



Q: A microscopic analysis of tissue from an individual suffering from recurrent seizures involves using hematoxylin & eosin stain alongside a vimentin stain. Cells with stronger vimentin expression are significantly larger than surrounding entities. Which identity is most probable for these prominent vimentin-expressing cells?

- A) Dystrophic neurons typically found around glial scars
- B) Enlarged reactive astrocytes near injury sites ✗**
- C) Aberrant large cells characteristic of cortical malformation**
- D) Macrophages adapted to engulf cellular debris
- E) Fibroblast proliferation in response to brain injury

VLM Answer: Let me solve this step by step:

1) First, let's analyze what we're seeing in the images:

- The H&E stain (top image) shows tissue with scattered cells and some enlarged cells
- The vimentin stain (bottom image) shows strong brown staining of certain larger cells

2) Key information from the question:

- Patient has recurrent seizures
- Vimentin-positive cells are significantly larger
- Looking for most probable identity of these cells

3) Important facts about vimentin:

- Vimentin is an intermediate filament protein
- Strongly expressed in reactive astrocytes
- Also expressed in mesenchymal cells

4) In the context of seizures:

- Seizures can cause brain injury
- Brain injury triggers astrogliosis
- Astrocytes become reactive and enlarged in response to injury

5) Looking at the options:

- Option 1: Neurons don't typically express vimentin
- Option 2: Reactive astrocytes do express vimentin and enlarge during injury
- Option 3: Cortical malformation cells wouldn't necessarily express vimentin
- Option 4: Macrophages are typically smaller
- Option 5: Fibroblasts would be rare in this context

6) The morphology and staining pattern of the large cells, combined with the clinical context of seizures, most strongly suggests reactive astrocytes.

The answer is (2) ✗

Error type: Misconception

Error reason: The AI is able to interpret the question and image, but lacks the knowledge to recognize the link between recurrent seizures, cortical dysplasia, and large ballooned cells.

Subject: Neurobiology

Bloom's level: 3 (Application)

Specimen: Resection specimen for epilepsy