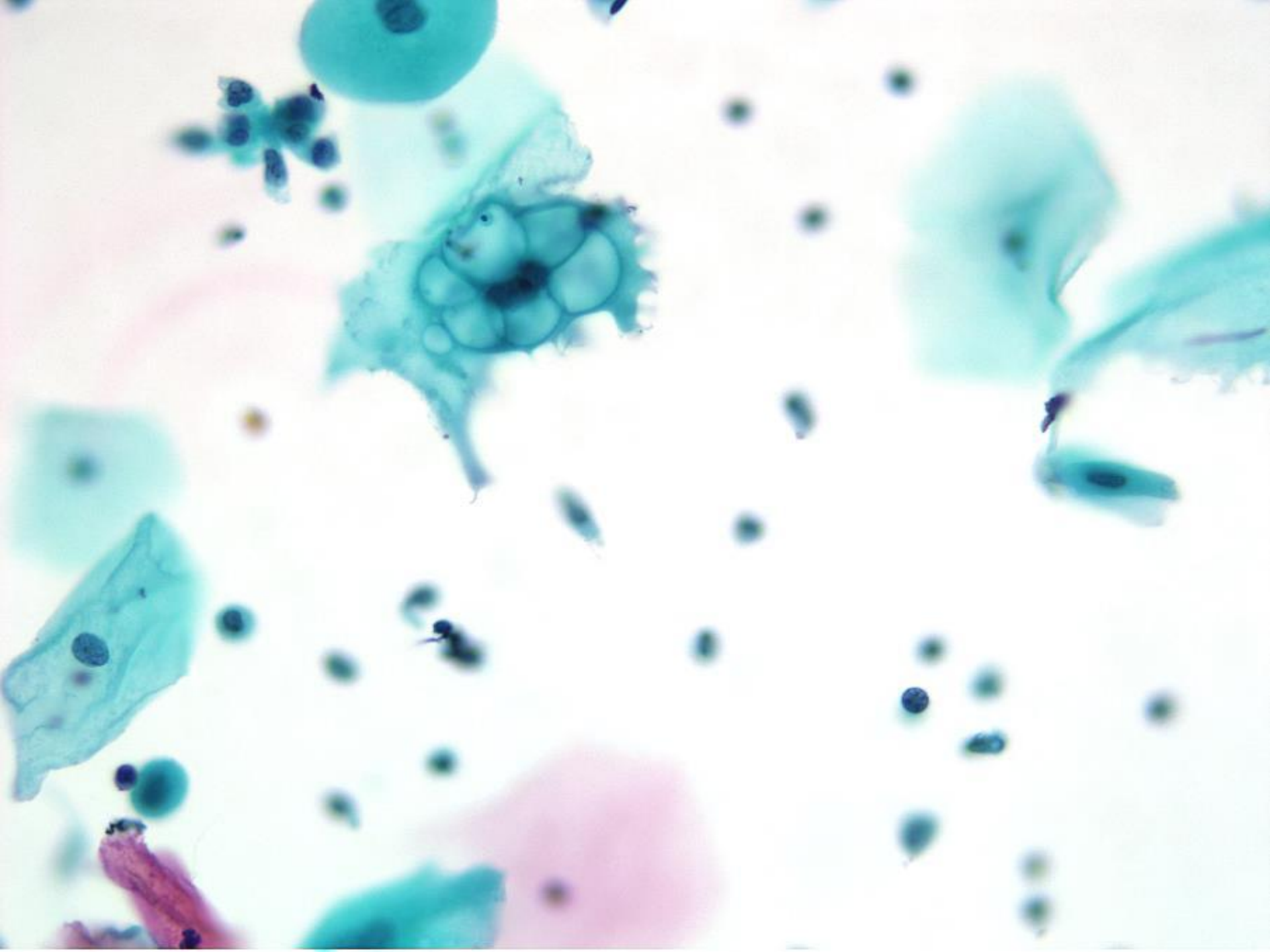
RADIATION EFFECT

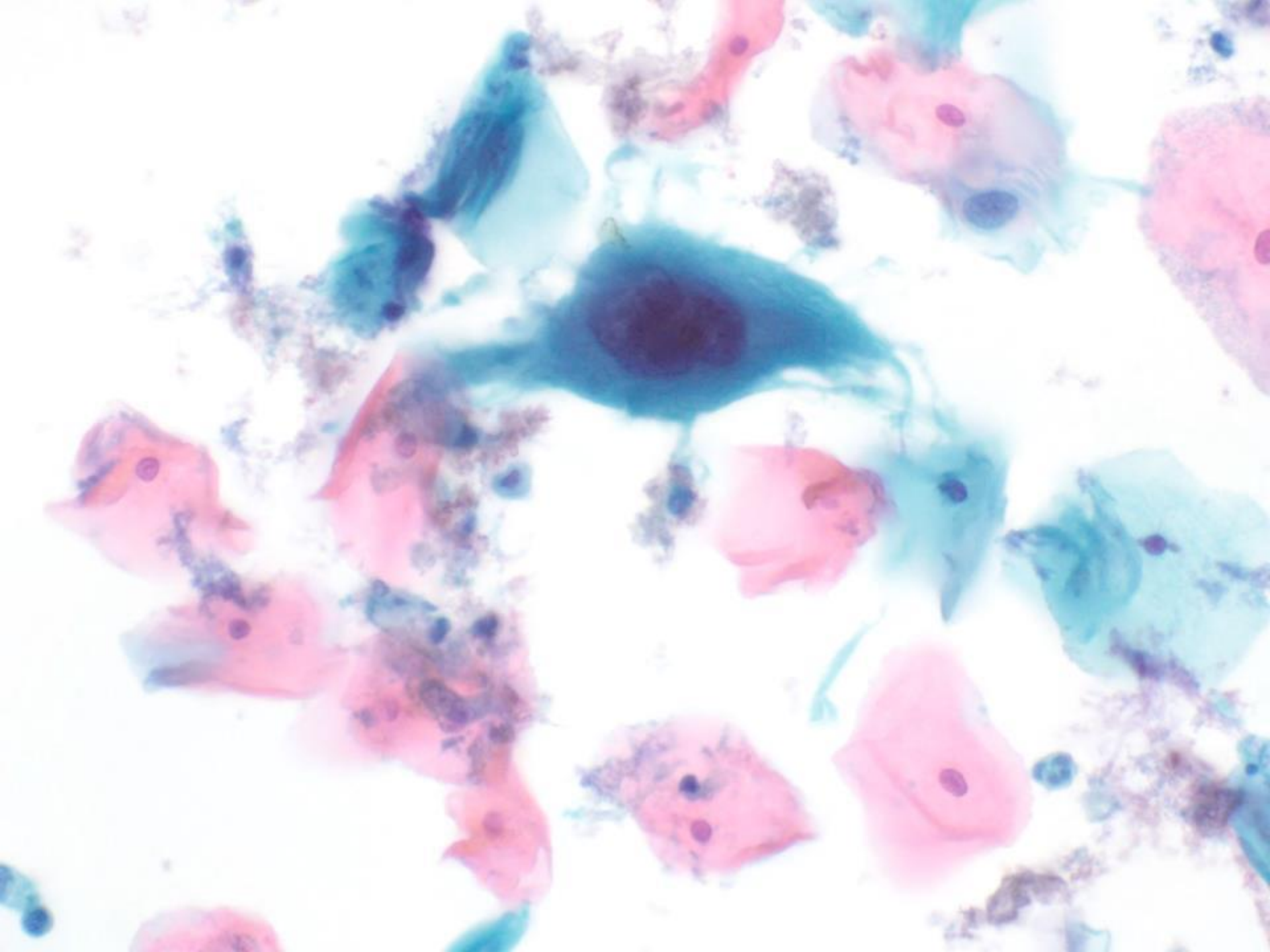
- Radiation Changes
  - Less streaming
  - More prominent nucleoli
  - Better preservation = less atypia
  - Degenerated nuclei resembling LSIL

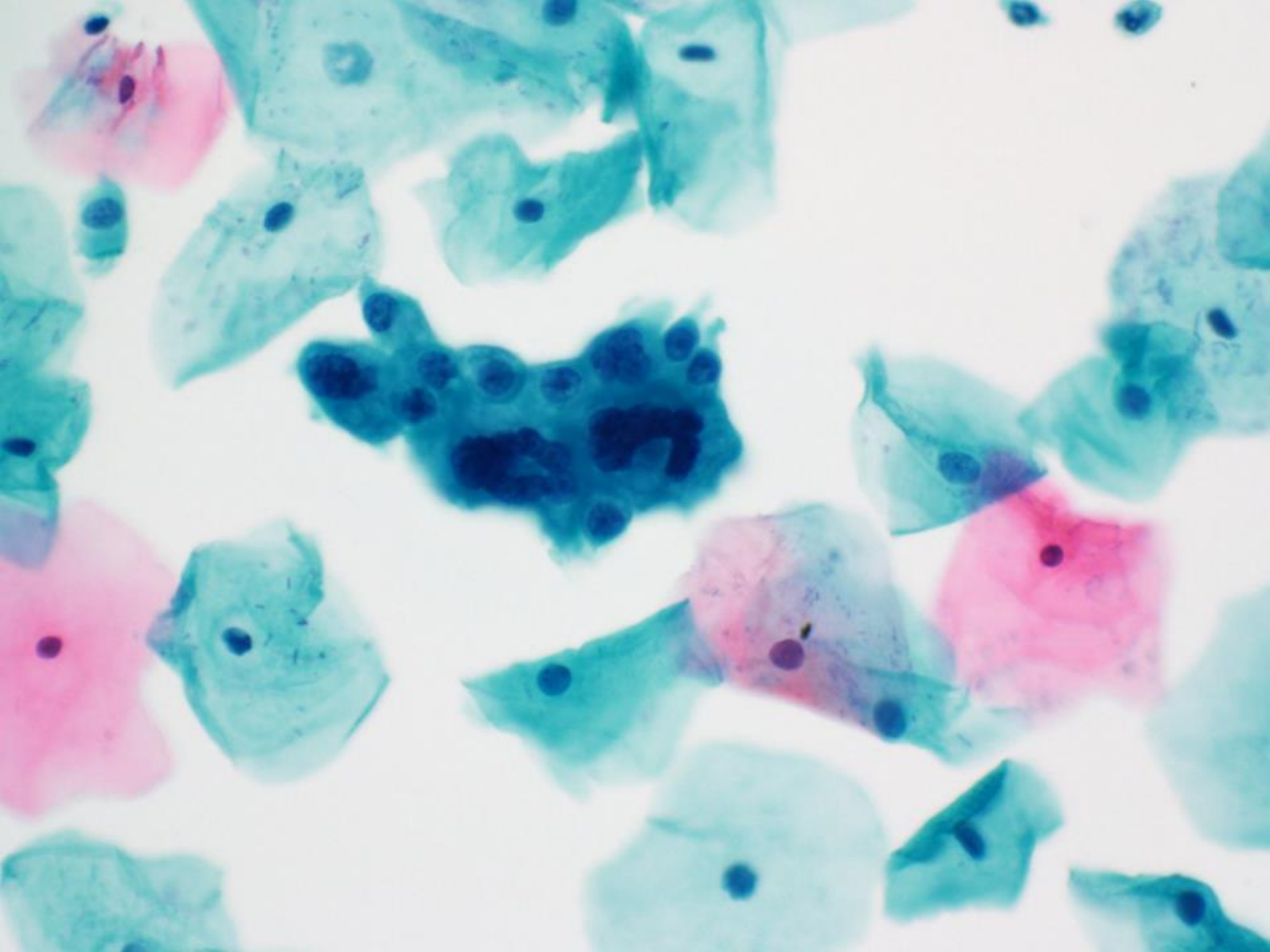


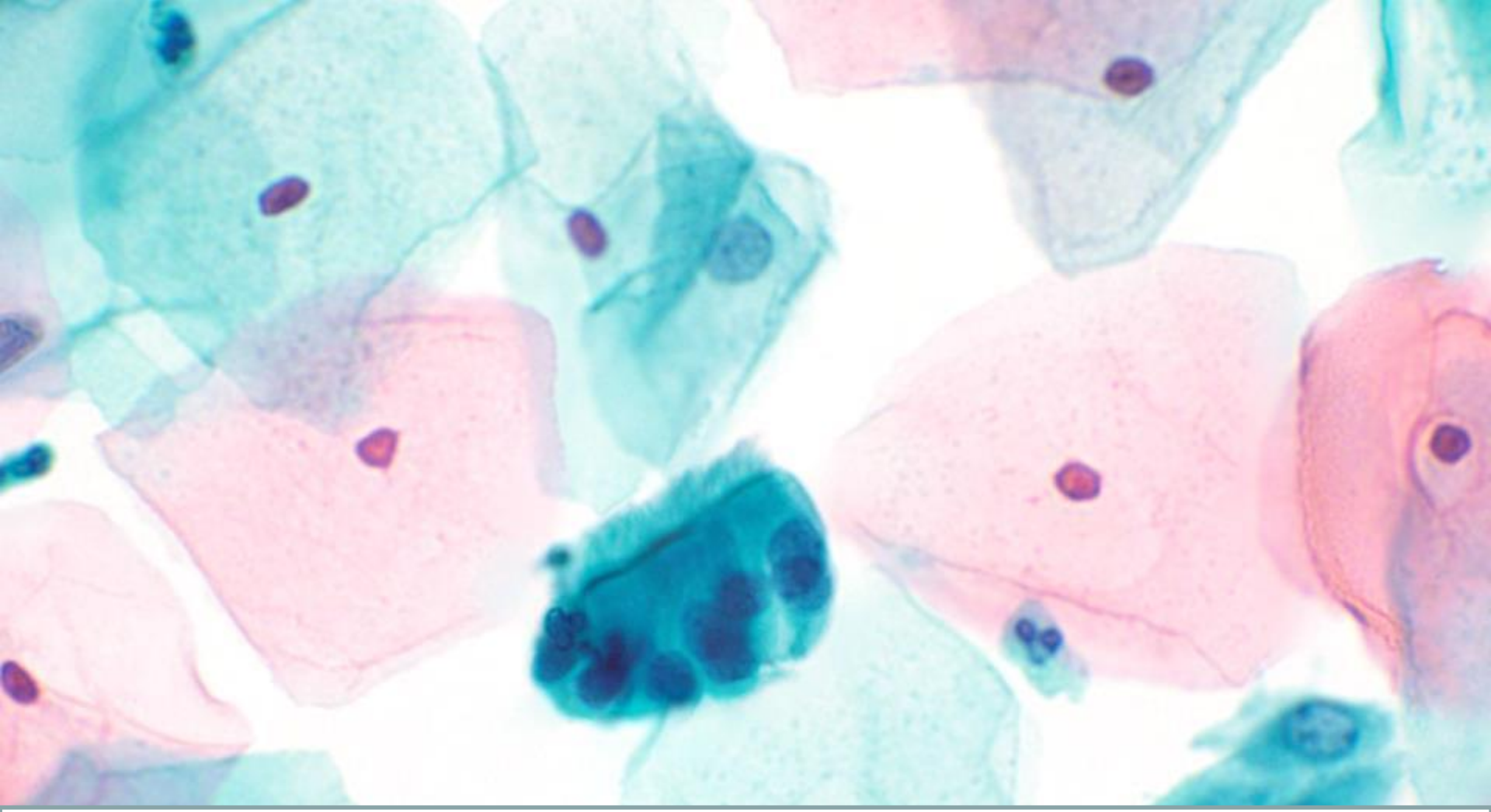




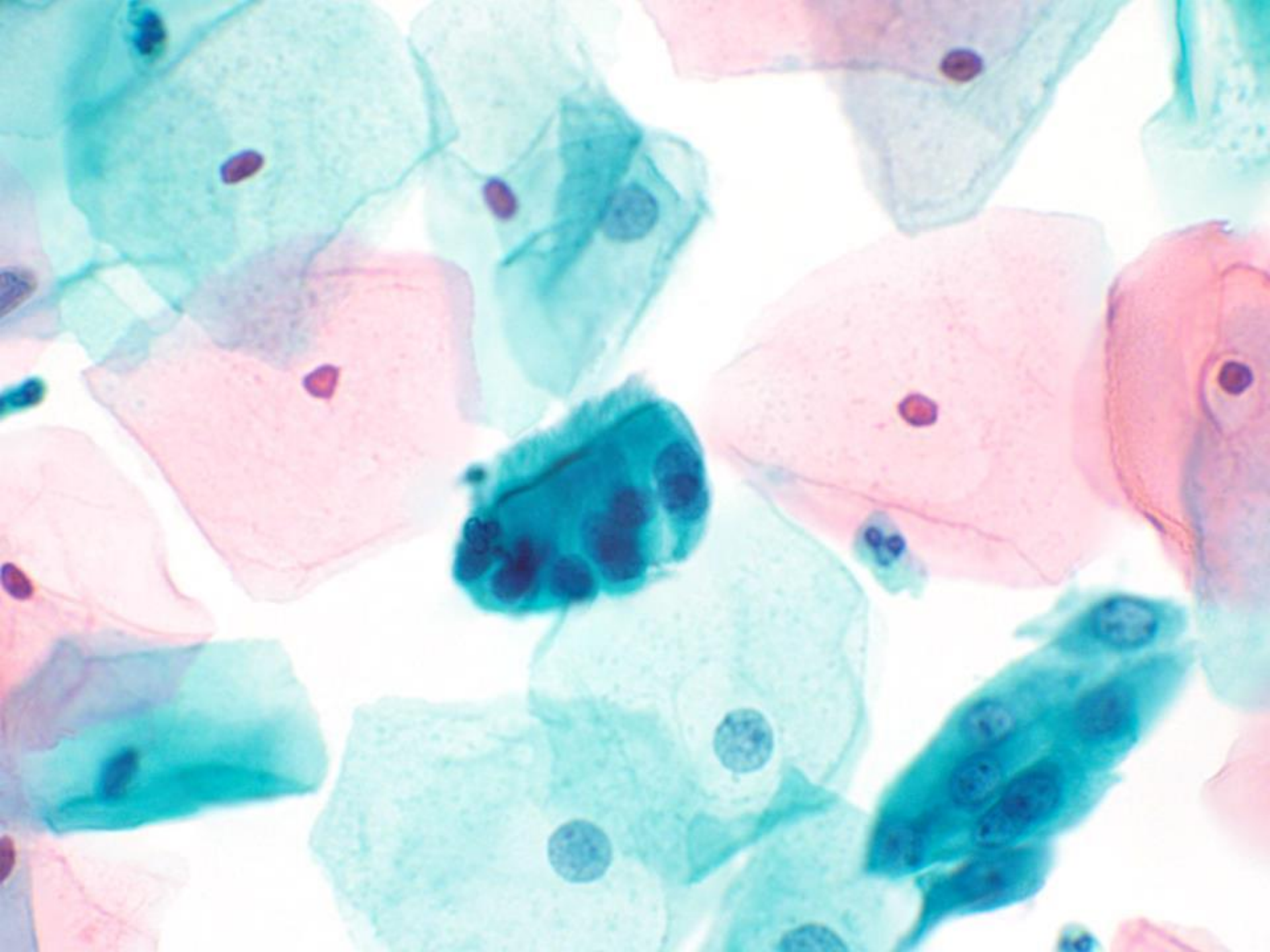


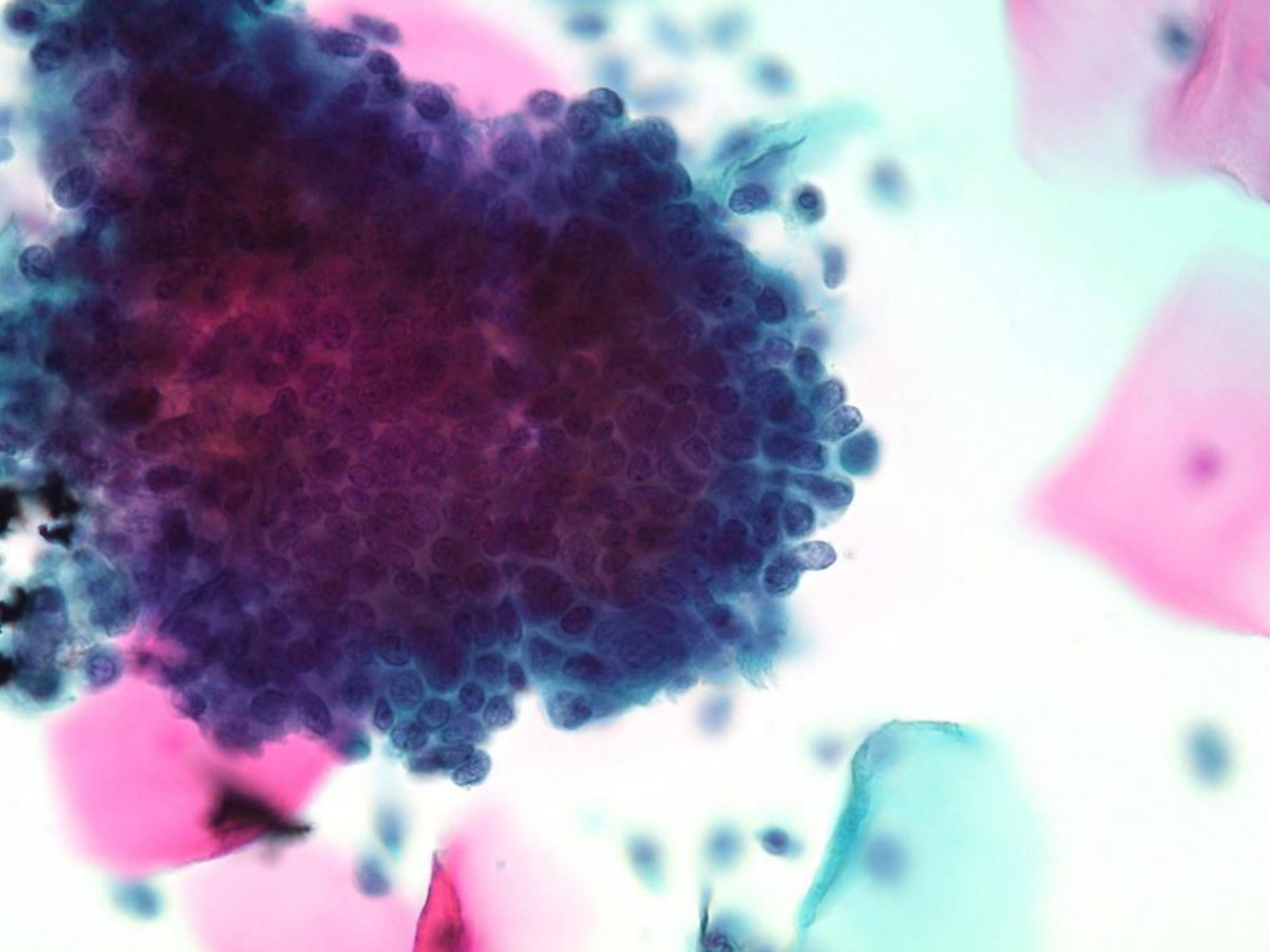


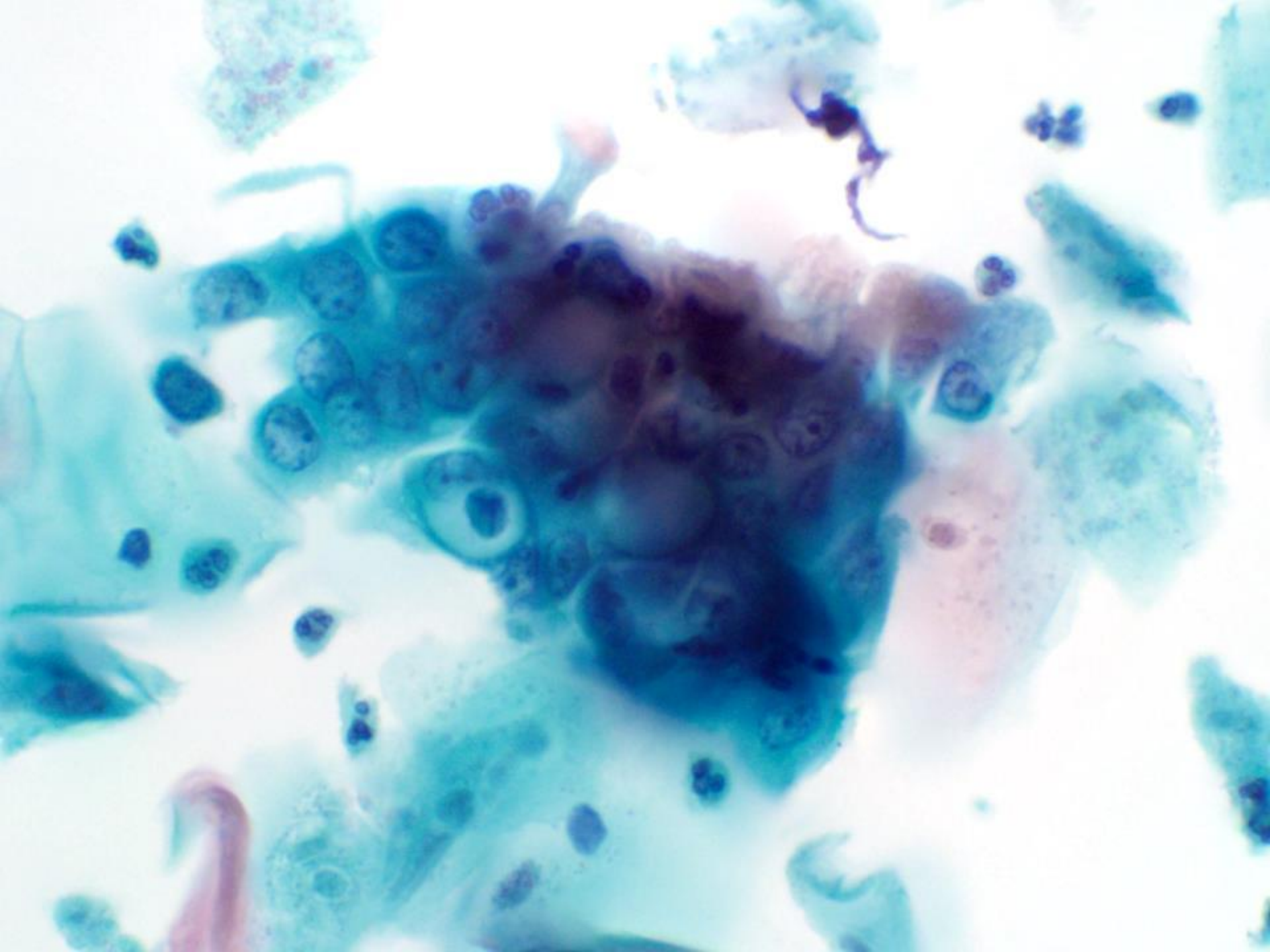


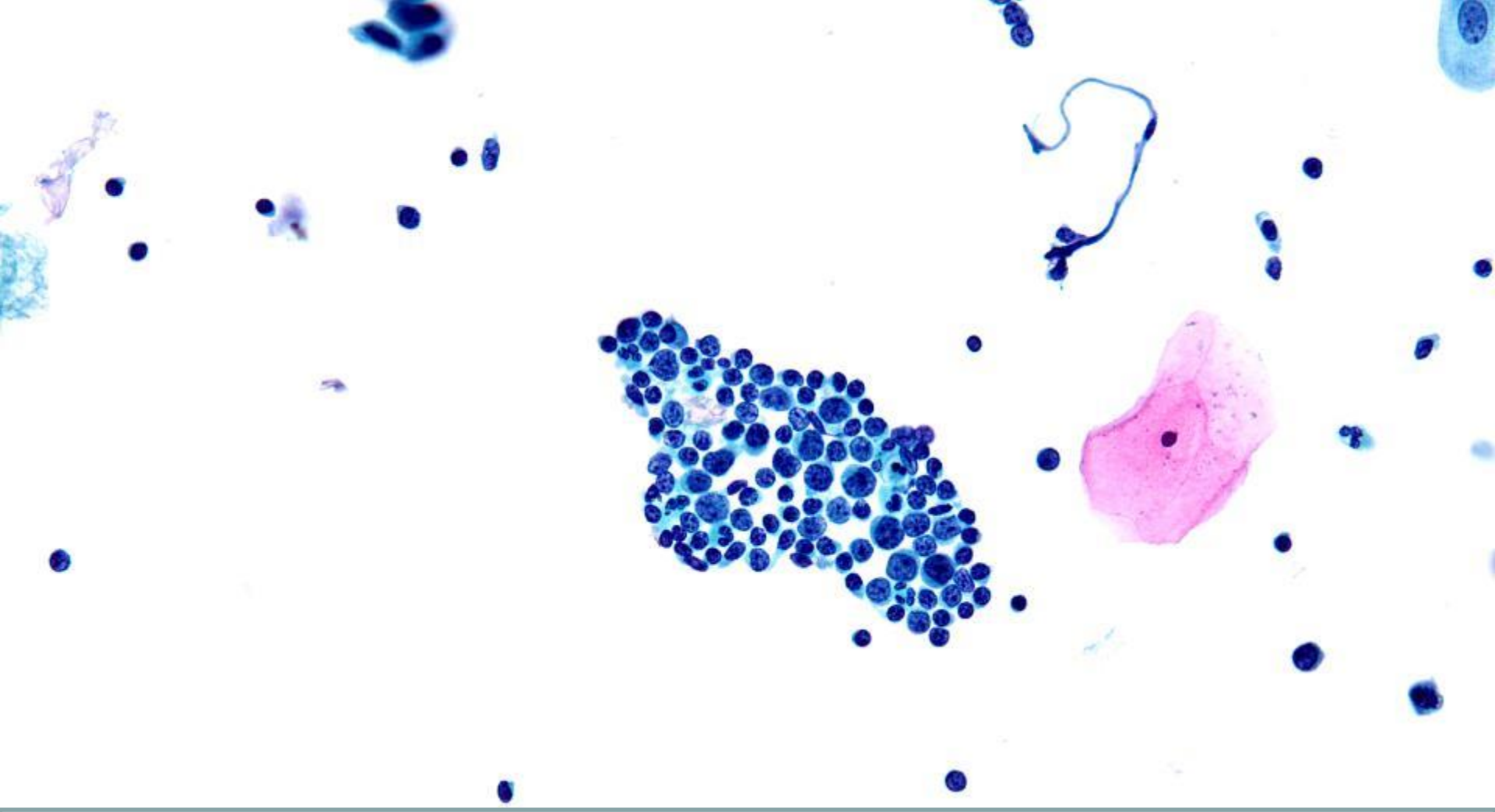


TUBAL METAPLASIA



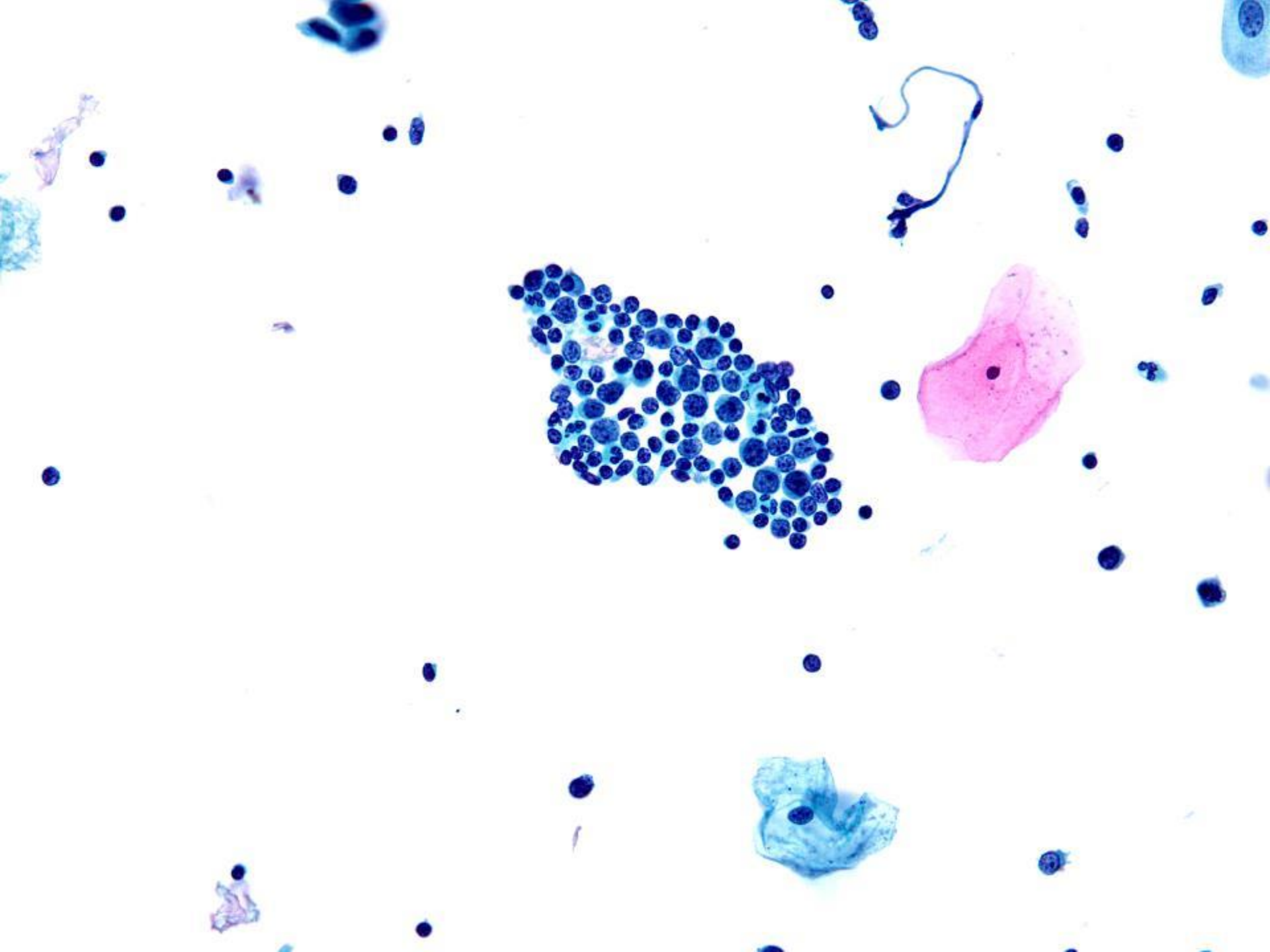


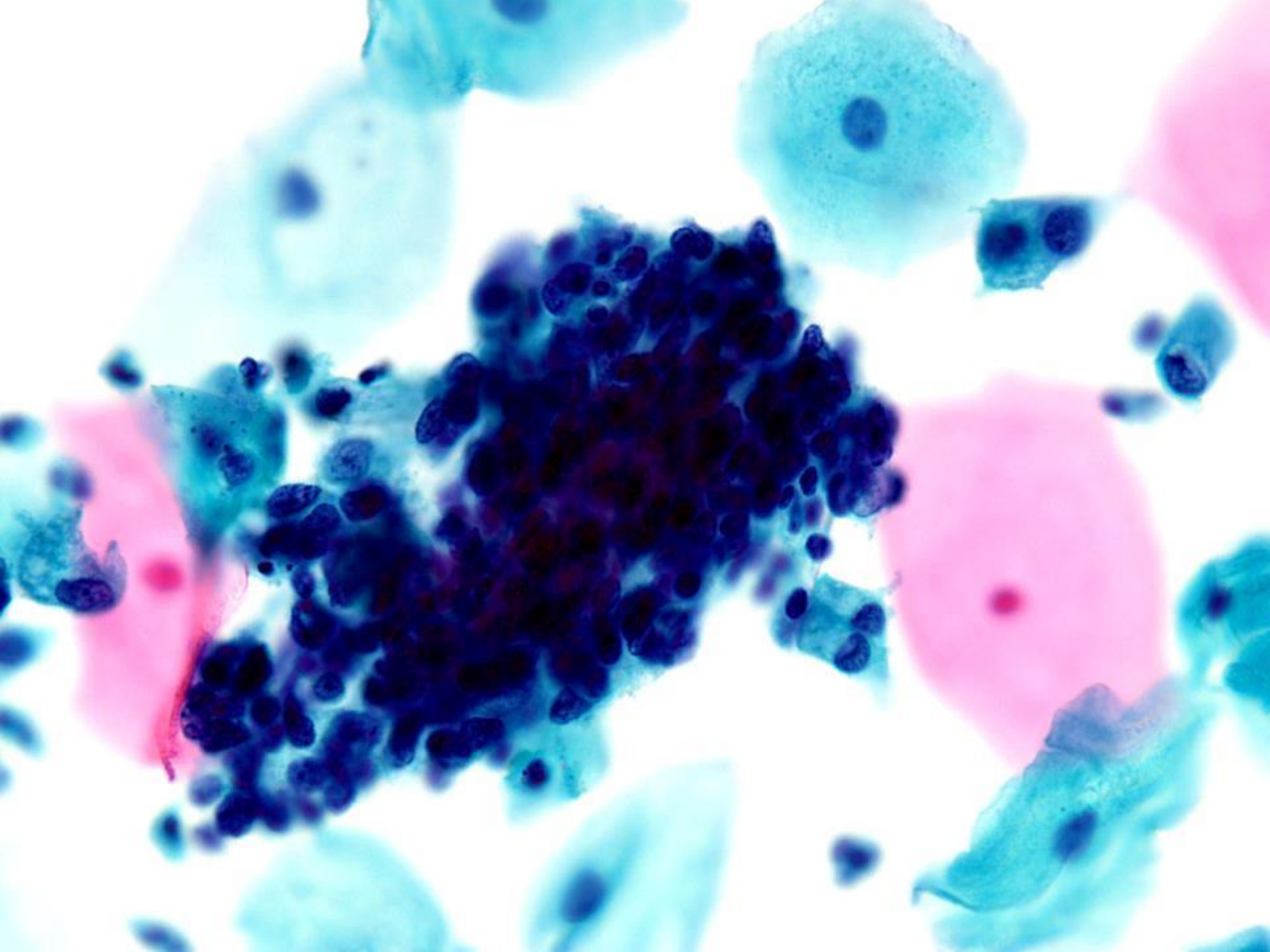


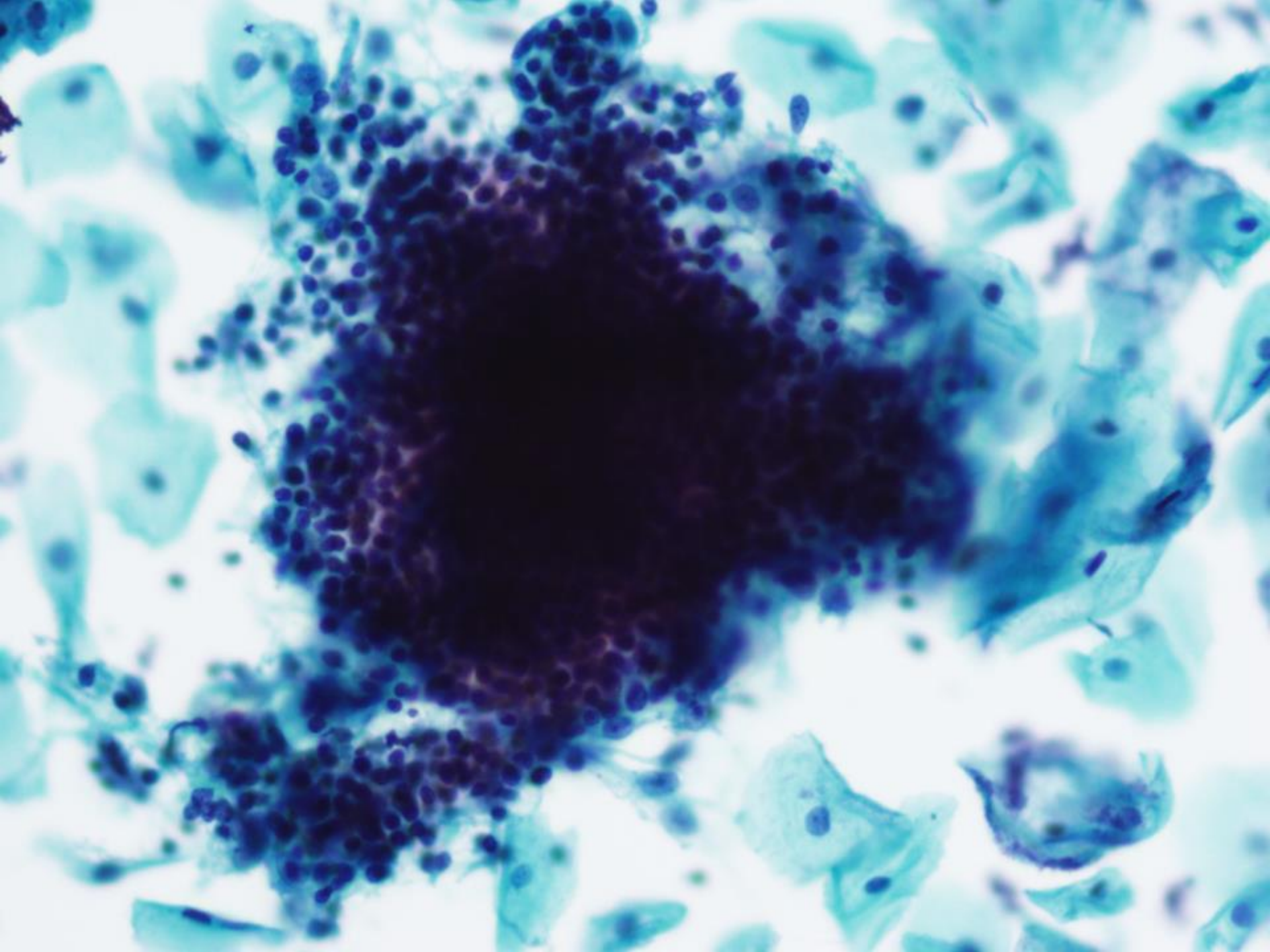


FOLLICULAR CERVICITIS

- Follicular Cervicitis
  - Dispersed lymphocytes in the background
  - Loosely aggregated clusters

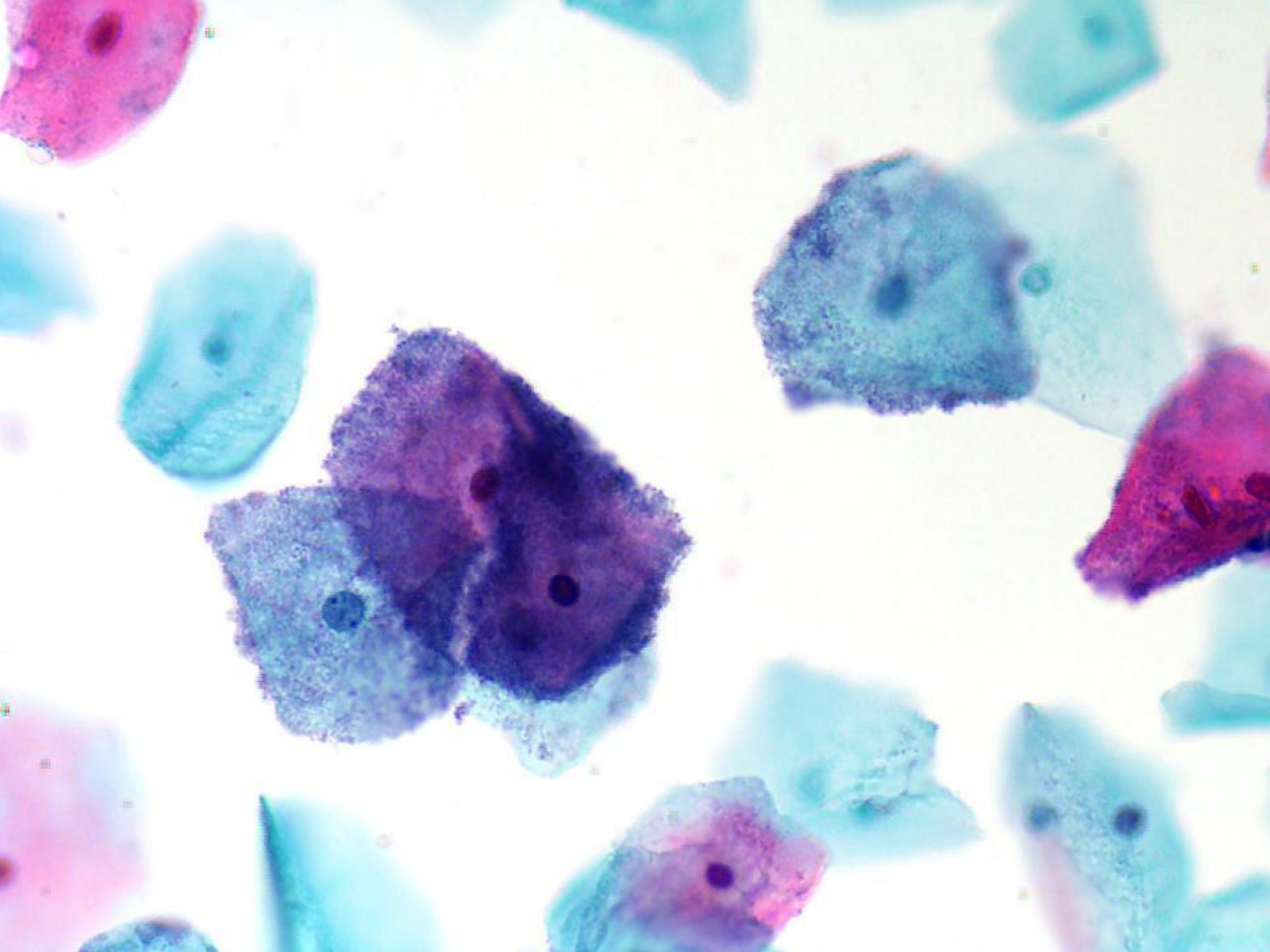




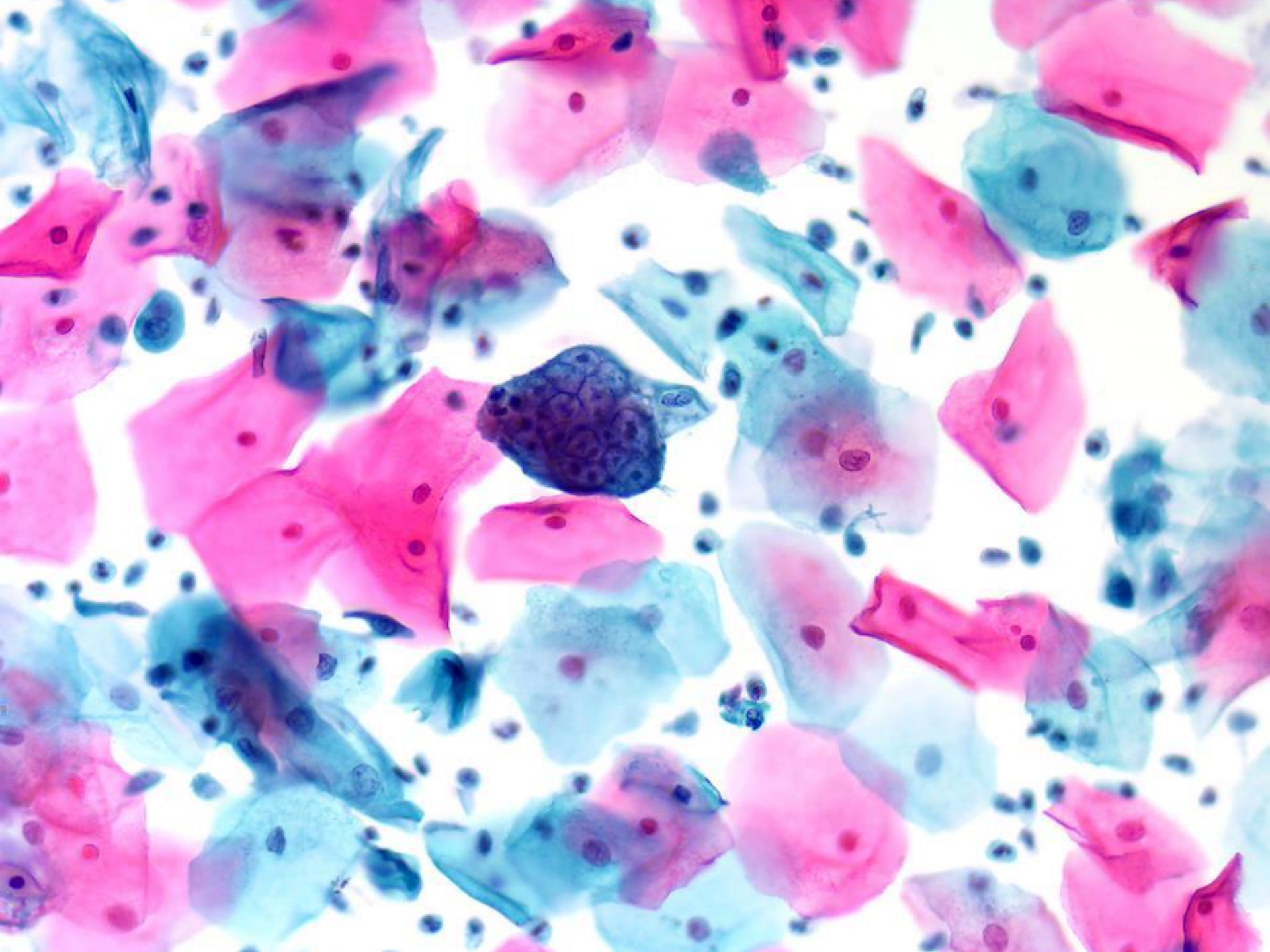


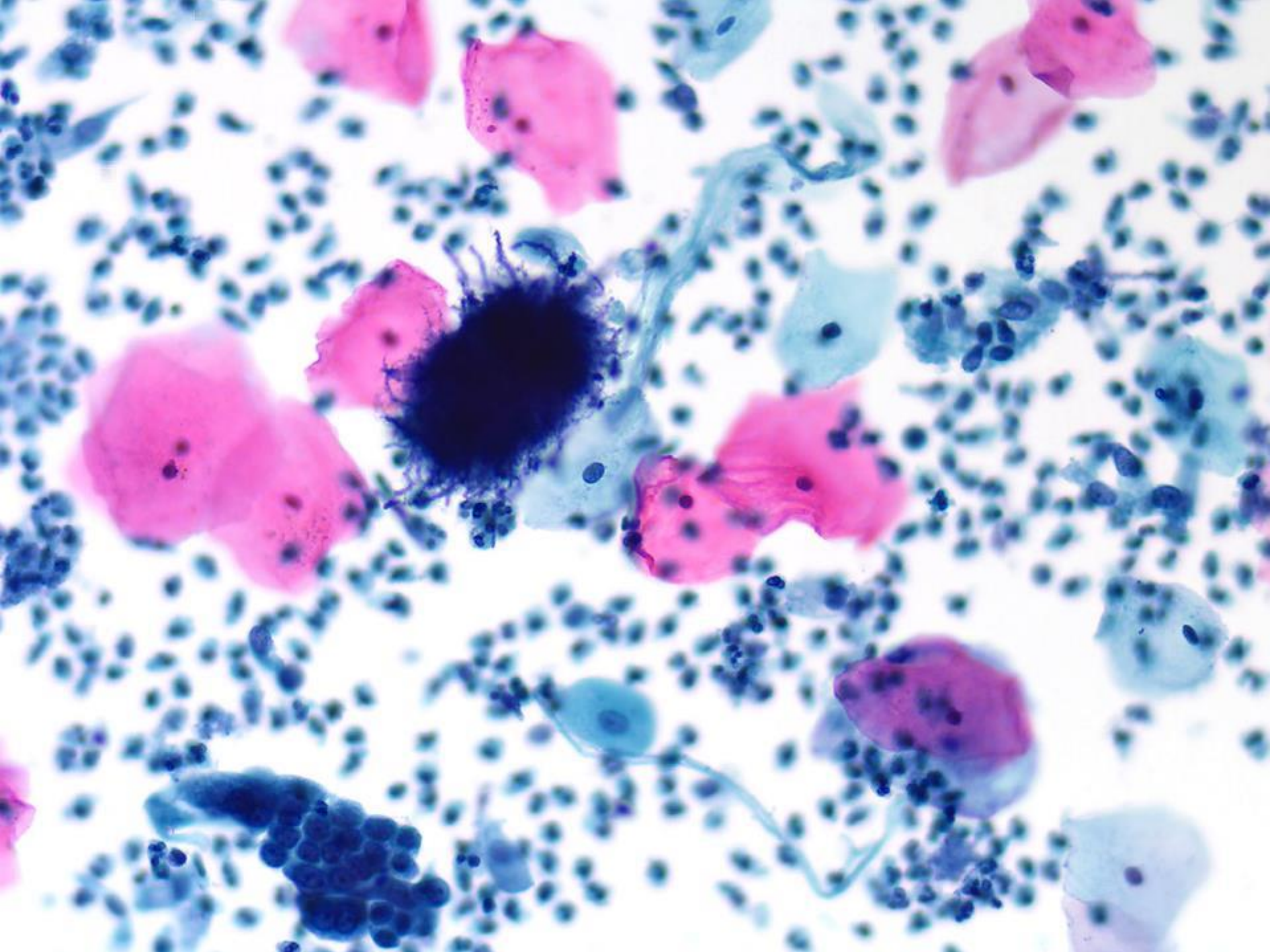
INFECTIOUS ORGANISMS

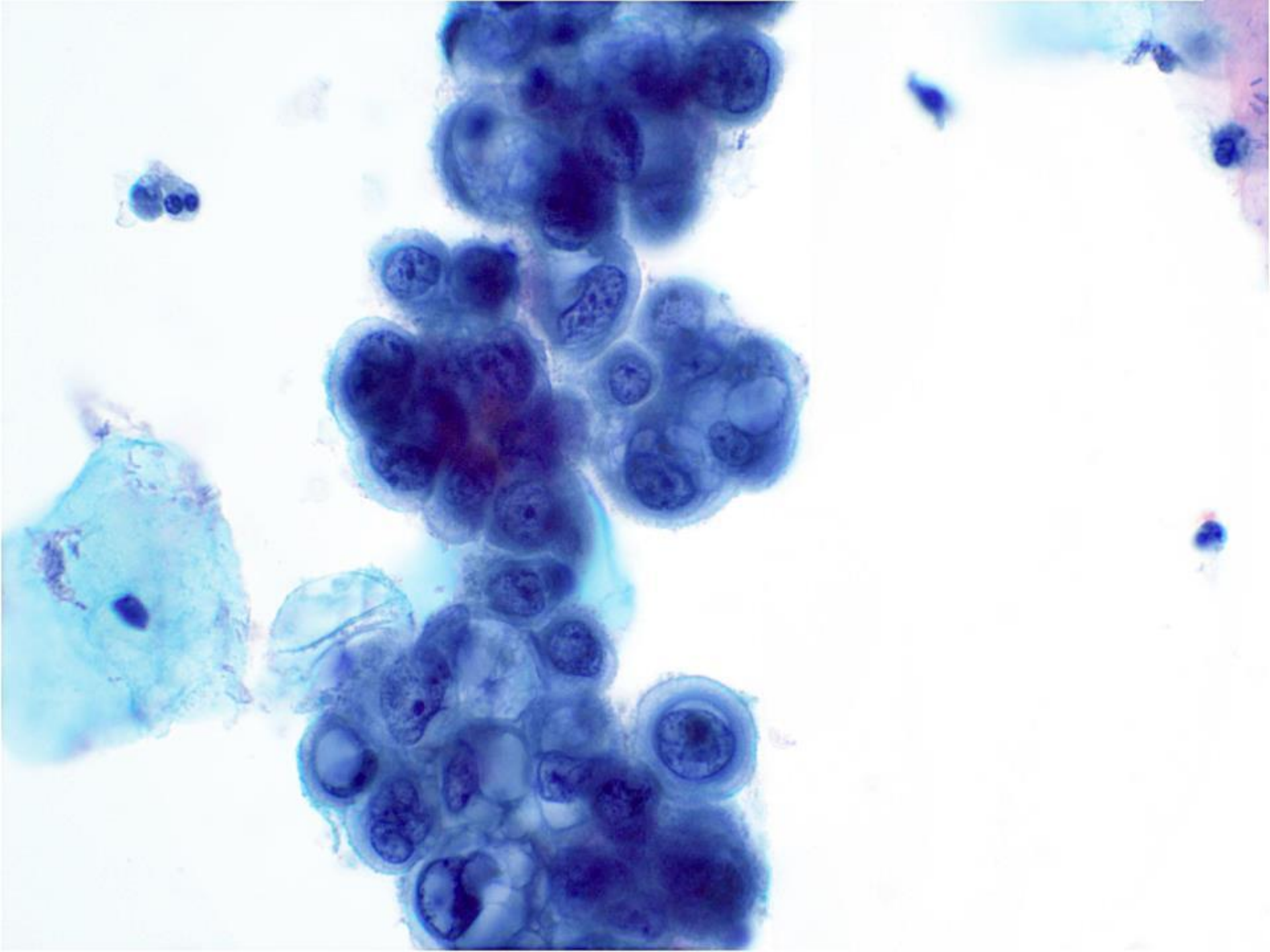
- Bacterial Vaginosis
  - Detected more often with CPS
    - BV 38.7% vs. 30.2% (SP)
  - Coccobacilli stuck to cells with clean background



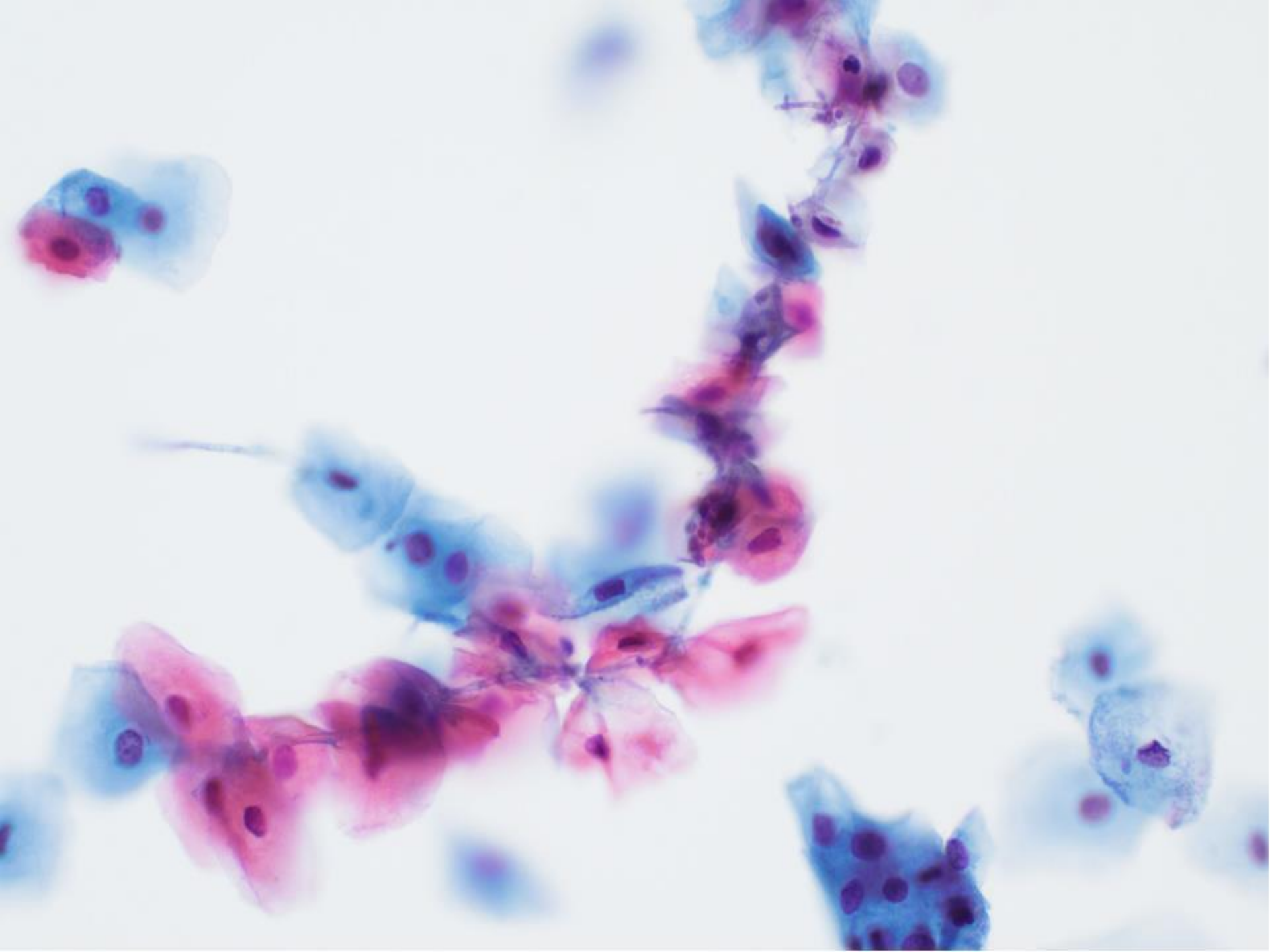
- Actinomyces – easier to visualize in LBP
  - Finer filaments at edges
- HSV/CMV –
  – similar in appearance
  – smaller cell size



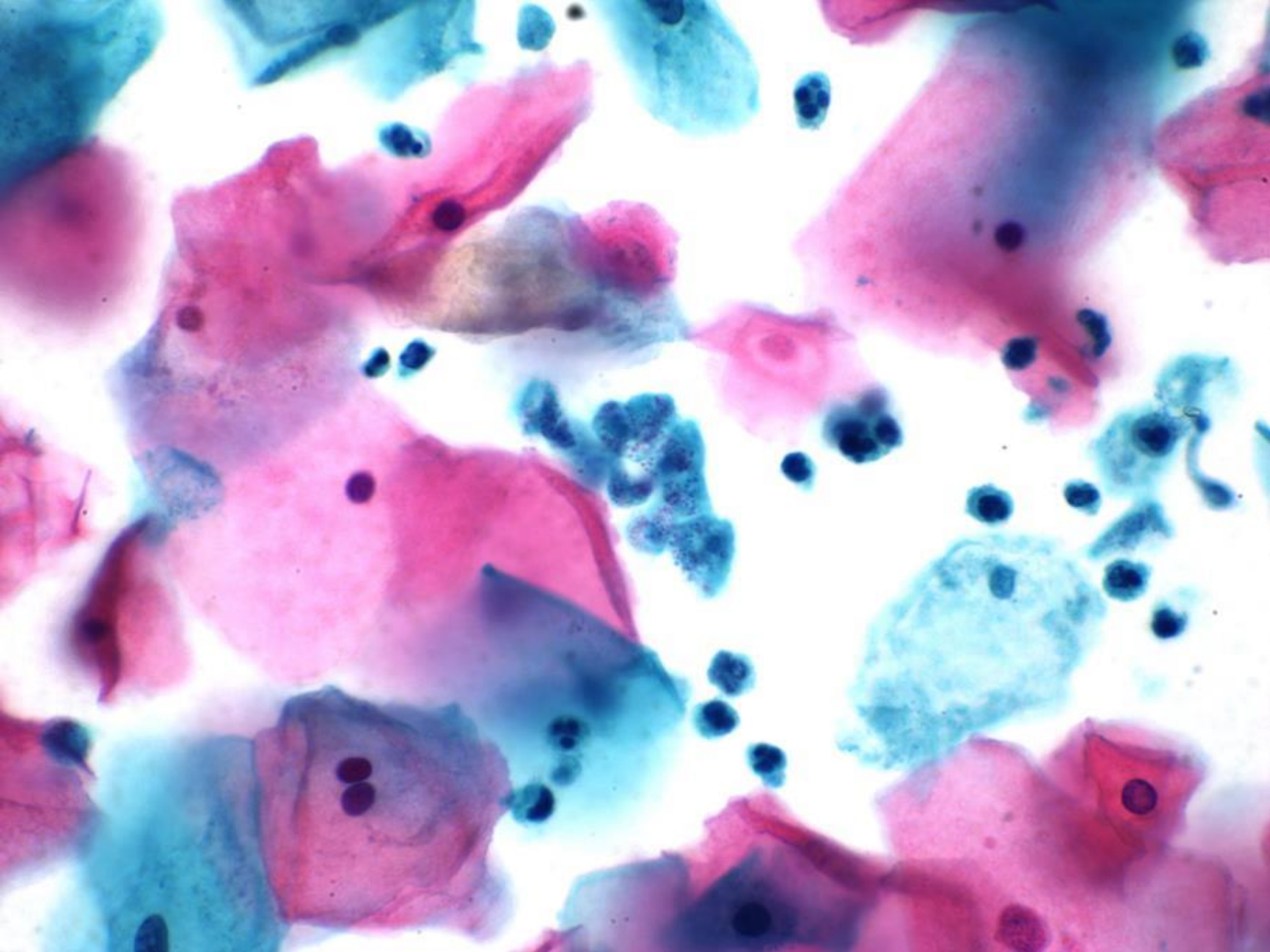


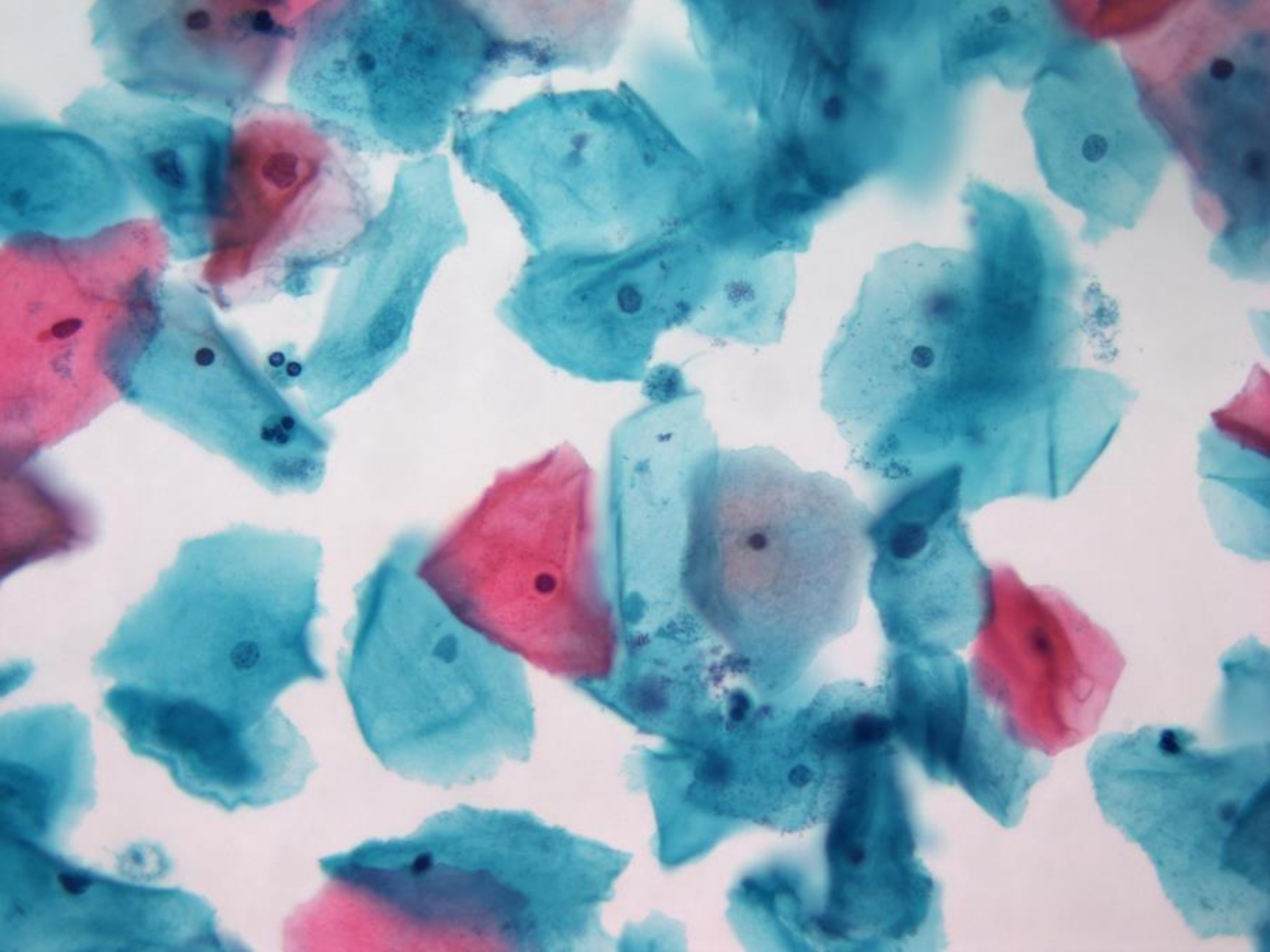


- Candidiasis
  - Detected more often with SP (13.7% vs. 7.7% CPS)
  - “Shish kebobs” pattern more pronounced



- Trichomonas
- Detected more often with CPS
    - Trichomonas 13.4% vs 8.3% (SP)
  - Red/basophilic granules more prominent
  - Smaller organisms
  - Kite-shaped forms more prominent on SP





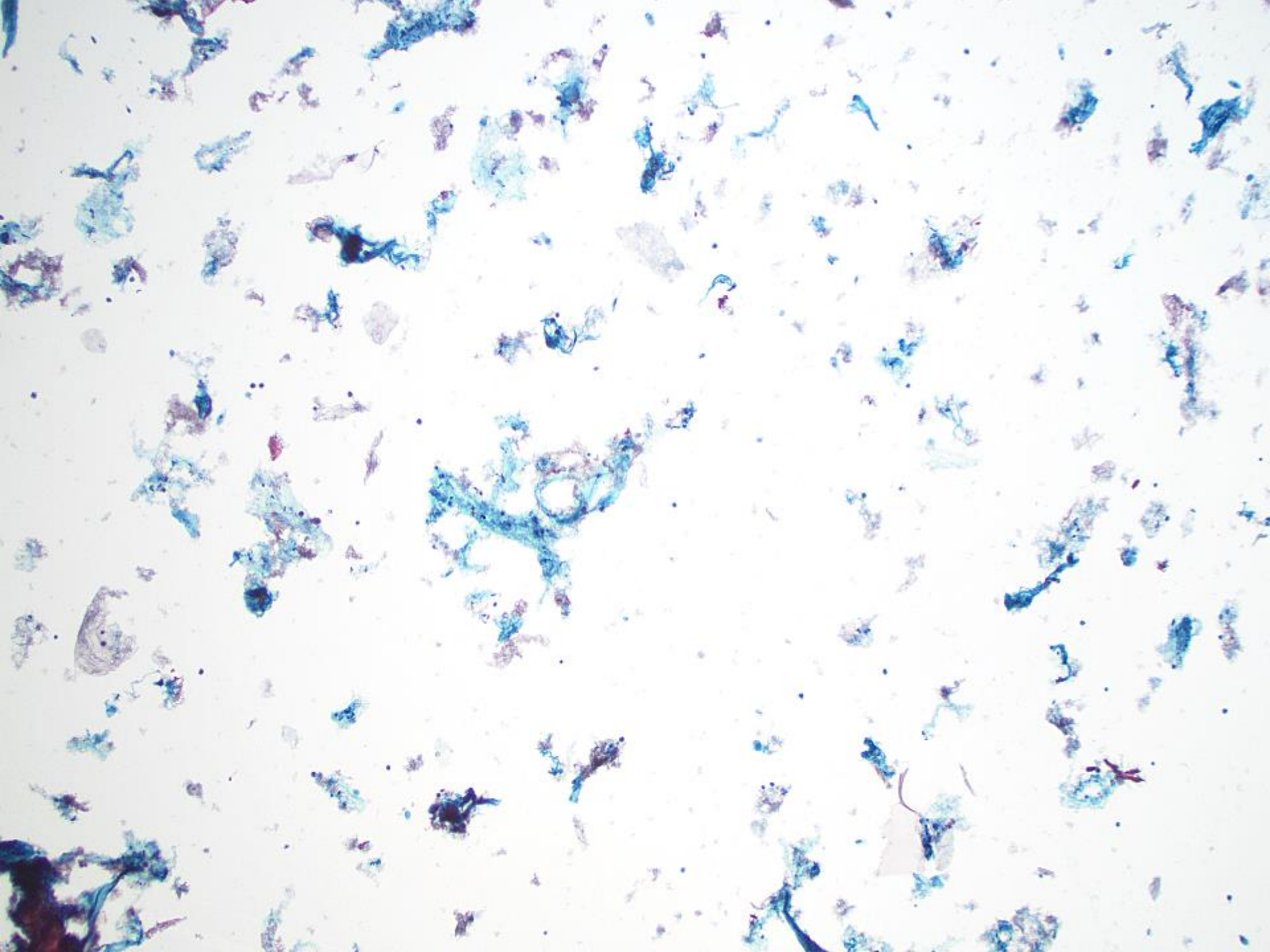
ADEQUACY

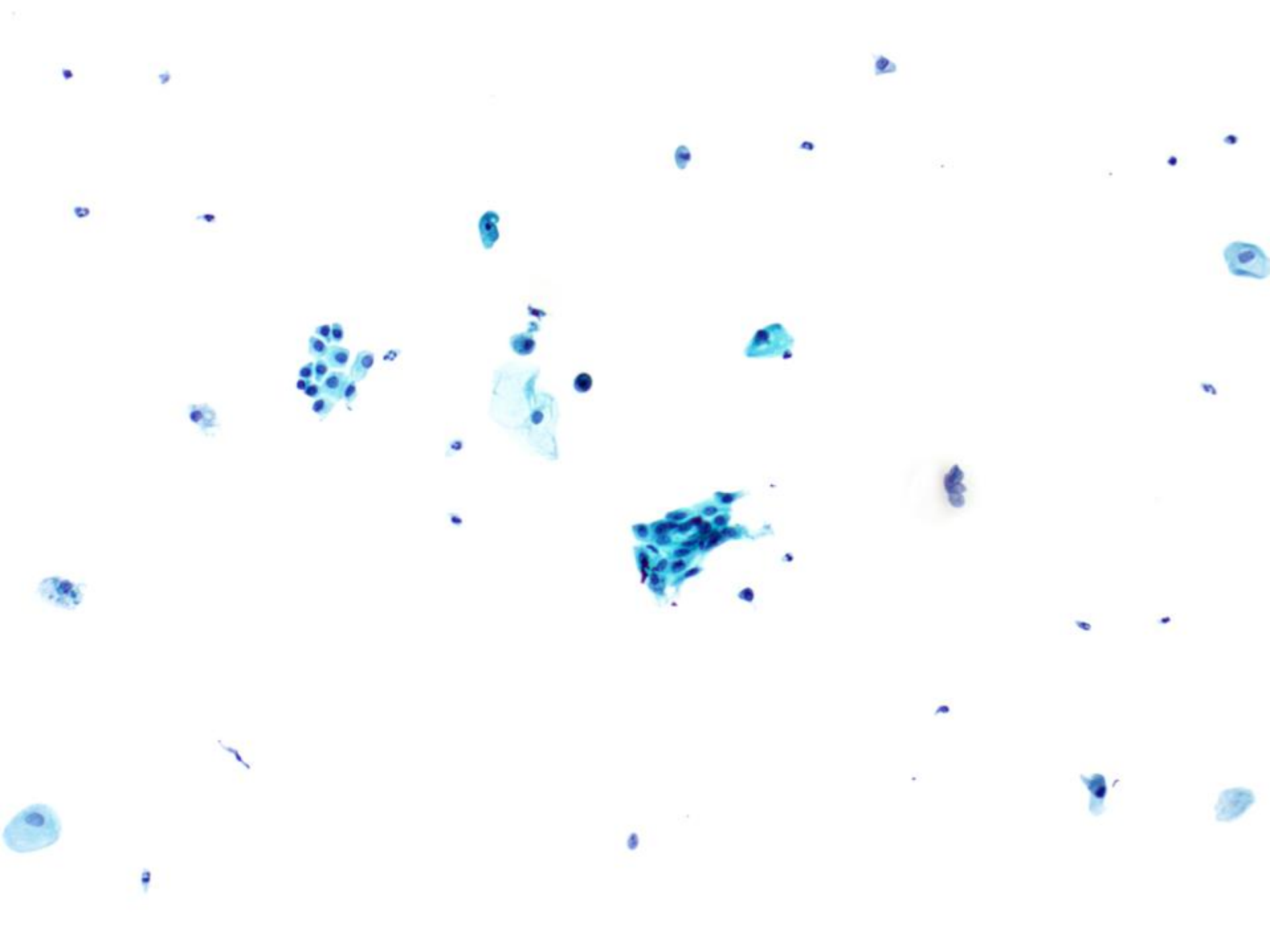
TABLE 8.1: Criteria for Adequacy According to Reporting System Guidelines

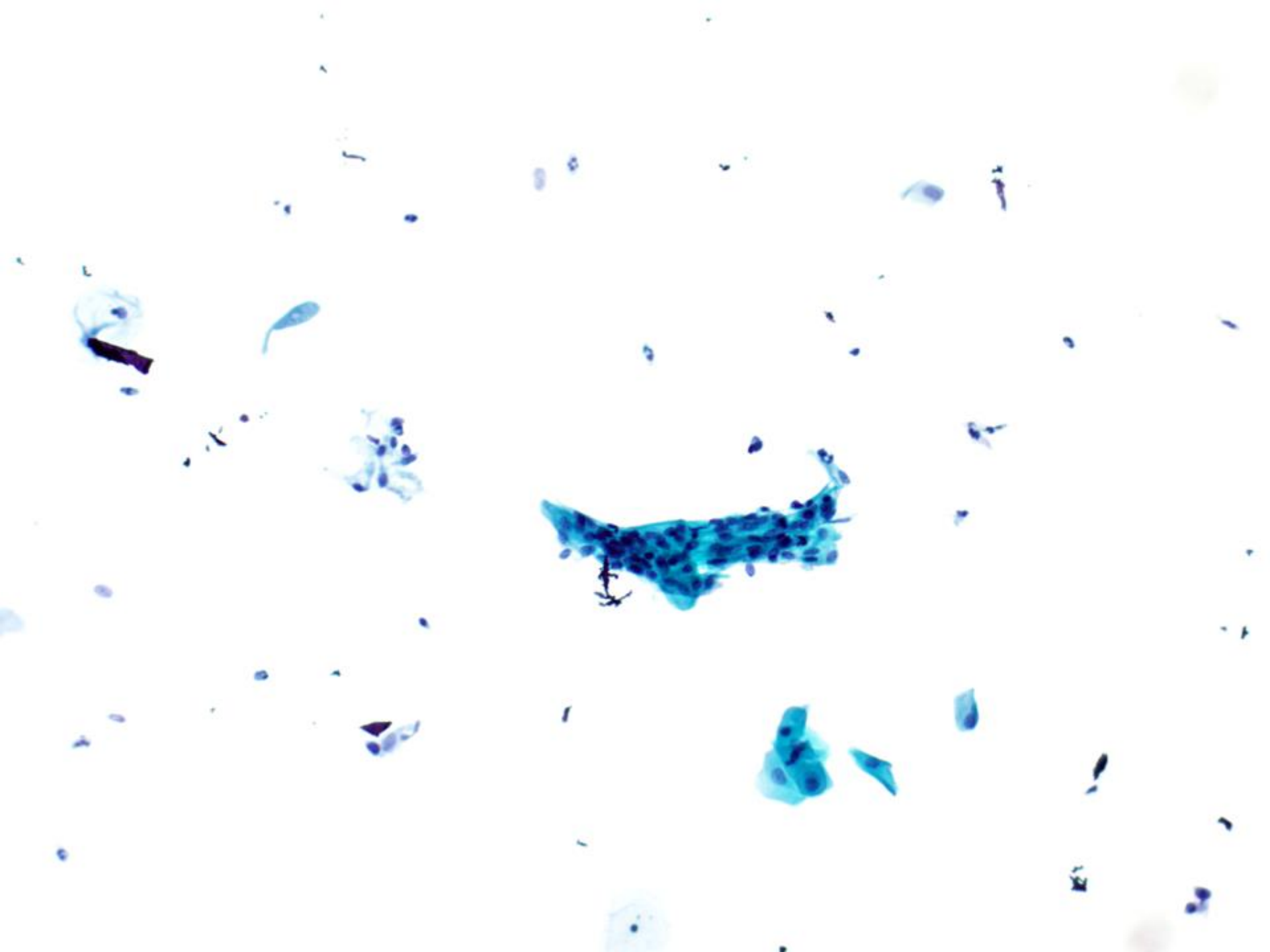
Specimen Type	Inadequate if[a]
Pap test, conventional smear	Less than 8000-12,000 squamous cells or more than 75% of cells obscured by inflammation or bacteria
Pap test, liquid-based preparation	Less than 5000 squamous cells or more than 75% of cells obscured by inflammation or bacteria
Thyroid fine-needle aspiration (FNA)	Less than six groups of 10 follicular cells in the absence of abundant colloid or numerous lymphocytes

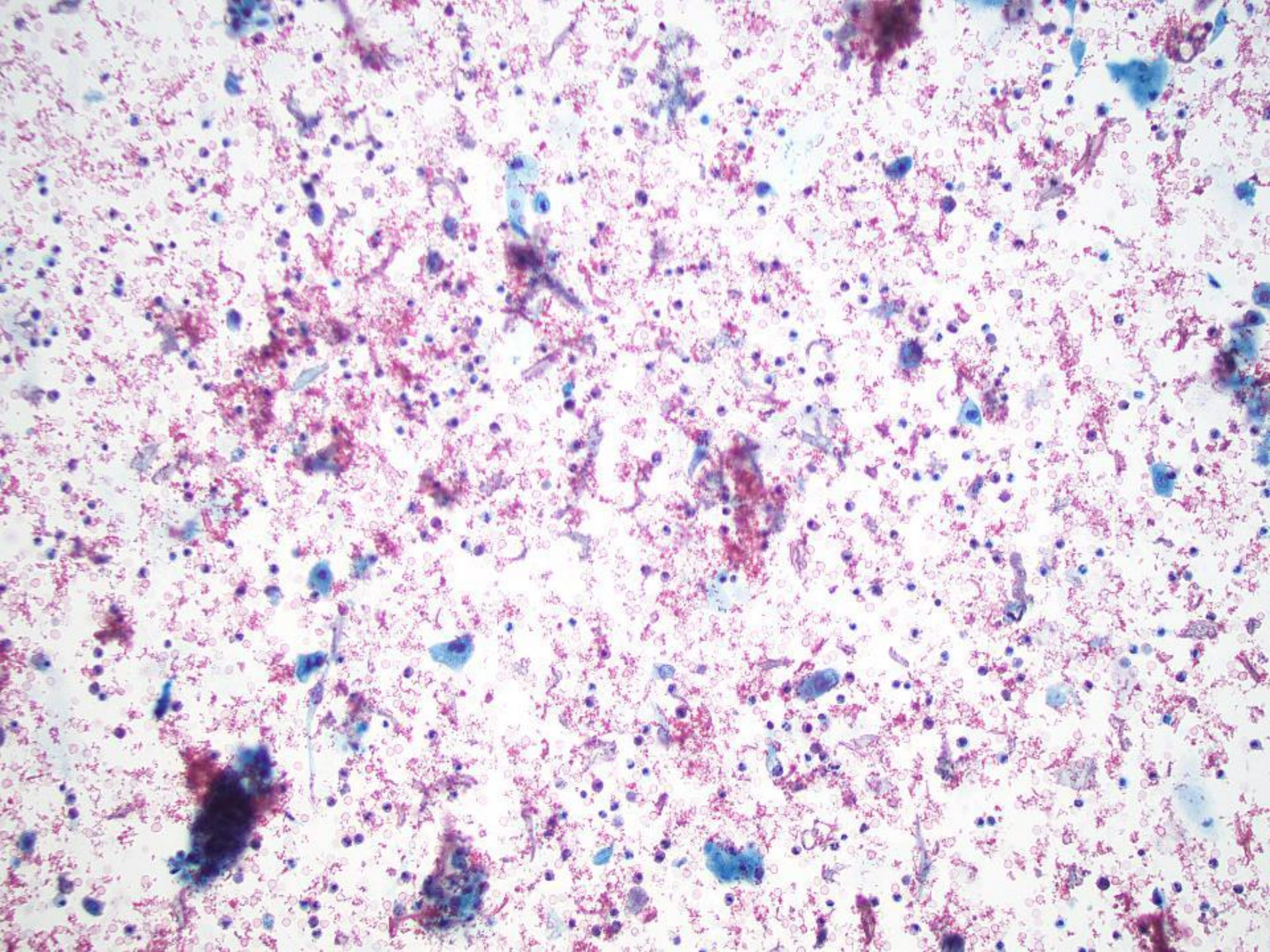
[a]Specimens are always adequate if any atypical findings are present, including a single atypical cell.

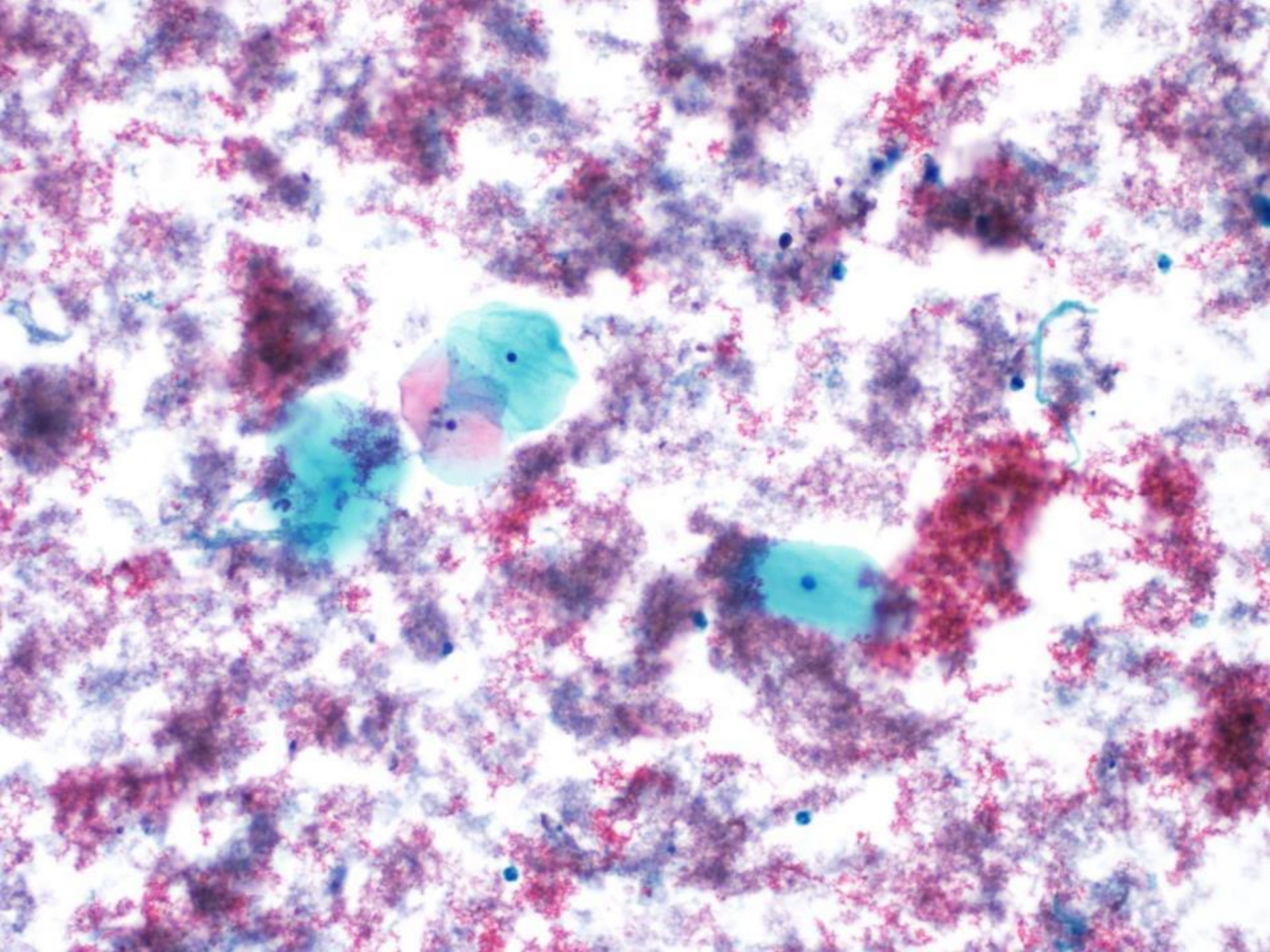
- Adequacy
  - TP 0.3%-8.3% at various institutions
    - Too few squamous cells
    - Obscuring red blood cells, inflammation, mucin
  - SP 0.23%, usually from low cellularity
    - Better than TP at removing obscuring blood

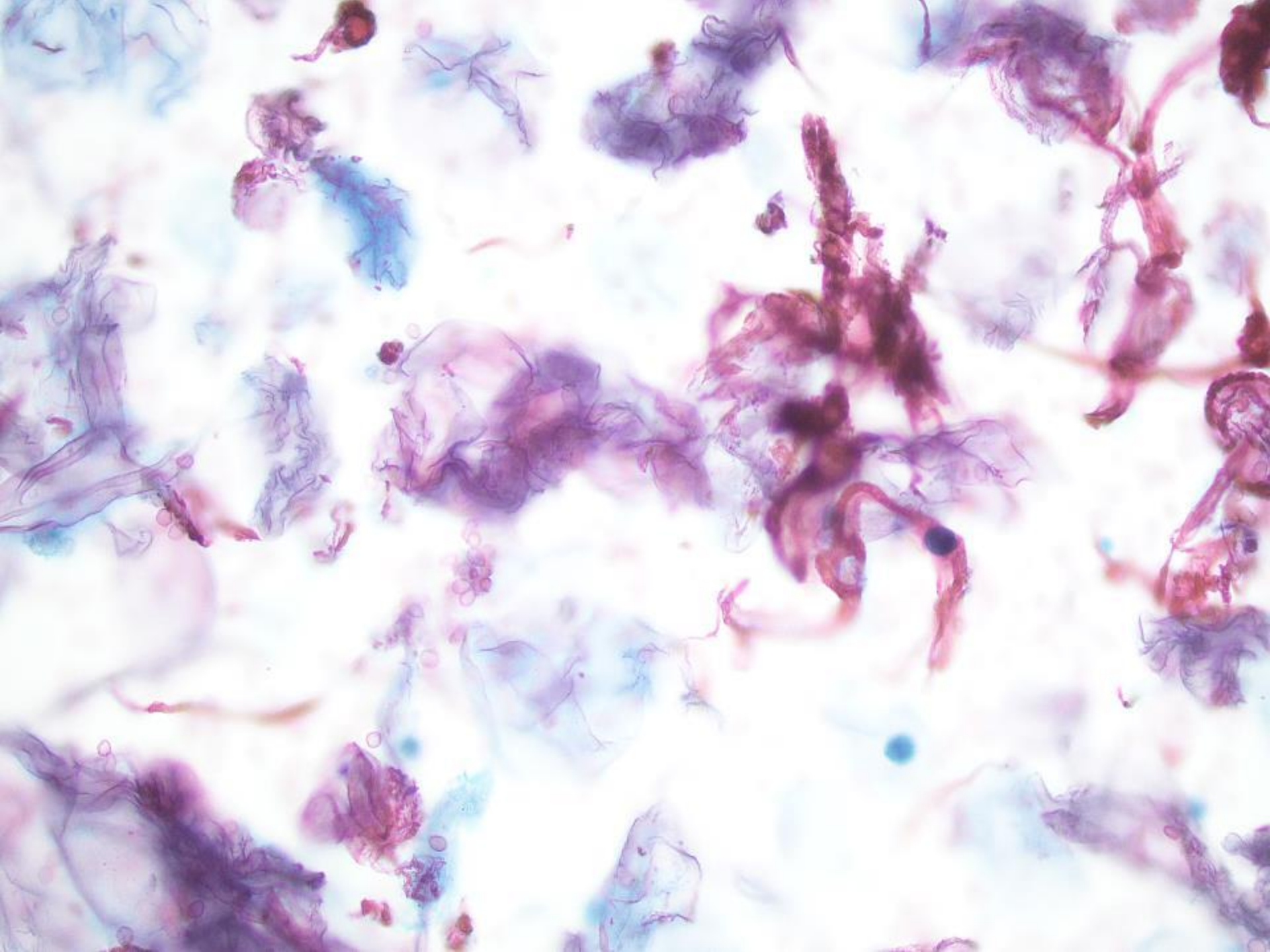


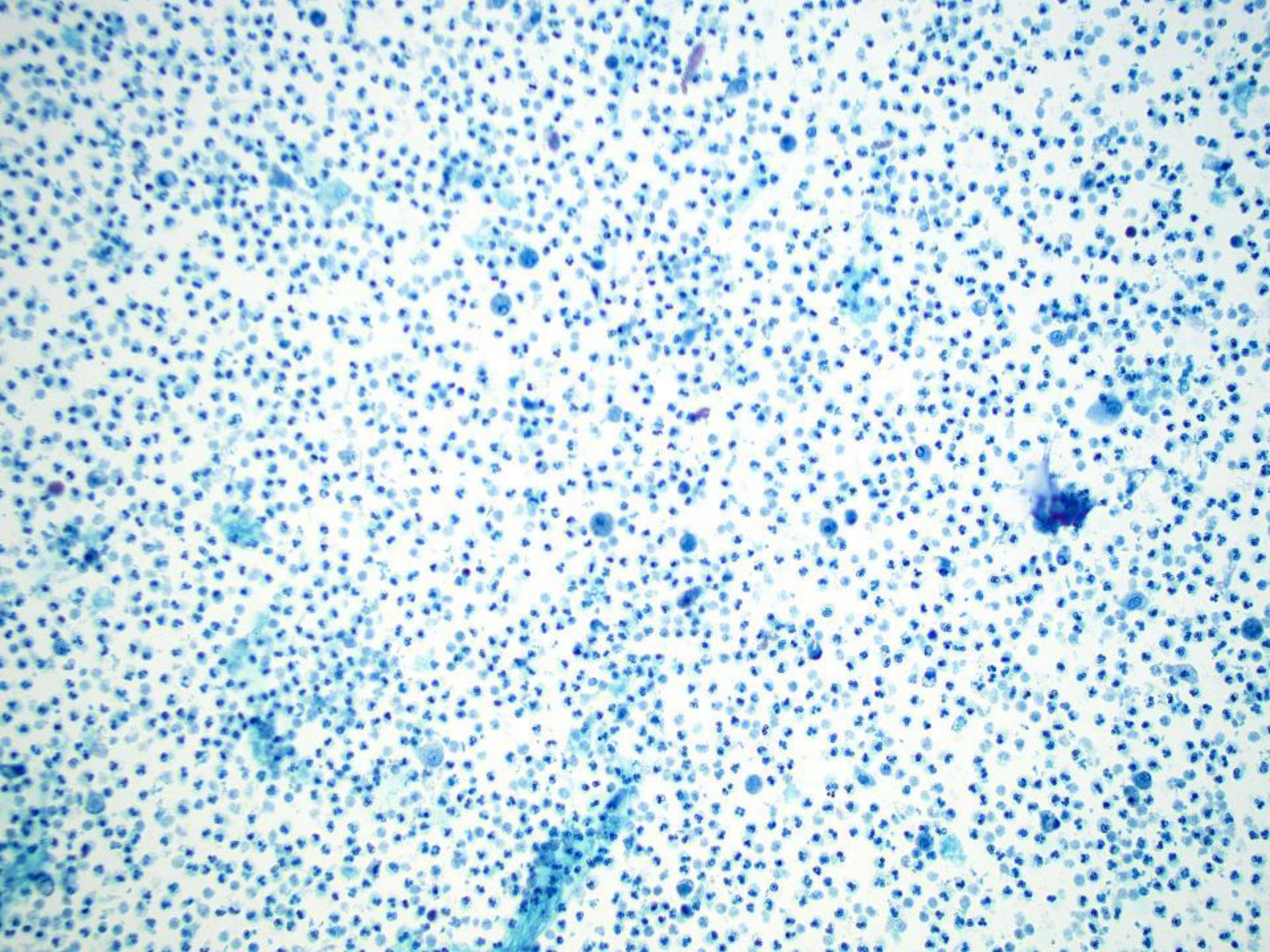












Questions?