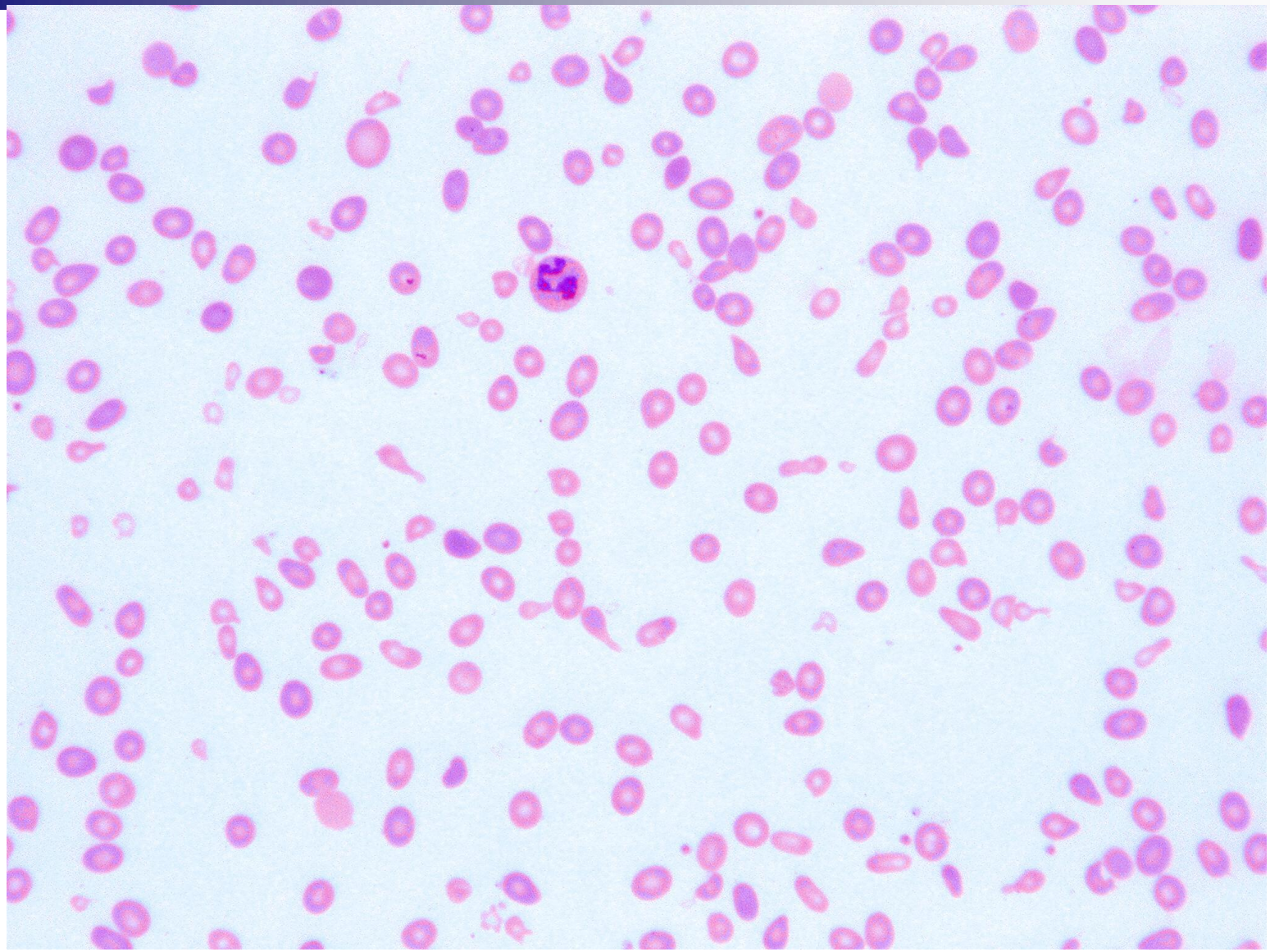
Hematology Case Conference

10/7/03

Peripheral Blood Smear Case
Patient: Glxx Dexxx

- 62 year old AA female presented in ER with abdominal pain, vomitting
- WBC= 5.3, Hgb=4.4, Plt=61, Retic 1.1%, MCV 108
  Rare NRBCs
  Seg 52, Lymph 43, mono 1
- LDH 4621, haptoglobin <6, DAT negative
  normal lipase, TSH, PT/PTT
  Serum iron 164 (ref 30-160)
  TIBC 172 (ref 228-428)
  Iron sat 95 (ref 12-57)
- Patient received 2 units PRBCs in ER
- Request for plasmapheresis if indicated



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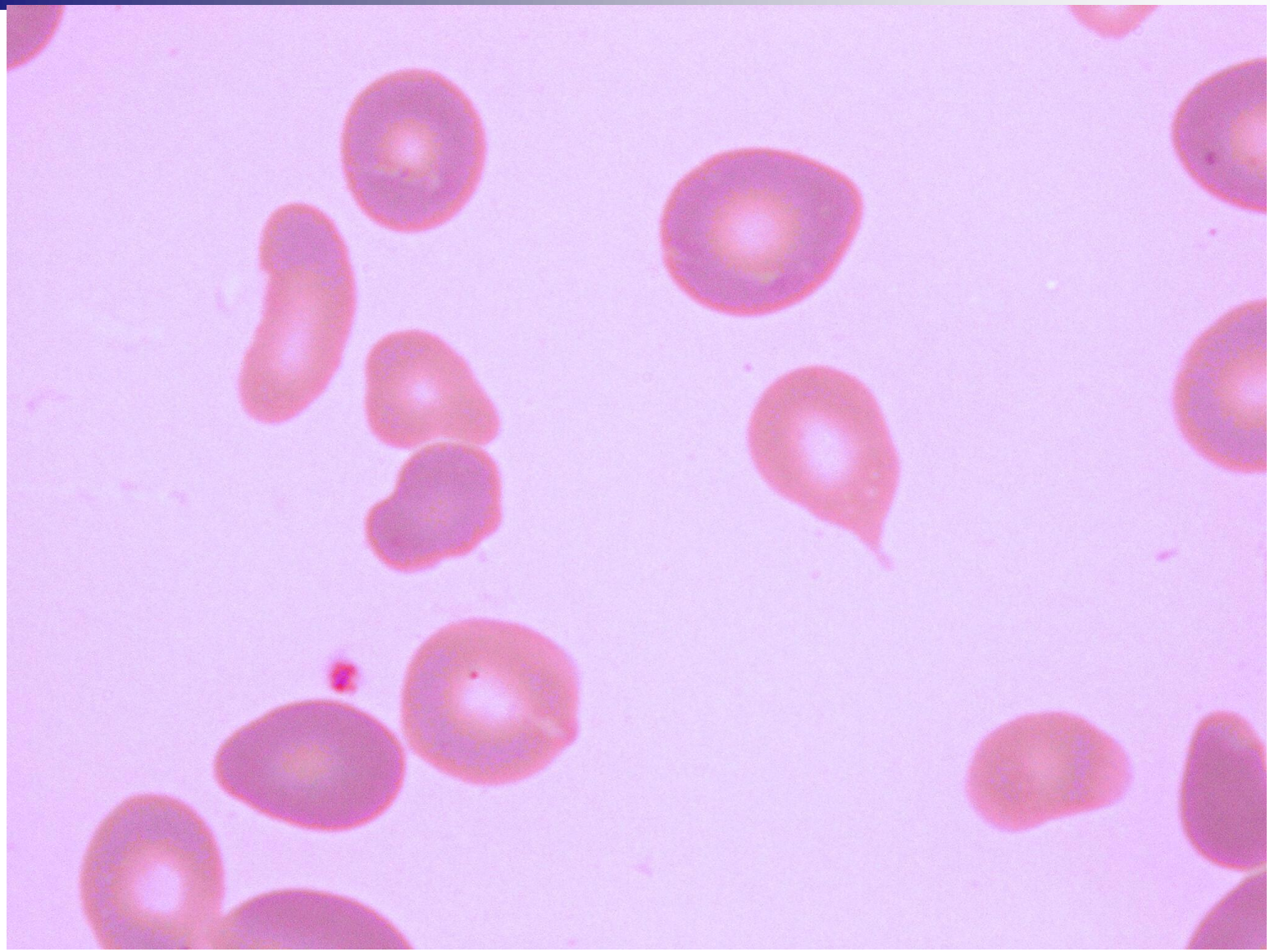

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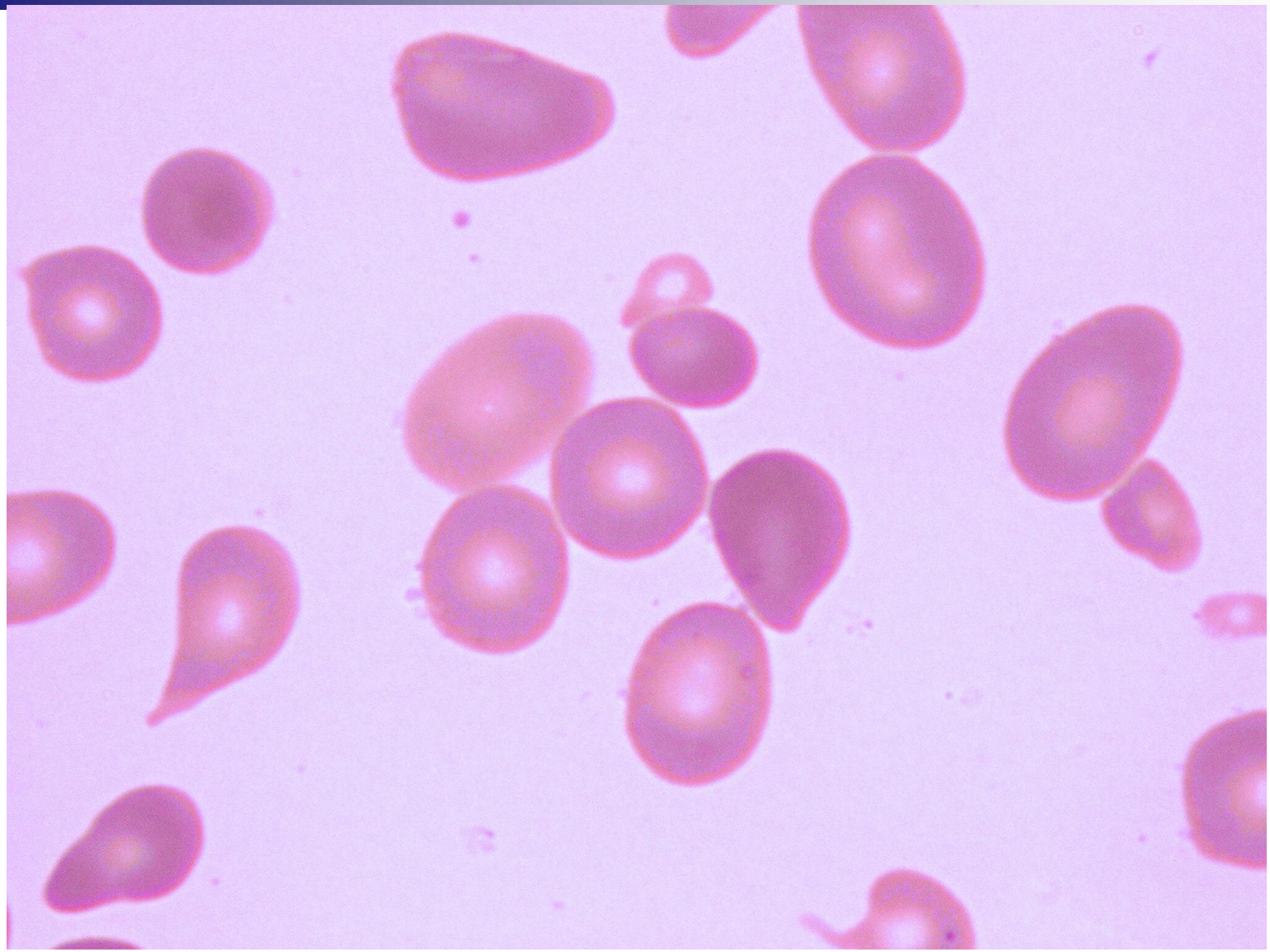

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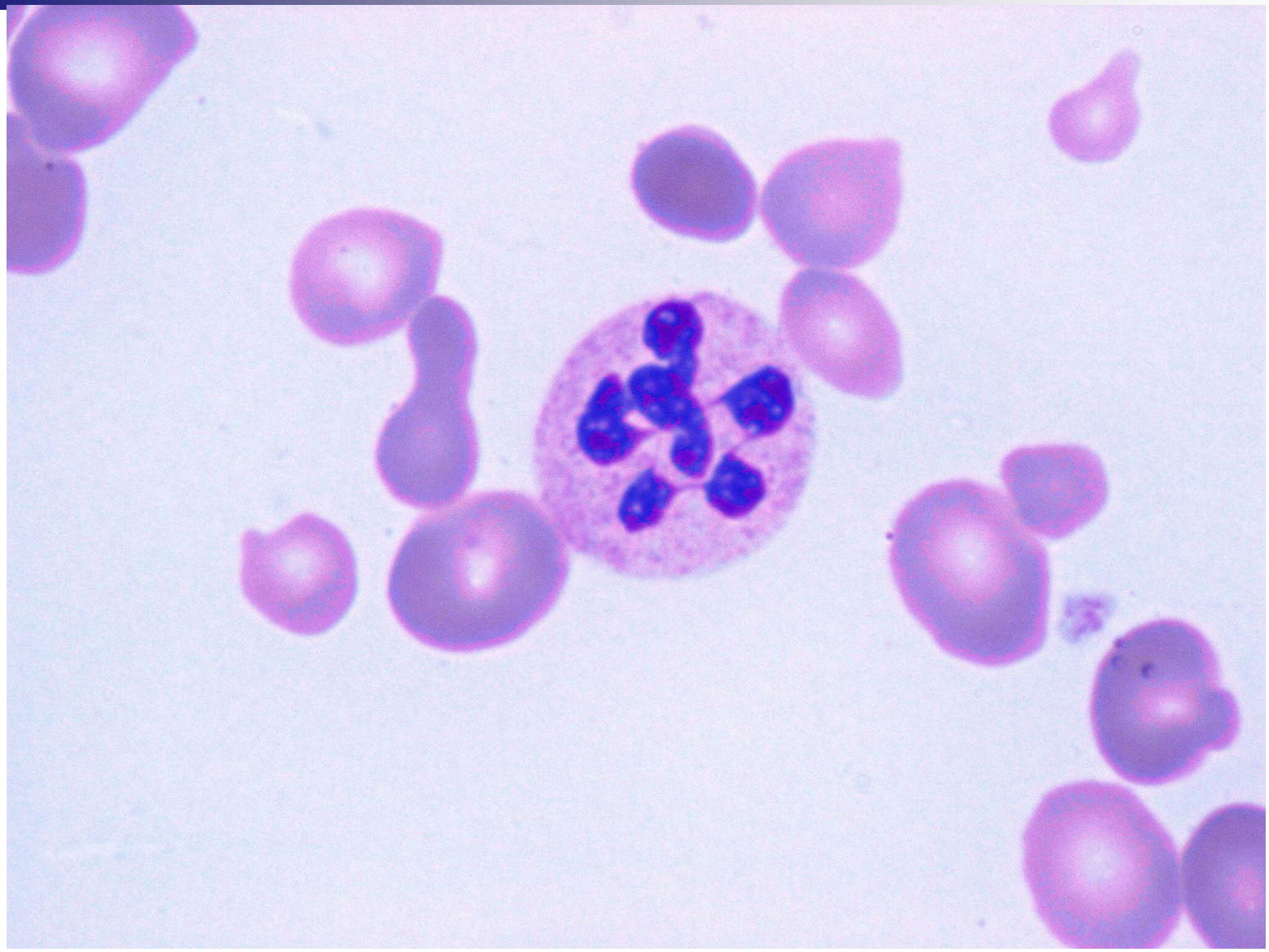


ps4

Diagnosis

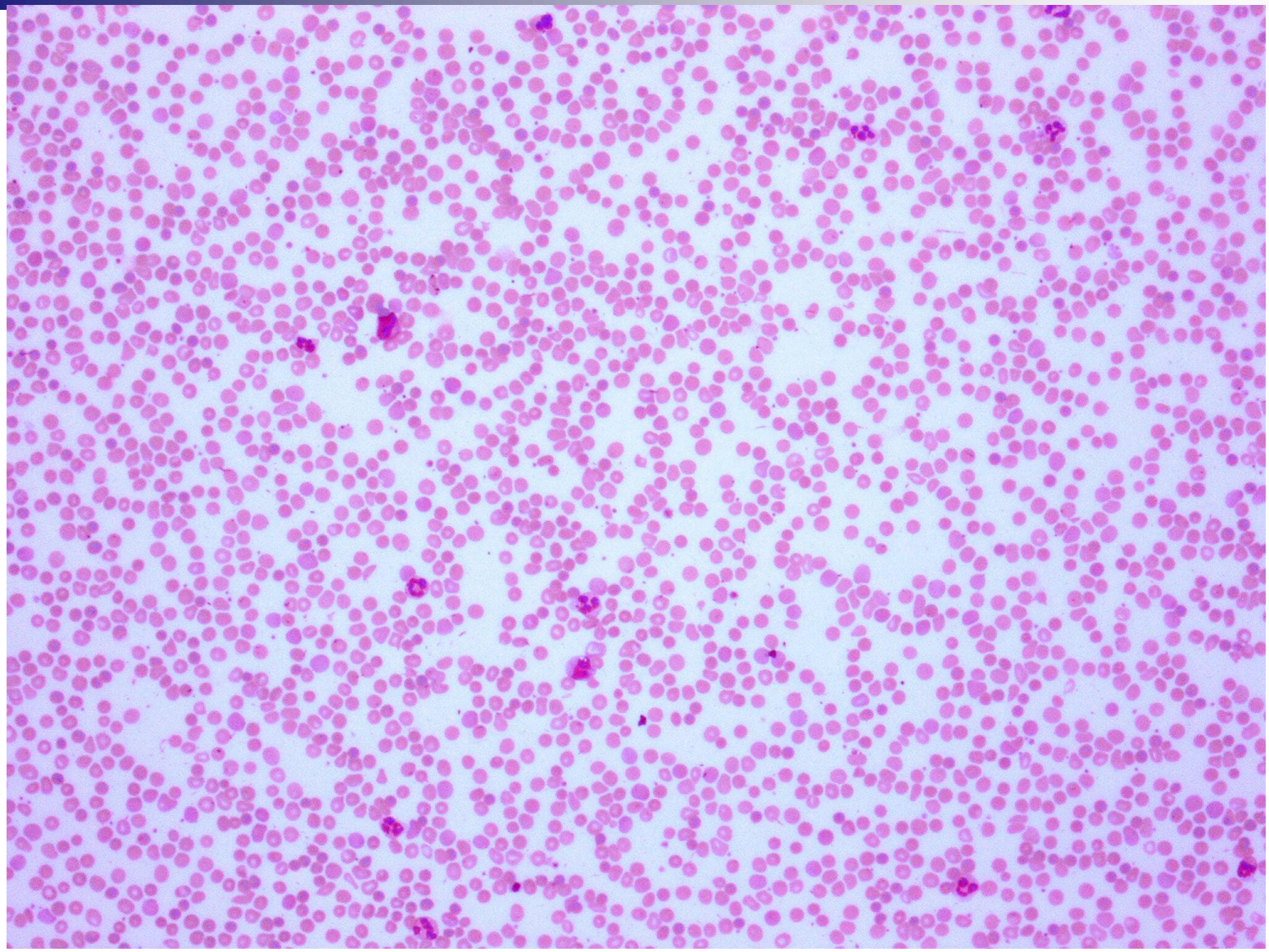
- B12= 27 pg/ml (ref 190-1000)
  Folate=6.3 mg/ml (ref > 3)

- DX: megaloblastic anemia secondary to B12 deficiency

- A few common etiologies:
  Dietery deficiency
  Decreased Intrinsic Factor (pernicious anemia)
  Defective ileal mucosa (surgical resection, enteritis)

Peripheral Blood Smear Case
Patient: G/Oxxx Hexxx

- 3 day/old female presented with jaundice
- WBC= 18.7, Hgb=14.2, Plt=218, Retic 16.2%
  Seg 88, Lymph 6, mono 4
- DAT (IgG) positive
  T. bili 11.0 (ref < 1.5), I bili 10.5 (ref < 0.8)



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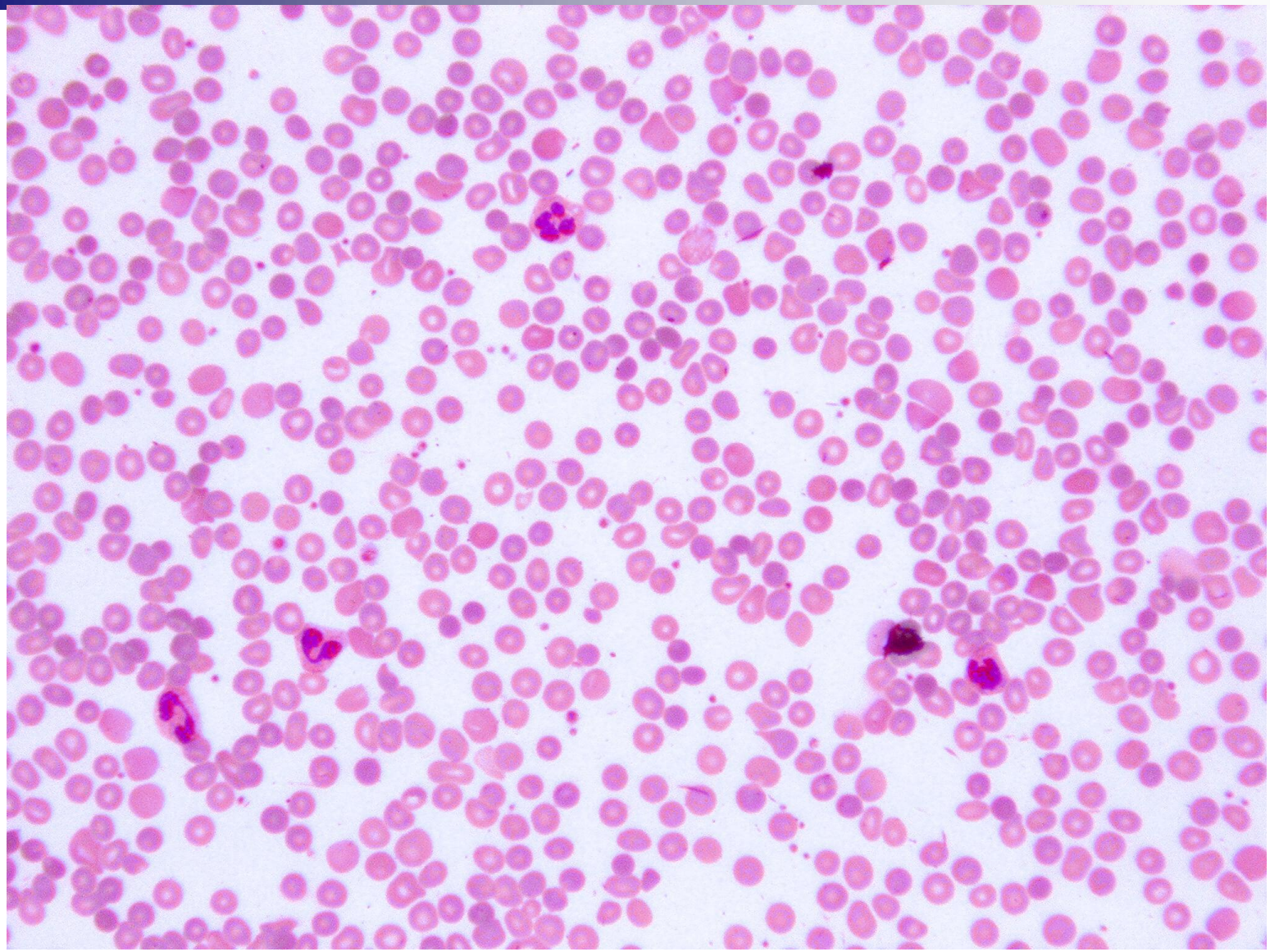

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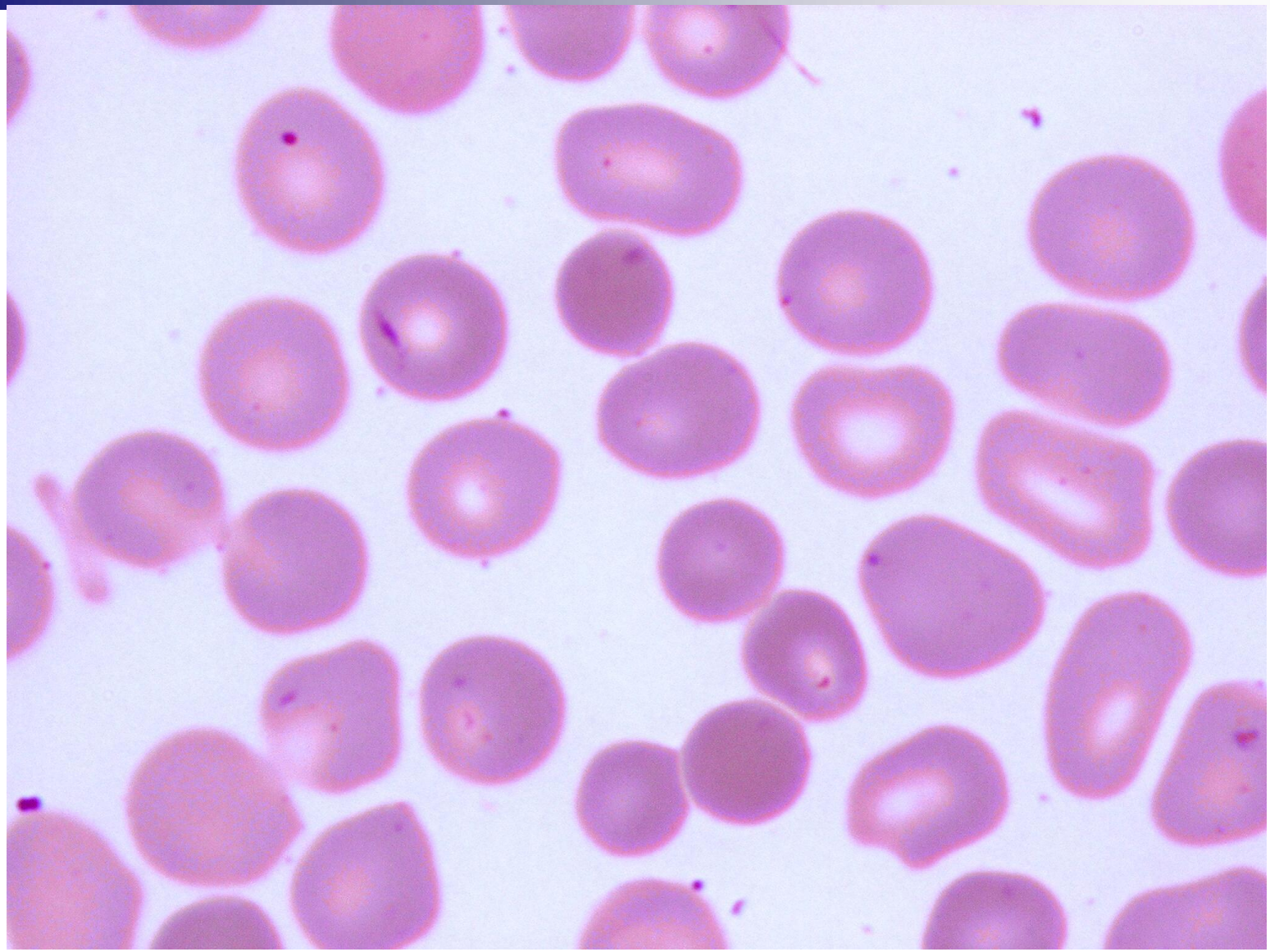

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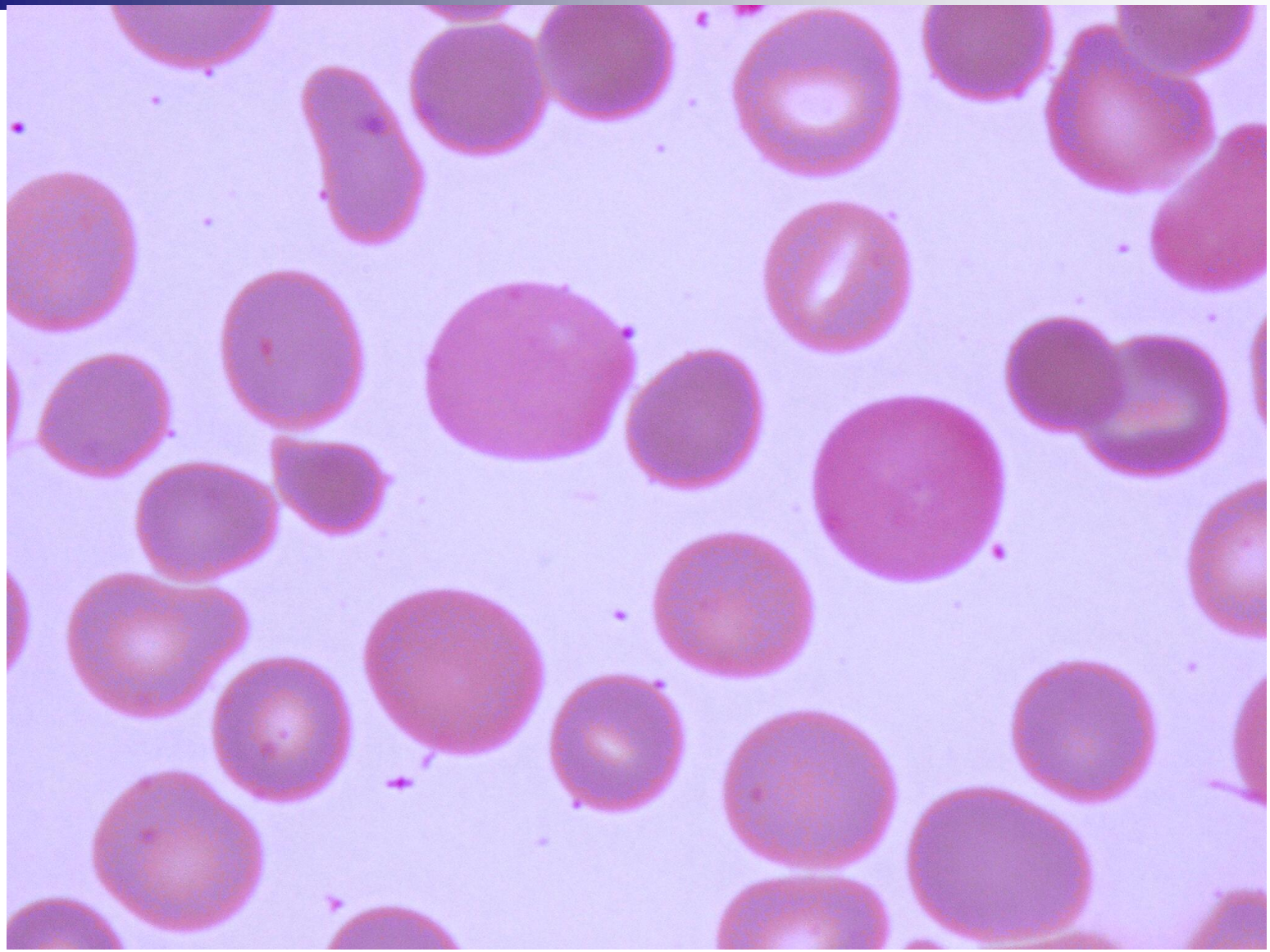

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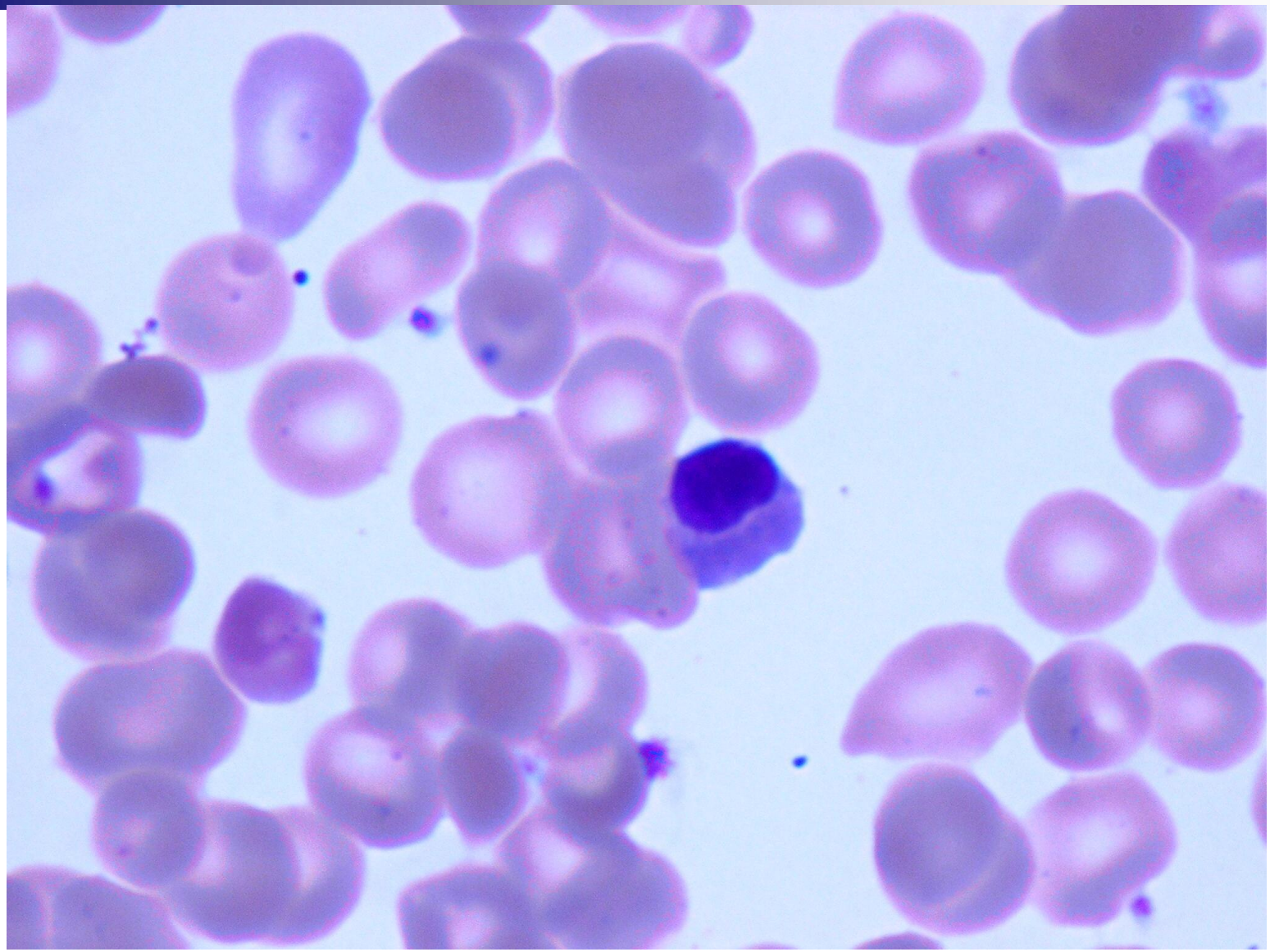

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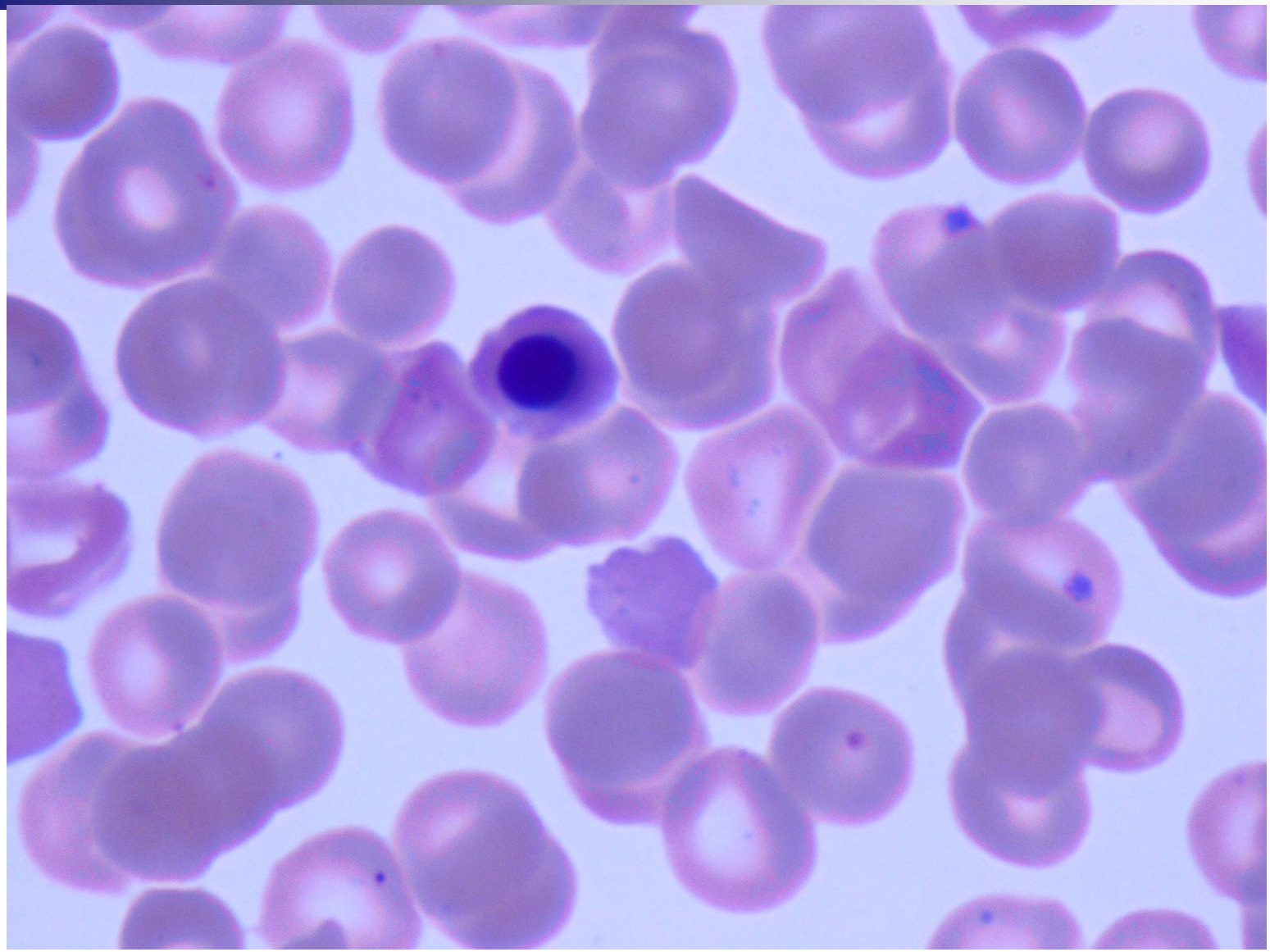

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Diagnosis

- Patient blood group B pos
  Mother O pos, negative antibody screen

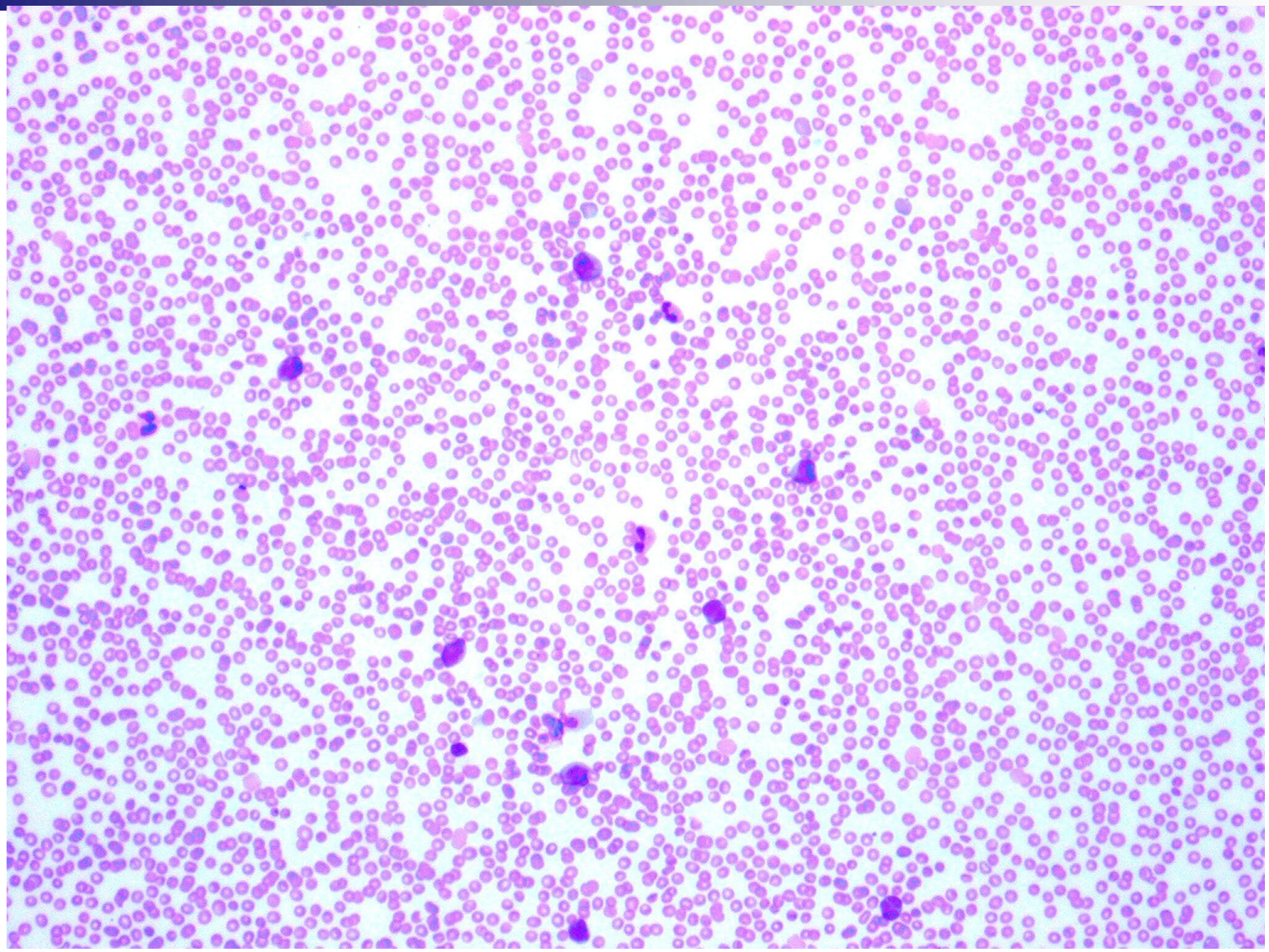
- Dx: ABO hemolytic disease of the newborn HDN (fetal-maternal incompatibility)

ABO HDN

- Common but usually not severe
- Mother Gr O, fetus Gr A, B, or AB
  Can occur in 1 st pregnancy
- Secreated A or B substance crosses placenta-> production of maternal IgG isotype of Anti-A or Anti-B-> Anti-A or Anti-B IgG cross placenta to attach to the fetal RBCs
- Poor avidity, typically occurs 3-4 days after delivery
- Sequestration of IgG-sensitized RBCs by spleen and liver-> hepatospelomegaly, extravascular hemolysis
- Tx: phototherapy to oxidize bilirubin in the infant's skin

Peripheral Blood Smear Case
Patient: Hexxx Jixxx

- 28 year old male presented at MNW with H/A, recent hx of brusing. Patient developed intracranial hemorrhage and was transferred to Hermann only after a few hours at MNW
- No significant past medical hx
- WBC= 21.4, Hgb=11.5, Plt=6
  Abnormal DIC panel



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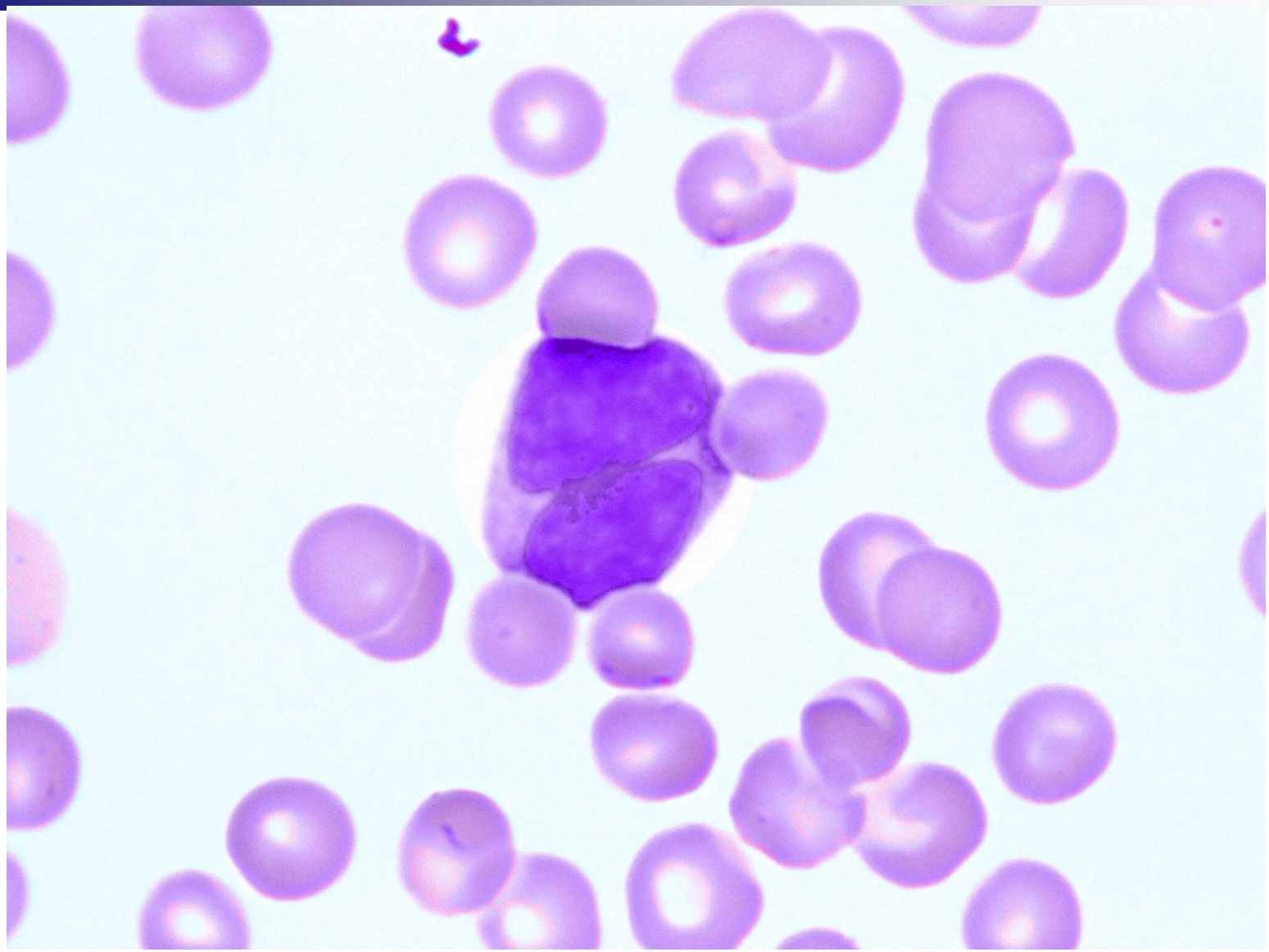

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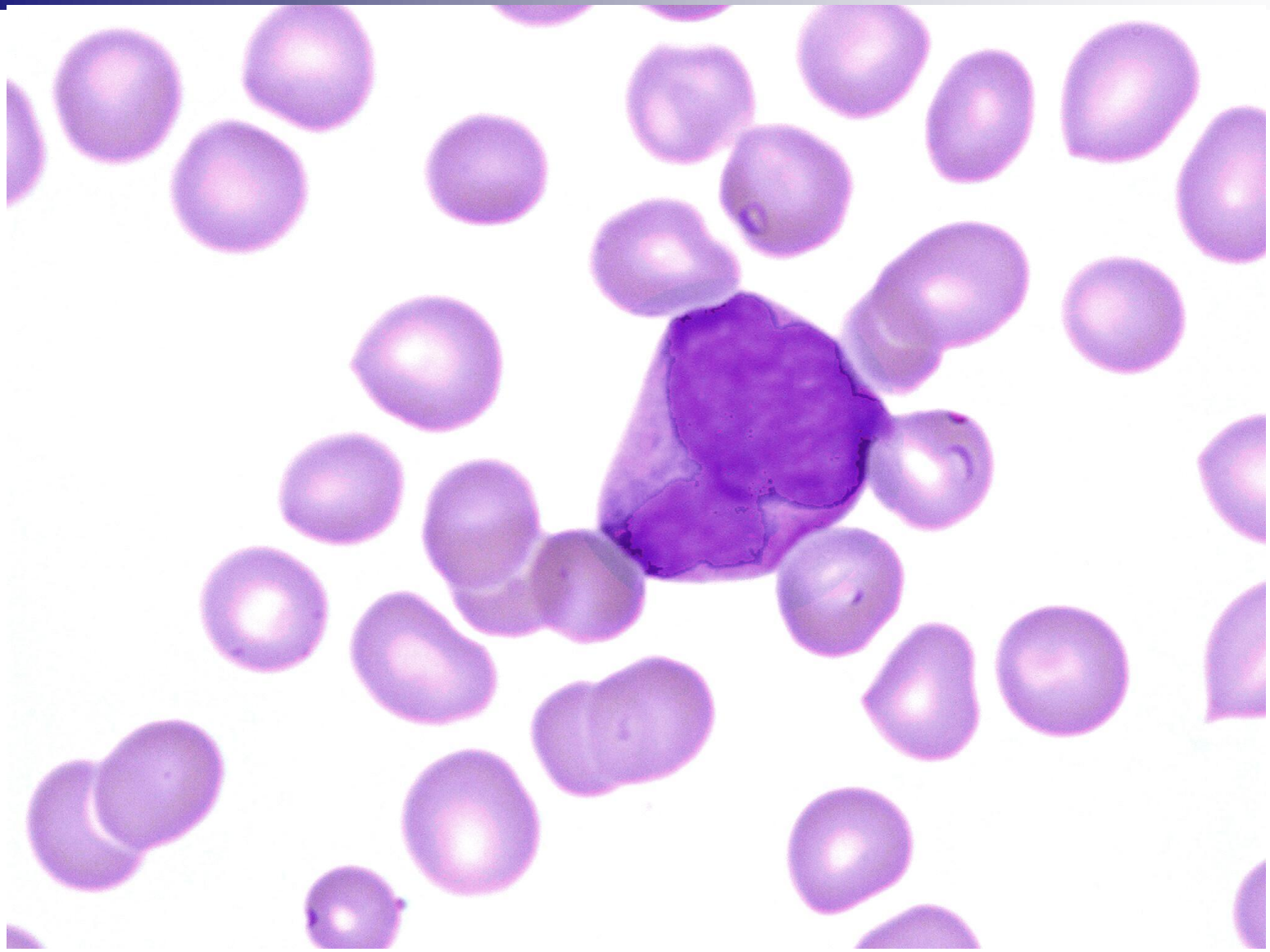

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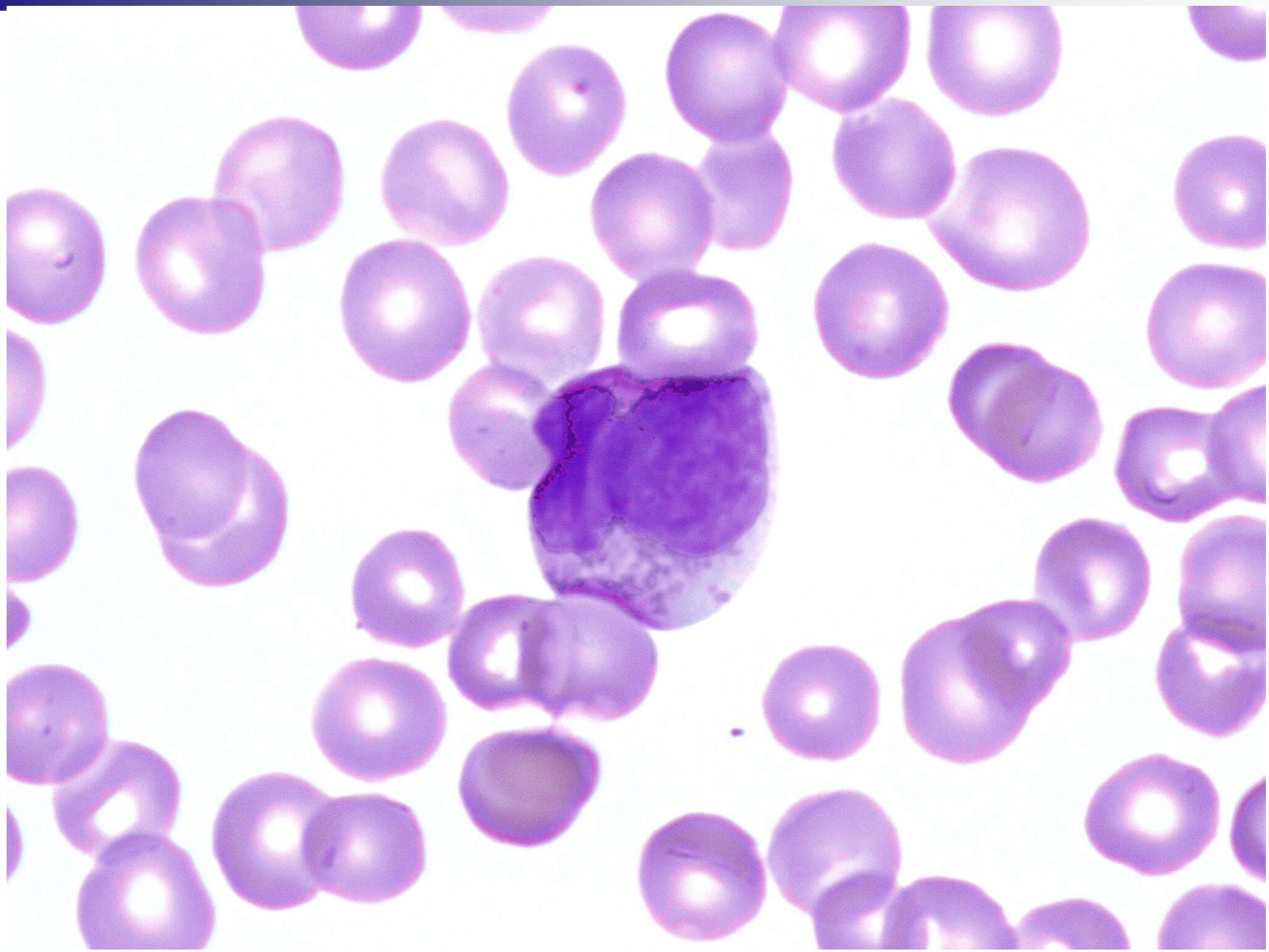

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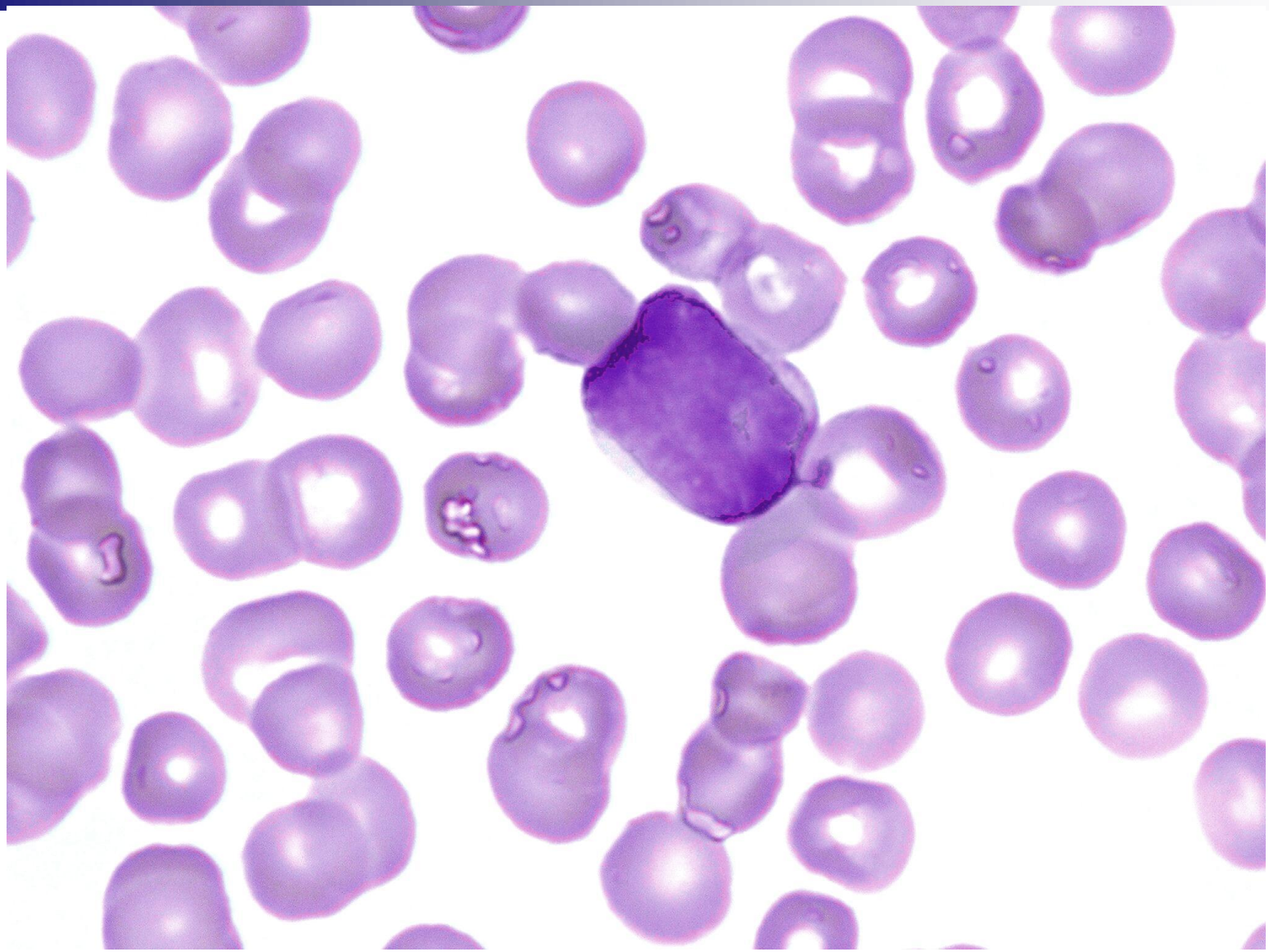

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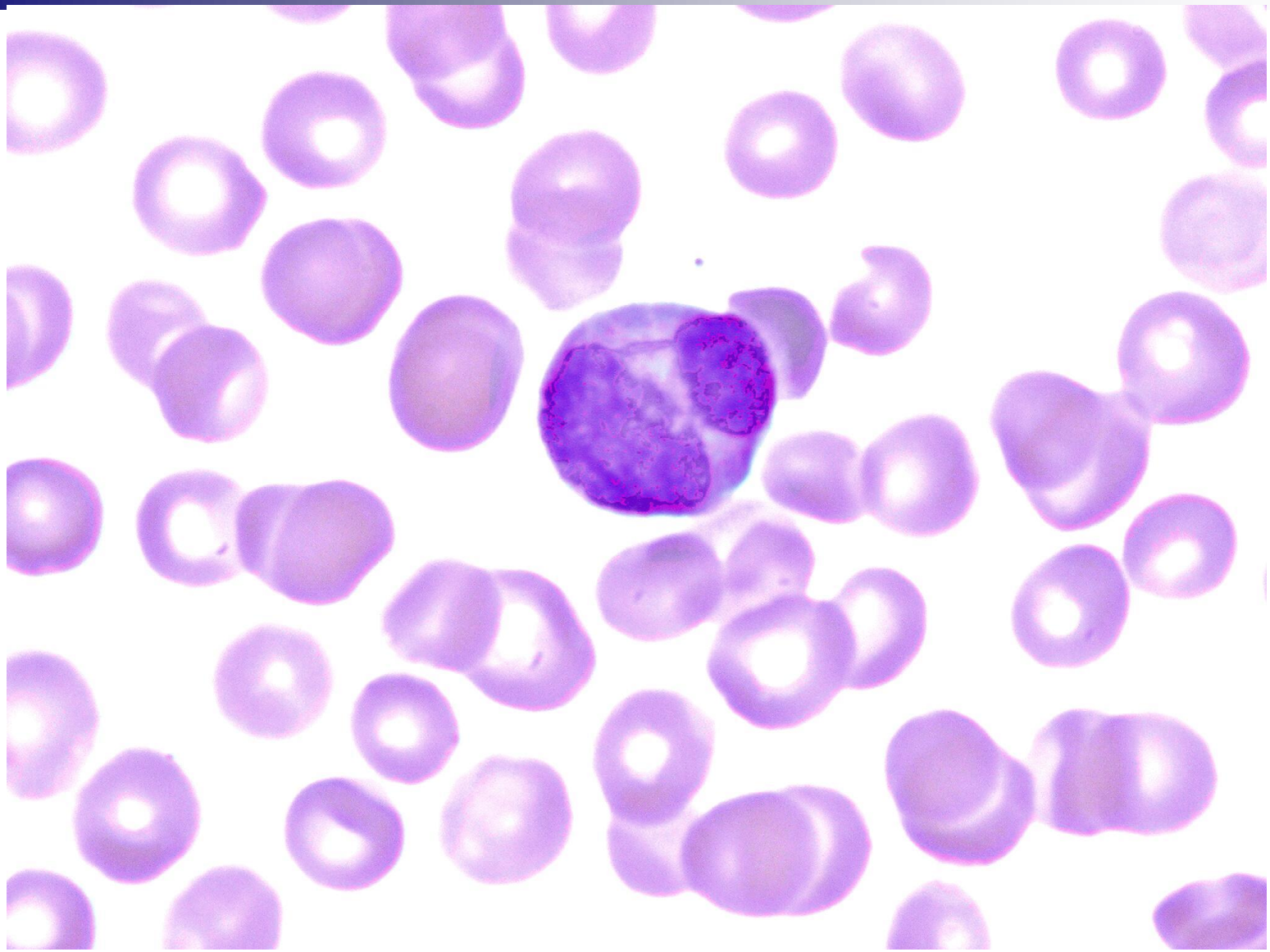

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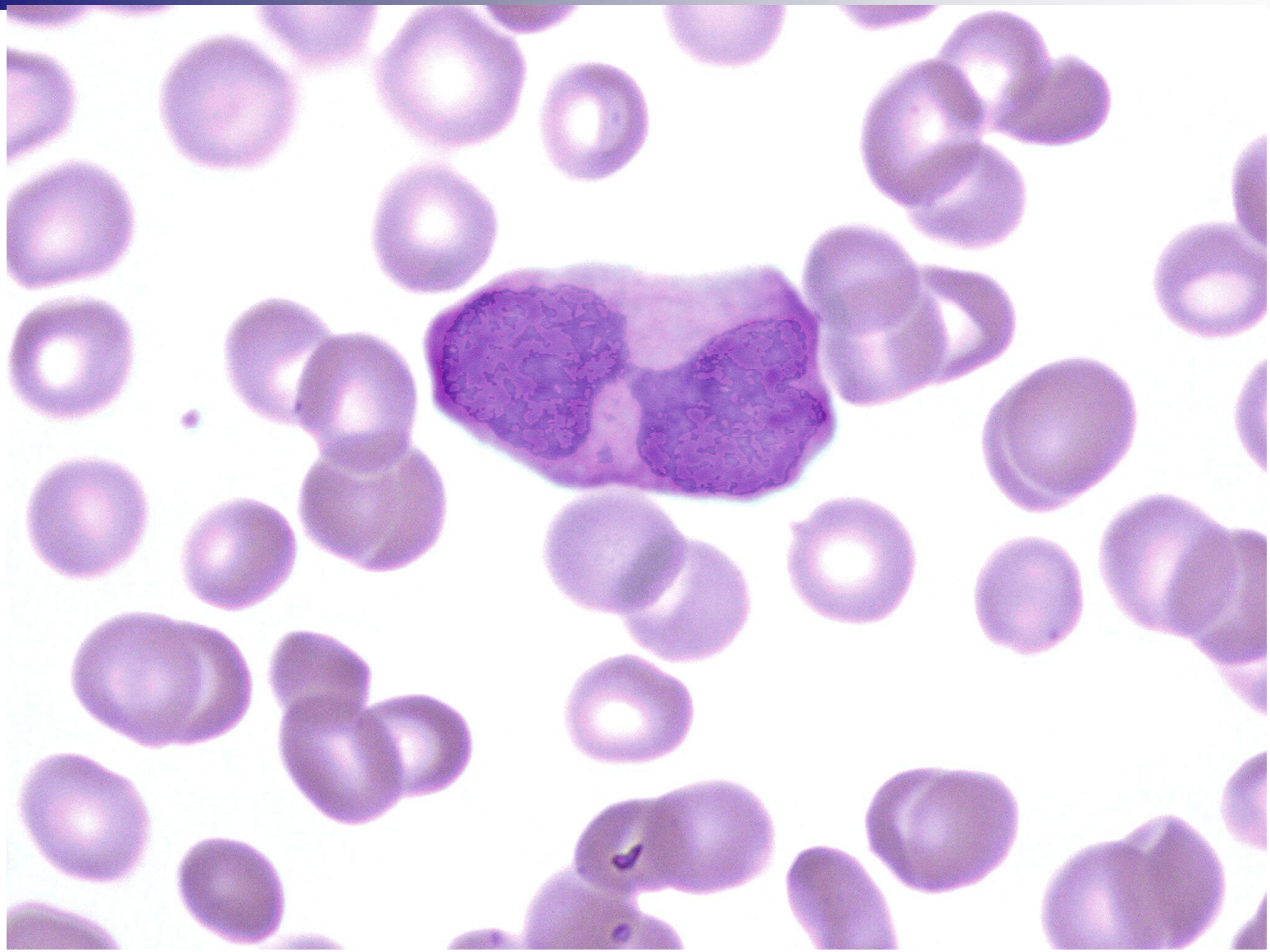


ps7

Diagnosis

- Acute promyelocytic leukemia, hypogranular variant
- Peripheral blood was submitted for flow cytometry immunophenotyping and cytogentics but were subsequently cancelled

Acute promyelocytic leukemia,

hypogranular variant

- Small granules in most leukemic promyelocytes (also known as “microgranular variant”)
- Predominant promyelocytes with bilobed nuclei (“apple-core” nuclei)
- Peripheral blood typically shows increase in leukocytes with may leukemic promyelocytes, a few blasts
- Immunophenotypes:
  (+) CD13, CD33
  (-) HLA-DR, CD34

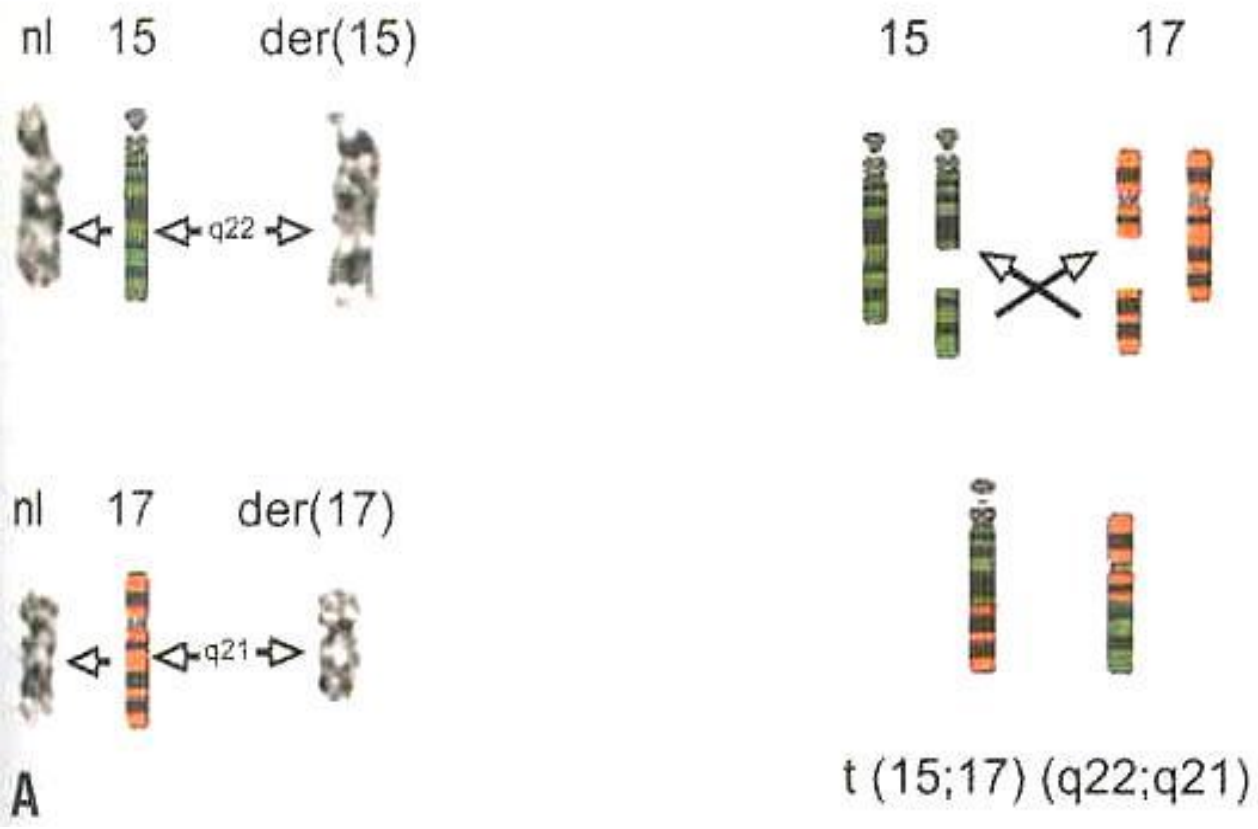
- High risk of DIC
- Tx: all trans-retinoic acid (ATRA) + anthracycline
- Prognosis: relatively favorable after initial risk of DIC,
  ~ AML with t(8;21) or inv(16)

Acute promyelocytic leukemia, Genetics

- Translocation t(15; 17)
  retinoic acid receptor alpha (RARα) gene on 17q12
  PML gene on 15q22

- Normally, RARα protein forms heterodimers with retinoid X receptor protein (RXR) -> activate transcription (differentiation)
- With t(15; 17), PML-RARα fusion protein binds to PML and RXR proteins-> repress transcription (differentiation)

- Other translocations (resistant to all-trans retinoic acid):
  t(5;17)
  t(11, 17)



Translocation t(15, 17)

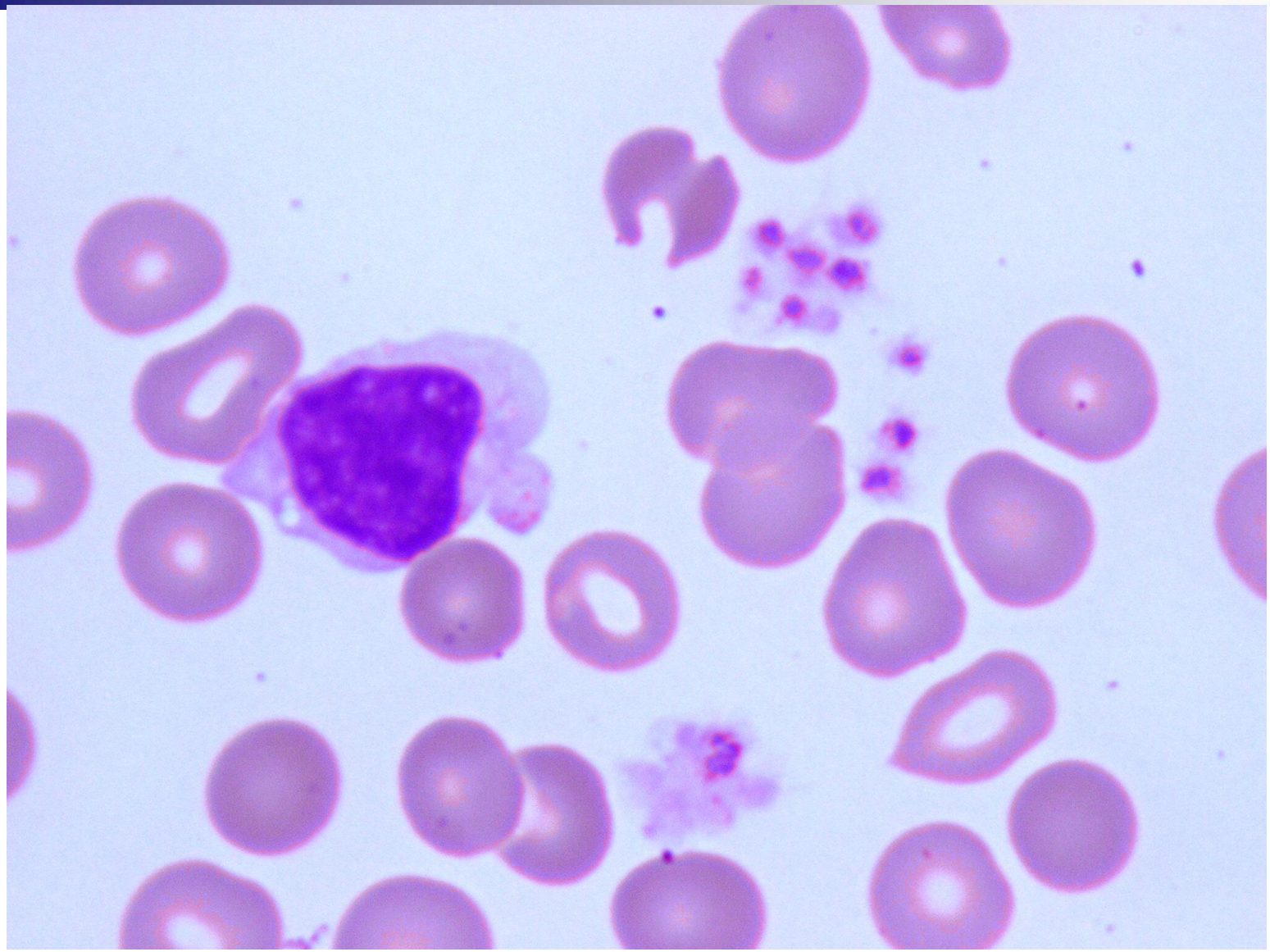
Fluororescence-in-situ-hybridization (FISH), dual colors

DIC in Acute promyelocytic leukemia, possible mechanisms

- High level of annexin II on APL cells-> accelerate formation of plasmin by t-PA-> fibrinolysis
- APL cells contain tissue factor -> activate extrinsic pathway
- APL cells activate factor X directly with a cysteine proteinase (~solid tumors)
- APL cells have large amount of Interleukin-1-> increase synthesis of tissue factor by endothelial cells
- DIC worsens with lysis of APL cells. ATRA promotes differentiation of promyelocytes to mature forms and alleviate DIC

Peripheral Blood Smear Case
Patient: Dxx Mcxxx

- 66 year old male with Cardiology service
- WBC= 24.6, Hgb=8.1, Plt=76
  Seg 59, Lymph 28, mono 8



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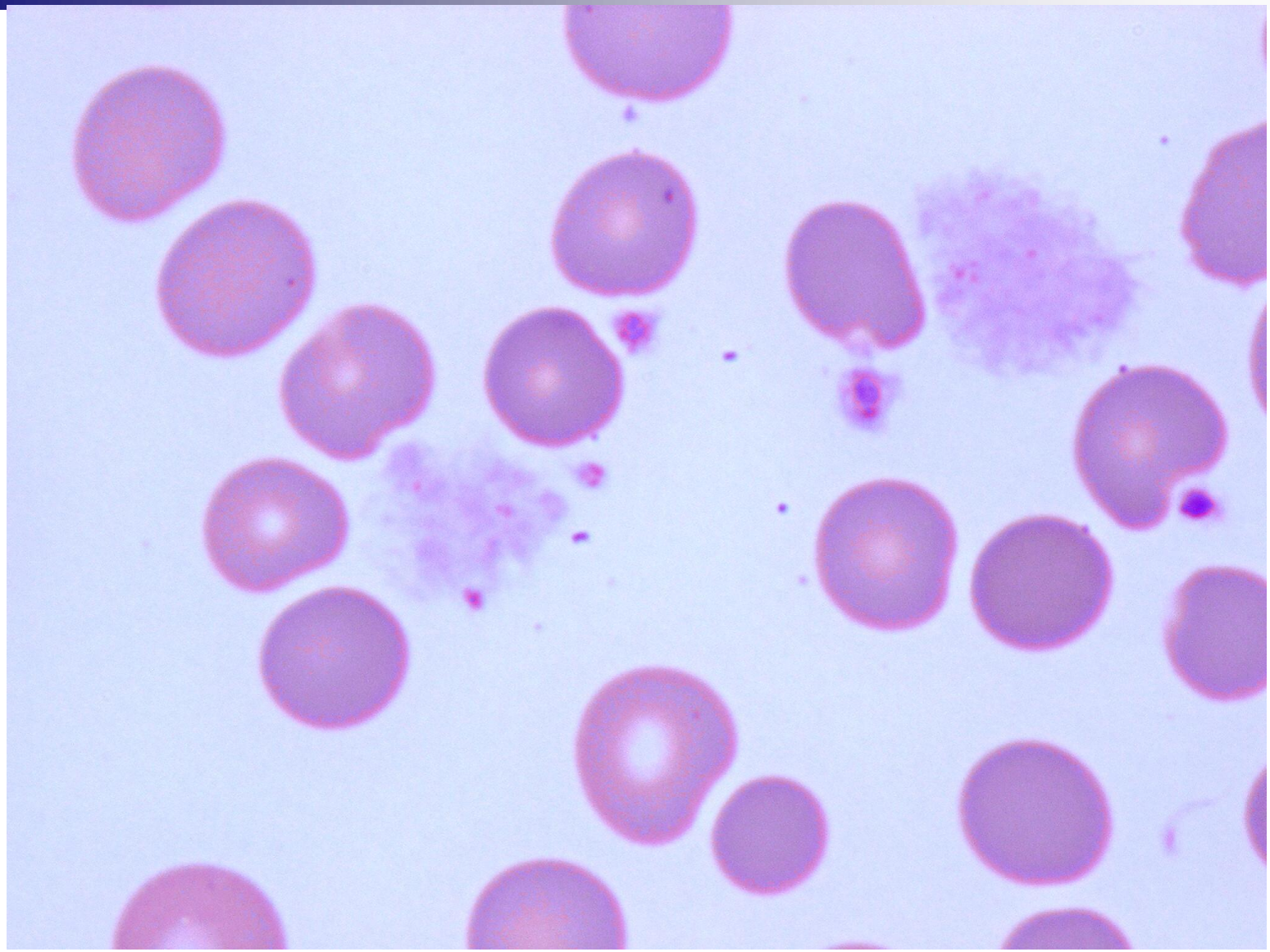

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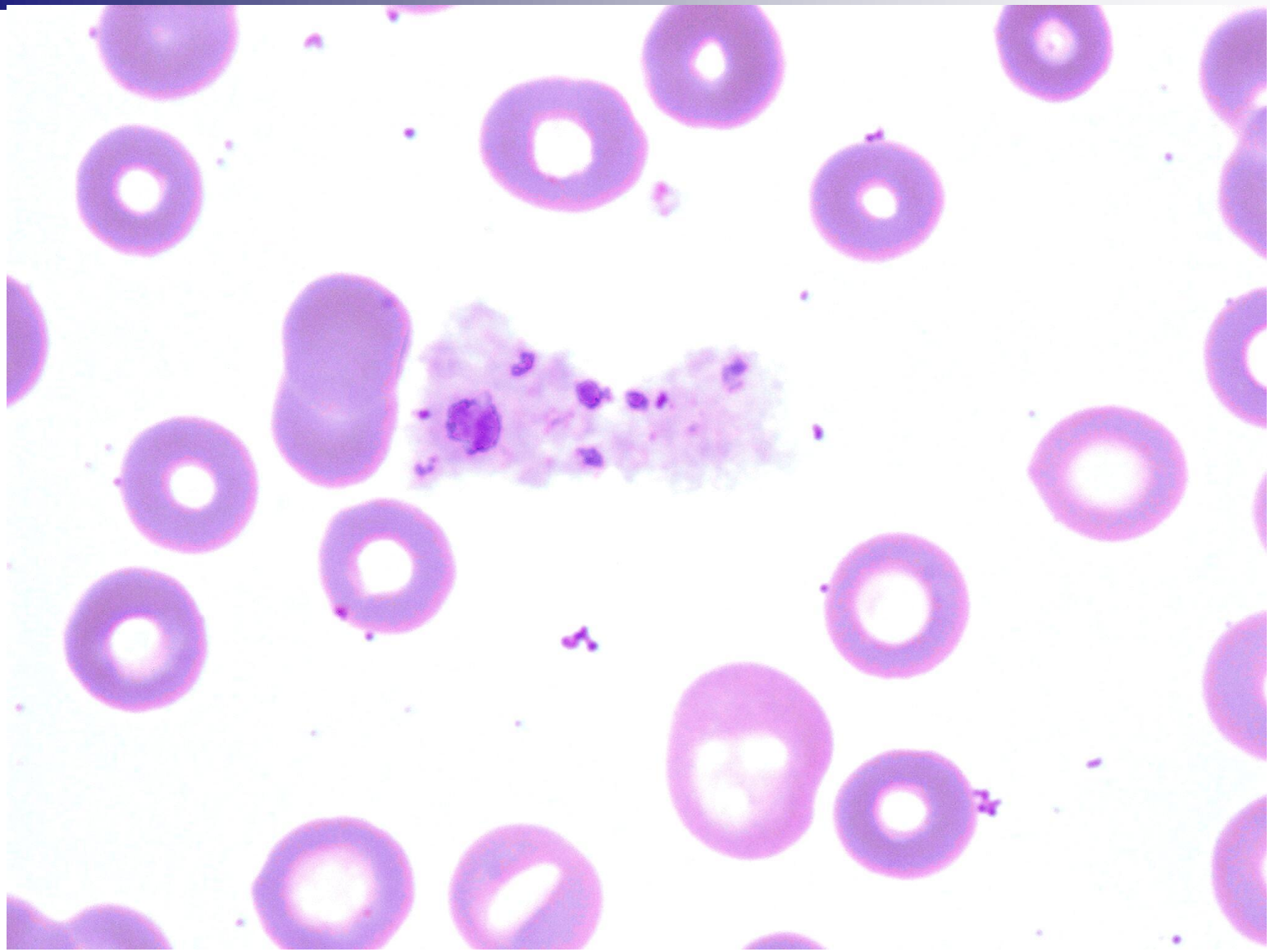

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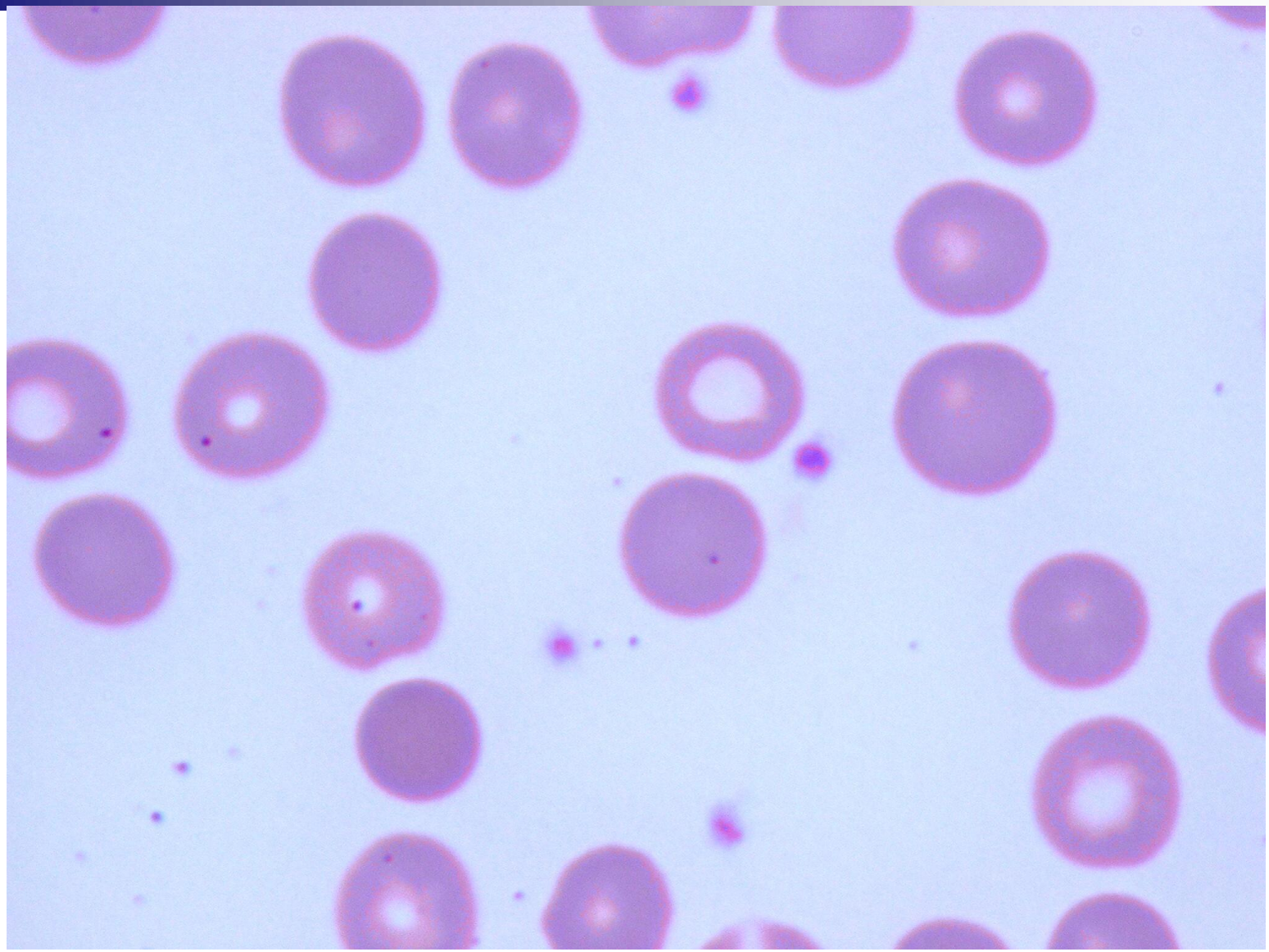

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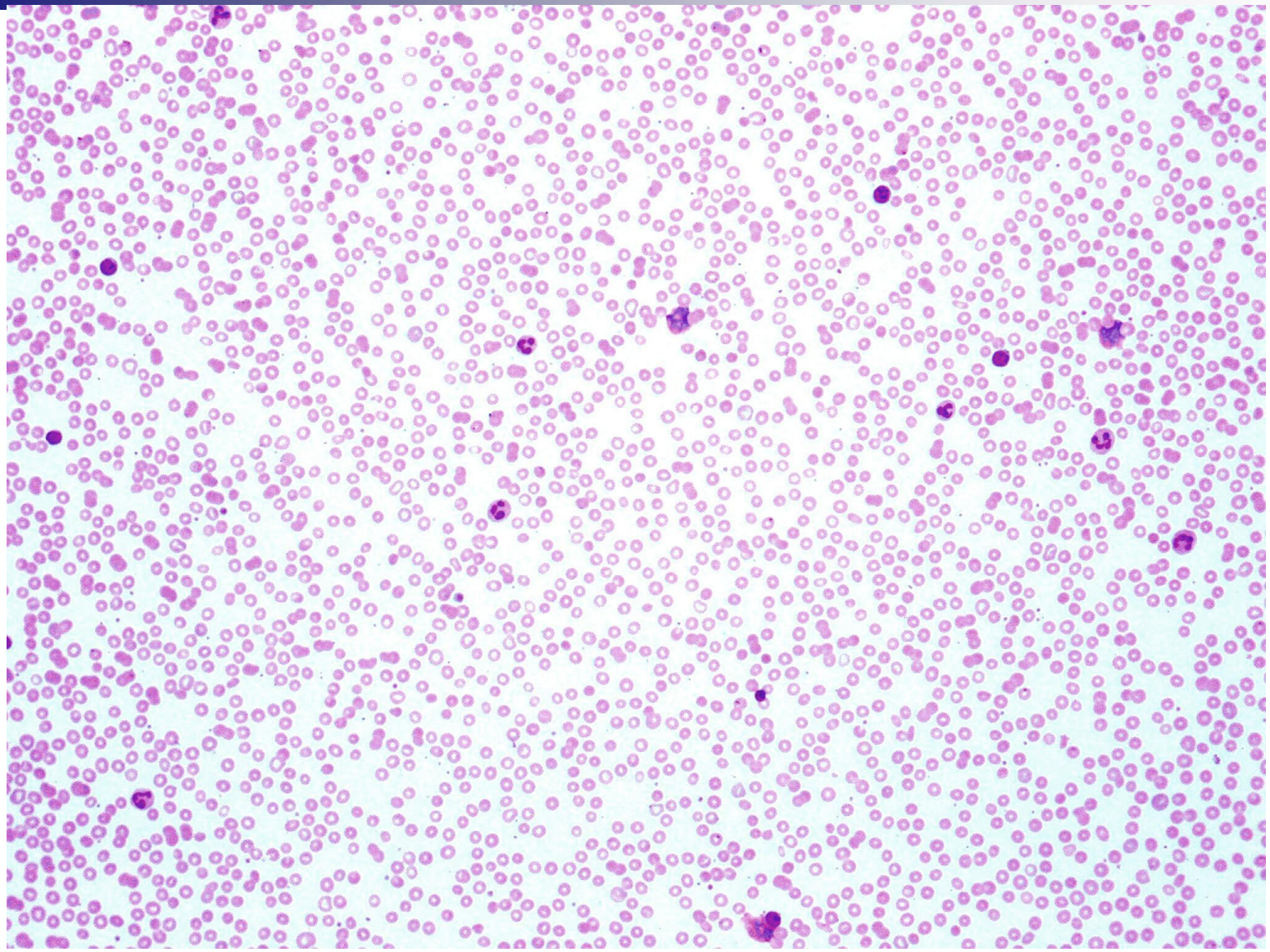
Diagnosis

- Subsequent blood was collected in blue-top tube, with platelet count in the 200's
- Dx: spurious thrombocytopenia (pseudothrombocytopenia) secondary to EDTA (ethylenediamine tetracetic acid) buffer
- Incidence 0.1%

Peripheral Blood Smear Case
Patient: Joxxx Nexxx

- 87 year old male with pelvic fracture, admitted through trauma service
- WBC= 22.3, Hgb=12.0, Plt=384
  Seg 30, Lymph 63, mono 4



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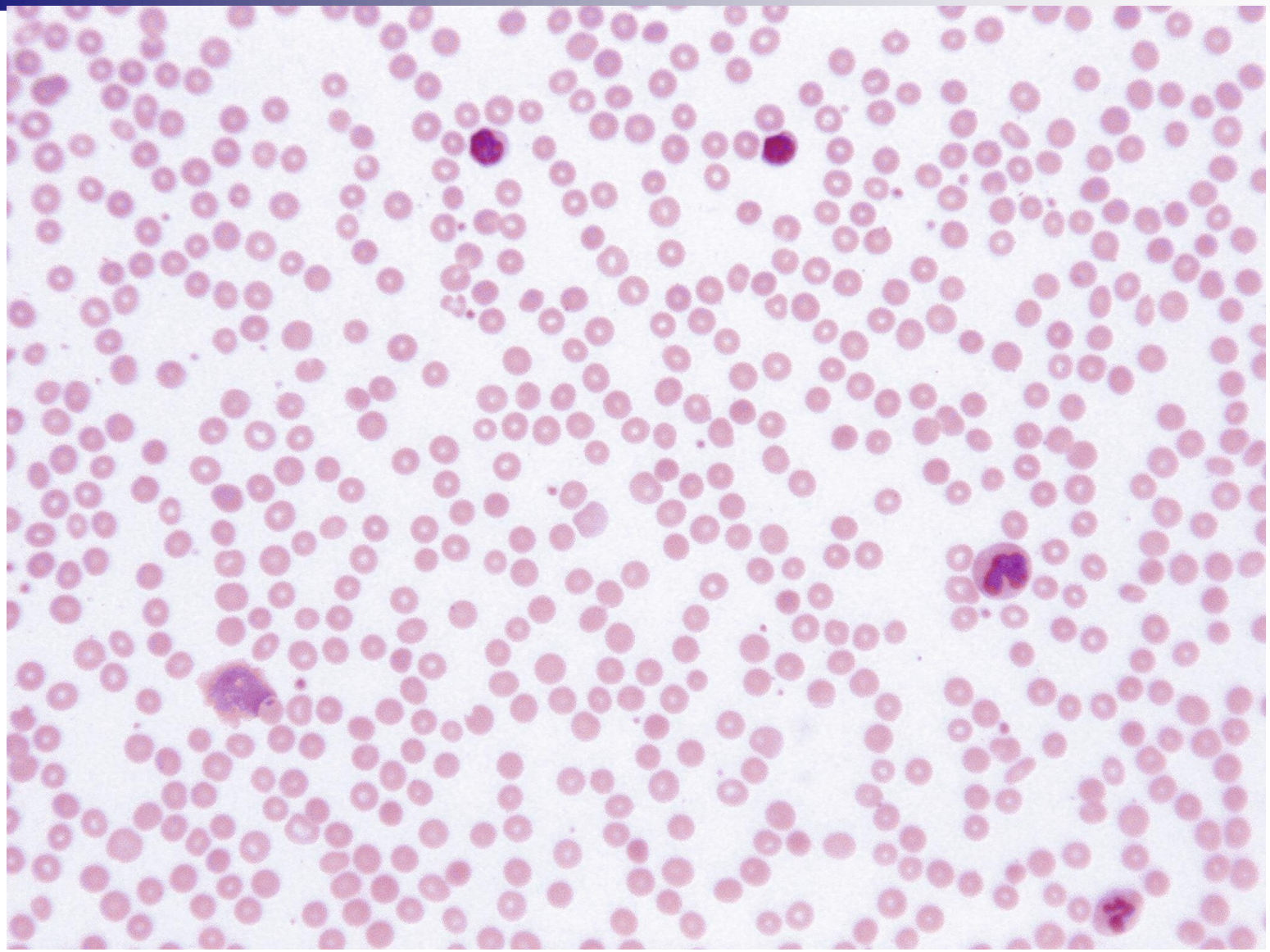

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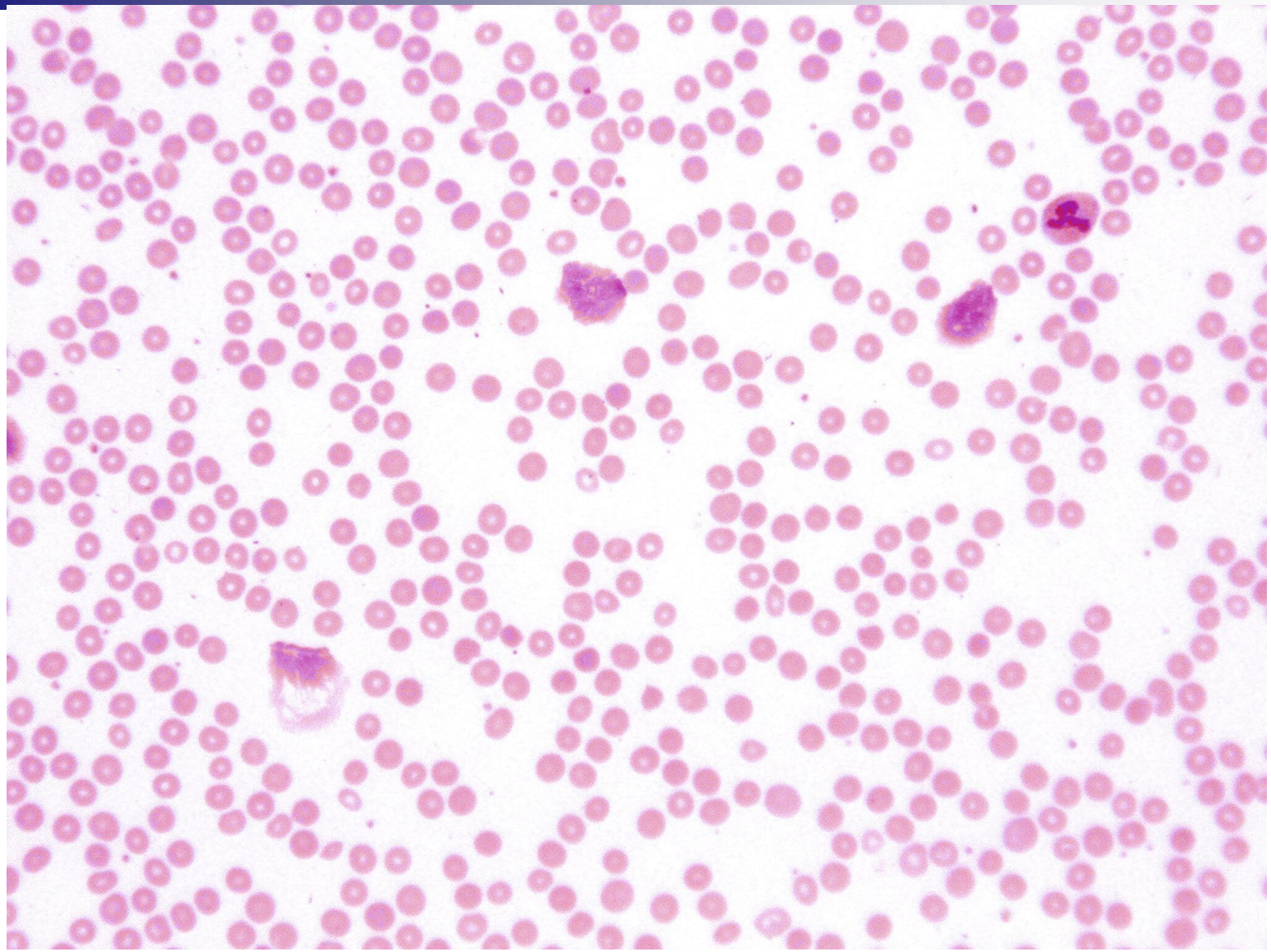

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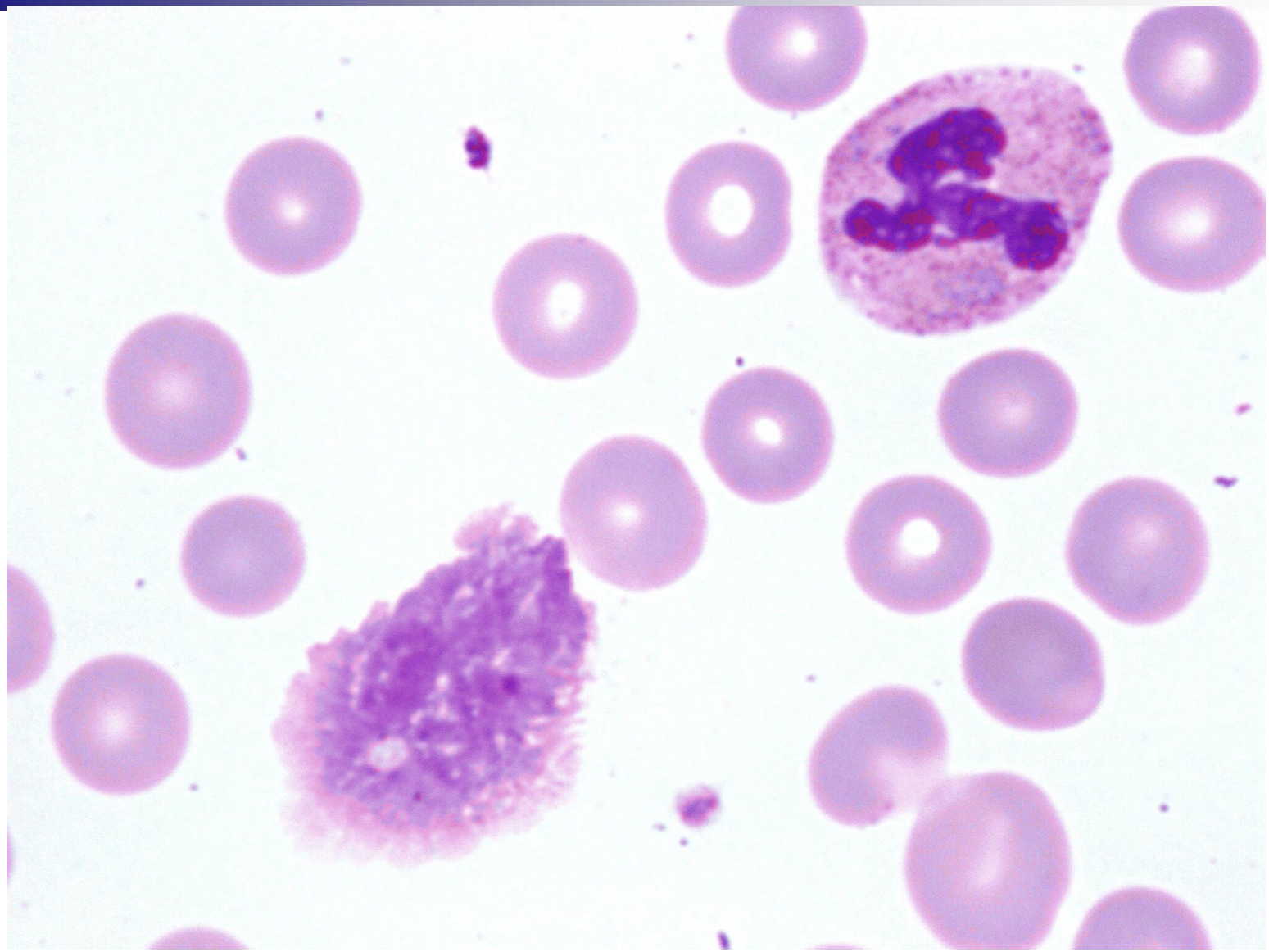

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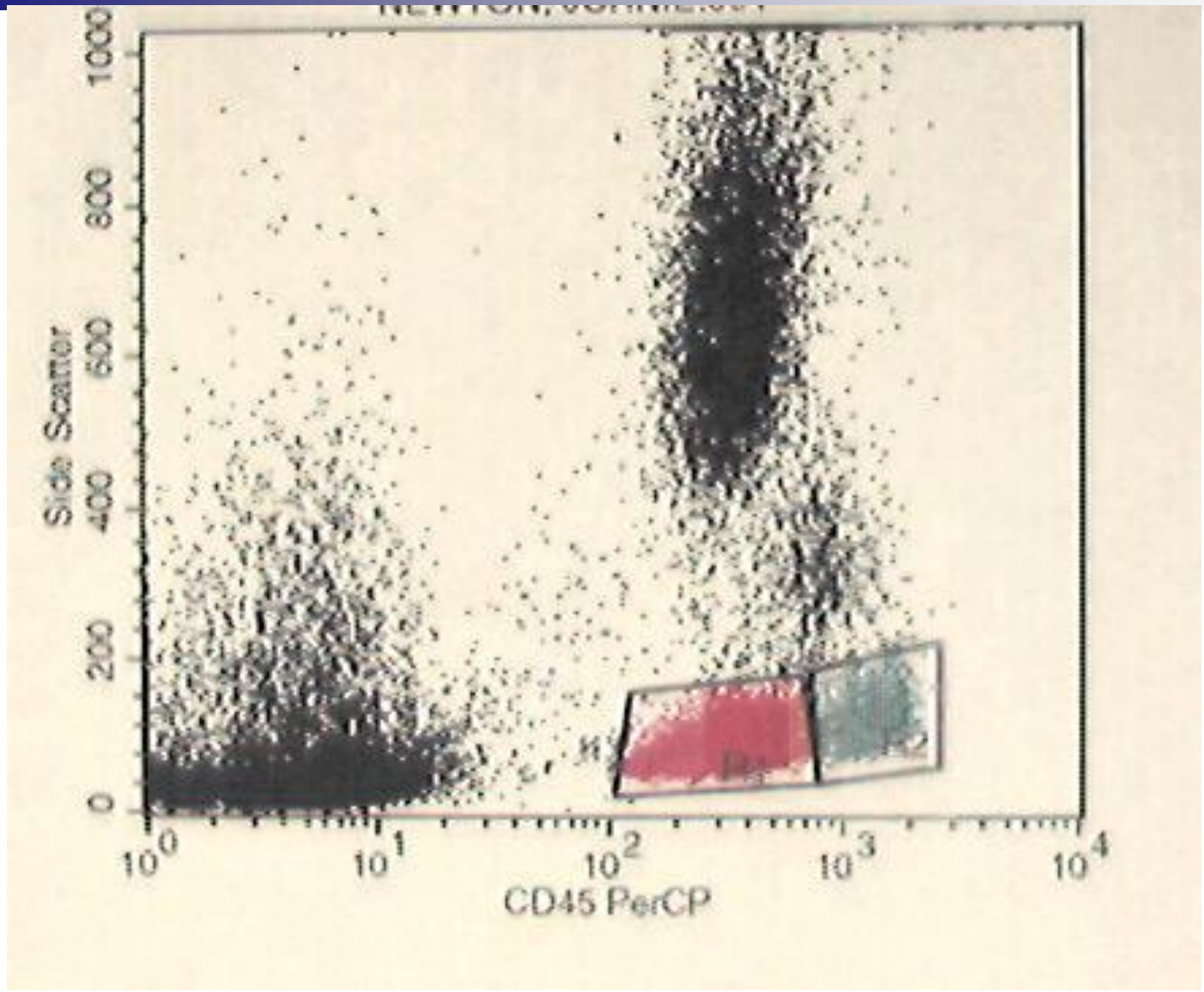
Side Scatter
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600
800
1000
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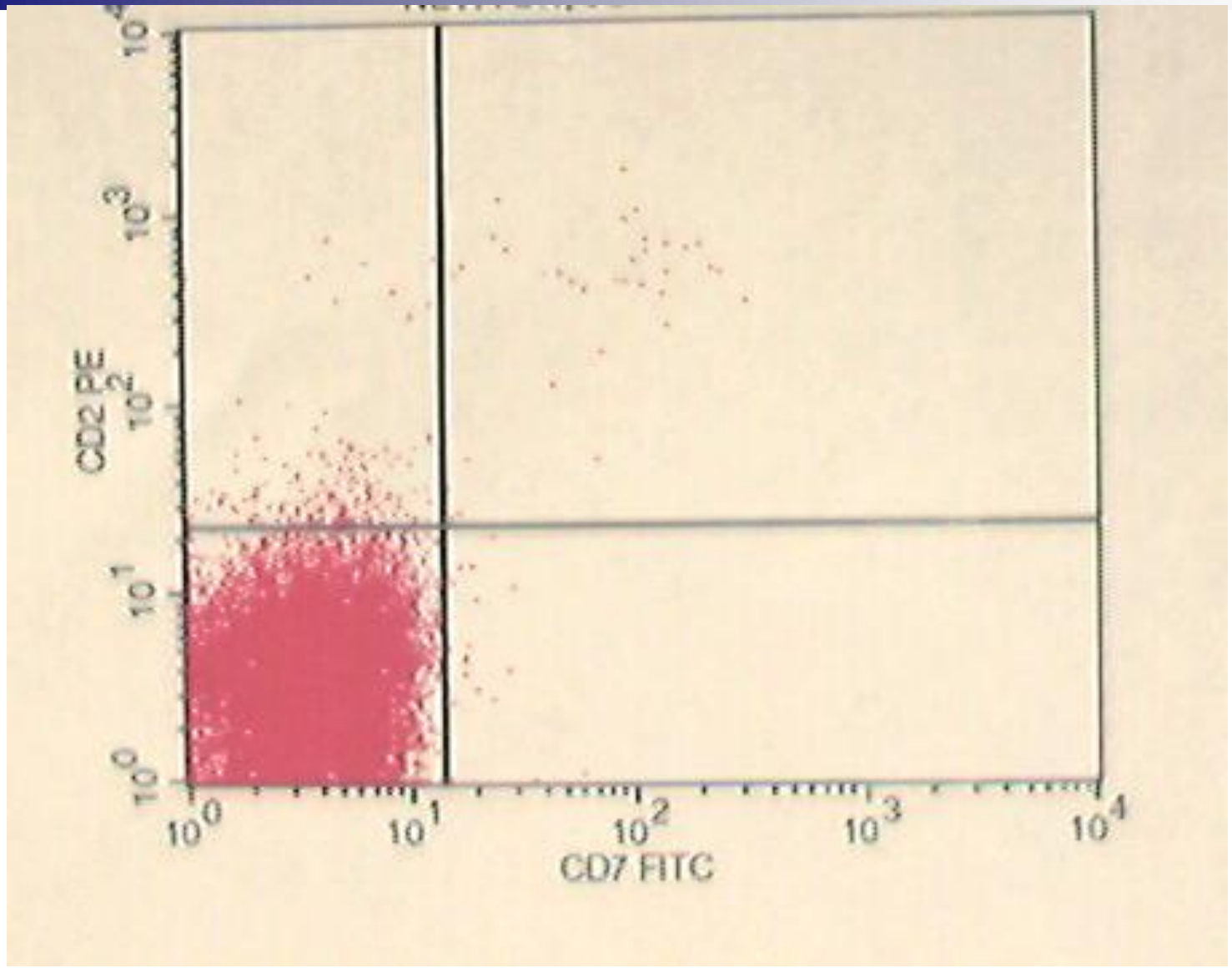
10^1
10^2
10^3
10^4
CD45 PerCP

flow1



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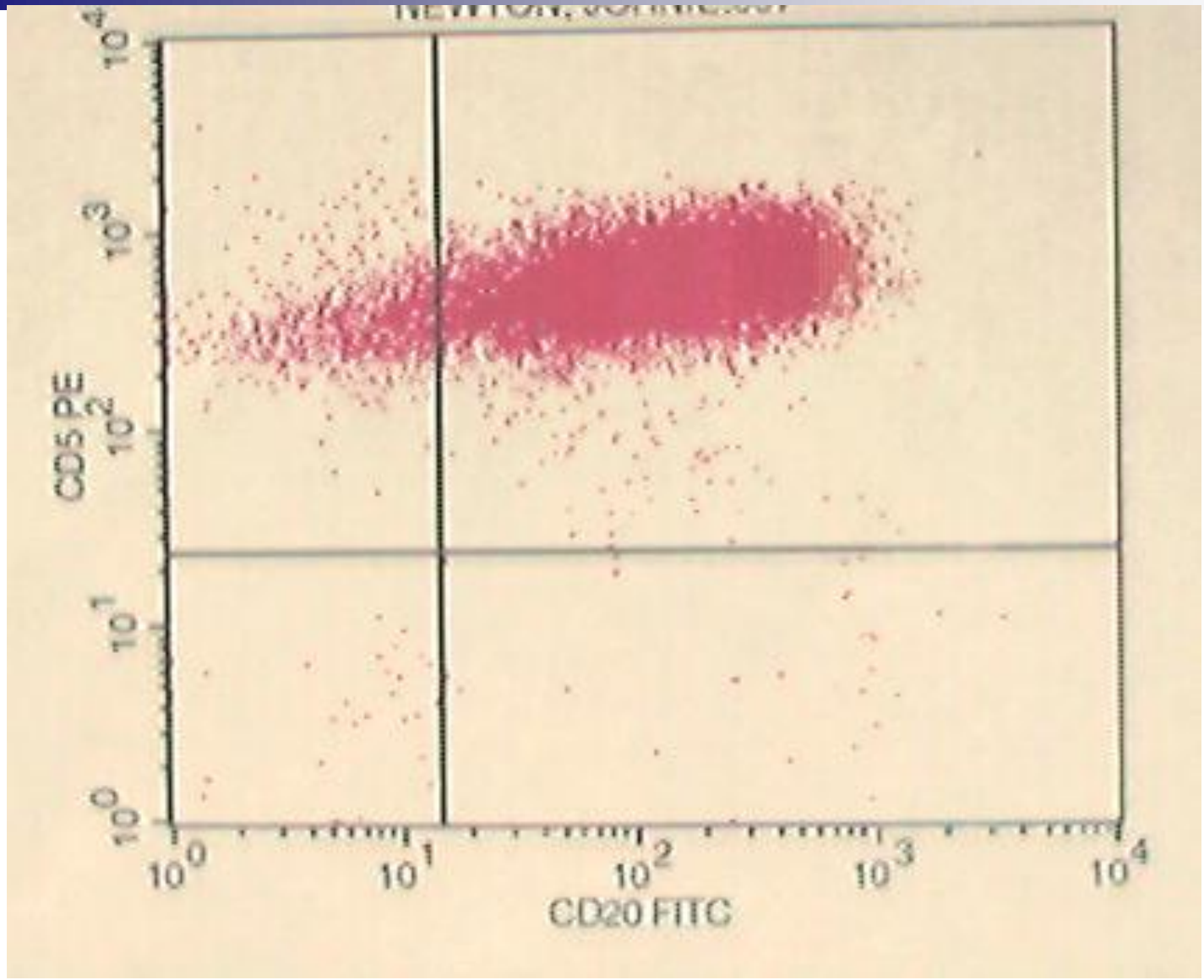

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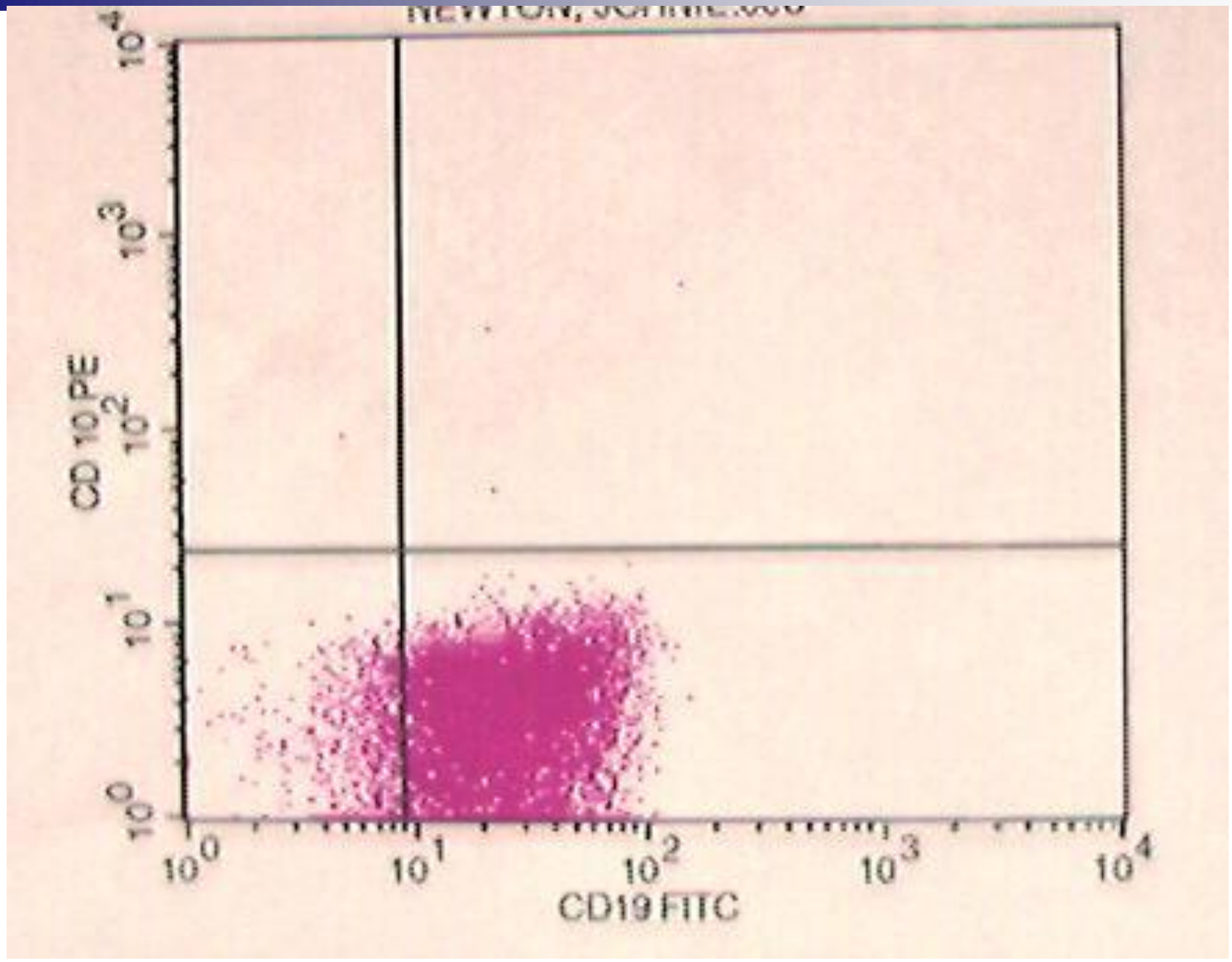

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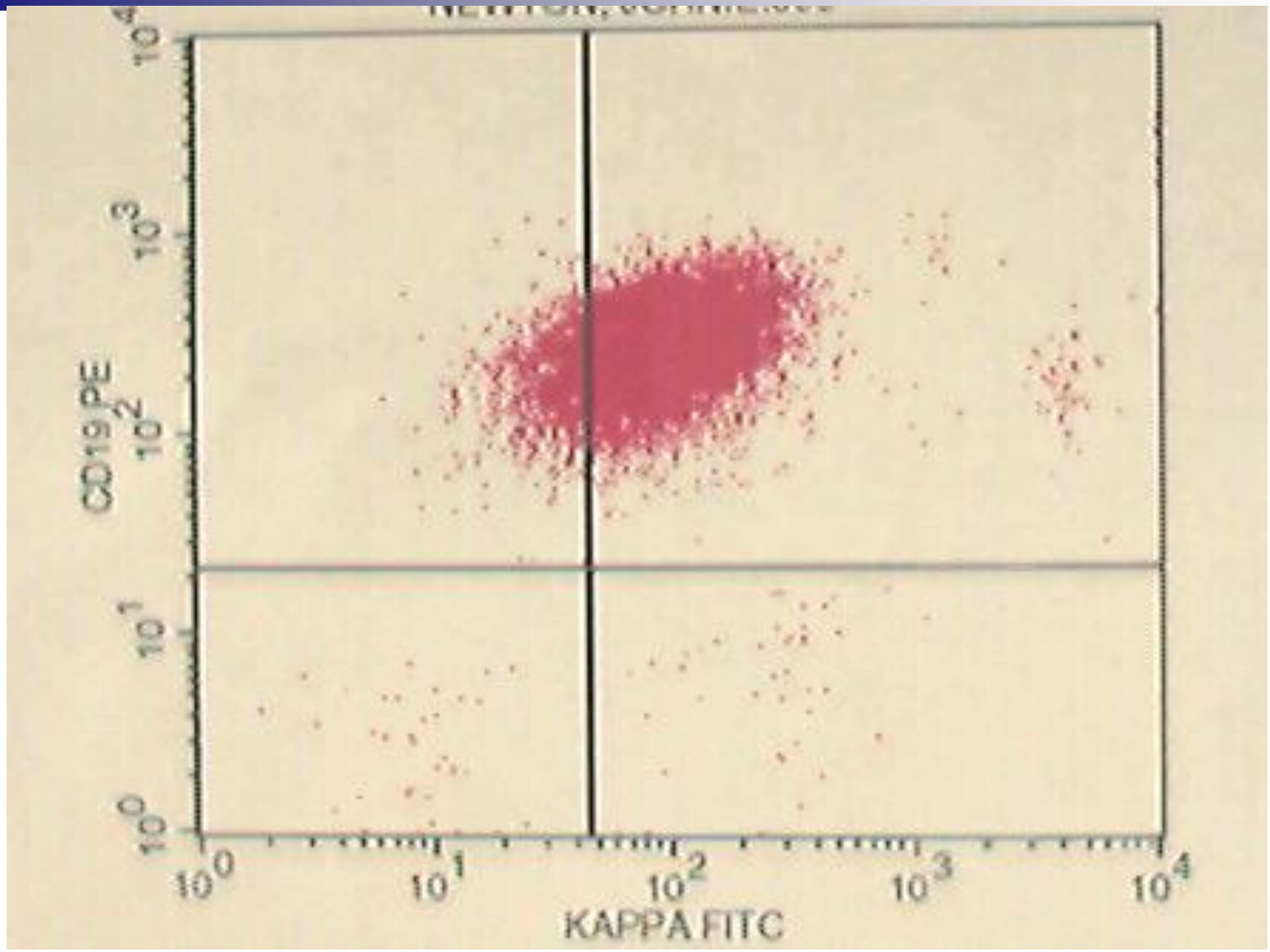

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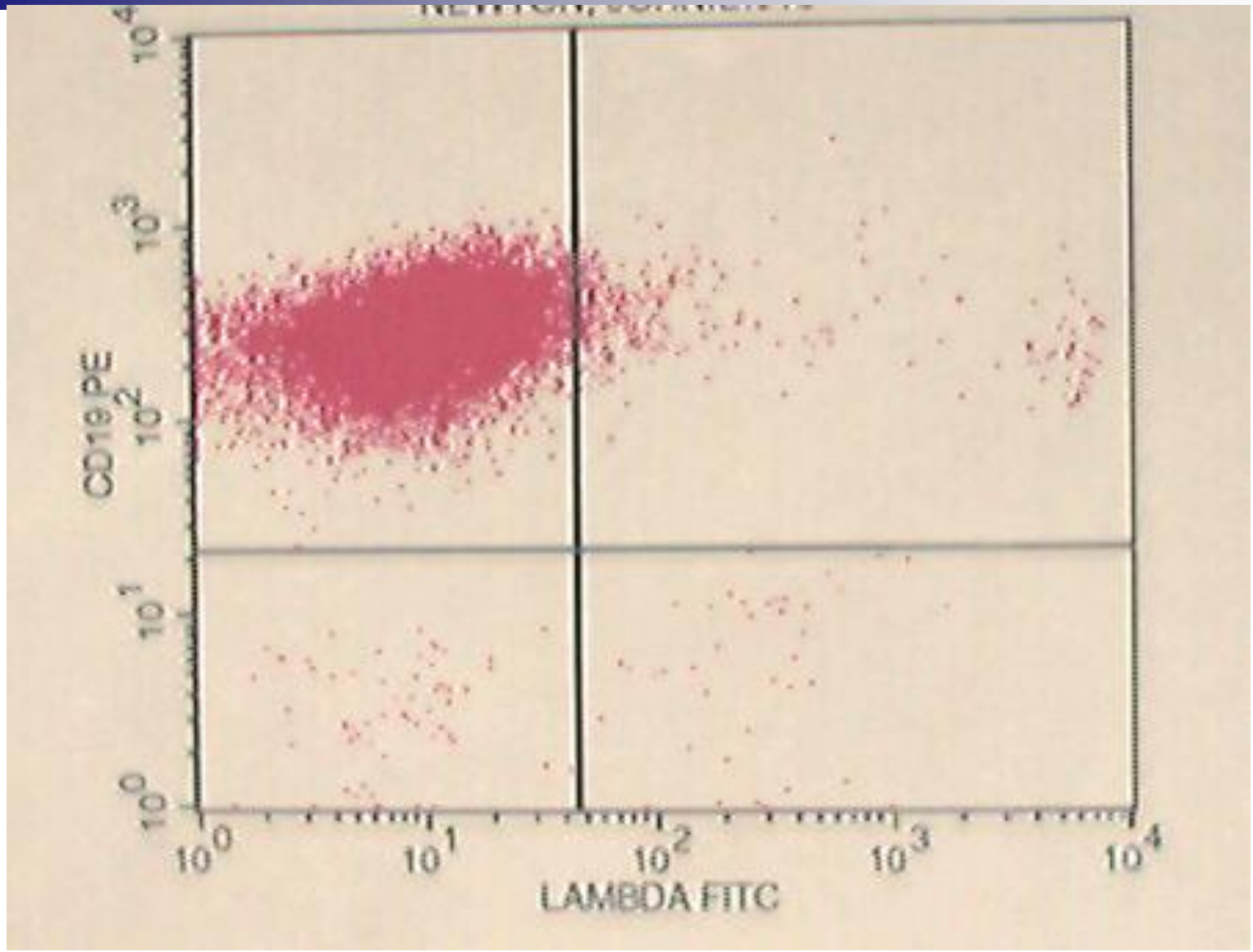

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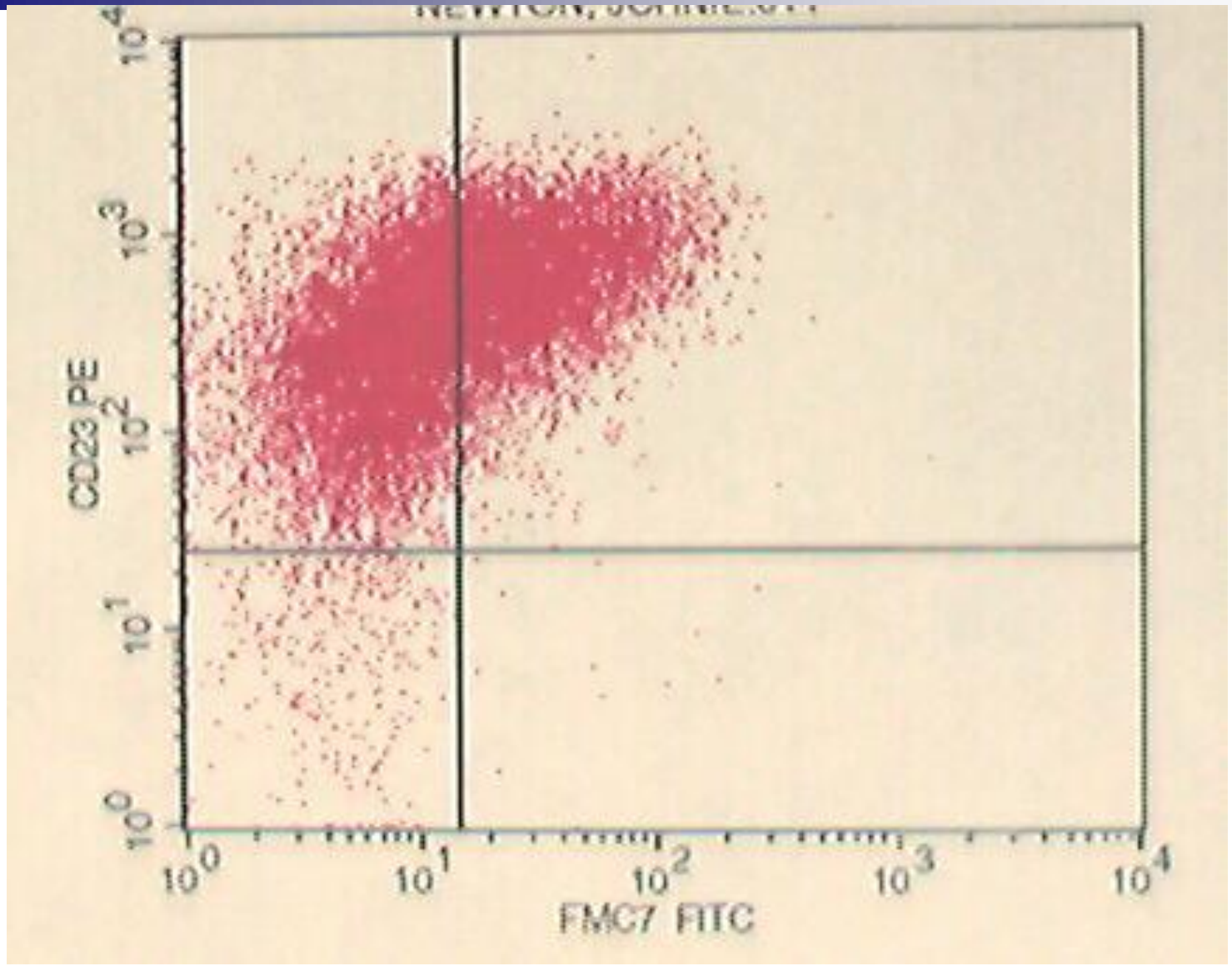

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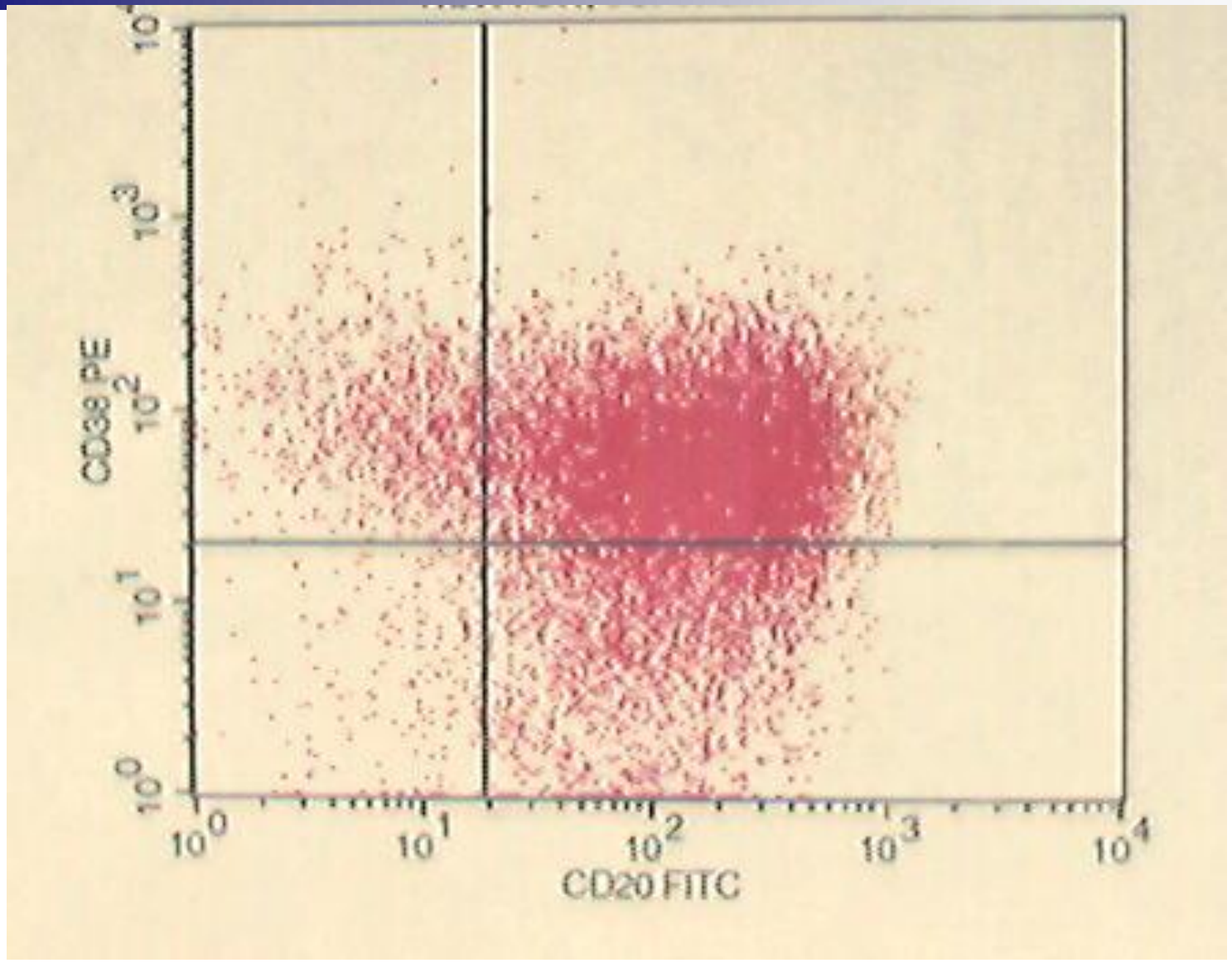

flow8

Diagnosis

- Flow cytometry results: B-cells that are
  (+) CD5, CD19, CD20, CD23, Kappa light-chain restriction
  (-) CD10

- Chronic lymphocytic leukemia (CLL)