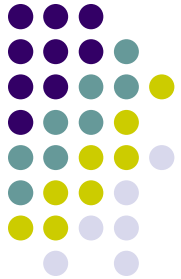
Q

Lens Embryology

- Which embryologic cell line gives rise to all of the components of the lens?

Q/A



- Which embryologic cell line gives rise to all of the components of the lens? surface vs neuro- *ectoderm*

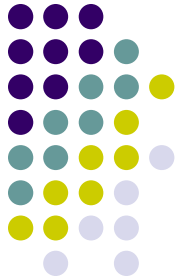
A

Lens Embryology

- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*

Q

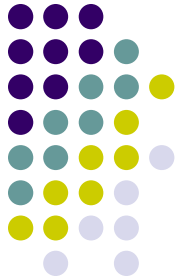
Lens Embryology



- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*
- T/F: The optic vesicle is the primordial structure that becomes the lens. It consists of a single layer of cuboidal cells encased within their basement membrane

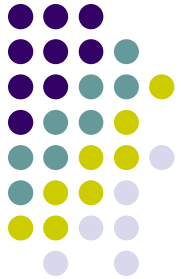
A

Lens Embryology



- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*
- T/F: The ~~optic~~ *lens* vesicle is the primordial structure that becomes the lens. It consists of a single layer of cuboidal cells encased within their basement membrane **F**

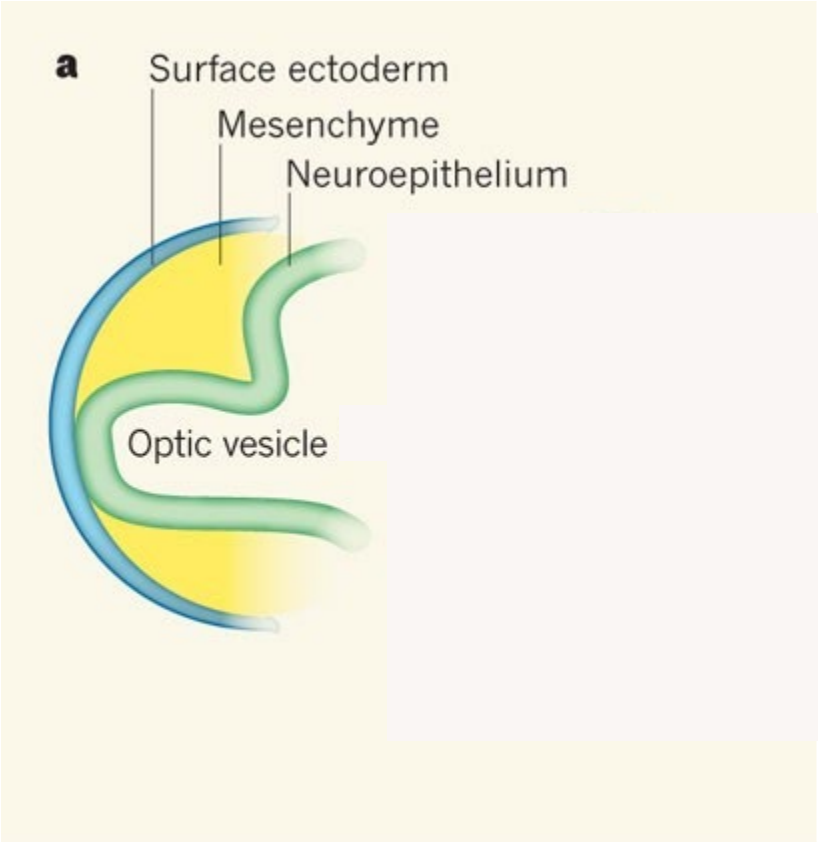
Lens Embryology



Re surface ectoderm and lens formation:

(No info yet—advance when ready)

Lens Embryology

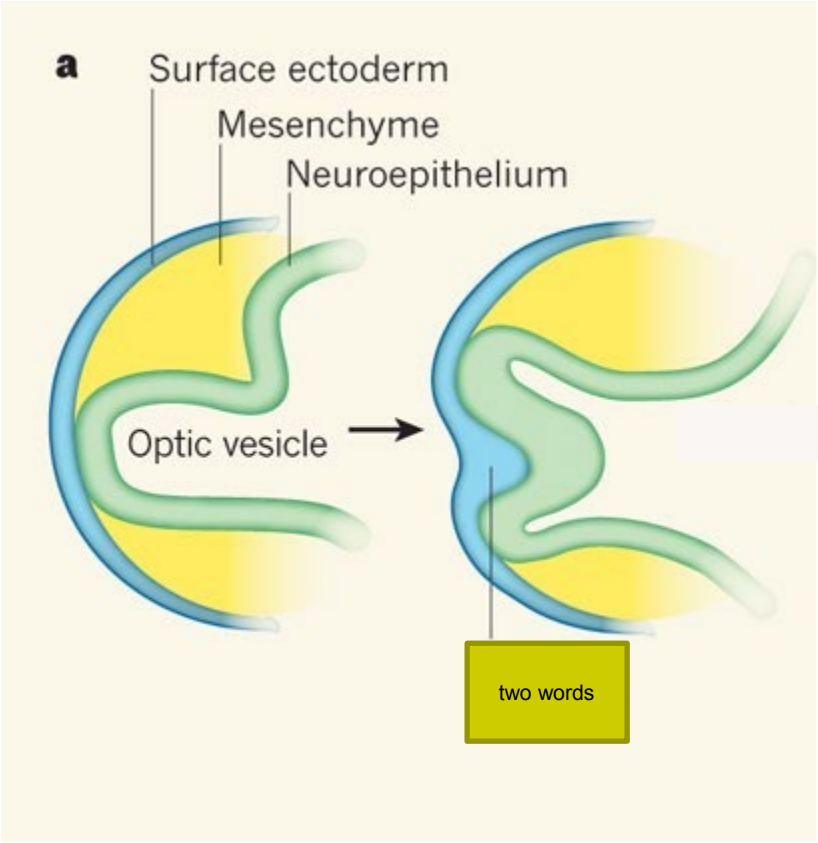


Re surface ectoderm and lens formation:

(Glance at this, then keep going to see the points being made)

Q

Lens Embryology

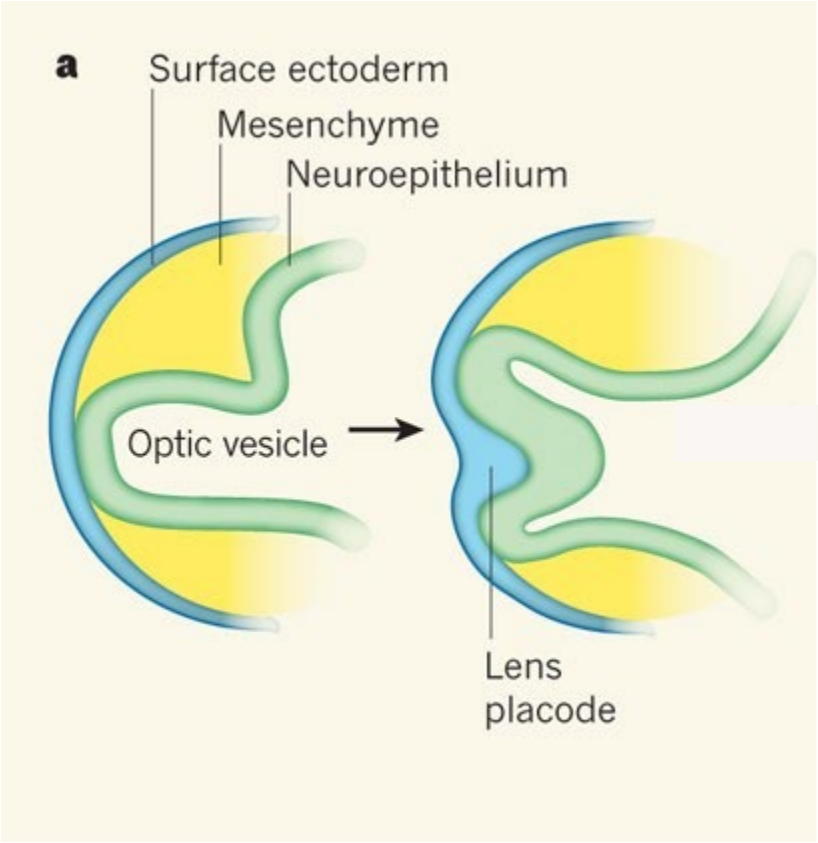


Re surface ectoderm and lens formation:

--A portion of surface ectoderm thickens to form the two words

A

Lens Embryology

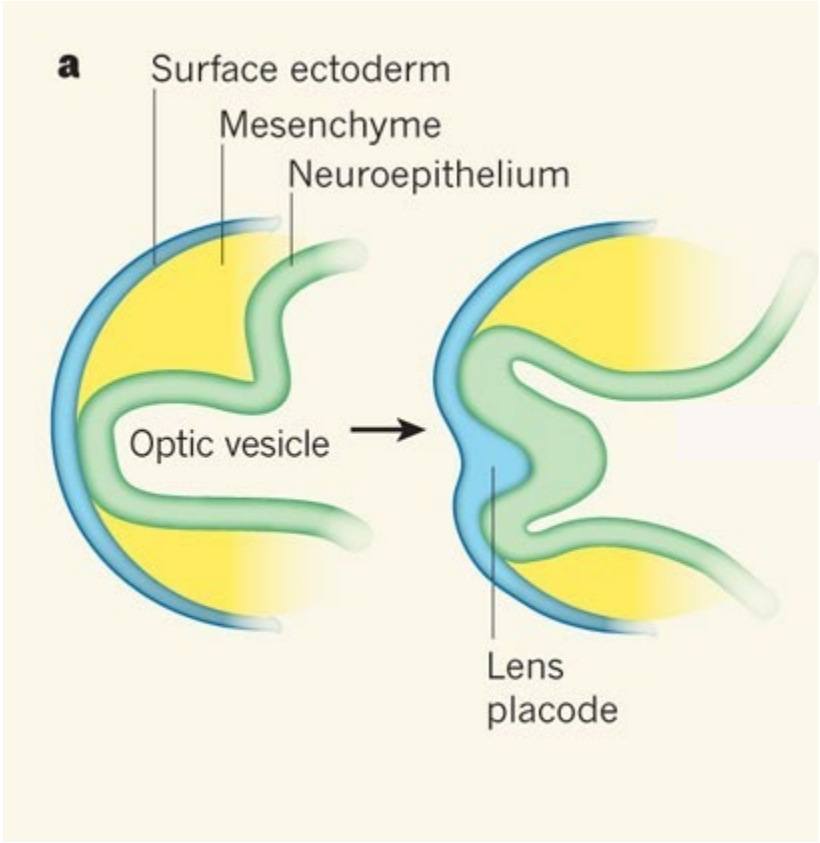


Re surface ectoderm and lens formation:

--A portion of surface ectoderm thickens to form the lens placode

Q

Lens Embryology

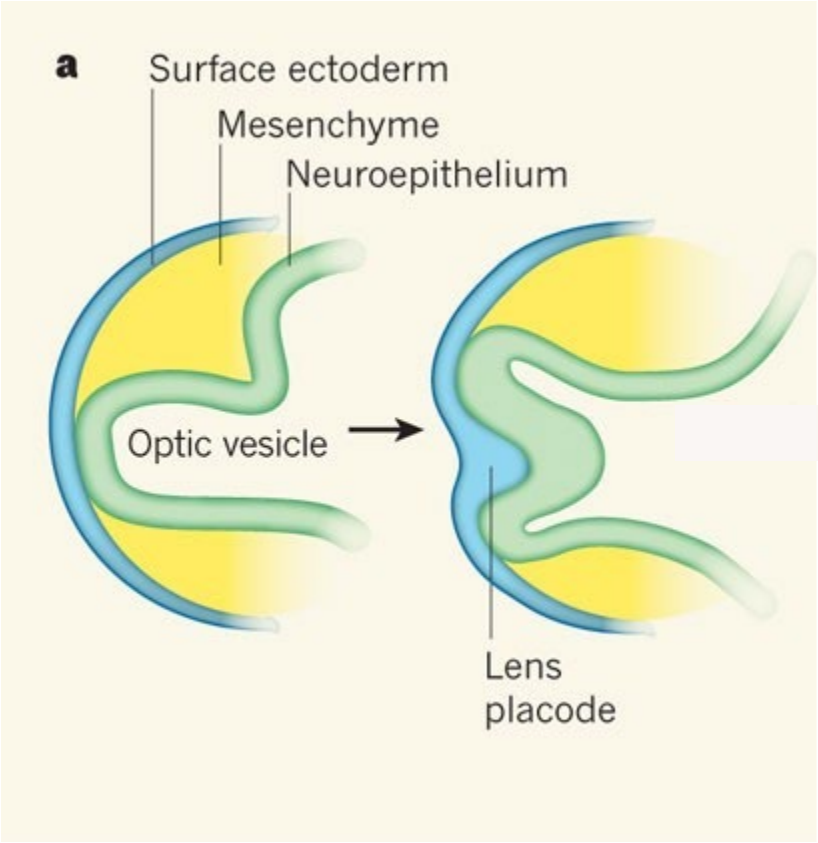


Re surface ectoderm and lens formation:

--A portion of surface ectoderm thickens to form the lens placode (aka the two words)

A

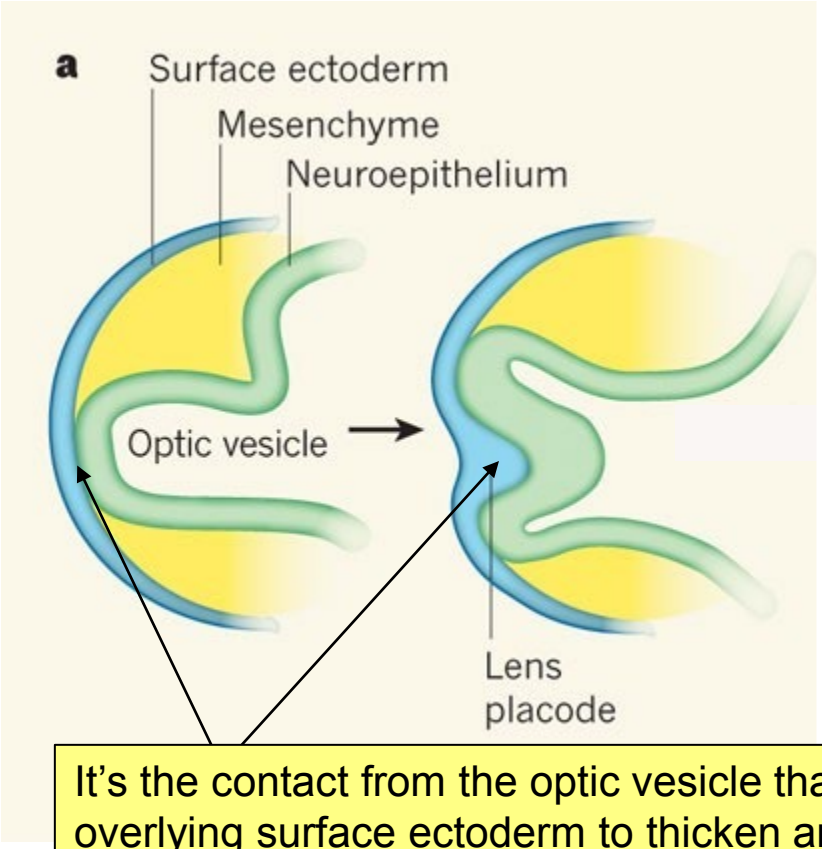
Lens Embryology



Re surface ectoderm and lens formation:

--A portion of surface ectoderm thickens to form the lens placode (aka the lens **plate**)

Lens Embryology



It's the contact from the optic vesicle that induces the overlying surface ectoderm to thicken and form the placode

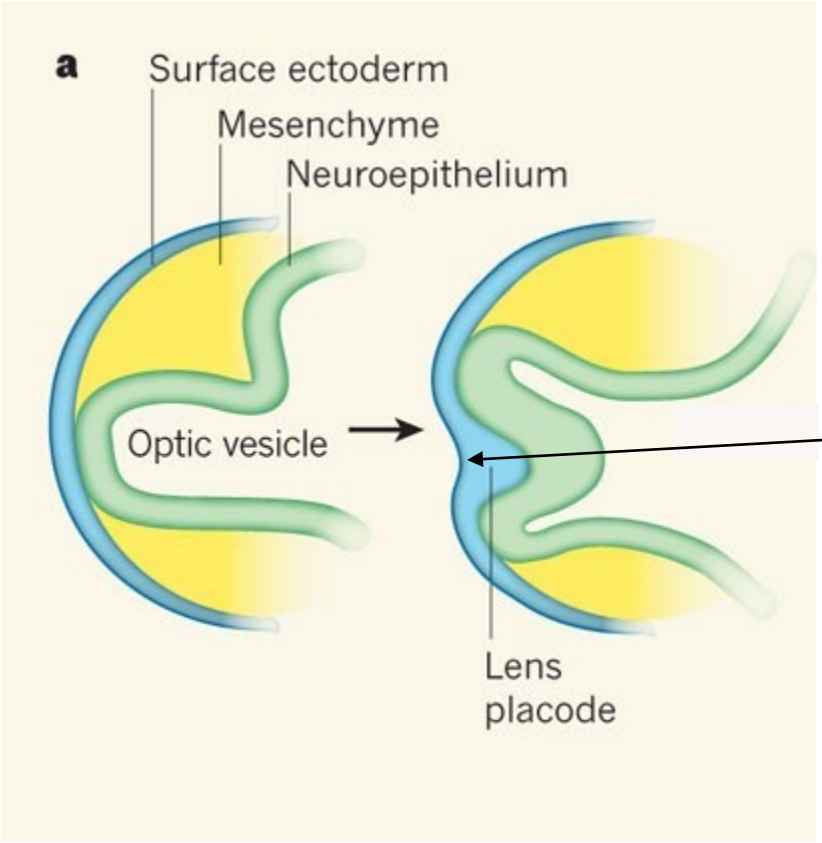
Re surface ectoderm and lens formation:

--A portion of surface ectoderm thickens to form the lens placode (aka the lens **plate**)

(No question—advance when ready)

Q

Lens Embryology



Note the presence of an indentation in the lens placode; this is called the

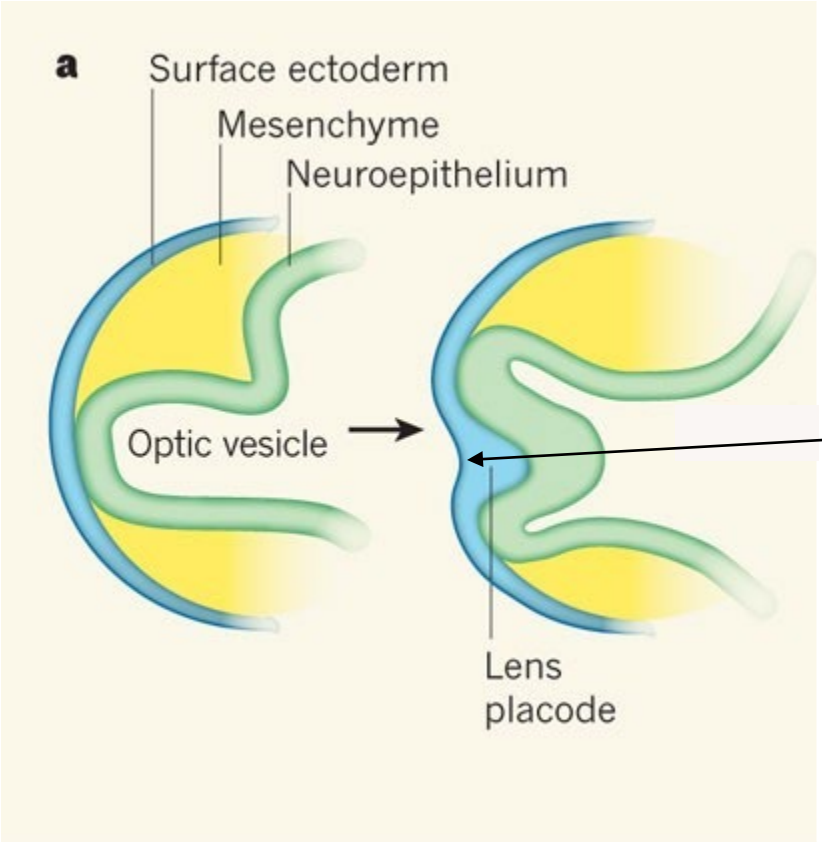
two words

Re surface ectoderm and lens formation:

--A portion of surface ectoderm thickens to form the lens placode (aka the lens **plate**)

A

Lens Embryology



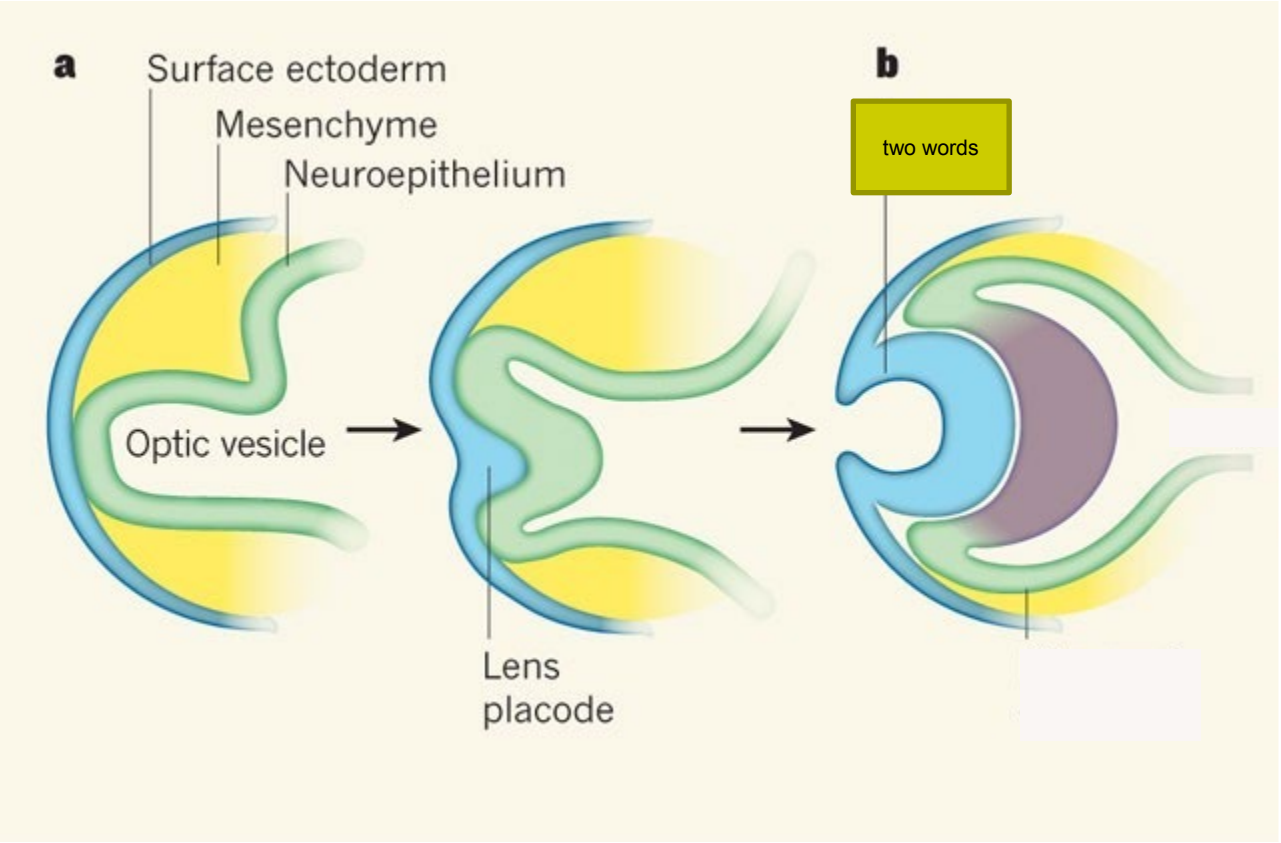
Note the presence of an indentation in the lens placode; this is called the lens **pit**

Re surface ectoderm and lens formation:

--A portion of surface ectoderm thickens to form the lens placode (aka the lens **plate**)

Q

Lens Embryology



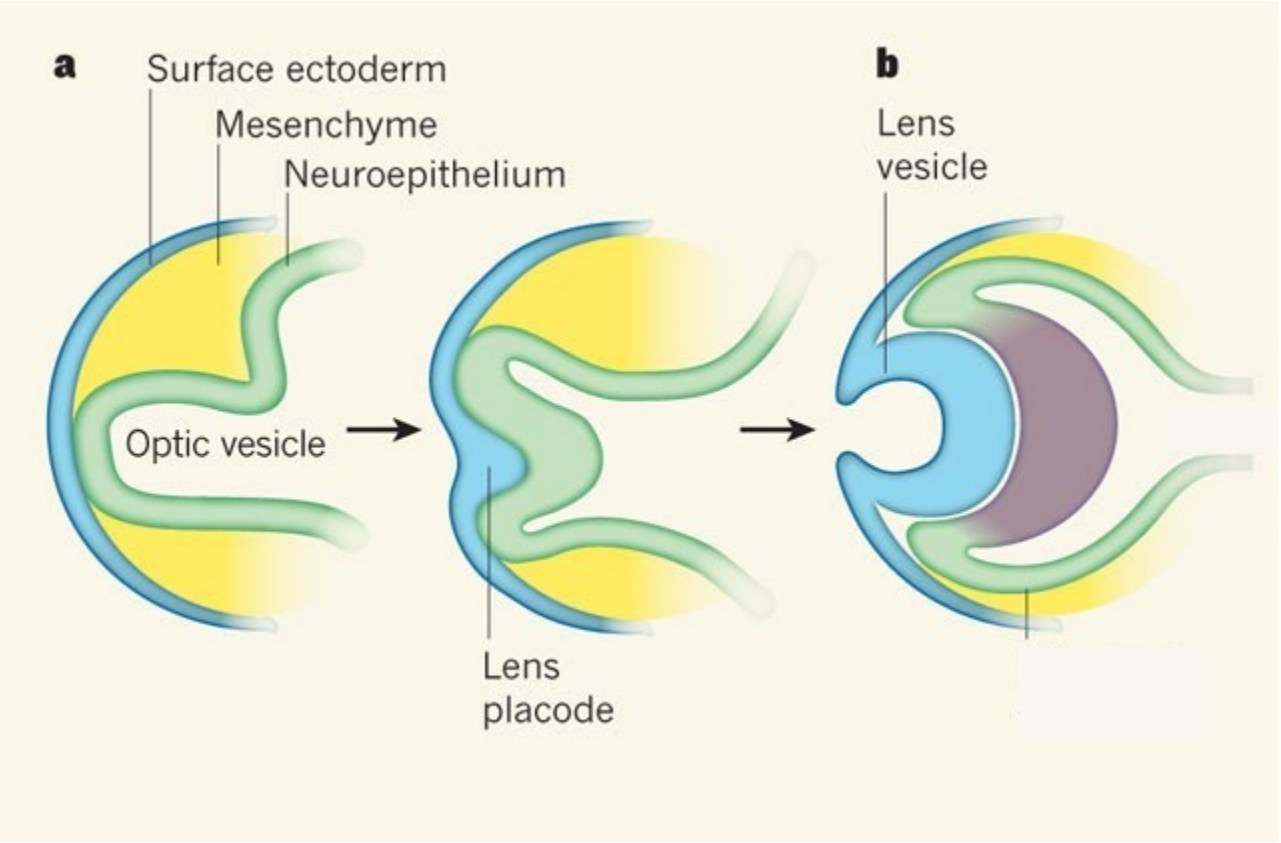
Re surface ectoderm and lens formation:

--A portion of surface ectoderm thickens to form the lens placode (aka the lens **plate**)

--The placode invaginates to form the two words

A

Lens Embryology



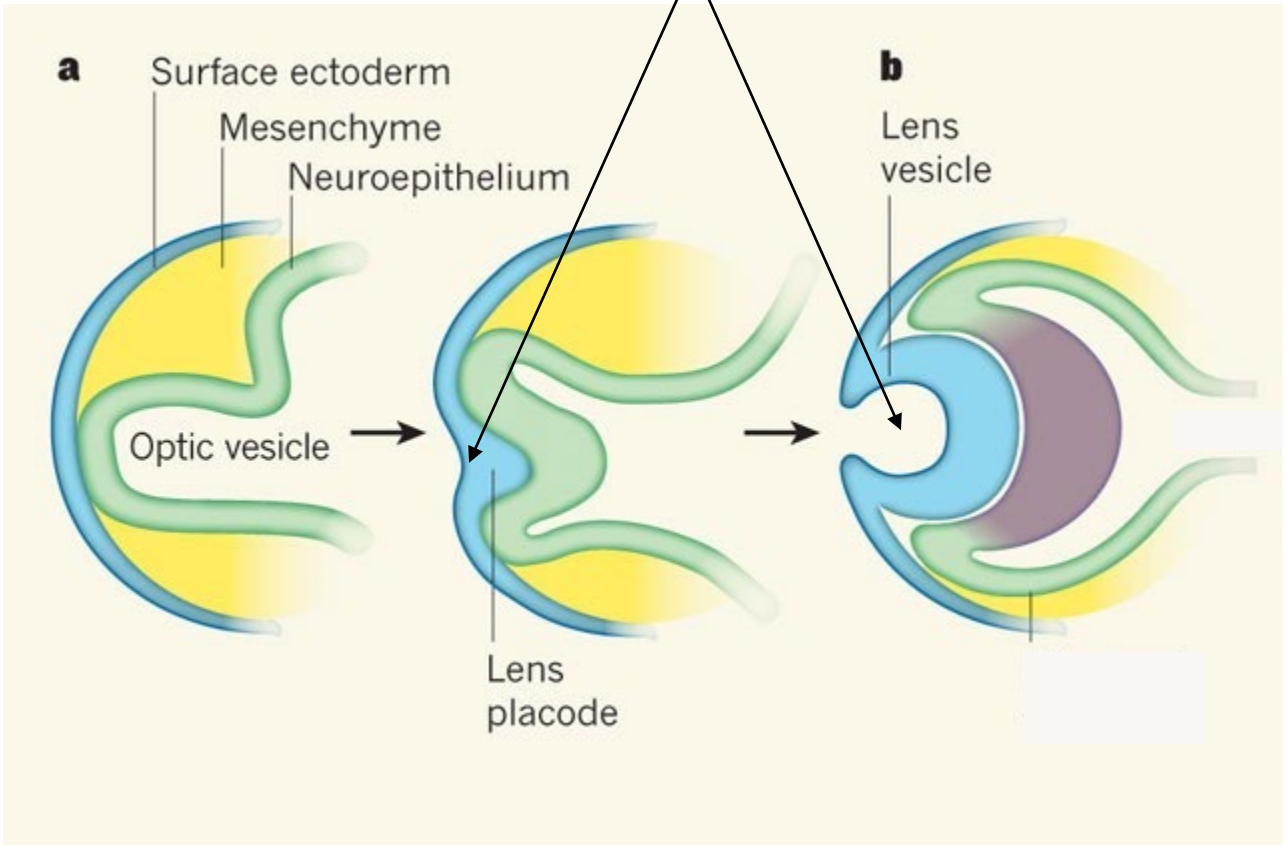
Re surface ectoderm and lens formation:

--A portion of surface ectoderm thickens to form the lens placode (aka the lens **plate**)

--The placode invaginates to form the lens vesicle

Lens Embryology

(Note that the invagination process consists of a progressive deepening of the lens pit)



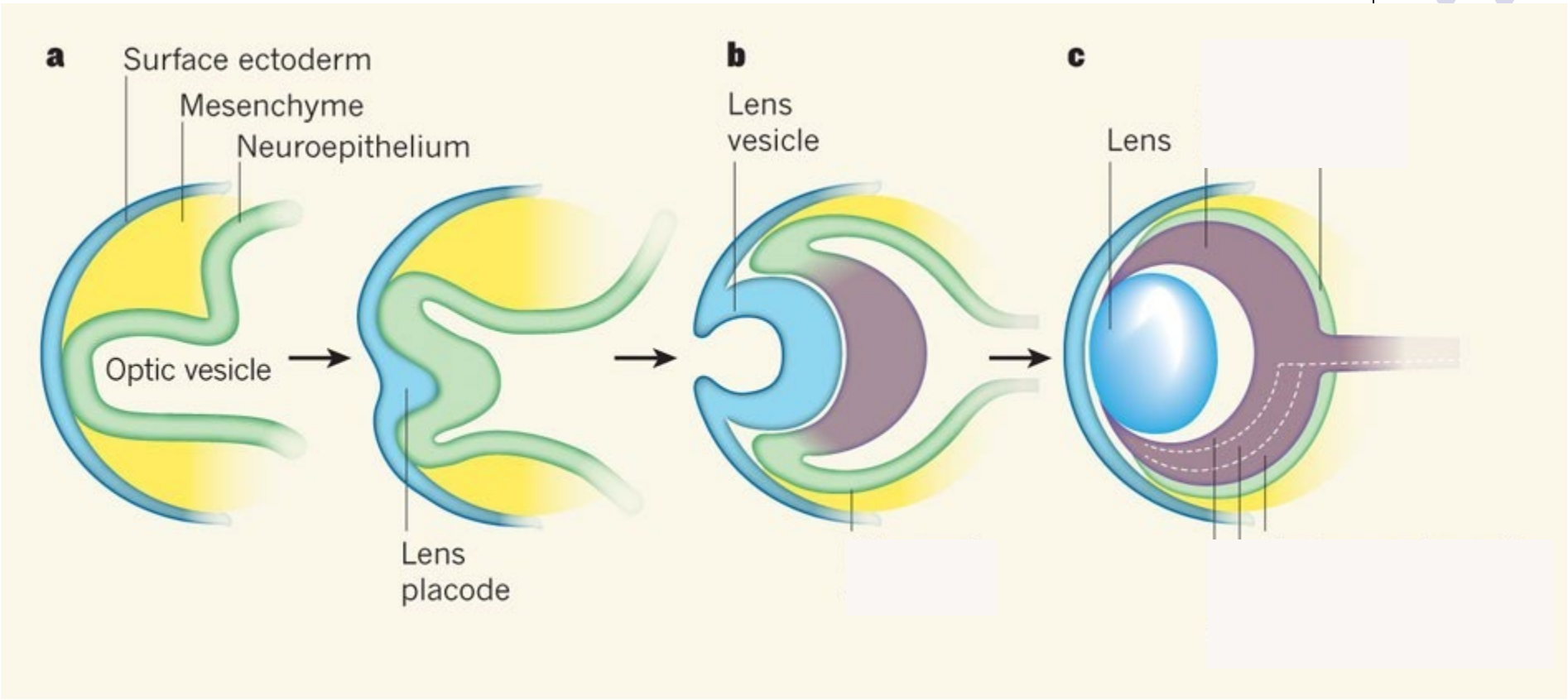
Re surface ectoderm and lens formation:

--A portion of surface ectoderm thickens to form the lens placode (aka the lens **plate**)

--The placode invaginates to form the lens vesicle

(No question—advance when ready)

Lens Embryology



Re surface ectoderm and lens formation:

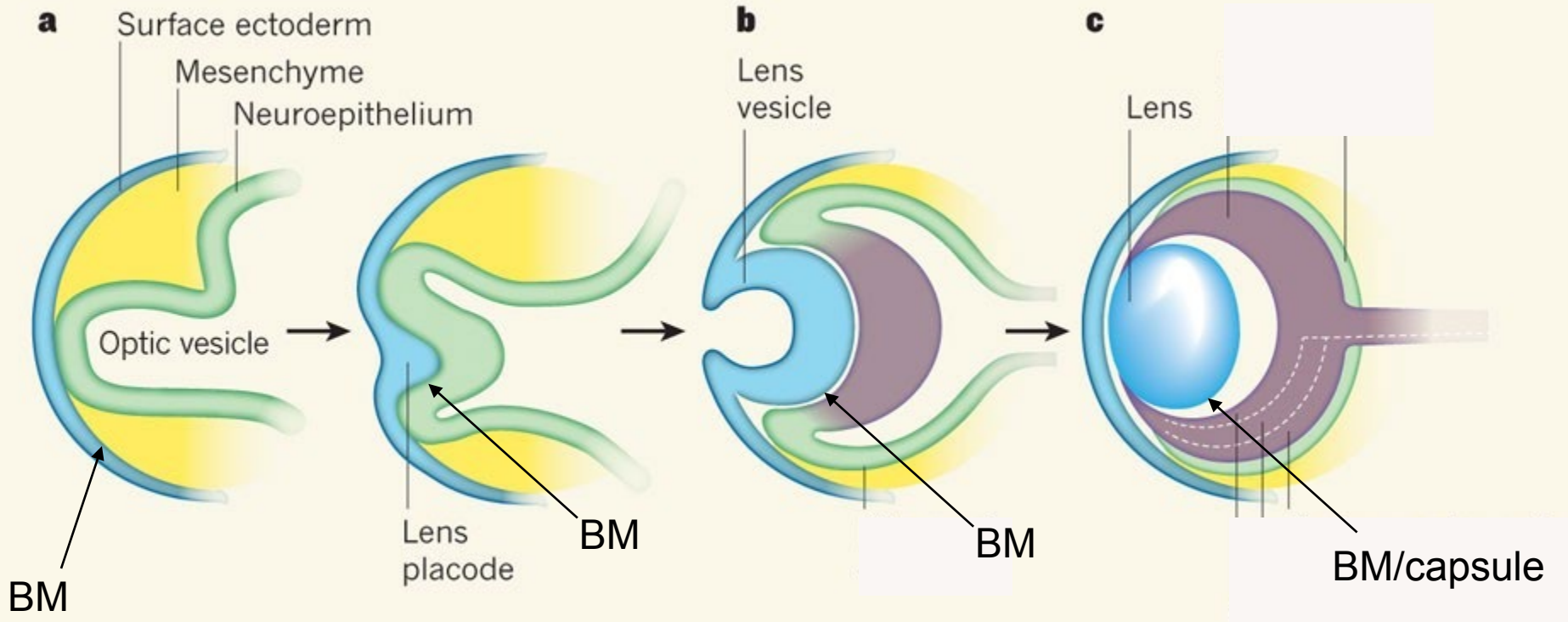
--A portion of surface ectoderm thickens to form the lens placode (aka the lens **plate**)

--The placode invaginates to form the lens vesicle

--The lens vesicle goes on to form (eventually; there are intervening steps) the mature lens.

(No question—advance when ready)

Lens Embryology

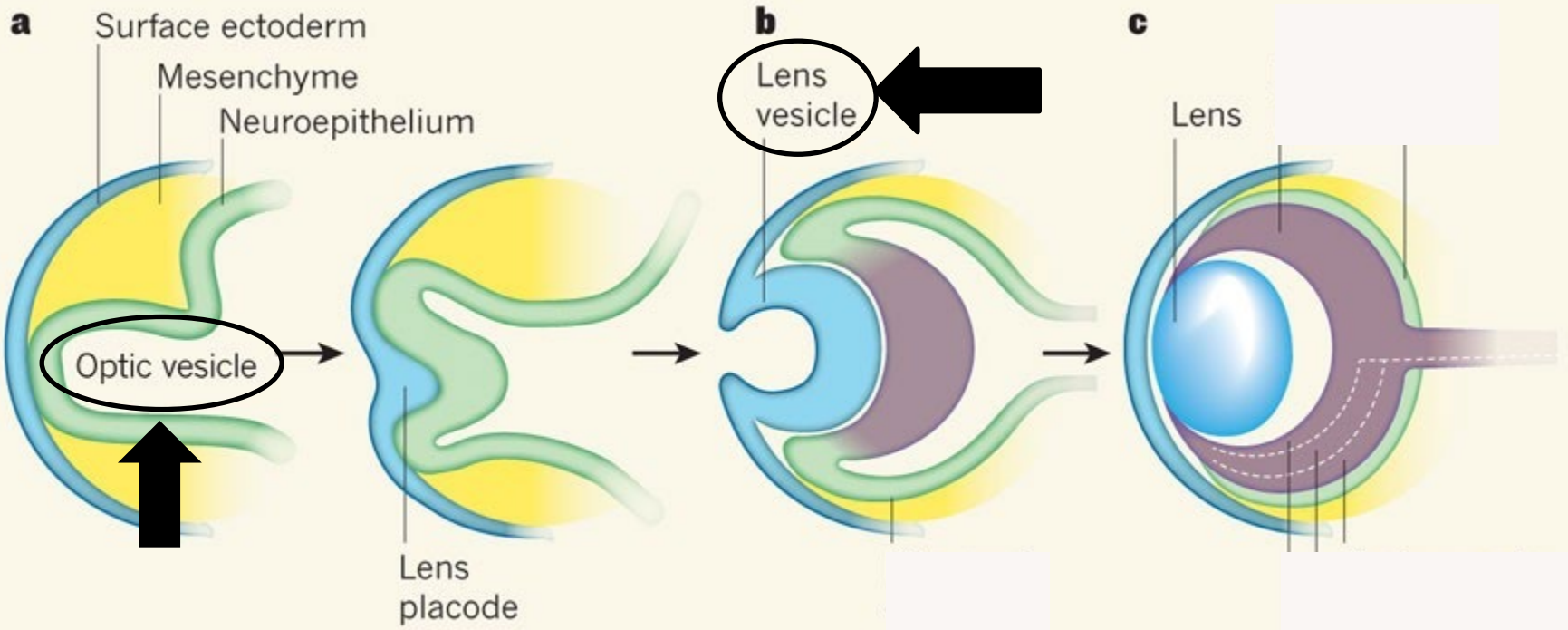


Take note that the invagination process leads to the weird result of a structure (the lens) that has its epithelium on its *inside* and its basement membrane on its *outside*.

--The lens vesicle goes on to form (eventually; there are intervening steps) the mature lens.

(No question—advance when ready)

Lens Embryology



Re surface ectoderm and lens formation

--A portion of surface ectoderm thickens to form the lens placode (aka the lens **plate**)

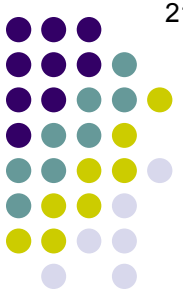
--The placode invaginates to form the lens vesicle

--The lens vesicle goes on to form (eventually; there are intervening steps) the mature lens.

Finally: Note that *optic* vesicle and *lens* vesicle are different structures—don't mix them up!

Q

Lens Embryology



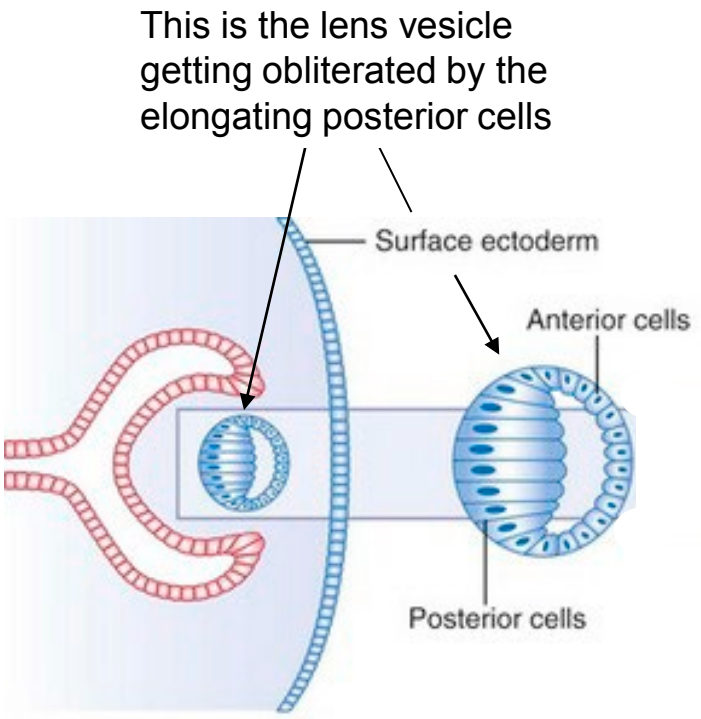
- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*
- T/F: The ~~optic~~ *lens* vesicle is the primordial structure that becomes the lens. It consists of a single layer of cuboidal cells encased within their basement membrane **F**
- T/F: The anterior cells of the lens vesicle elongate and progressively obliterate the lumen, forming the embryonic nucleus

A

Lens Embryology

- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*
- T/F: The ~~optic~~ *lens* vesicle is the primordial structure that becomes the lens. It consists of a single layer of cuboidal cells encased within their basement membrane **F**
- T/F: The ~~anterior~~ *posterior* cells of the lens vesicle elongate and progressively obliterate the lumen, forming the embryonic nucleus **F**

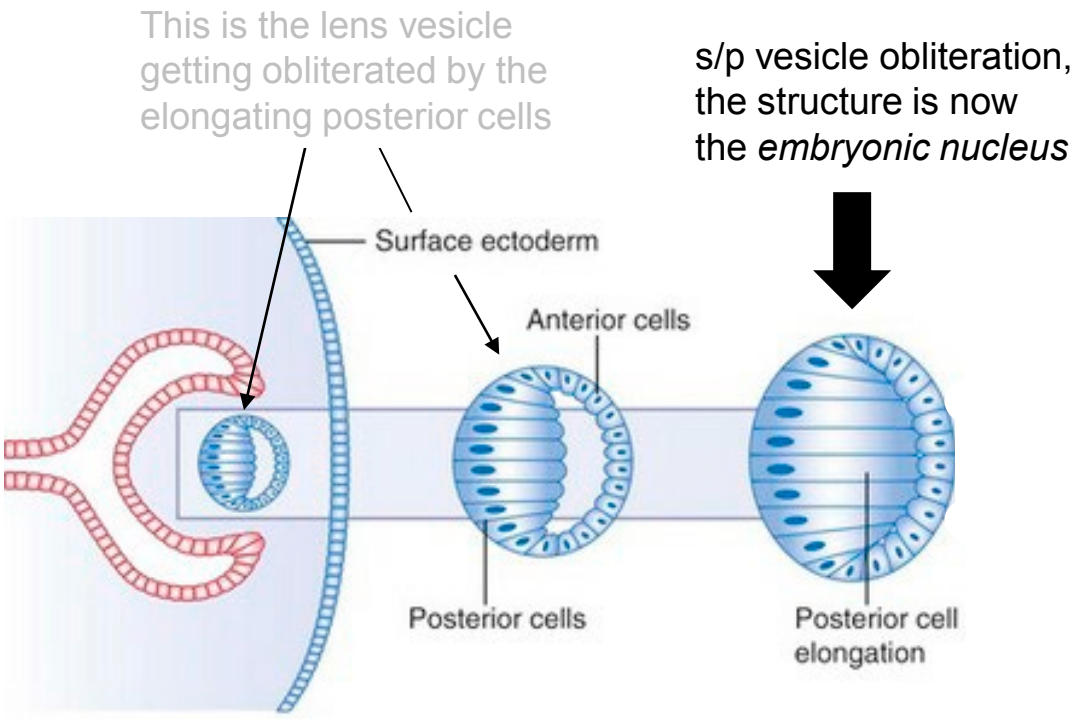
Lens Embryology



Posterior cells of the lens vesicle elongate to obliterate the vesicle's lumen, thus creating the embryonic nucleus

(No question—advance when ready)

Lens Embryology



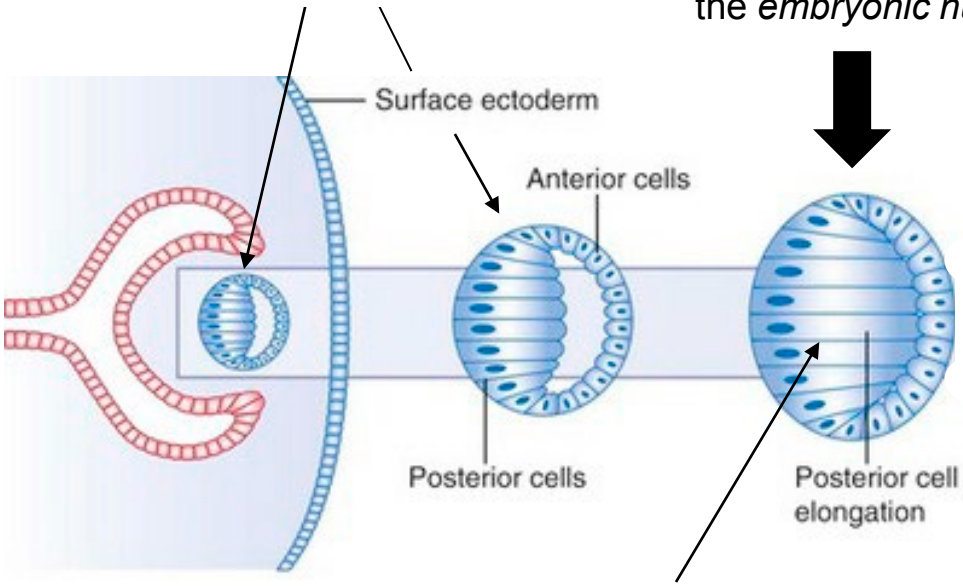
Posterior cells of the lens vesicle elongate to obliterate the vesicle's lumen, thus creating the embryonic nucleus

(No question—advance when ready)

Lens Embryology

This is the lens vesicle getting obliterated by the elongating posterior cells

s/p vesicle obliteration, the structure is now the *embryonic nucleus*



As they elongate, these cells lose their organelles and thereby transform into ‘fibers.’

Posterior cells of the lens vesicle elongate to obliterate the vesicle's lumen, thus creating the embryonic nucleus

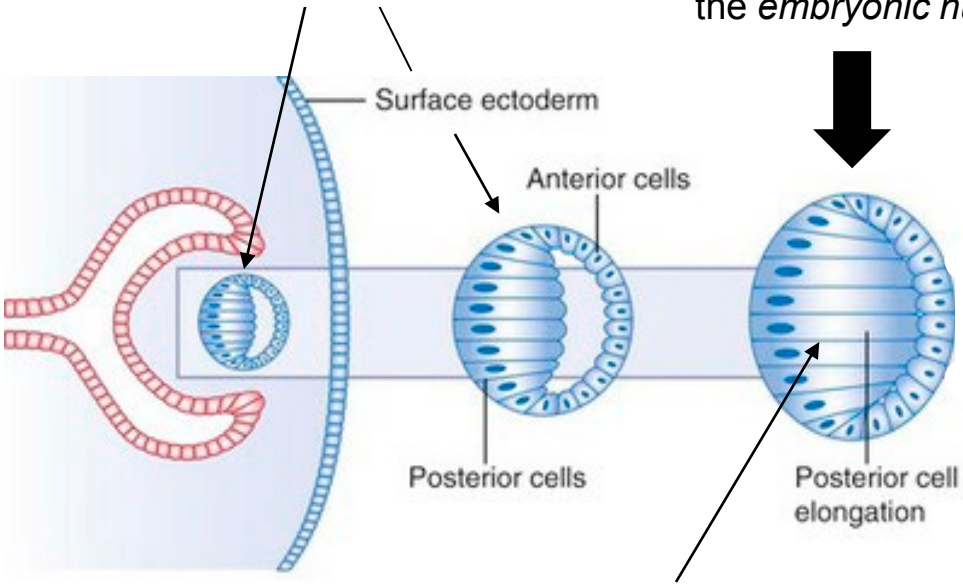
(No question yet—advance when ready)

Q

Lens Embryology

This is the lens vesicle getting obliterated by the elongating posterior cells

s/p vesicle obliteration, the structure is now the *embryonic nucleus*



As they elongate, these cells lose their organelles and thereby transform into 'fibers.' They are known as the [redacted] *lens fibers.*

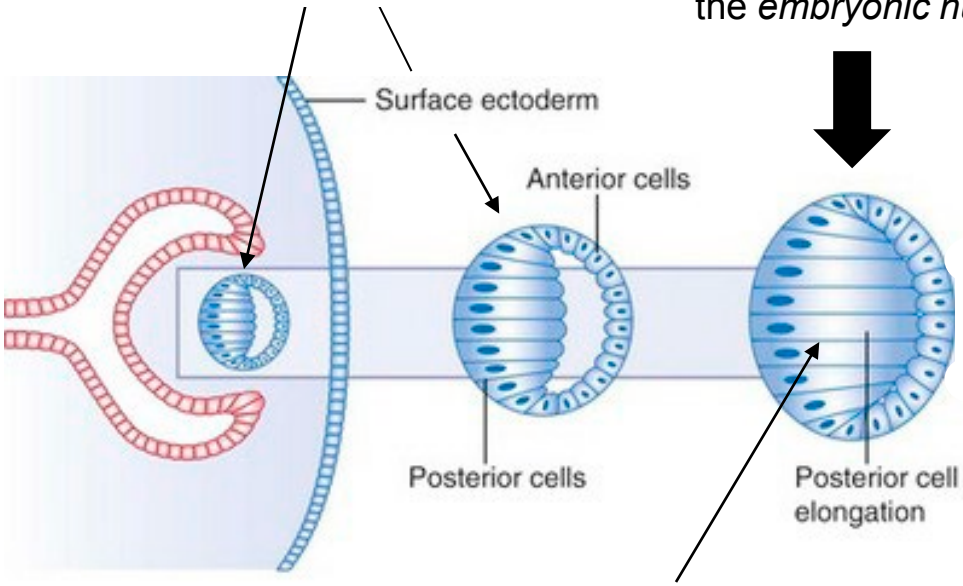
Posterior cells of the lens vesicle elongate to obliterate the vesicle's lumen, thus creating the embryonic nucleus

A

Lens Embryology

This is the lens vesicle getting obliterated by the elongating posterior cells

s/p vesicle obliteration, the structure is now the *embryonic nucleus*



As they elongate, these cells lose their organelles and thereby transform into 'fibers.' They are known as the *primary lens fibers.*

Posterior cells of the lens vesicle elongate to obliterate the vesicle's lumen, thus creating the embryonic nucleus

Q

Lens Embryology

- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*
- T/F: The ~~optic~~ *lens* vesicle is the primordial structure that becomes the lens. It consists of a single layer of cuboidal cells encased within their basement membrane **F**
- T/F: The ~~anterior~~ *posterior* cells of the lens vesicle elongate and progressively obliterate the lumen, forming the embryonic nucleus **F**
- The anterior cells become the [two words]

A

Lens Embryology

- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*
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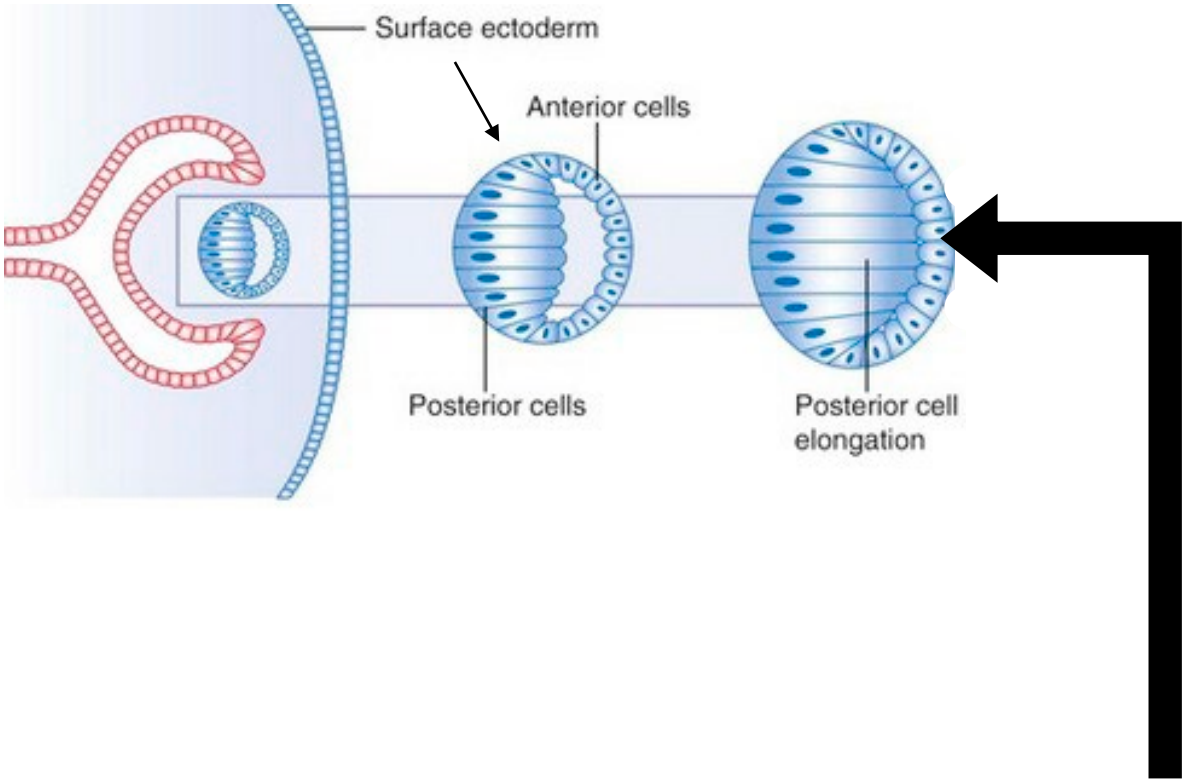
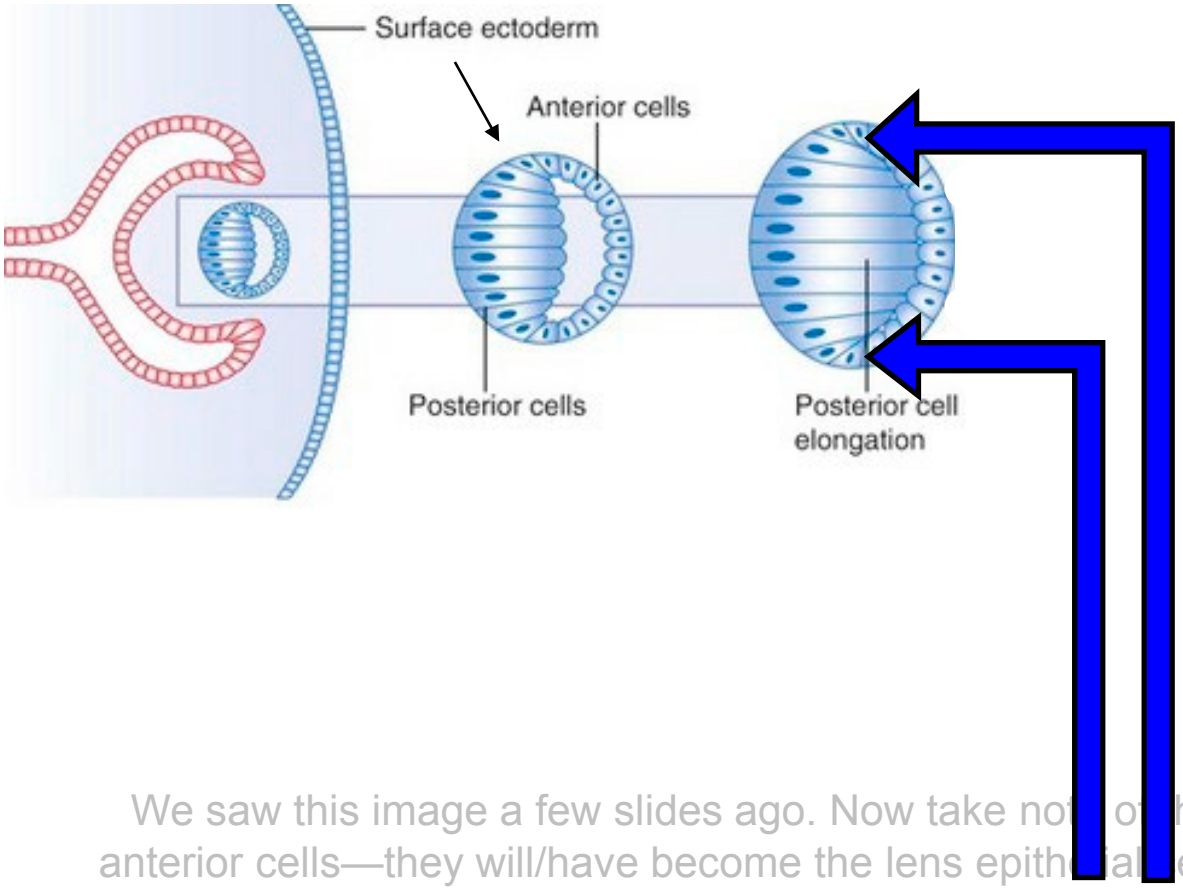
- The anterior cells become the *lens epithelium*

Lens Embryology



We saw this image a few slides ago. Now take note of the anterior cells—they will/have become the lens epithelial cells.

Lens Embryology



We saw this image a few slides ago. Now take note of the anterior cells—they will/have become the lens epithelial cells.

Note also that they extend around to the lens' equatorial region.

Q

Lens Embryology

- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*
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- T/F: The ~~anterior~~ *posterior* cells of the lens vesicle elongate and progressively obliterate the lumen, forming the embryonic nucleus **F**
- The anterior cells become the *lens epithelium*
- The equatorial epi cells become fibers that elongate both anteriorly and posteriorly, thereby forming the

two words

A

Lens Embryology

- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*
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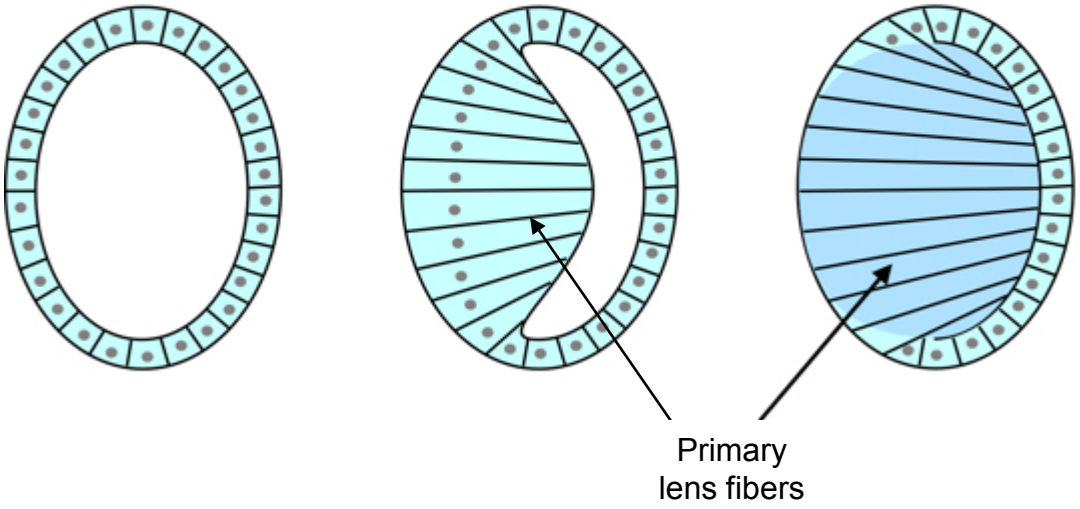
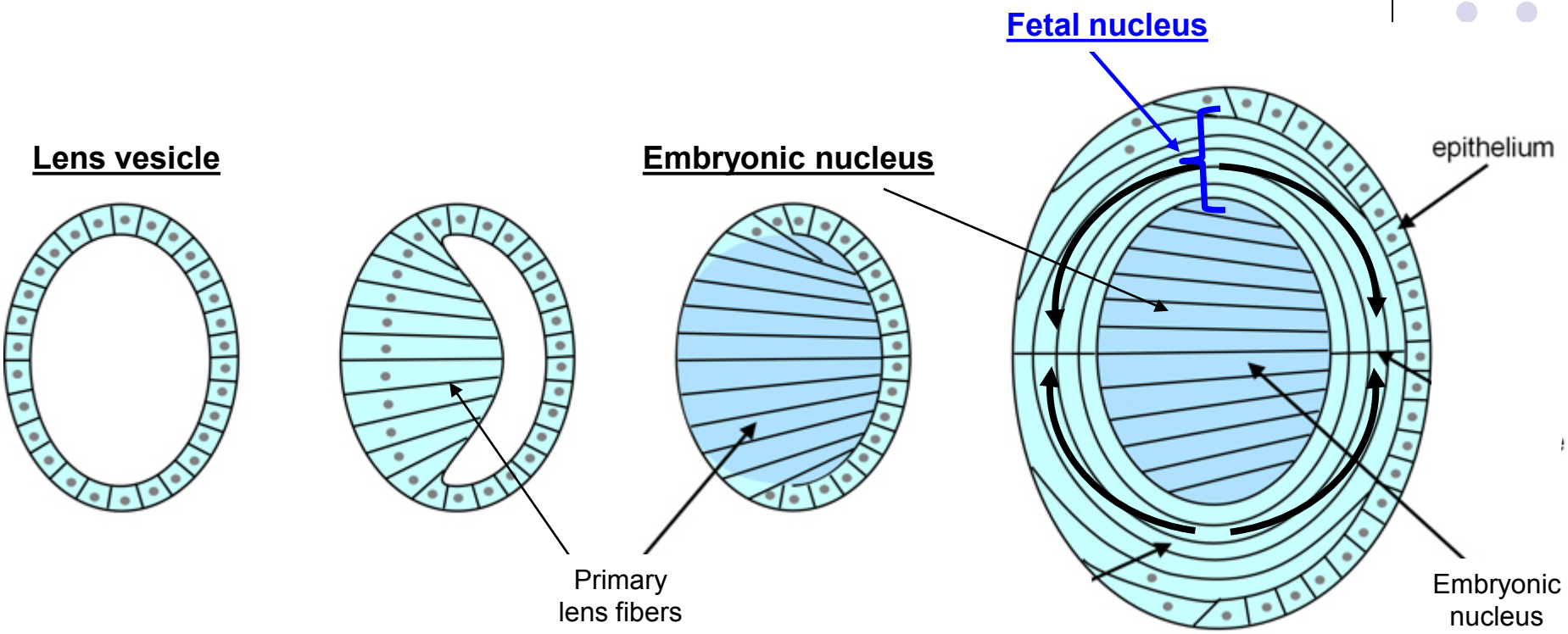
- The equatorial epi cells become fibers that elongate both anteriorly and posteriorly, thereby forming the *fetal nucleus*

Lens Embryology



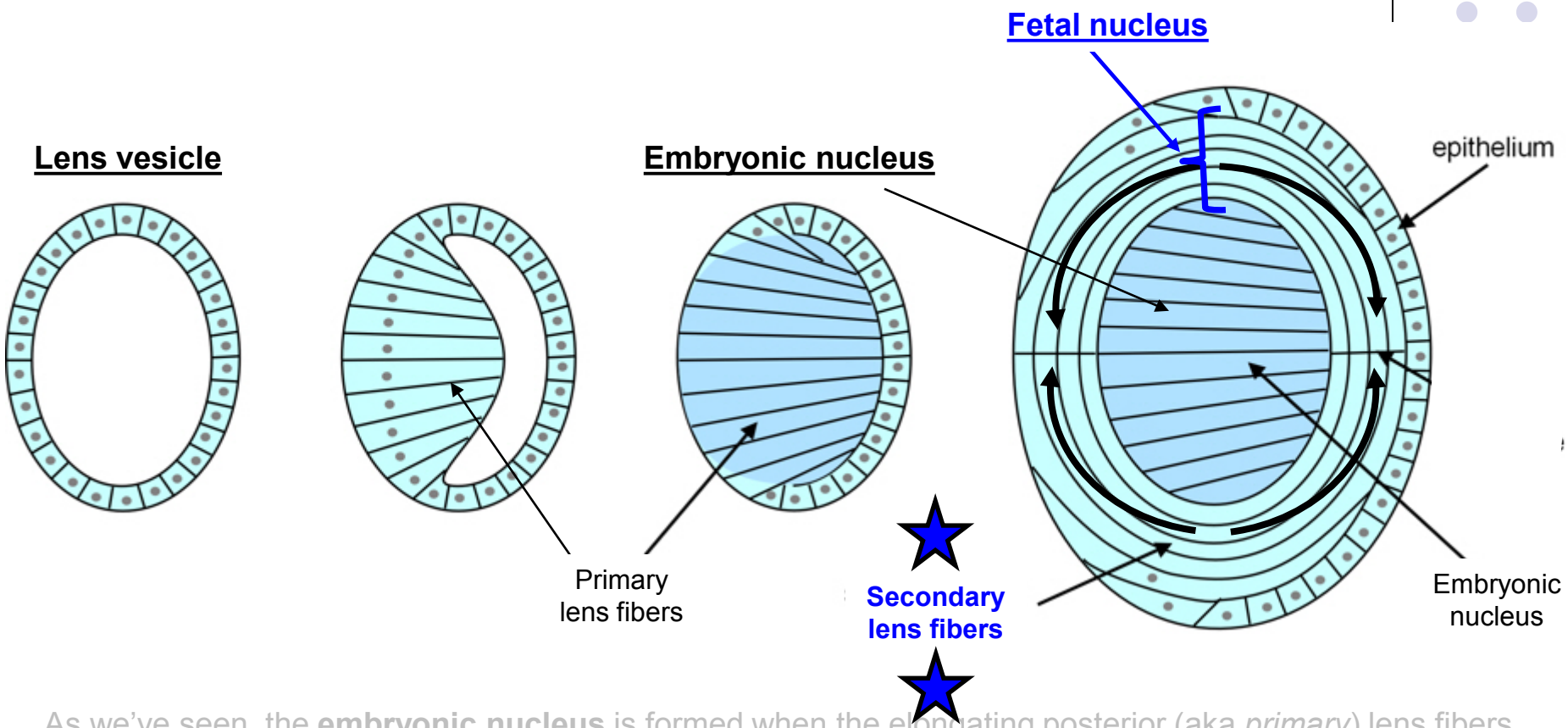
As we've seen, the **embryonic nucleus** is formed when the elongating posterior (aka *primary*) lens fibers obliterate the vesicle.

Lens Embryology



As we've seen, the **embryonic nucleus** is formed when the elongating posterior (aka *primary*) lens fibers obliterate the vesicle. The **fetal nucleus** is formed by the equatorial epithelial cells as they elongate both anteriorly (insinuating themselves between the anterior epithelial cells and the primary lens fibers of the embryonic nucleus) and posteriorly (insinuating themselves between the originations of the primary lens fibers and the underlying capsule).

Lens Embryology



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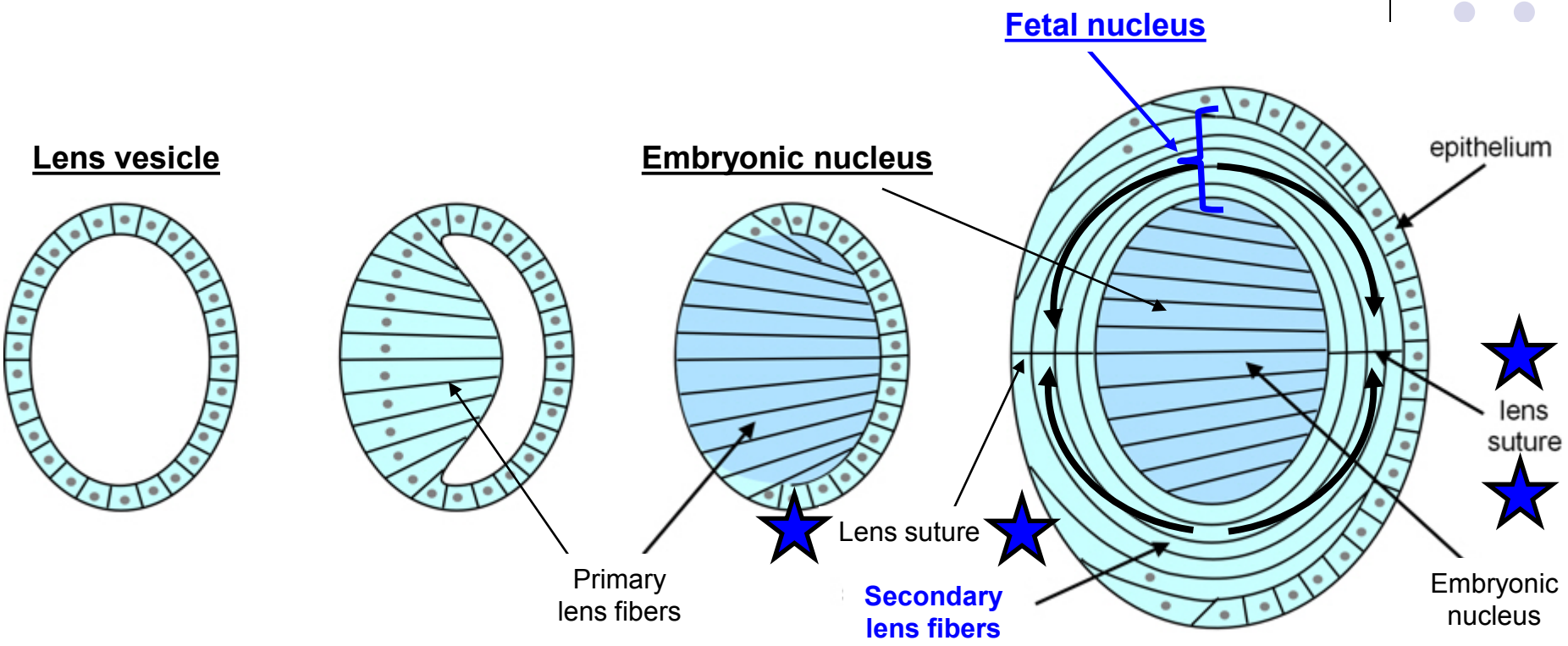
Lens Embryology



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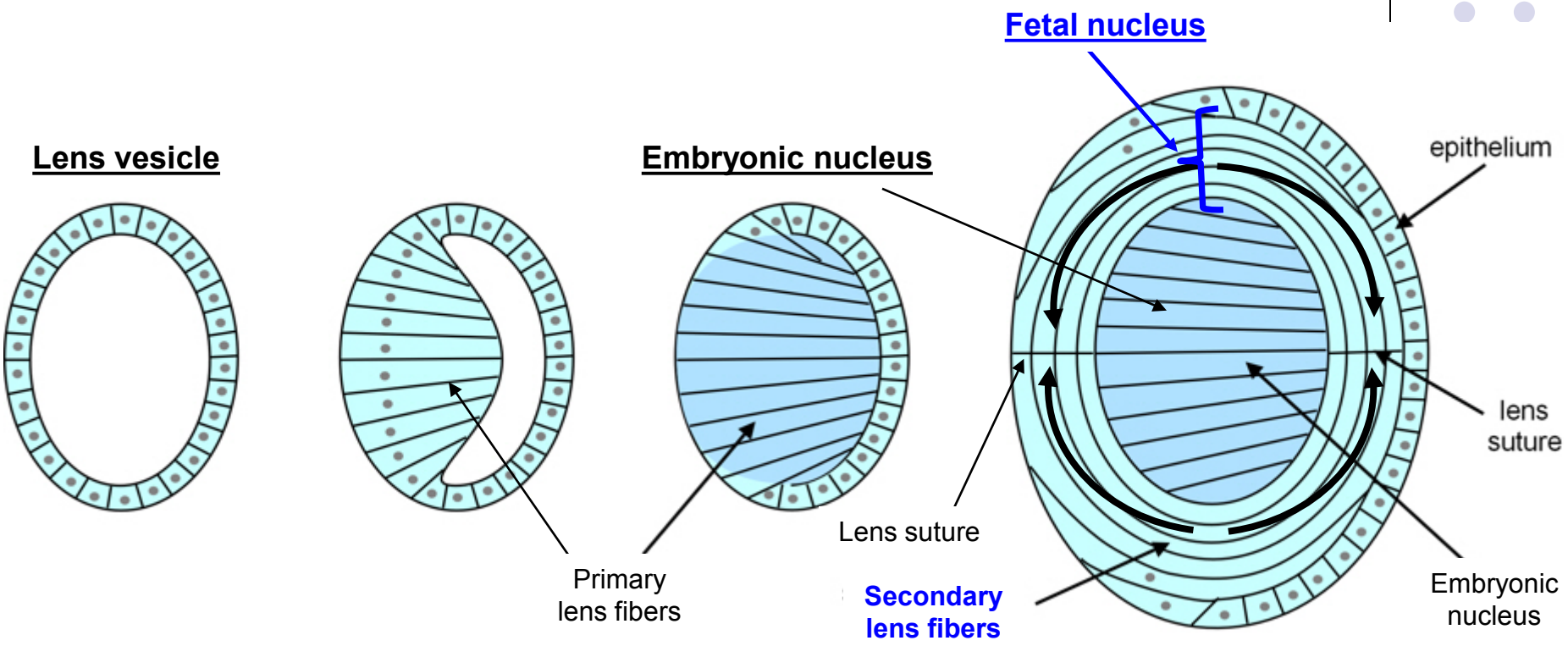
To be clear: The fetal nucleus is **not** this entire structure; rather, it is only the portion formed by the secondary lens fibers, as indicated by the { .



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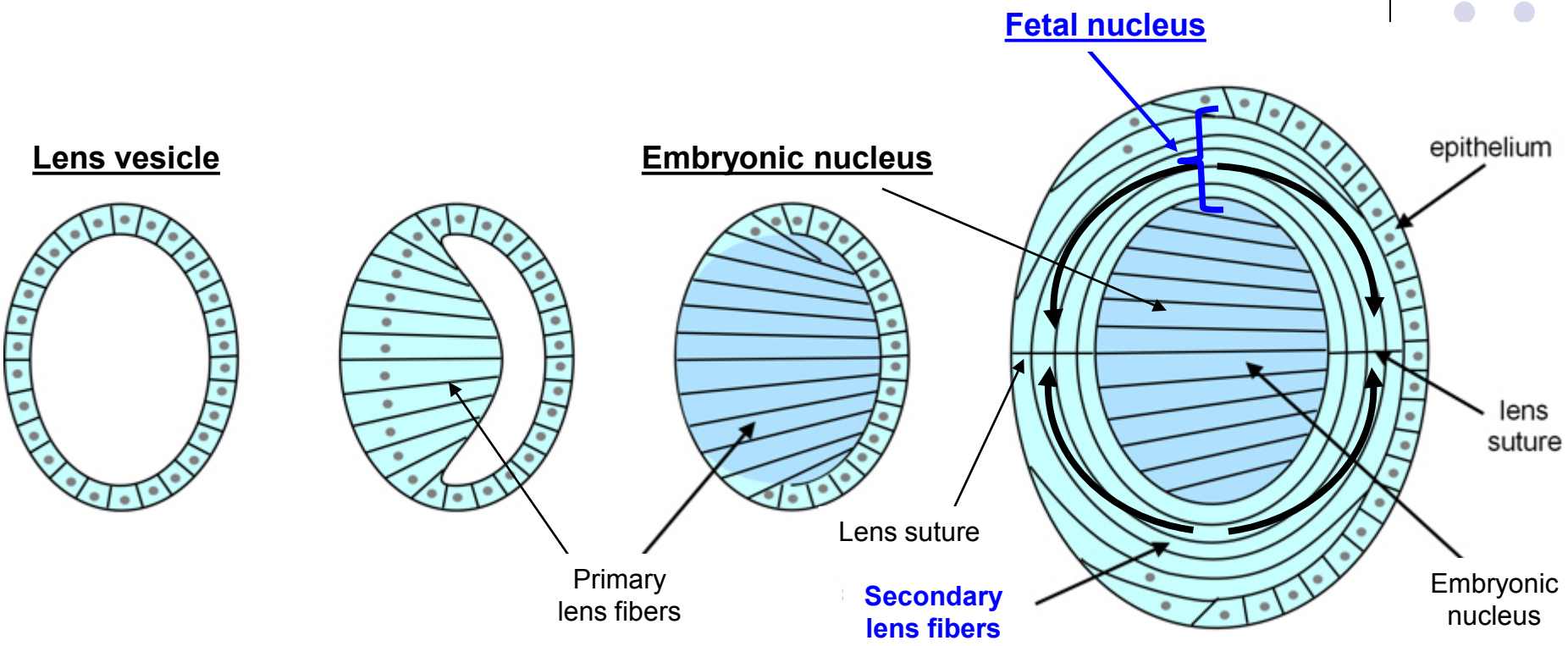
To be clear: The fetal nucleus is **not** this entire structure; rather, it is only the portion formed by the secondary lens fibers, as indicated by the { .
Put another way: The fetal nucleus *surrounds* the embryonic nucleus.



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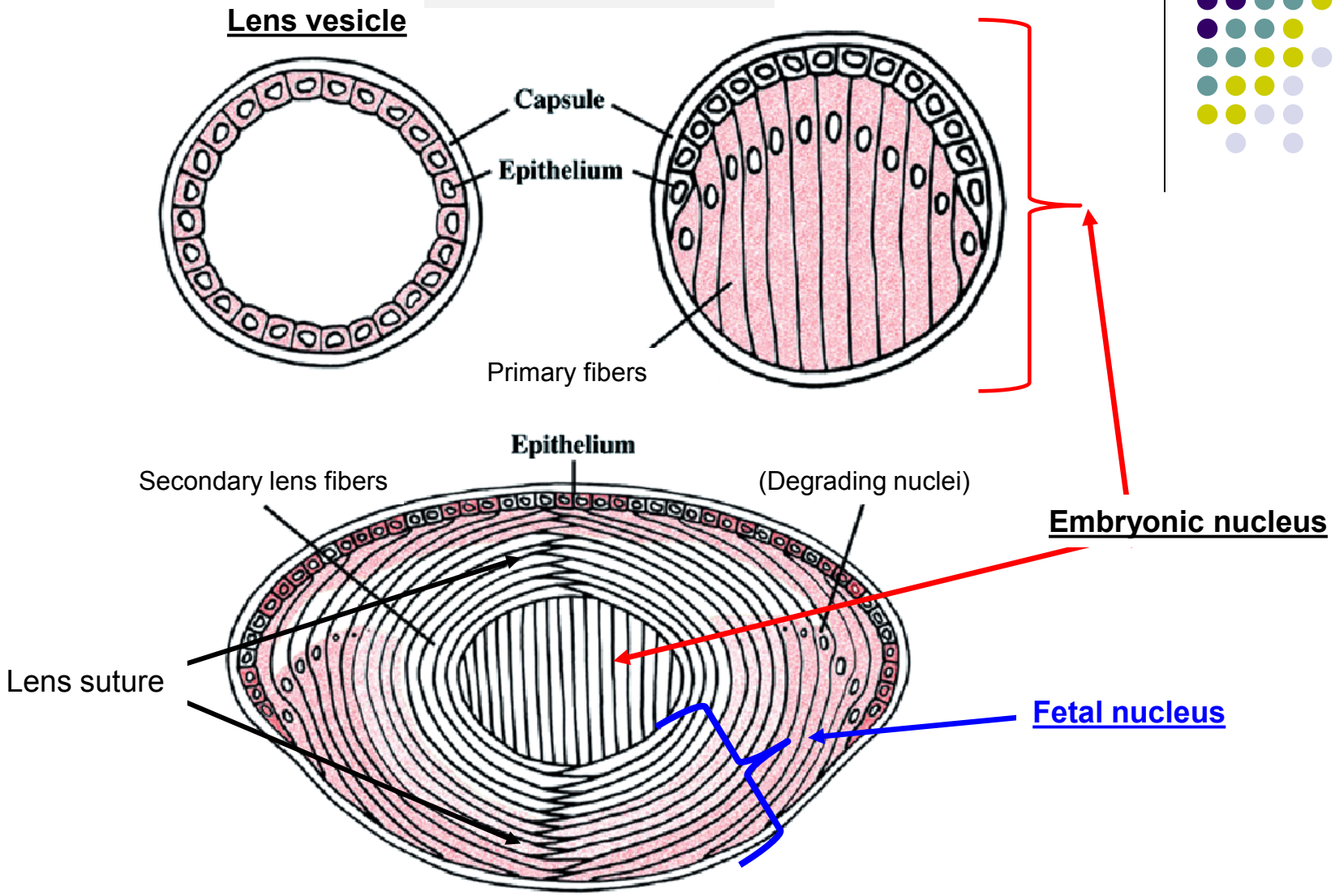
Lens Embryology



Another illustration making the same set of points

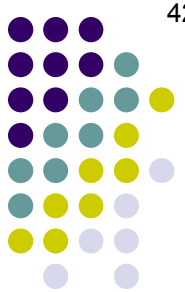
Q

Lens Embryology

- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*
- T/F: The ~~optic~~ *lens* vesicle is the primordial structure that becomes the lens. It consists of a single layer of cuboidal cells encased within their basement membrane **F**
- T/F: The ~~anterior~~ *posterior* cells of the lens vesicle elongate and progressively obliterate the lumen, forming the embryonic nucleus **F**
- The anterior cells become the *lens epithelium*
- The equatorial epi cells become fibers that elongate both anteriorly and posteriorly, thereby forming the *fetal nucleus*
- The two words (sort of) are formed by the anterior and posterior interdigitations of fetal nucleus fibers

A

Lens Embryology



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- The equatorial epi cells become fibers that elongate both anteriorly and posteriorly, thereby forming the *fetal nucleus*
- The *Y sutures* are formed by the anterior and posterior interdigitations of fetal nucleus fibers

Q

Lens Embryology

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- The anterior ce
- The equatorial anteriorly and p
- The ***Y sutures*** interdigitations

(Here begins the 'more to say about the lens sutures' alluded to previously.)

Why are they called the 'Y sutures'?

A

Lens Embryology

- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*
- T/F: The ~~optic~~ *lens* vesicle is the primordial structure that becomes the lens. It consists of a single layer of cuboidal cells encased within their basement membrane **F**
- T/F: The ~~anterior~~ *posterior* cells of the lens vesicle elongate and progressively obliterate the lumen, forming the embryonic nucl
- The anterior ce
- The equatorial anteriorly and p
- The ***Y sutures*** interdigitations

(Here begins the 'more to say about the lens sutures' alluded to previously.)

Why are they called the 'Y sutures'?
Because they look like the letter *Y*

Q

Lens Embryology

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How many Y sutures are there?

A

Lens Embryology

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How many Y sutures are there?
Just the two—one anterior, one posterior

Q

Lens Embryology

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How many Y sutures are there?
Just the two—one anterior, one posterior

How are they oriented?

Q/A

Lens Embryology

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Because they look like the letter *Y*

How many Y sutures are there?
Just the two—one anterior, one posterior

How are they oriented?
The anterior vs posterior one is right-side up; the anterior vs posterior one , upside down

A

Lens Embryology

- Which embryologic cell line gives rise to all of the components of the lens? *Surface ectoderm*
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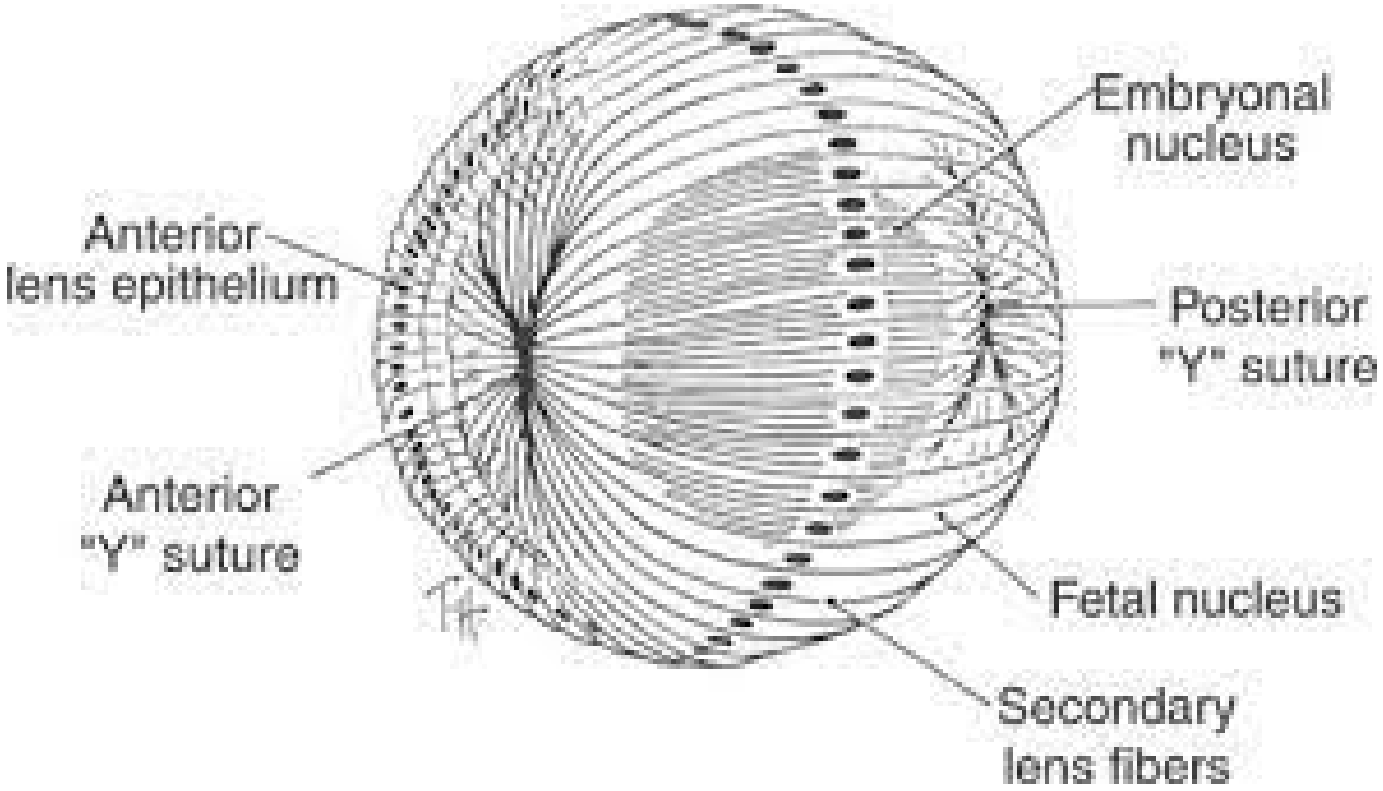
Because they look like the letter *Y*

How many Y sutures are there?
Just the two—one anterior, one posterior

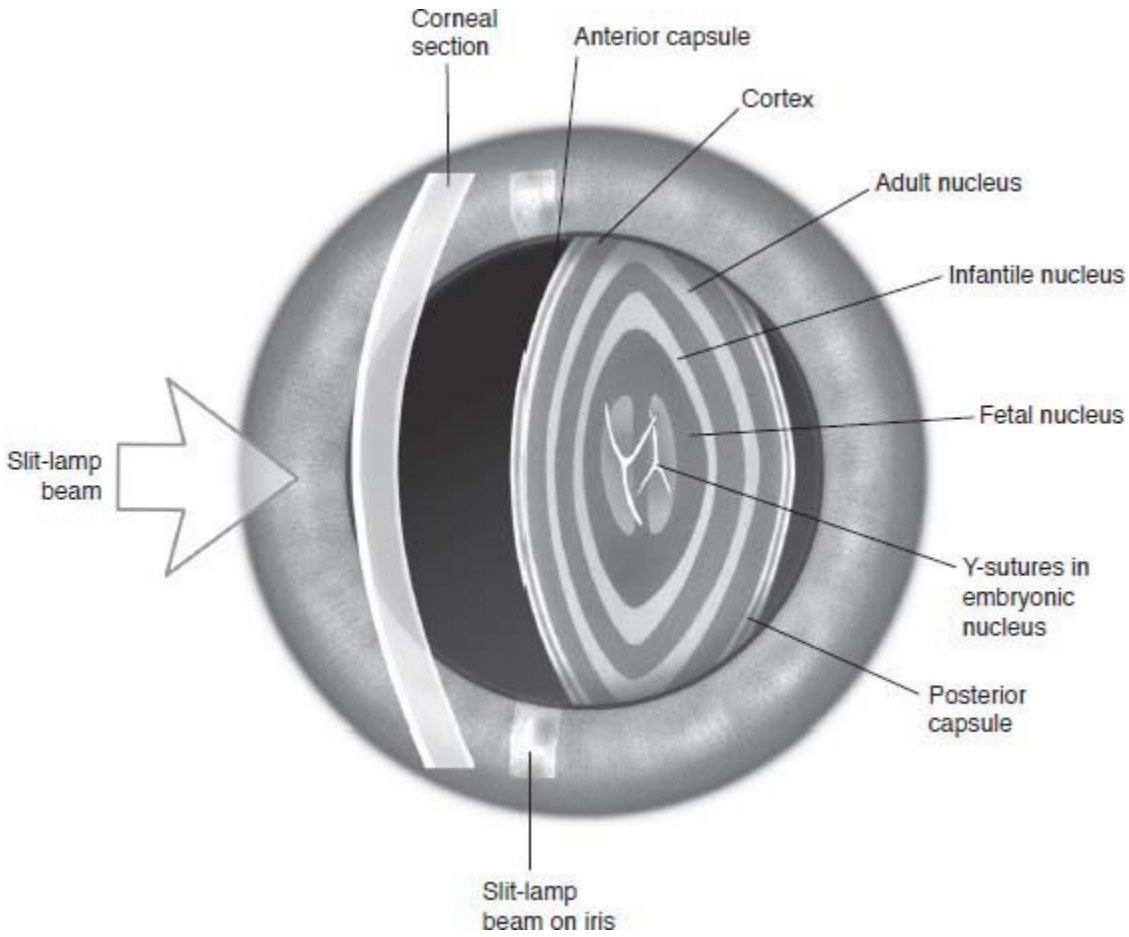
How are they oriented?
The anterior one is right-side up; the posterior one , upside down

Lens Embryology



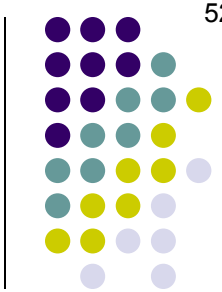
Lens: *Y* suture formation

Lens Embryology



Y sutures as they might be seen at the slit lamp

Lens Embryology

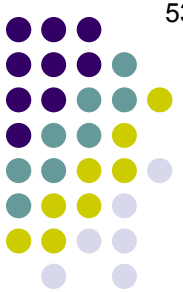


The *lens* originates as a thickening of surface ectoderm overlying the *optic* (not lens!) *vesicle*, an outpouching of the primitive forebrain destined to become the neurosensory retina, RPE, and ciliary body epithelium (among other things). This thickened area of surface ectoderm is called the *lens placode*. The placode subsequently invaginates (at the *lens pit*), eventually forming a fluid-filled sphere containing a single layer of cells; this sphere is the *lens* (not optic!) *vesicle*. The outer wall of the lens vesicle consists of the basement membrane of the surface ectoderm cells now lining the *inner* aspect of the vesicle; this BM will form the *lens capsule*. The cells at the posterior aspect of the vesicle elongate to obliterate the vesicle's lumen and transform into the *primary lens fibers* that comprise the *embryonic nucleus*. Soon thereafter, equatorial epithelial cells elongate both anteriorly and posteriorly; as they encounter one another at the anterior and posterior poles, they interdigitate in a manner that creates the *Y sutures*. These *secondary lens fibers* comprise the *fetal nucleus*.

(No question—review slide)

Q

Lens (Vasculature) Embryology



- The vascular supply encapsulating the developing lens is called the something something something

A

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis

Q

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
  It has three sections:

  1) ***?***

  2) ***?***

  3) ***?***

A

Lens (Vasculature) Embryology

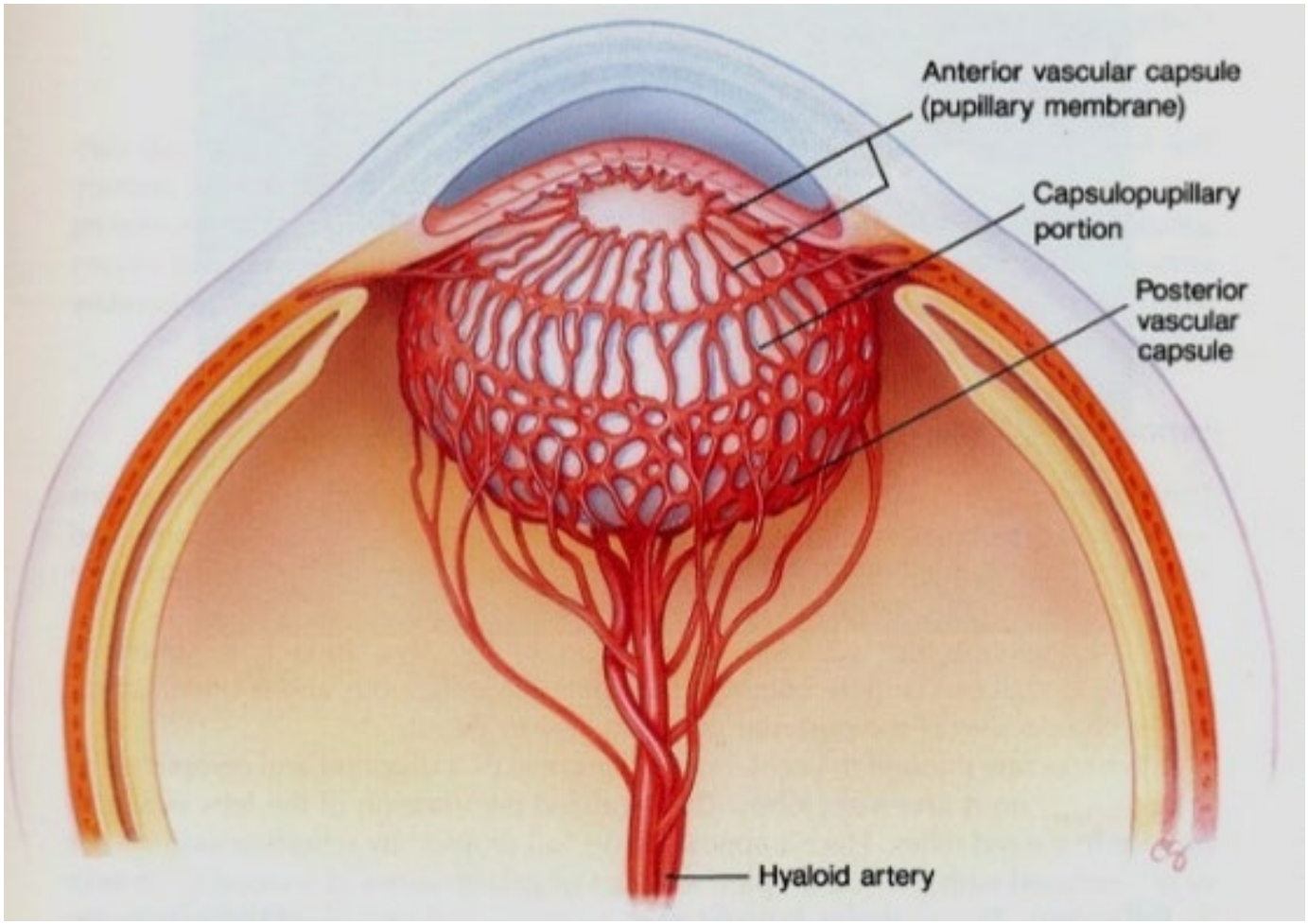
- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
  It has three sections:

  1) The *posterior vascular capsule*

  2) The *anterior vascular capsule*

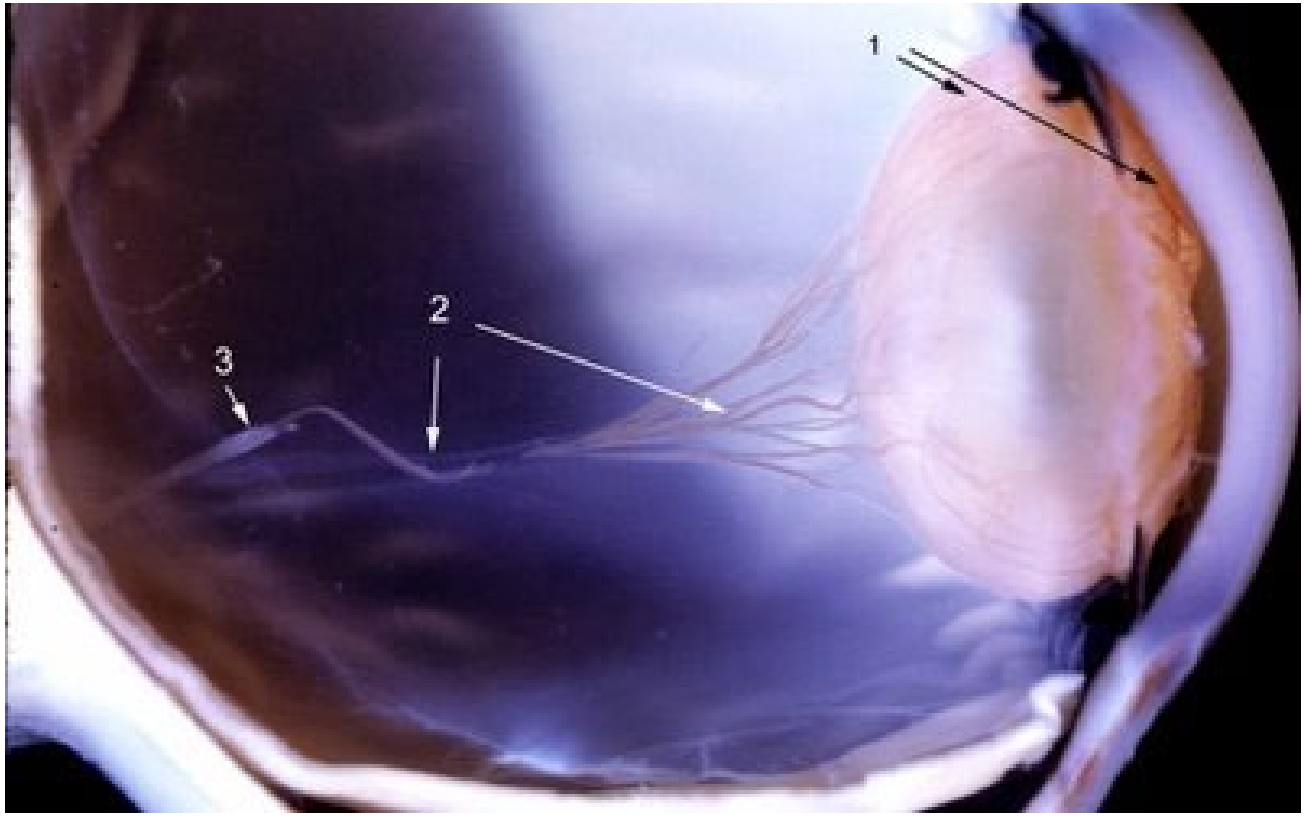
  3) The *capsulopupillary portion*

Lens (Vasculature) Embryology



Tunica vasculosa lentis

Lens (Vasculature) Embryology



In the eye of this very premature infant, the **tunica vasculosa lentis** surrounds the lens (arrows 1).

(We'll get to Arrows 2 and 3 shortly)

Q

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
  It has three sections:

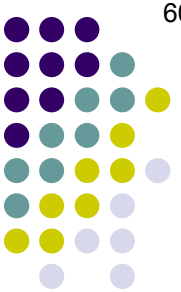
  1) The *posterior vascular capsule* arises from the [ ] artery

  2) The *anterior vascular capsule*

  3) The *capsulopupillary portion*

Q

Lens (Vasculature) Embryology



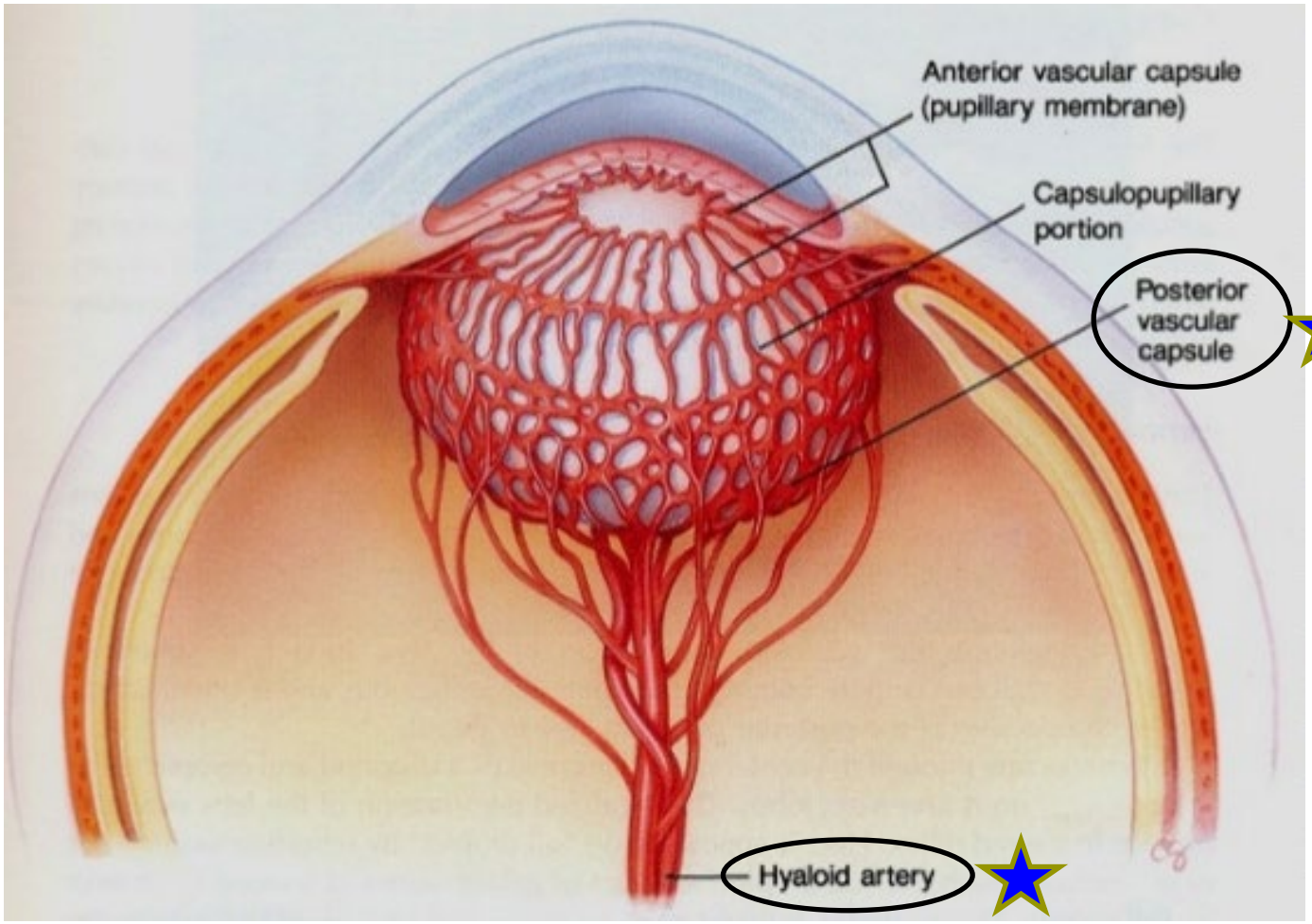
- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
  It has three sections:

  1) The *posterior vascular capsule* arises from the hyaloid artery

  2) The *anterior vascular capsule*

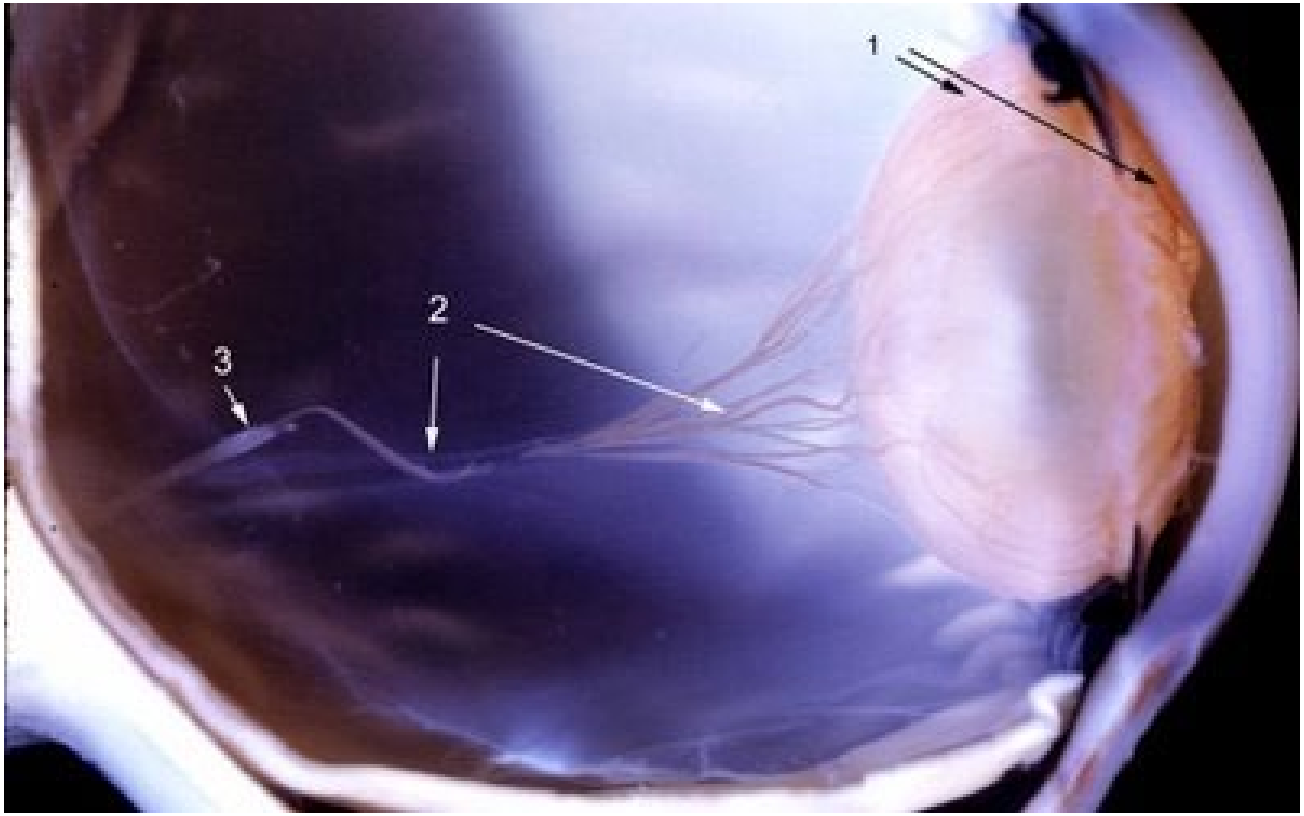
  3) The *capsulopupillary portion*

Lens (Vasculature) Embryology



Tunica vasculosa lentis: Posterior vascular capsule

Lens (Vasculature) Embryology



In the eye of this very premature infant, the **tunica vasculosa lentis** surrounds the lens (arrows 1). It is contiguous with the hyaloid artery and its branches (arrow 2).

Q

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing len tis.
  It
  1) the **hyaloid artery**
  2)
  3) The *capsulopupillary portion*

The hyaloid artery runs from where to where?

A

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing len tis.
  It
  1) the **hyaloid** **artery**
  2)
  3) The *capsulopupillary portion*

The hyaloid artery runs from where to where?
From the optic nerve head to the back of the fetal lens

Q

Lens (Vasculature) Embryology

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The hyaloid artery runs from where to where?
From the optic nerve head to the back of the fetal lens

Does it survive into post-fetal life?

A

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing len tis.
  It

1) the **hyaloid artery**

2)

3) The *capsulopupillary portion*

The hyaloid artery runs from where to where?
From the optic nerve head to the back of the fetal lens

Does it survive into post-fetal life?
No—it is supposed to regress prior to birth

Q

Lens (Vasculature) Embryology

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The hyaloid artery runs from where to where?
From the optic nerve head to the back of the fetal lens

Does it survive into post-fetal life?
No—it is supposed to regress prior to birth

What is the name of the trans-vitreous passageway that remains after it regresses?

A

Lens (Vasculature) Embryology

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The hyaloid artery runs from where to where?
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Does it survive into post-fetal life?
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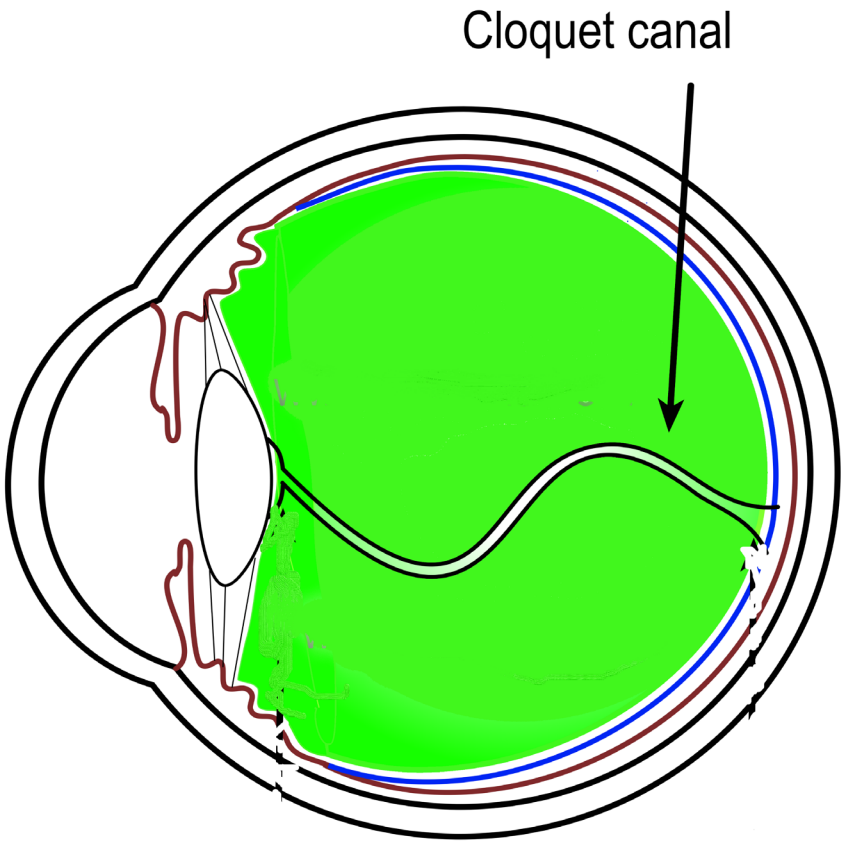
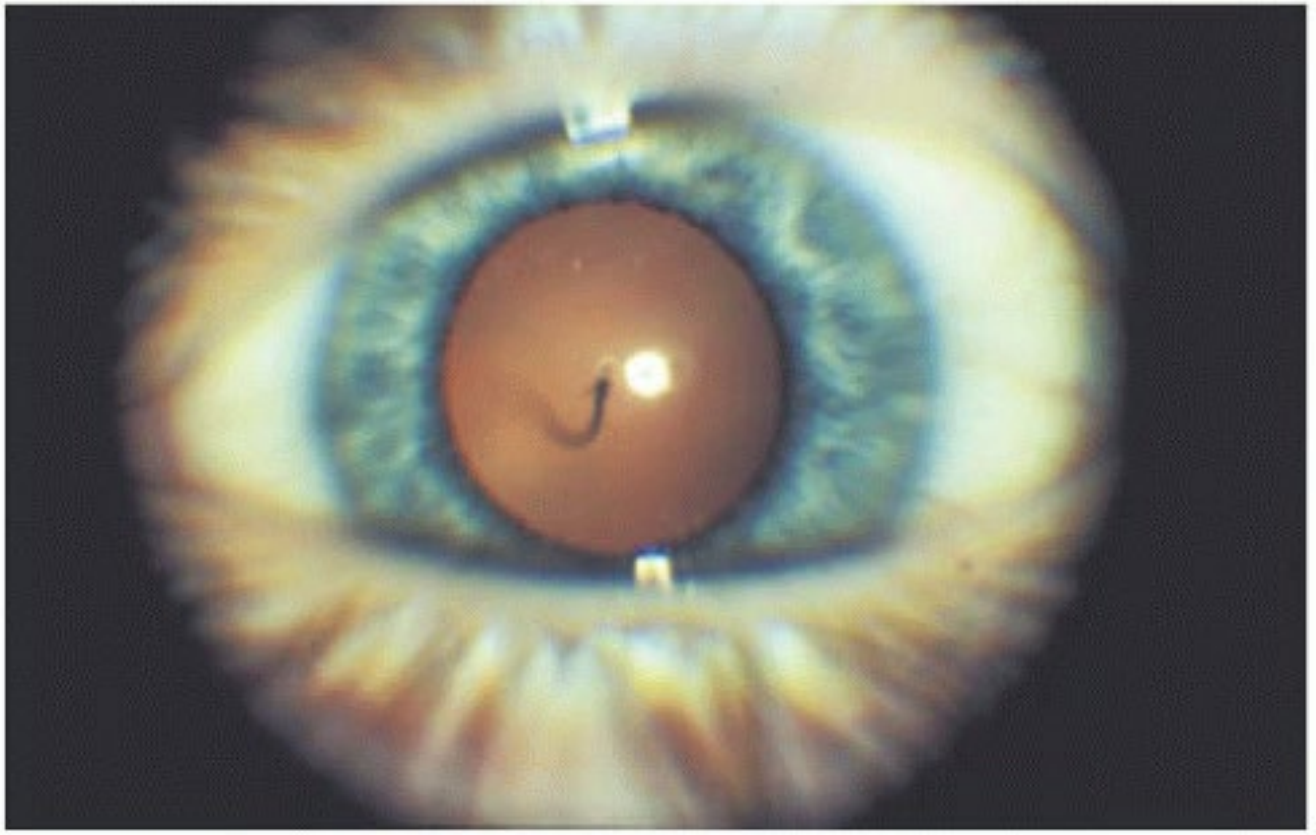
What is the name of the trans-vitreous passageway that remains after it regresses?
Cloquet's canal

Lens (Vasculature) Embryology



Cloquet's canal

Lens (Vasculature) Embryology



Single loop of a persistent hyaloid artery extending anteriorly within Cloquet's canal to insert on the posterior capsule of the lens.

Q

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing len tis.
  It

The hyaloid artery runs from where to where?
From the optic nerve head to the back of the fetal lens

Does it survive into post-fetal life?
No—it is **supposed** to regress prior to birth

1) the **hyaloid** artery

'Supposed to regress' implies it doesn't always do so. Is this the case?

2)

3) The *capsulopupillary portion*

A

Lens (Vasculature) Embryology

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Does it survive into post-fetal life?
No—it is **supposed** to regress prior to birth

'Supposed to regress' implies it doesn't always do so. Is this the case?
Yes—in a significant number of people, complete regression fails to occur (to some degree)

Q

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing lens is.
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2)

3) The *capsulopupillary portion*

The hyaloid artery runs from where to where?
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'Supposed to regress' implies it doesn't always do so. Is this the case?
Yes—in a significant number of people, complete regression **fails to occur** (to some degree)

Is this failure-to-regress clinically significant?

A

Lens (Vasculature) Embryology

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The hyaloid artery runs from where to where?
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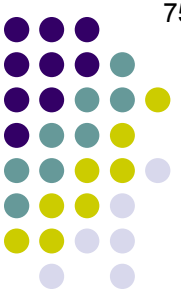
Does it survive into post-fetal life?
No—it is **supposed** to regress prior to birth

'Supposed to regress' implies it doesn't always do so. Is this the case?
Yes—in a significant number of people, complete regression **fails to occur** (to some degree)

Is this failure-to-regress clinically significant?
In the vast majority of cases, no; but it is **extremely** significant —as in sight-threatening—in a few (more on this shortly)

Q

Lens (Vasculature) Embryology



- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
  It has three sections:

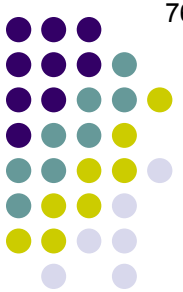
  1) The *posterior vascular capsule* arises from the hyaloid artery
     - A common, clinically insignificant remnant is the [two words]

  2) The *anterior vascular capsule*

  3) The *capsulopupillary portion*

A

Lens (Vasculature) Embryology



- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
  It has three sections:

  1) The *posterior vascular capsule* arises from the hyaloid artery
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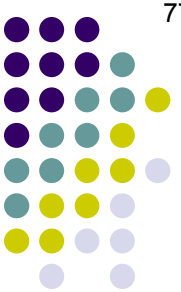
  2) The *anterior vascular capsule*

  3) The *capsulopupillary portion*

Q

Lens (Vasculature) Embryology



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  1) The *posterior vascular capsule* arises from the hyaloid artery
     - A common, clinically insignificant remnant is the Mittendorf dot

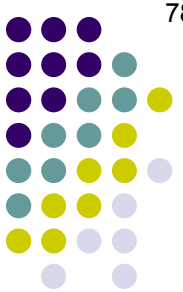
  (two words works too—more about it shortly)

  2) The *anterior vascular capsule*

  3) The *capsulopupillary portion*

A

Lens (Vasculature) Embryology



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  It has three sections:

  1) The *posterior vascular capsule* arises from the hyaloid artery
     - A common, clinically insignificant remnant is the Mittendorf dot

  (*Bergmeister papillae* works too—more about it shortly)

  2) The *anterior vascular capsule*

  3) The *capsulopupillary portion*

Q

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
  It
  1
  2
  3) The *capsulopupillary portion*

How does a Mittendorf dot present clinically?

ne hyaloid artery
the **Mittendorf dot**

A

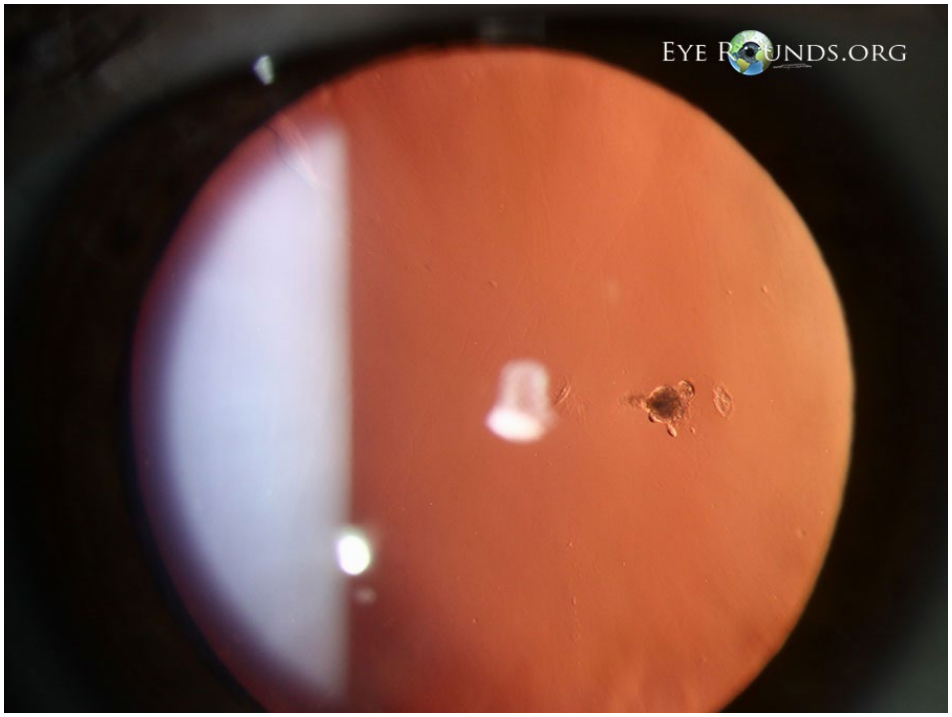
Lens (Vasculature) Embryology

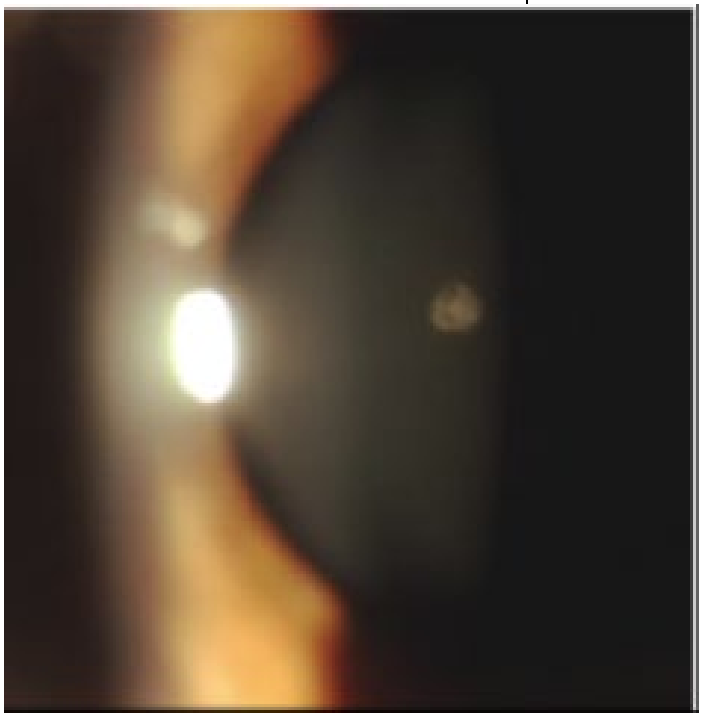
- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
  It
  1 ...he hyaloid artery
  ... the **Mittendorf dot**
  2

How does a Mittendorf dot present clinically?
As a small white dot on the posterior capsule of the lens

3) The *capsulopupillary portion*

Lens (Vasculature) Embryology





Mittendorf dot

Q

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
  It
  1 ne hyaloid artery
  the **Mittendorf dot**
  2
  3) The *capsulopupillary portion*

How does a Mittendorf dot present clinically?
As a small white dot on the posterior capsule of the lens

Is it located on the central aspect of the capsule?

A

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
  It
  1 ne hyaloid artery
  the **Mittendorf dot**
  2

How does a Mittendorf dot present clinically?
As a small white dot on the posterior capsule of the lens

Is it located on the central aspect of the capsule?
No, usually it is a bit nasal and inferior of center

3) The *capsulopupillary portion*

Q

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
  It
  1 ne hyaloid artery
  the **Mittendorf dot**
  2

How does a Mittendorf dot present clinically?
As a small white dot on the posterior capsule of the lens

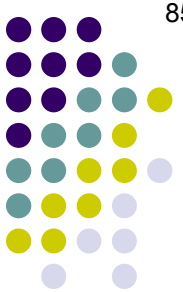
Is it located on the central aspect of the capsule?
No, usually it is a bit nasal and inferior of center

If you encounter a larger, gnarlier, more central opacification involving the posterior capsule, is that also a Mittendorf dot?

3) The *capsulopupillary portion*

Q/A

Lens (Vasculature) Embryology



- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
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  1) ...he hyaloid artery
  ...the **Mittendorf dot**
  2)

How does a Mittendorf dot present clinically?
As a small white dot on the posterior capsule of the lens

Is it located on the central aspect of the capsule?
No, usually it is a bit nasal and inferior of center

If you encounter a larger, gnarlier, more central opacification involving the posterior capsule, is that also a Mittendorf dot?
Perhaps, but the description is more consistent with a

three words

3) The *capsulopupillary portion*

A

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
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How does a Mittendorf dot present clinically?
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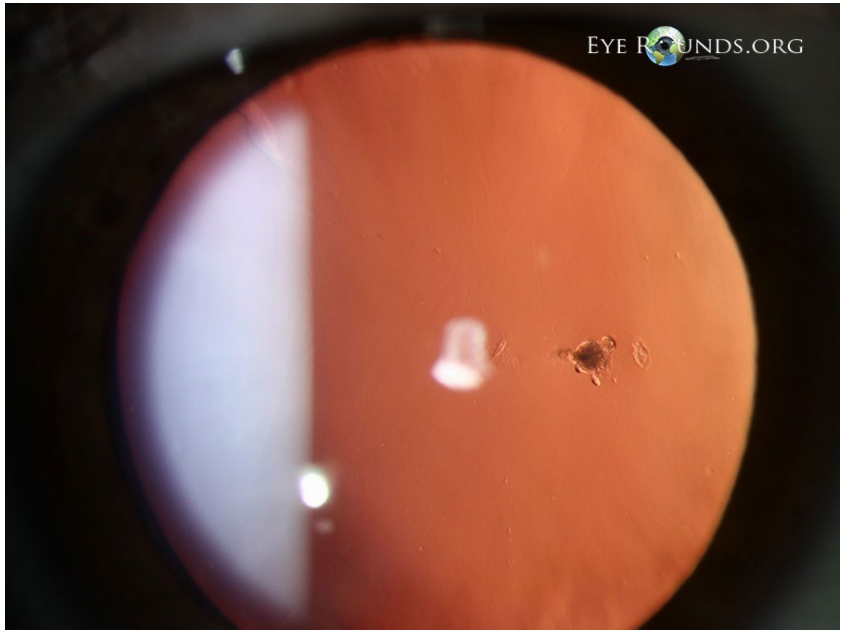
Is it located on the central aspect of the capsule?
No, usually it is a bit nasal and inferior of center

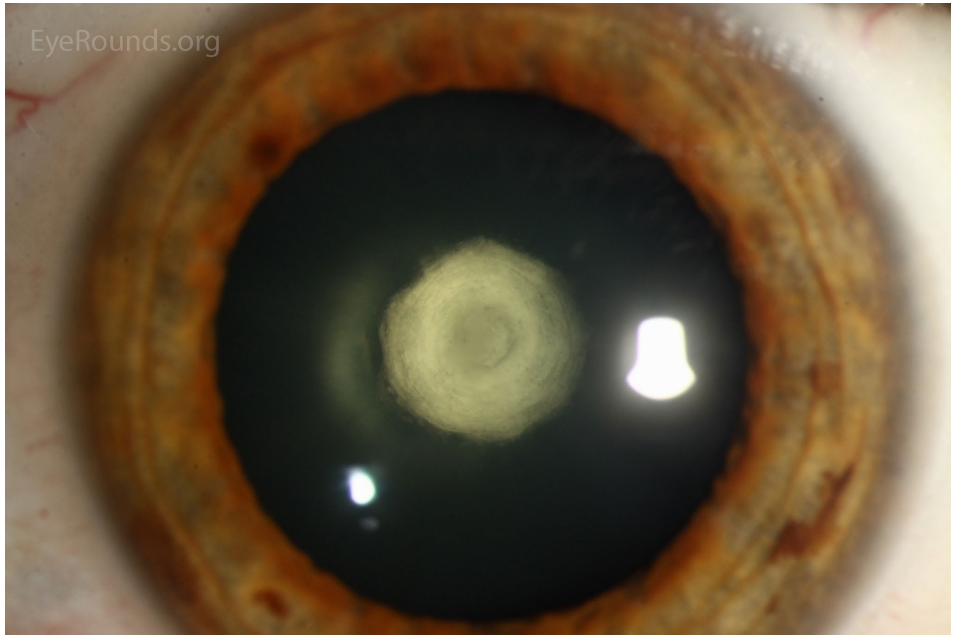
If you encounter a larger, gnarlier, more central opacification involving the posterior capsule, is that also a Mittendorf dot?
Perhaps, but the description is more consistent with a *posterior polar cataract*

3) The *capsulopupillary portion*

Lens (Vasculature) Embryology



Mittendorf dot



Posterior polar cataract

Q

Lens (Vasculature) Embryology

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  It
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     ... the **Mittendorf dot**
  2. ...

How does a Mittendorf dot present clinically?
As a small white dot on the posterior capsule of the lens

Is it located on the central aspect of the capsule?
No, usually it is a bit nasal and inferior of center

If you encounter a larger, gnarlier, more central opacification involving the posterior capsule, is that also a Mittendorf dot?
Perhaps, but the description is more consistent with a
posterior polar cataract

Is a posterior polar cataract clinically insignificant a la a Mittendorf dot?

Q/A

Lens (Vasculature) Embryology

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If you encounter a larger, gnarlier, more central opacification involving the posterior capsule, is that also a Mittendorf dot?
Perhaps, but the description is more consistent with a
posterior polar cataract

Is a posterior polar cataract clinically insignificant a la a Mittendorf dot?
No! It greatly increases the risk of [two words] during cataract surgery

A

Lens (Vasculature) Embryology

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Is a posterior polar cataract clinically insignificant a la a Mittendorf dot?
No! It greatly increases the risk of capsule rupture during cataract surgery

Q

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
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  1. ...he hyaloid artery
     ... the **Mittendorf dot**
  2. ...

How does a Mittendorf dot present clinically?
As a small white dot on the posterior capsule of the lens

Is it located on the central aspect of the capsule?
No, usually it is a bit nasal and inferior of center

If you encounter a larger, gnarlier, more central opacification involving the posterior capsule, is that also a Mittendorf dot?
Perhaps, but the description is more consistent with a
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But a posterior polar cataract is that vacuolated, hazy cataract associated with uveitis and/or steroid use. Why does it convey a risk of cap rupture?

Q/A

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No, that describes a three words

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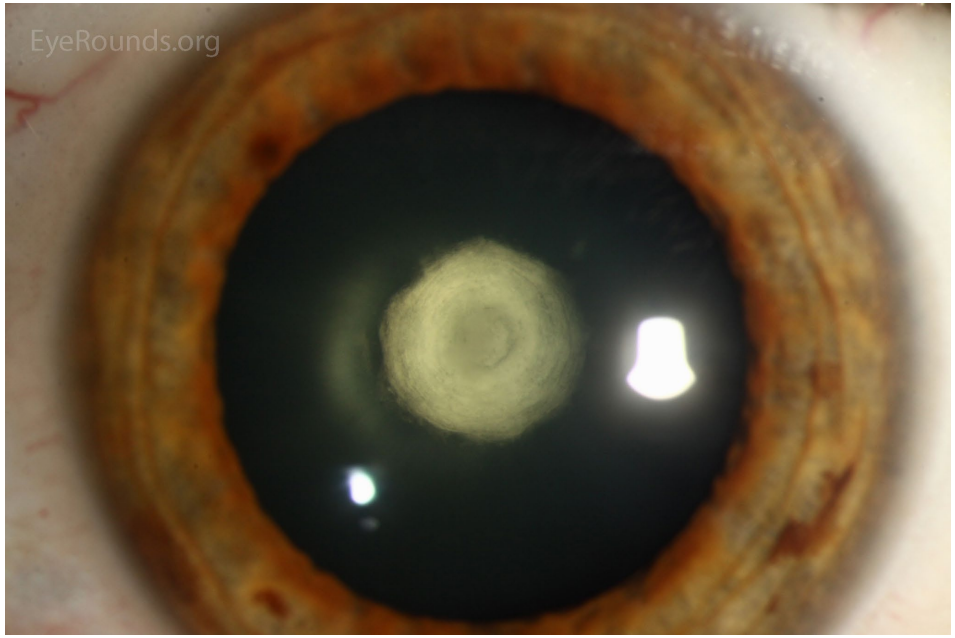
But a posterior polar cataract is that vacuolated, hazy cataract associated with uveitis and/or steroid use. Why does it convey a risk of cap rupture?
No, that describes a *posterior* **subcapsular** *cataract* (PSC) . PSCs are not related to posterior polar cats, and do not carry an increased risk of cap rupture.

Lens (Vasculature) Embryology

PSC



Posterior polar cataract

Q

Lens (Vasculature) Embryology

- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
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  1) The *posterior vascular capsule* arises from the hyaloid artery
     - *How does a Bergmeister papilla present clinically?*
     - t is the ~~Mittendorf dot~~ Bergmeister papilla

  2) The *anterior vascular capsule*

  3) The *capsulopupillary portion*

Q/A

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     - *How does a Bergmeister papilla present clinically?*
       As a tuft of glial-like tissue extending veil-like from the optic nerve head *vs* posterior capsule a short distance into the vitreous
     - t is the ~~Mittendorf dot~~ Bergmeister papilla

  2) ~~The anterior vascular capsule~~

  3) The *capsulopupillary portion*

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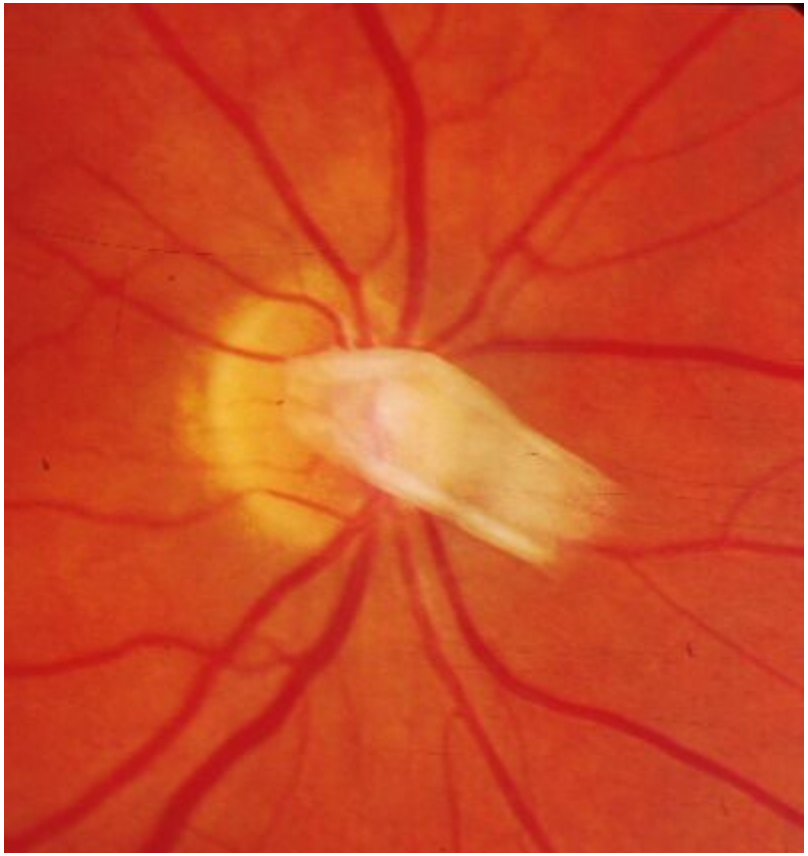
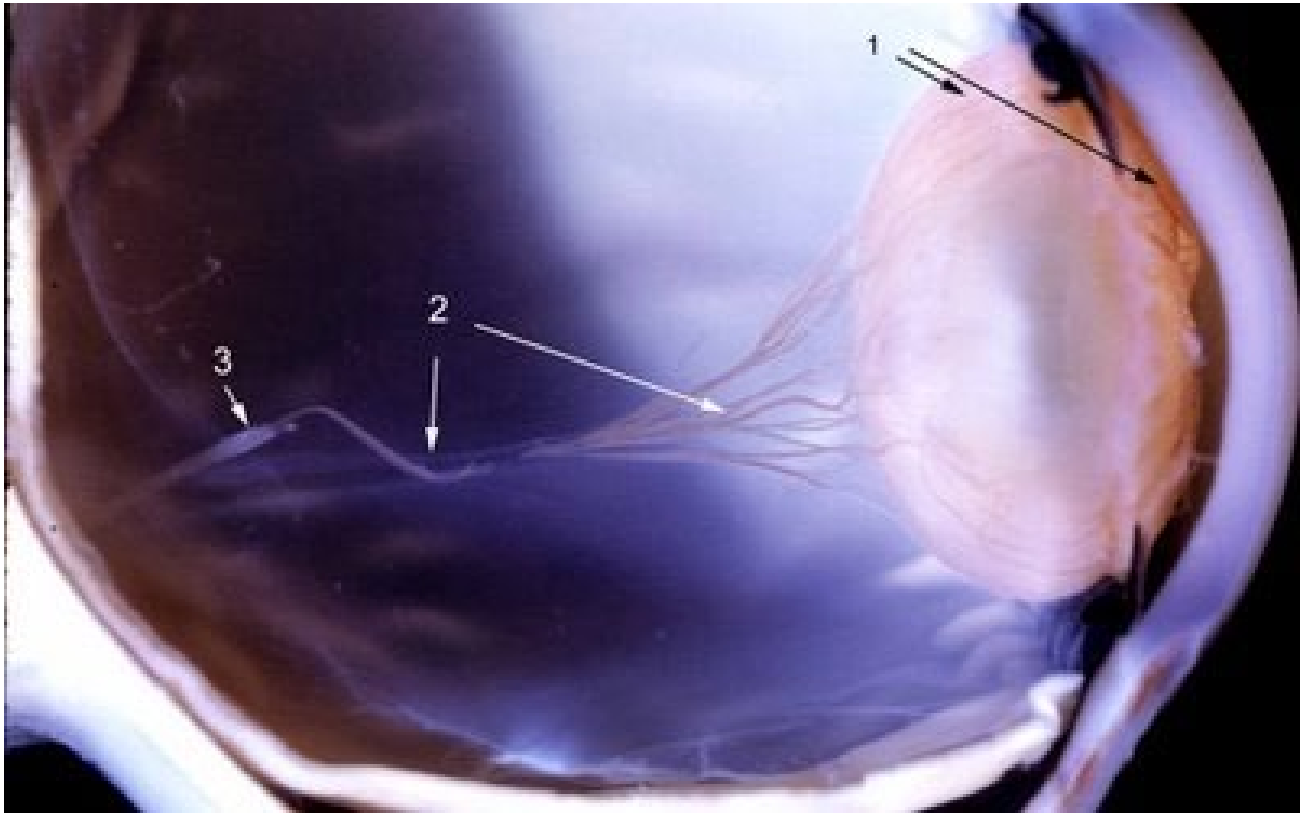
Lens (Vasculature) Embryology



Bergmeister papillae

Lens (Vasculature) Embryology



In the eye of this very premature infant, the **tunica vasculosa lentis** surrounds the lens (arrows 1). It is contiguous with the hyaloid artery and its branches (arrow 2). Notice the glial sheath of the hyaloid artery (arrow 3).

Q

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  I saw a pt with a vascularized Bergmeister papilla. Is the vessel a hyaloid artery remnant?

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Q/A

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     I saw a pt with a vascularized Bergmeister papilla. Is the vessel a hyaloid artery remnant?
     No, the vessel is what is known as a [three words].

  3) The *capsulopupillary portion*

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     No, the vessel is what is known as a **prepapillary vascular loop** .

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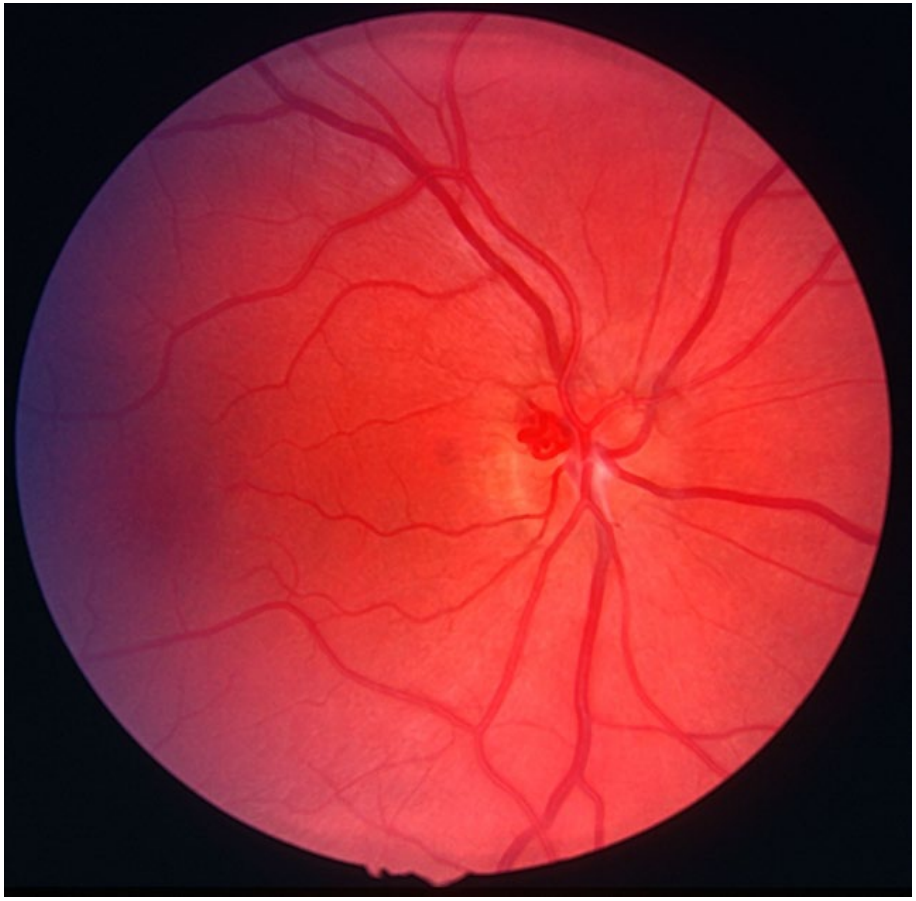
No, the vessel is what is known as a **prepapillary vascular loop** .
It is a retinal vessel that has grown up into the papilla.

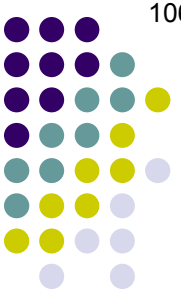
Lens (Vasculature) Embryology



Prepapillary vascular loop

Q

Lens (Vasculature) Embryology



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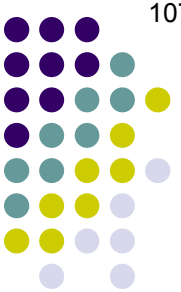
Lens (Vasculature) Embryology



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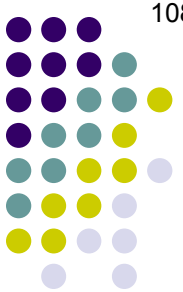
Q

Lens (Vasculature) Embryology



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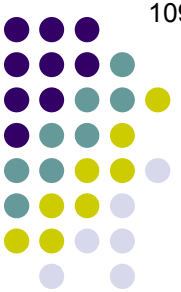
  What does PFV stand for in this context?

  3) The *capsulopupillary portion*

A

Lens (Vasculature) Embryology



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Persistent fetal vasculature

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Is this failure-to-regress clinically significant?
In the vast majority of cases, no; but it is **extremely** significant (ie, sight-threatening) in a few (more on this coming in hot)

Remember this Q&A?

Rhetorical question—proceed when ready

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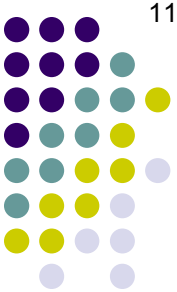
Remember this Q&A?
PFV is the 'rare but extremely significant' sequelae being alluded to

Proceed when ready

Q

Lens (Vasculature) Embryology



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By what name was this condition known previously?

3) The *capsulopupillary portion*

A

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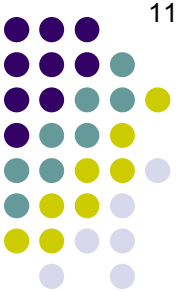

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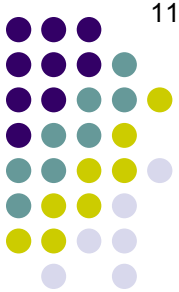
  3) The *capsulopupillary portion*

Lens (Vasculature) Embryology



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We will see why this weird name makes sense later in the slide-set

Q

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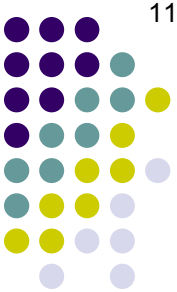

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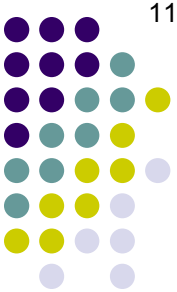
In a nutshell, what is PFV?

3) The *capsulopupillary portion*

Q/A

Lens (Vasculature) Embryology



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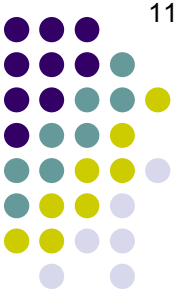
In a nutshell, what is PFV?

A [three words] that induces a variety of sight-threatening problems

3) The *capsulopupillary portion*

A

Lens (Vasculature) Embryology



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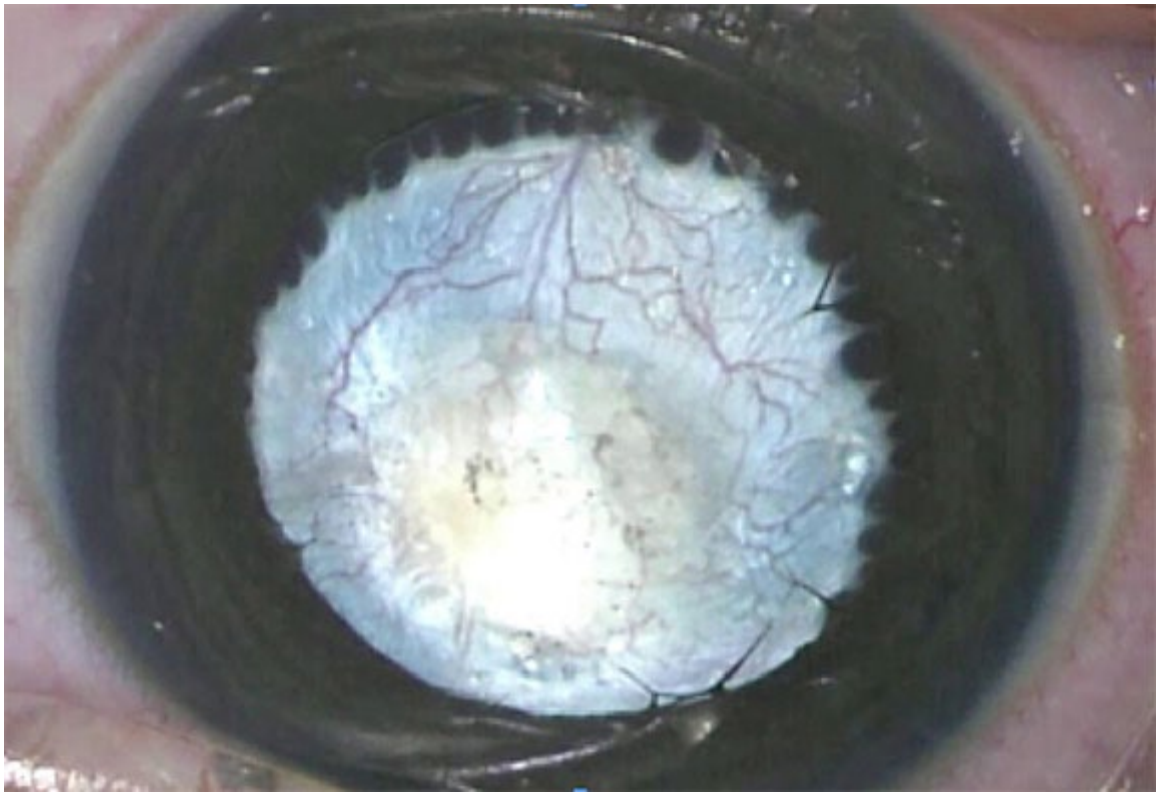
In a nutshell, what is PFV?
A retrolental fibrovascular membrane that induces a variety of sight-threatening problems

3) The *capsulopupillary portion*

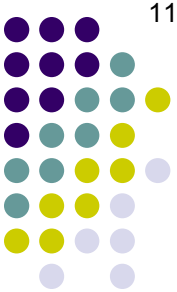
Lens (Vasculature) Embryology



PFV: Retrolental fibrovascular membrane

Q

Lens (Vasculature) Embryology



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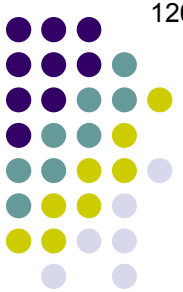
What is the inheritance pattern for PFV?

  3) The *capsulopupillary portion*

A

Lens (Vasculature) Embryology



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What is the inheritance pattern for PFV?
None (it is sporadic)

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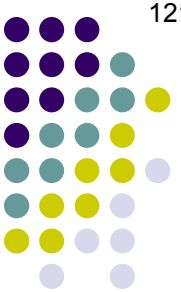
Q

Lens (Vasculature) Embryology



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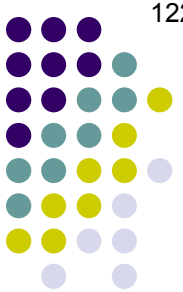
Does it present unilaterally, or bilaterally?

Q/A

Lens (Vasculature) Embryology



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In a nutshell, what is PFV?
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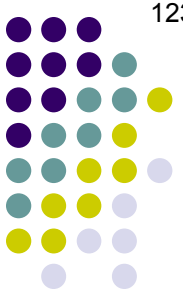
What is the inheritance pattern for PFV?
None (it is sporadic)

Does it present unilaterally, or bilaterally?
It is unilateral in % of cases

A

Lens (Vasculature) Embryology



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In a nutshell, what is PFV?
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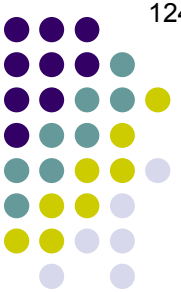
What is the inheritance pattern for PFV?
None (it is sporadic)

Does it present unilaterally, or bilaterally?
It is unilateral in 90% of cases

Lens (Vasculature) Embryology



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In a nutshell, what is PFV?
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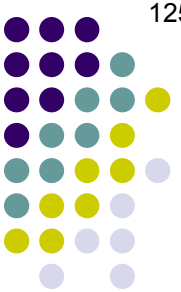
Take note! On the OKAP, PFV will always be unilateral

pattern for PFV?
e (it is sporadic)

y, or bilaterally?
It is **unilateral** in 90% of cases

No question—proceed when ready

Lens (Vasculature) Embryology



- The vascular supply encapsulating the developing lens is called the tunica vasculosa lentis.
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  1) The *posterior vascular capsule* arises from the hyaloid artery
     - A common, clinically insignificant remnant is the Mittendorf dot
     - A less common, clinically devastating remnant is **PFV**
  2) The *anterior vascular capsule*
  3) The *capsulopupillary portion*

In a nutshell, what is PFV?
A retrolental fibrovascular membrane that induces a variety of sight-threatening problems

Take note! On the OKAP, PFV will always be unilateral, and there will be no history of family members with a similar condition

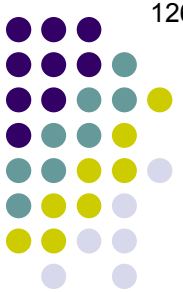
pattern for PFV?
(it is **sporadic**)

y, or bilaterally?
It is **unilateral** in 90% of cases

No question—proceed when ready

Q

Lens (Vasculature) Embryology



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a variety of sight-threatening problems

What are the sight-threatening manifestations of PFV?
--?
--?
--?

Does it present unilaterally, or bilaterally?
It is unilateral in 90% of cases

Q/A

Lens (Vasculature) Embryology

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What are the sight-threatening manifestations of PFV?
--Cataract
--Progressive AC
--*?*

3) The *capsulopupillary portion*

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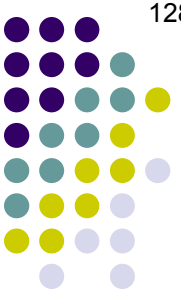
A

Lens (Vasculature) Embryology



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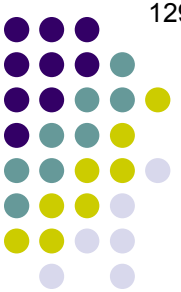
Q

Lens (Vasculature) Embryology



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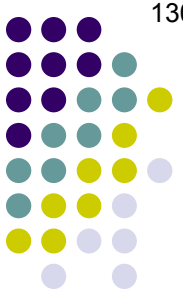
How is shallowing of the AC sight-threatening?

bilaterally?
of cases

A

Lens (Vasculature) Embryology



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--Cataract
--**Progressive AC shallowing**

How is shallowing of the AC sight-threatening?
It can lead to angle-closure glaucoma

bilaterally?
of cases

Q

Lens (Vasculature) Embryology

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What are the sight-threatening manifestations of PFV?
--Cataract
--Progressive AC shallowing
--Retinal [redacted]

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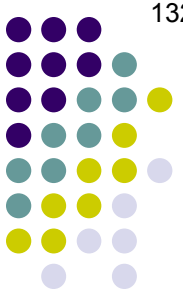
A

Lens (Vasculature) Embryology



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--Progressive AC shallowing
--Retinal detachment

Does it present unilaterally, or bilaterally?
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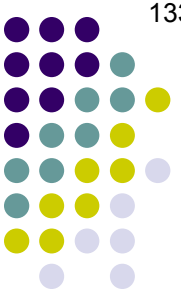
Lens (Vasculature) Embryology



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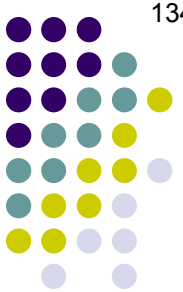
Wha
--Ca
--Pr
--Retinal detachment

Is PFV inevitably a blinding disease?

Does it present unilaterally, or bilaterally?
It is unilateral in 90% of cases

A

Lens (Vasculature) Embryology



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--Ca
--Pr
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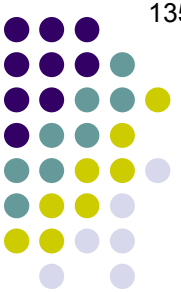
Is PFV inevitably a blinding disease?
No. Early cataract extraction and membranectomy may salvage the eye, and useful vision.

Does it present unilaterally, or bilaterally?
It is unilateral in 90% of cases

Q

Lens (Vasculature) Embryology



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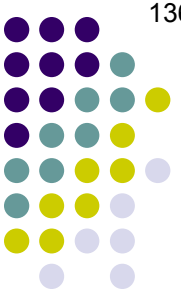
A

Lens (Vasculature) Embryology



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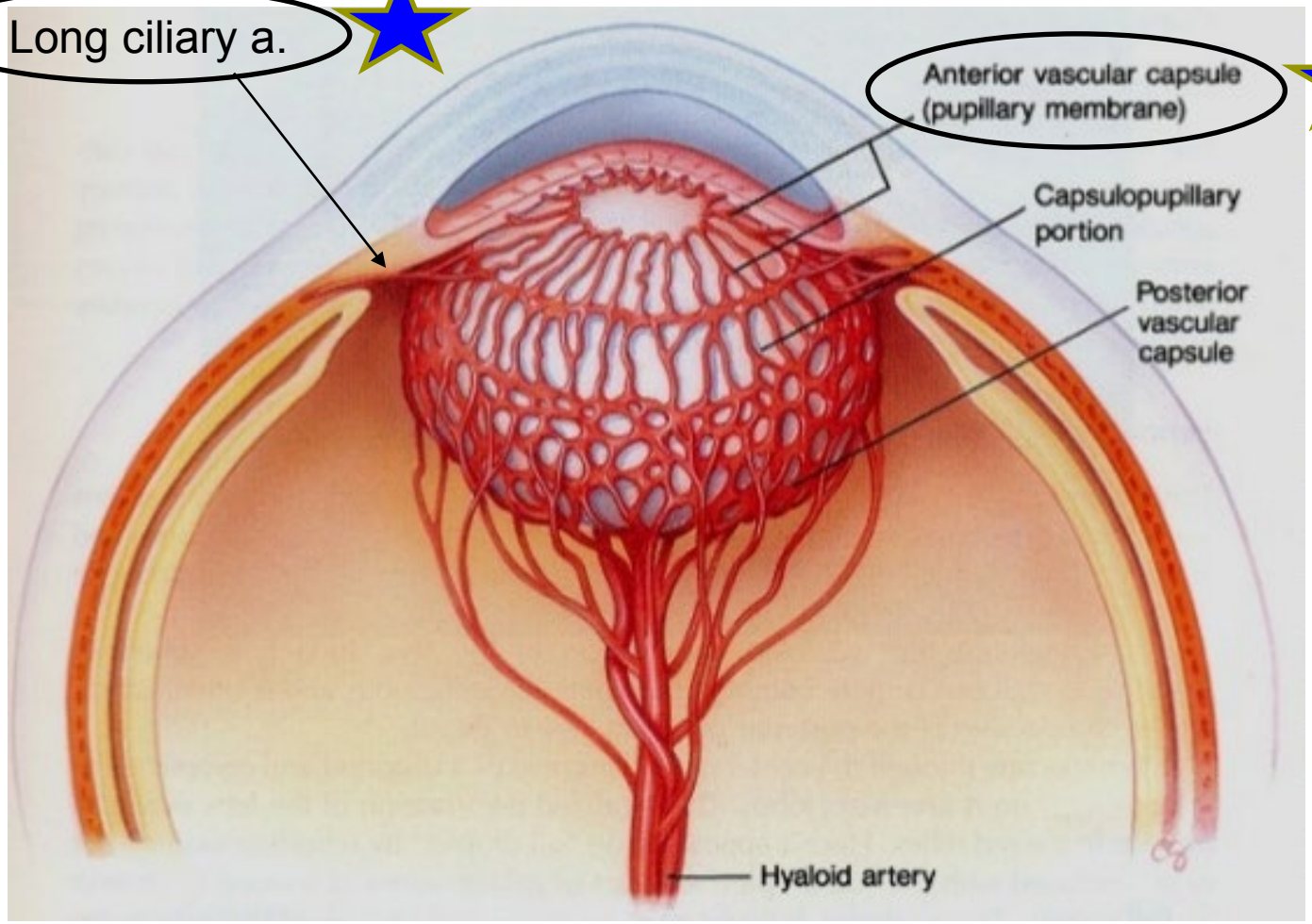
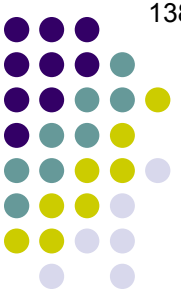
Lens (Vasculature) Embryology



Tunica vasculosa lentis: Anterior vascular capsule

Q

Lens (Vasculature) Embryology



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     - A common, clinically insignificant (usually) remnant is a

three words

3) The *capsulopupillary portion*

A

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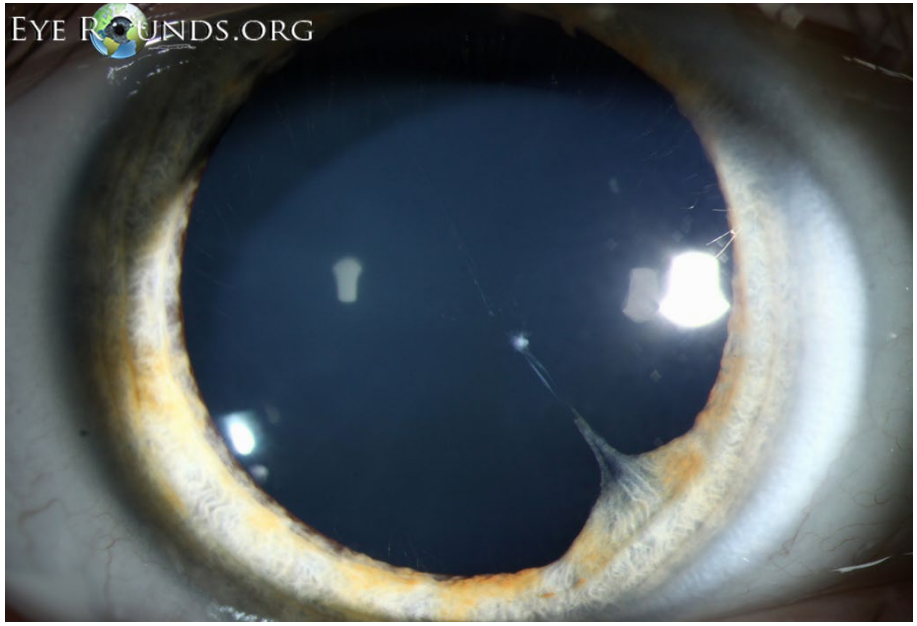
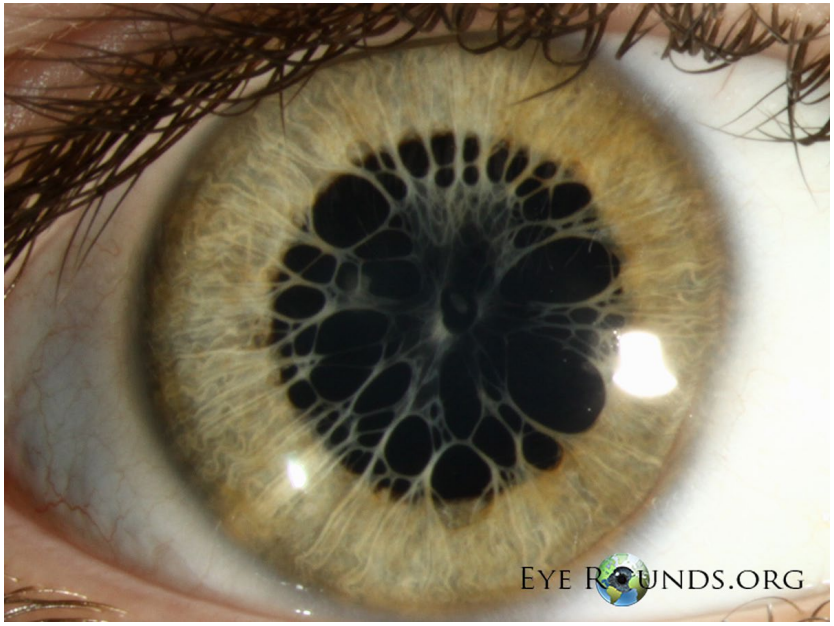
Lens (Vasculature) Embryology



Trivial case

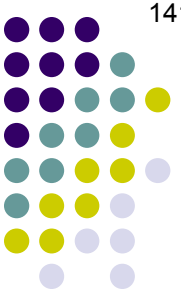


Hey now

Persistent pupillary membrane

Q

Lens (Vasculature) Embryology



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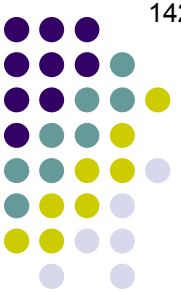
   - Another common remnant is the [two words]
3) The *capsulopupillary portion*

A

Lens (Vasculature) Embryology



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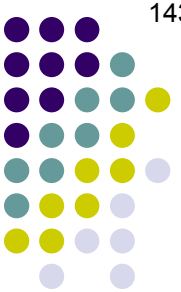
  3) The *capsulopupillary portion*

Q

Lens (Vasculature) Embryology



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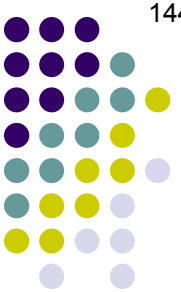
A

Lens (Vasculature) Embryology



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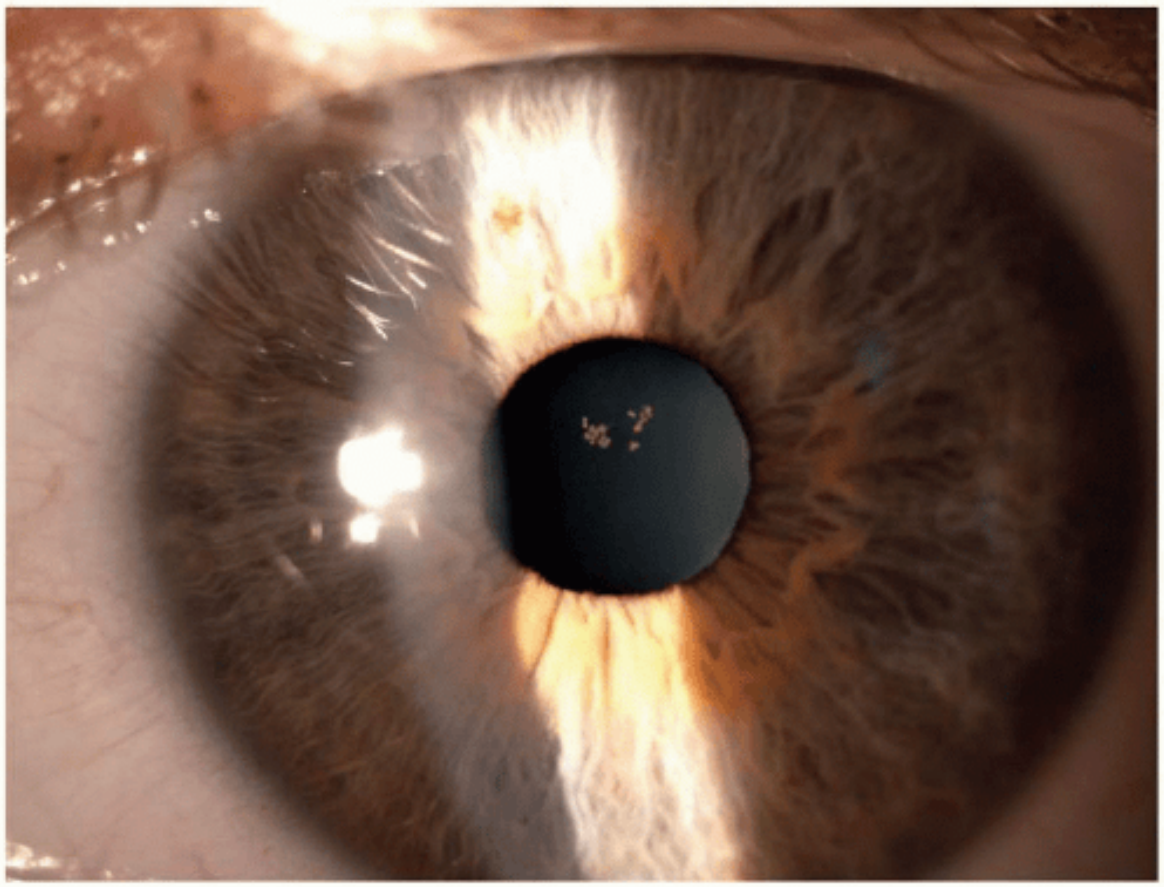
  3) The *capsulopupillary portion*

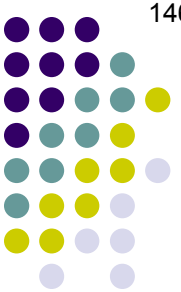
Lens (Vasculature) Embryology



Epicapsular star

Q

Lens (Vasculature) Embryology



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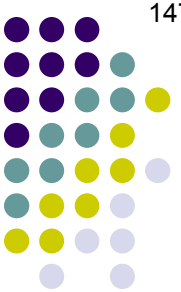
3) The *capsulopupillary portion* [redacted] the anterior and posterior sections of the tunica

A

Lens (Vasculature) Embryology



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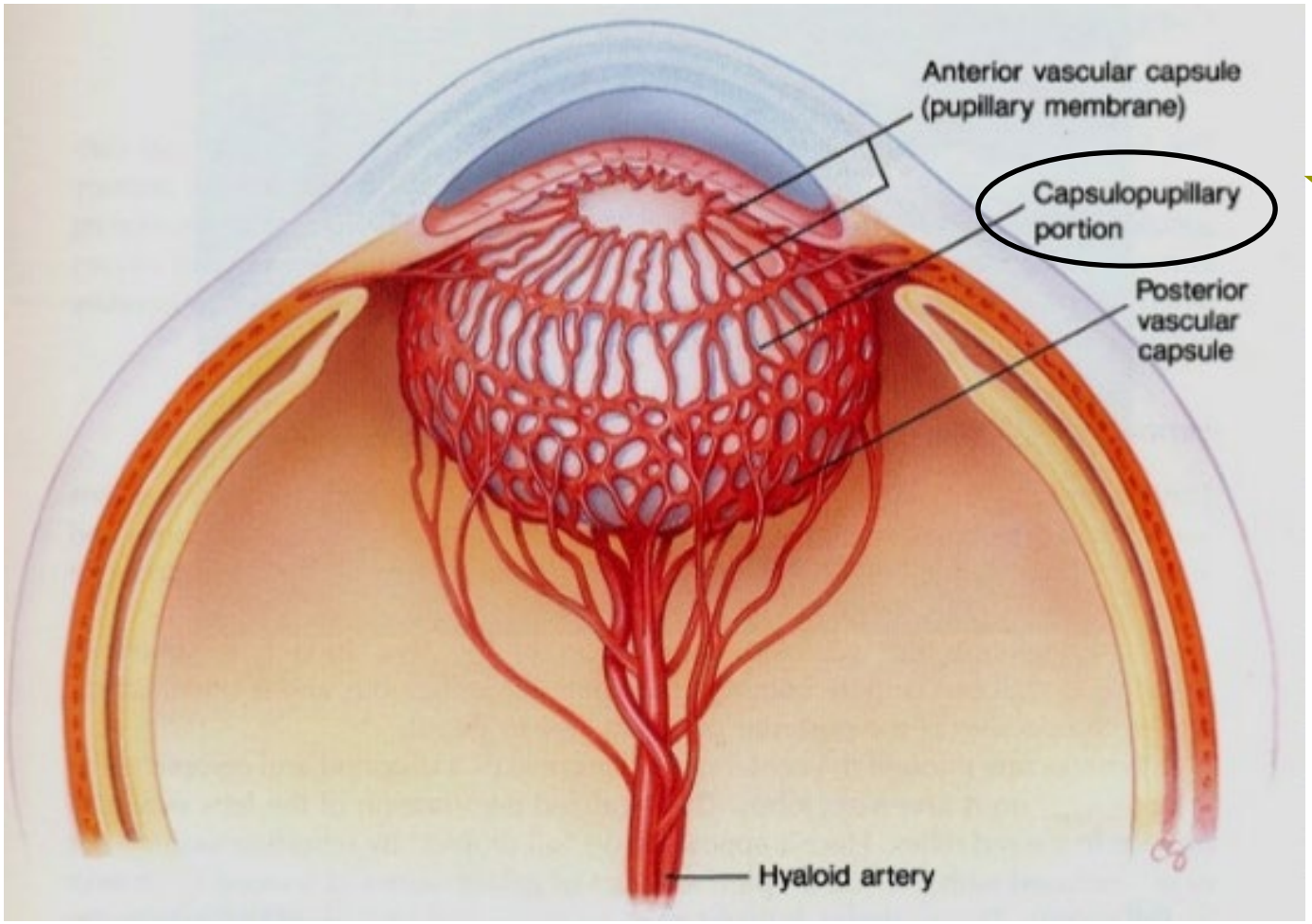
  3) The *capsulopupillary portion* anastomoses the anterior and posterior sections of the tunica

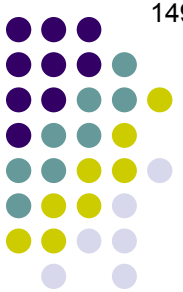
Lens (Vasculature) Embryology



Tunica vasculosa lentis: Capsulopupillary portion

Q

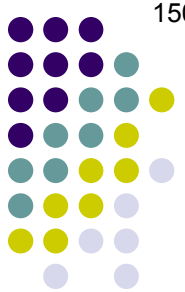
Lens (Zonules) Embryology



- Zonules are secreted by the [specific structure…] near the end of the third month of gestation

Q/A

Lens (Zonules) Embryology



- Zonules are secreted by the ciliary …and cell type near the end of the third month of gestation

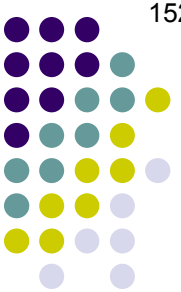
A

Lens (Zonules) Embryology

- Zonules are secreted by the ciliary epithelium near the end of the third month of gestation

Q

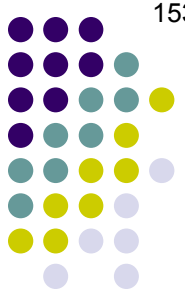
Lens (Zonules) Embryology



- Zonules are secreted by the ciliary epithelium near the end of the third month of gestation
- Zonules comprise the so-called 1º? 2º? 3º? *vitreous*

A

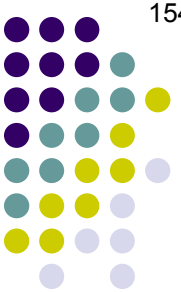
Lens (Zonules) Embryology



- Zonules are secreted by the ciliary epithelium near the end of the third month of gestation
- Zonules comprise the so-called *tertiary vitreous*

Q

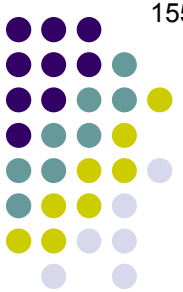
Lens (Zonules) Embryology



- Zonules are secreted by the ciliary epithelium near the end of the third month of gestation
- Zonules comprise the so-called *tertiary vitreous*
- This begs the question: *What are the primary and secondary vitreouses? (Vitrei?)*
  - *Primary vitreous*: The two words

A

Lens (Zonules) Embryology



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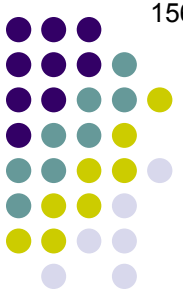
  - *Primary vitreous*: The hyaloid vasculature

Q

Lens (Zonules) Embryology



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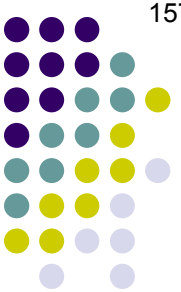
- Zonules comprise the so-called *tertiary vitreous*
- This begs the question: *What are the primary and secondary vitreouses? (Vitrei?)*
  - *Primary vitreous*: The hyaloid vasculature
    - Hence PFV is aka four words

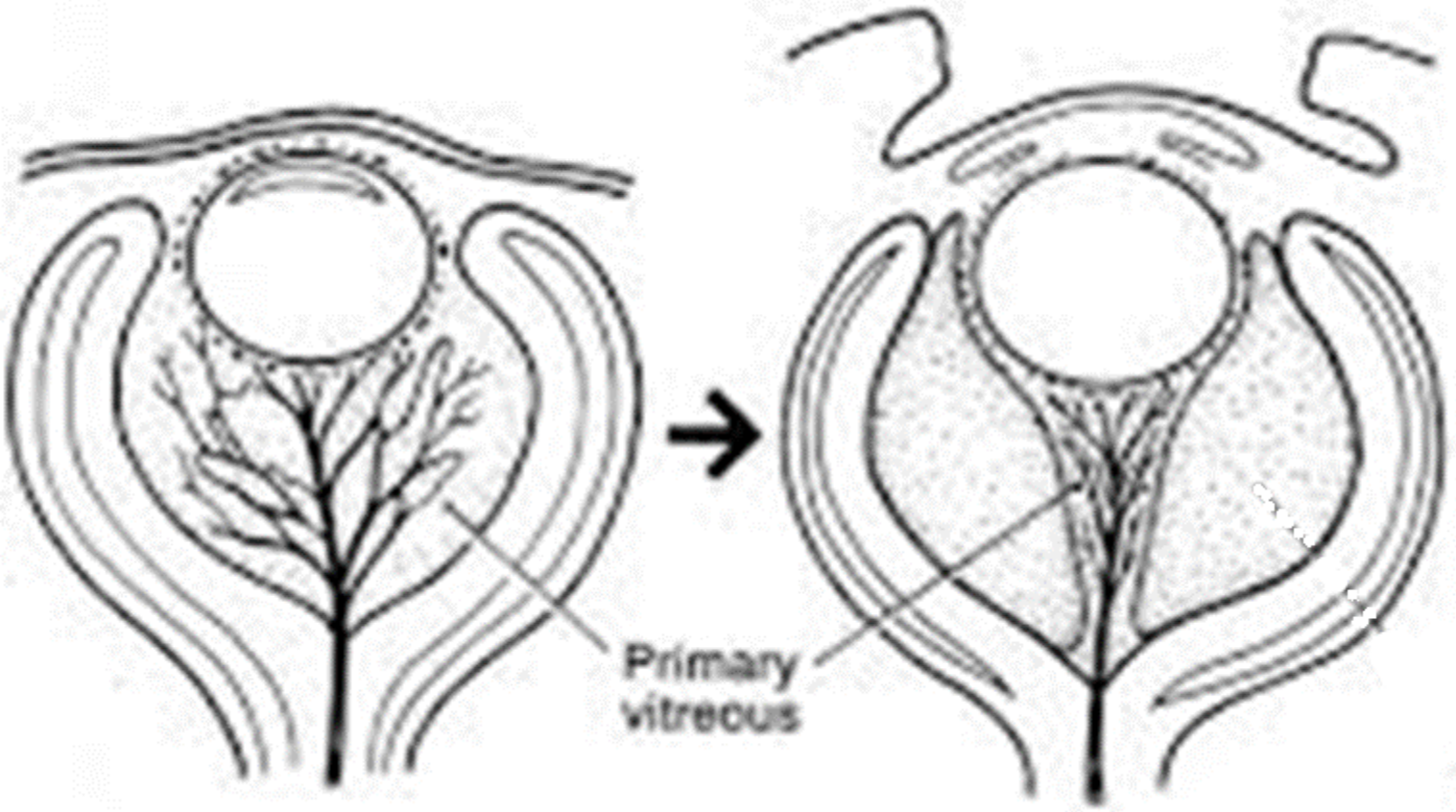
Q

Lens (Zonules) Embryology



- Zonules are secreted by the ciliary epithelium near the end of the third month of gestation
- Zonules comprise the so-called *tertiary vitreous*
- This begs the question: *What are the primary and secondary vitreouses? (Vitrei?)*
  - *Primary vitreous*: The hyaloid vasculature
    - Hence PFV is aka *persistent hyperplastic primary vitreous*

Lens (Zonules) Embryology



Primary vitreous

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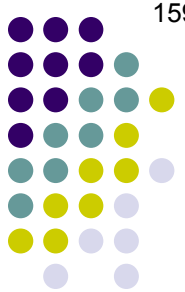

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Now we
~~We will~~ *see why this weird name makes sense* ~~*later in the slide-set*~~

No question—proceed when ready

Q

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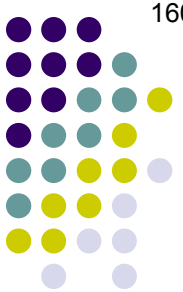

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  - *Secondary vitreous*: The

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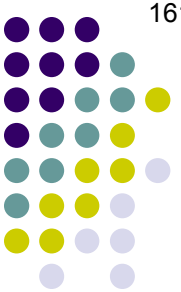

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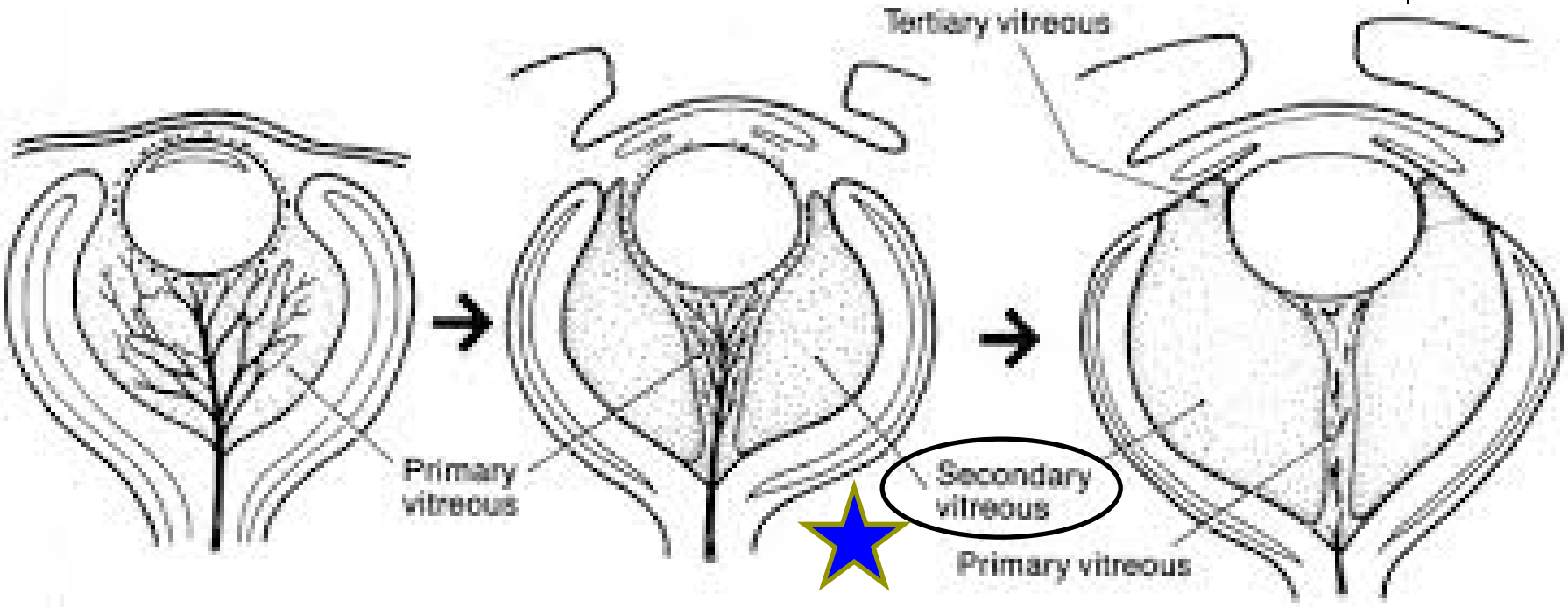
- This begs the question: *What are the primary and secondary vitreouses? (Vitrei?)*
  - *Primary vitreous*: The hyaloid vasculature
    - Hence PFV is aka *persistent hyperplastic primary vitreous*
  - *Secondary vitreous*: The main vitreous body

Lens (Zonules) Embryology

(Tertiary vitreous will form the zonules)



Secondary vitreous