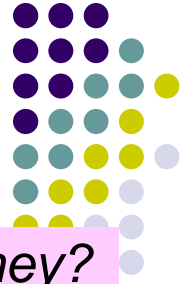


Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'immune sentinels of the ocular surface'

_____ cell

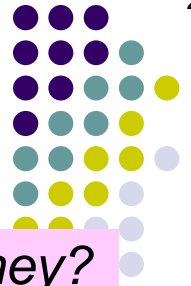
This one is:

- A type of giant cell found in granulomas
- Associated with TB
- Horseshoe-like arrangement of nuclei

_____ cell

A

Ocular-Surface Immunology



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Langerhans cell

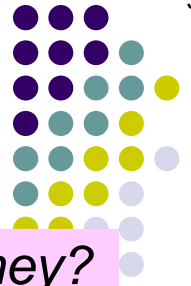
This one is:

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- Horseshoe-like arrangement of nuclei

Langhans cell

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

- A type of **dendritic cell** residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'immune sentinels of the ocular surface'

Langerhans cell

How did dendritic cells come to be called 'dendritic'? Does it have something to do with dendrites on the cornea, eg, as in HSV epitheliopathy?

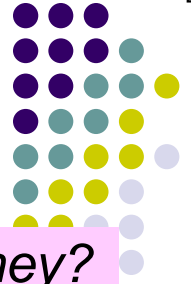
This one is:

- A type of **Langerhans cell**
- Associated with TB
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Langerhans cell

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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Langerhans cell

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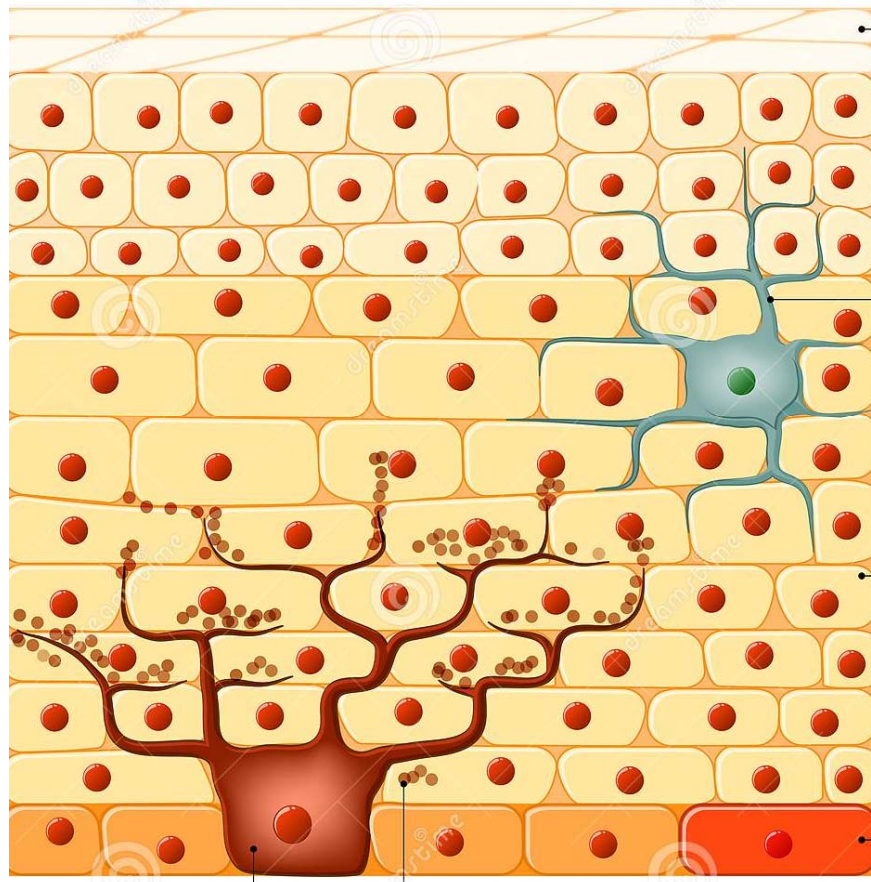
No, it is because the cells have cytoplasmic extensions jutting out which give the cell the appearance of the dendrite-end of a neuron

This one is:

- A type of **Langerhans cell**
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langhans cell

Ocular-Surface Immunology



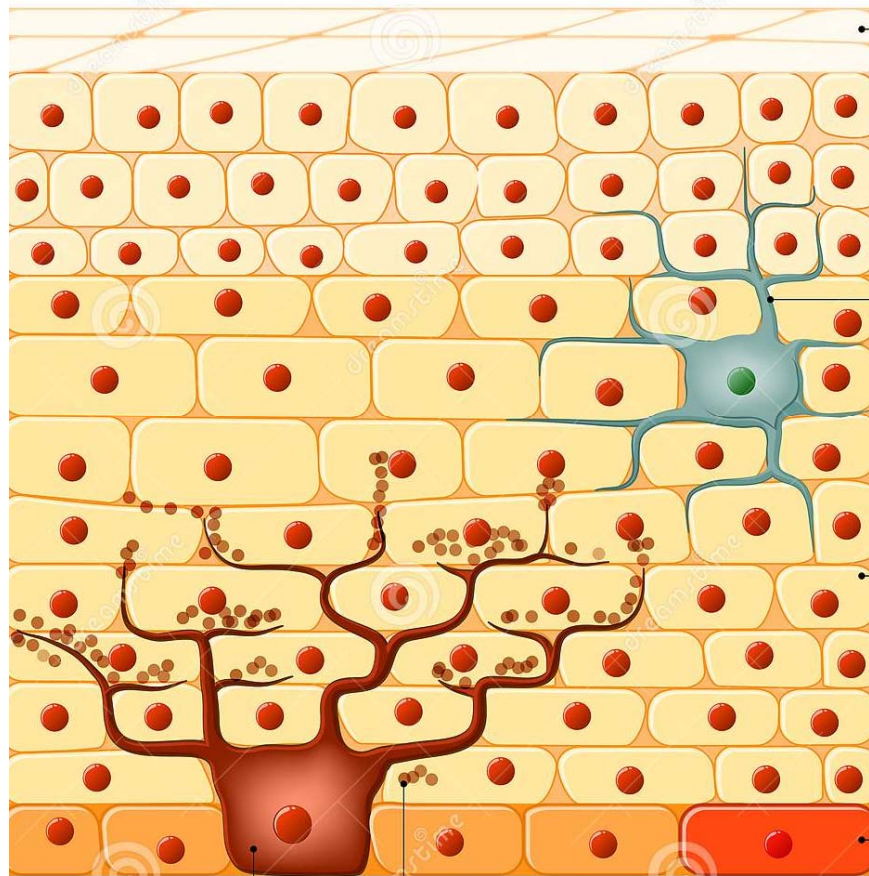
Note how the cytoplasmic extensions render the overall shape of the cell dendritic

Langerhans cell

Keratinocyte

Langerhans cell

Ocular-Surface Immunology



Note how the cytoplasmic extensions render the overall shape of the cell dendritic



Langerhans cell

Keratinocyte

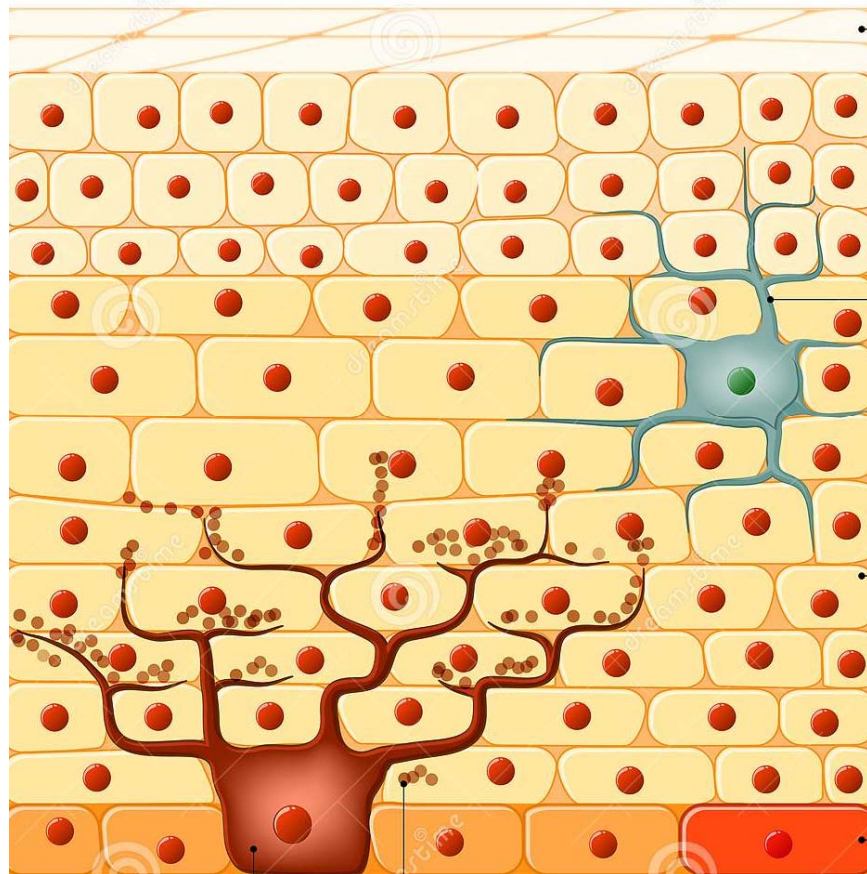
?

An important aside: The term *dendritic* is also used in the BCSC to describe the overall shape of a

cell type

Langerhans cell

Ocular-Surface Immunology



Langerhans cell

Keratinocyte

Melanocyte

Note how the cytoplasmic extensions render the overall shape of the cell dendritic

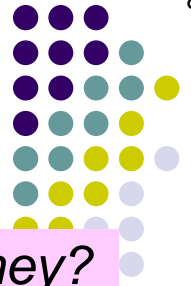


An important aside: The term *dendritic* is also used in the BCSC to describe the overall shape of a **melanocyte**

Langerhans cell

Q

Ocular-Surface Immunology



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Langerhans cell

Are Langerhans cells found in the conj epi, the corneal epi, or both?

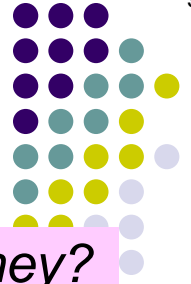
This one is:

- A type of g
- Associated
- Horseshoe

ns cell

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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--An *antigen-presenting cell* (APC)

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Langerhans cell

Are Langerhans cells found in the conj epi, the corneal epi, or both?
Both

This one is:

--A type of g

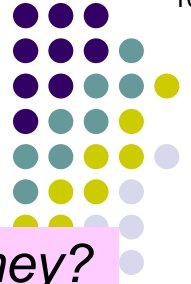
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ns cell

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Ocular-Surface Immunology



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This one is:

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--An *antigen-presenting cell* (APC)

--Described as the 'immune sentinels of the ocular surface'

Langerhans cell

*Are Langerhans cells found in the conj epi, the **corneal epi** or both?*

Both

This one is:

--A type of g

--Associated

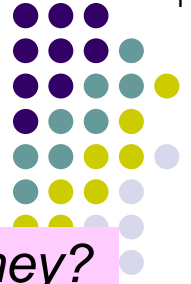
--Horseshoe

Regarding the cornea: Are Langerhans cells found anywhere in particular?

is cell

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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- A type of **dendritic cell residing in the ocular surface epithelium**
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Langerhans cell

Are Langerhans cells found in the conj epi, the **corneal epi** or both?
Both

This one is:

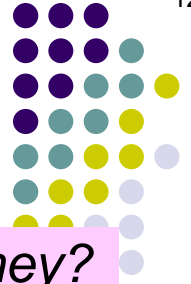
- A type of g
- Associated
- Horseshoe

Regarding the cornea: Are Langerhans cells found anywhere in particular?
Yes—they are found at the periphery (they will migrate inward if the central cornea is irritated)

is cell

Q

Ocular-Surface Immunology



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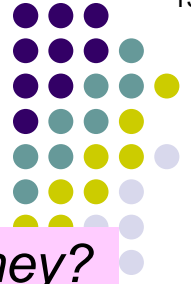
This one is:

- A type of g
 - Associated
 - Horseshoe
- At what two nonocular locations can Langerhans cells be found?*
--?
--?

Langerhans cell

A

Ocular-Surface Immunology



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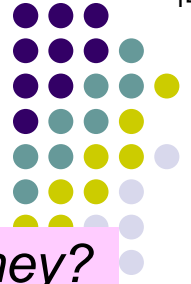
This one is:

- A type of g
 - Associated
 - Horseshoe
- At what two nonocular locations can Langerhans cells be found?*
- The oral mucosa
 - The genital mucosa

Langerhans cell

Q

Ocular-Surface Immunology



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At what

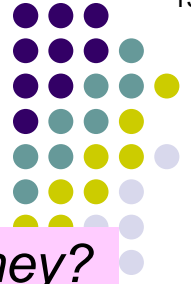
--The o

--The g

The conj and cornea comprise the ocular surface. In terms of immunology, what is the key difference between their epithelia?

A

Ocular-Surface Immunology



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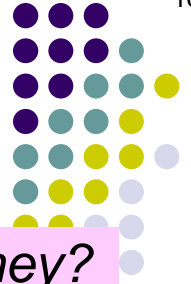
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The normal corneal epithelium is immunologically privileged

Q

Ocular-Surface Immunology



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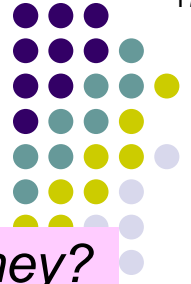
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What does this mean, 'immunologically privileged'?

A

Ocular-Surface Immunology



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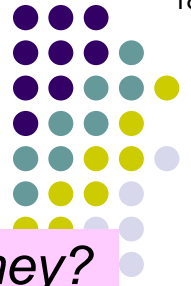
The normal corneal epithelium is **immunologically privileged**

What does this mean, 'immunologically privileged'?

It means the immune reaction to foreign antigens on the corneal surface is less than that of other tissues (including the conj)

Q

Ocular-Surface Immunology



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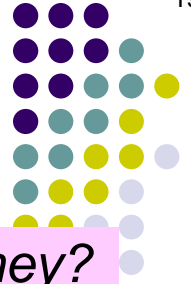
What does this mean, 'immunologically privileged'?

It means the immune reaction to foreign antigens on the corneal surface is less than that of other tissues (including the conj)

Is this privilege a result of active, or passive factors?

Q/A

Ocular-Surface Immunology



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Both. Passive factors include the absence of

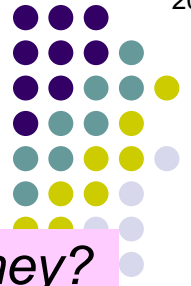
two words

and

one word

A

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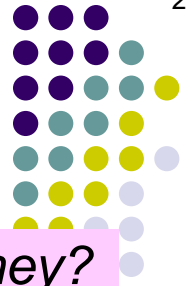
It means the immune reaction to foreign antigens on the corneal surface is less than that of other tissues (including the conj)

Is this privilege a result of active, or passive factors?

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A

Ocular-Surface Immunology



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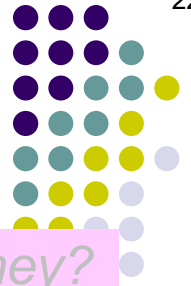
Is this privilege a result of active, or passive factors?

Both. Passive factors include the absence of blood vessels and lymphatics .

Active factors include release of immunomodulating chemoagents by the corneal epithelial cells.

Q

Ocular-Surface Immunology



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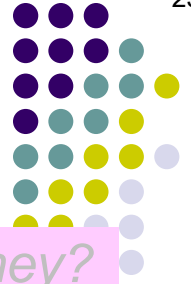
This one is:

- A type of giant cell found in **granulomas**
- Associated with *What is a granuloma?*
- Horseshoe-shaped

Giant cell

A

Ocular-Surface Immunology



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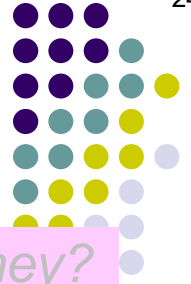
What is a granuloma?

Inflammatory material organized into tight, ball-like configuration
(the word *granuloma* translates literally as 'a small nodule')

giant cell

Q

Ocular-Surface Immunology



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Langerhans cell

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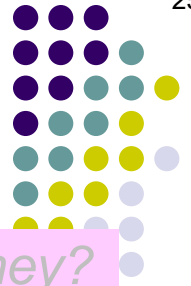
Inflammatory material organized into tight, ball-like configuration (the word *granuloma* translates literally as 'a small nodule')

For an organized inflammatory response to qualify as granulomatous, it must contain a specific type of inflammatory cell. What cell type is it?

Giant cell

A

Ocular-Surface Immunology



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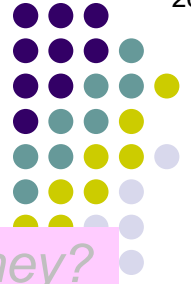
Inflammatory material organized into tight, ball-like configuration
(the word *granuloma* translates literally as 'a small nodule')

For an organized inflammatory response to qualify as granulomatous, it must contain a specific type of inflammatory cell. What cell type is it?
Histiocytes

giant cell

Q

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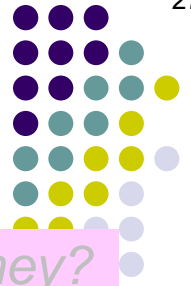
- A type of **giant cell** found in granulomas

What is a giant cell?

Langhans cell

Q/A

Ocular-Surface Immunology



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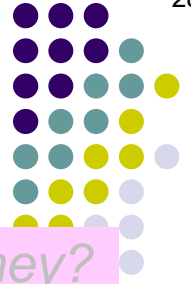
What is a giant cell?

It is an aggregate (the formal term is) of histiocytes

Langhans cell

A

Ocular-Surface Immunology



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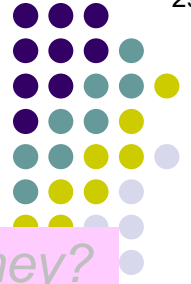
What is a giant cell?

It is an aggregate (the formal term is *syncytium*) of histiocytes

Langhans cell

A

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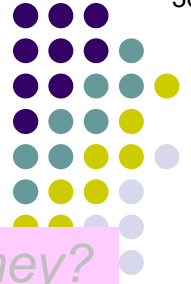
It is an aggregate (the formal term is *syncytium*) of histiocytes.

Put simply, it is a bunch of histiocytes that have glommed together.

Langhans cell

Q

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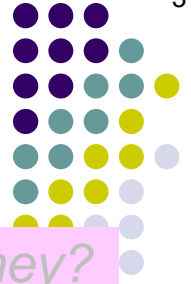
Put simply, it is a bunch of histiocytes that have glommed together.

What is the histologic hallmark of a giant cell?

Langhans cell

A

Ocular-Surface Immunology



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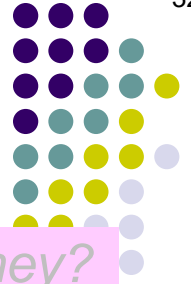
Langhans cell

What is the histologic hallmark of a giant cell?

It is *multinucleated*—the myriad nuclei of the involved histiocytes are all visible within it

Q

Ocular-Surface Immunology



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Langerhans cell

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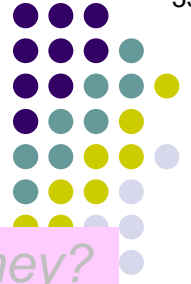
- A type of **giant cell** found in granulomas
- Associated with TB

What type of immune cell aggregates to form a giant cell?

Langhans cell

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'immune sentinels of the ocular surface'

Langerhans cell

Histiocytes

This one is:



- A type of **giant cell** found in granulomas
- Associated with TB

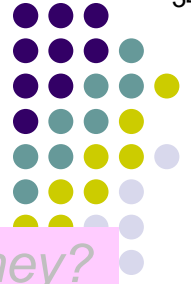
What type of immune cell aggregates to form a giant cell?

Histiocytes (geez, we just said that)

Langhans cell

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

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Langerhans cell

Histiocytes



This one is:

- A type of
- Associate

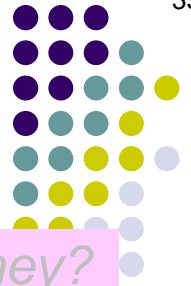
Histiocytes are also known as...?

Langhans cell

Histiocytes

A

Ocular-Surface Immunology



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This one is:

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Langerhans cell

Histiocytes



This one is:

- A type of
 - Associate
- Histiocytes are also known as...?
Macrophages

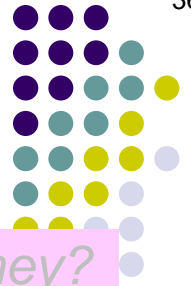
What type of i

Histiocytes

Langhans cell

Q

Ocular-Surface Immunology



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Langerhans cell

Histiocytes



**Histiocytes? are
Macrophages?**

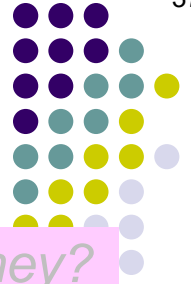
Which term does the BCSC prefer?

What type of i

Histiocytes

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
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Langerhans cell

Histiocytes



This one is:

- A type of
- Associate

Histiocytes? are
Macrophages?

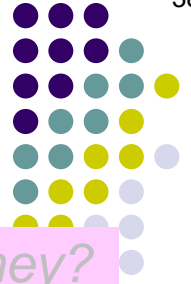
Which term does the BCSC prefer?

Depends on which book you ask—for example, the *Path* book strongly prefers *histiocyte*, whereas the *Uveitis* book uses *macrophage* exclusively

Histiocytes

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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Histiocytes



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Langhans cell

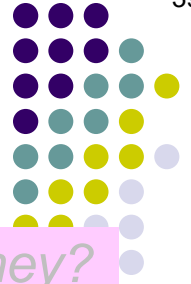
What type of i

Histiocytes

Histiocytes derive from what type of cell?

A

Ocular-Surface Immunology



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Langerhans cell

Histiocytes



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 - Associate
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Macrophages

What type of i

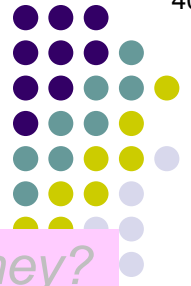
Histiocytes

Histiocytes derive from what type of cell?
Monocytes

Langhans cell

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

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Langerhans cell

Histiocytes

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 - Associate
- Histiocytes are also known as...?
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What type of i

Histiocytes

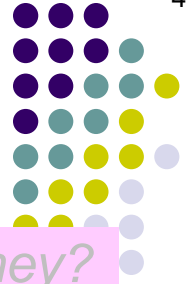
Histiocytes derive from what type of cell?
Monocytes

What does derive mean here? How does a monocyte become a histiocyte?

Langhans cell

A

Ocular-Surface Immunology



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This one is:

- A type of dendritic cell residing in the ocular surface epithelium
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Histiocytes



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Macrophages

What type of i

Histiocytes

Histiocytes derive from what type of cell?
Monocytes

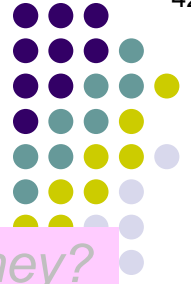
What does derive mean here? How does a monocyte become a histiocyte?

Monocytes are found within the vasculature. When a monocyte leaves the circulation and settles down within tissue, it becomes (ie, is re-classified) as a histiocyte.

Langhans cell

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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- Described as the 'immune sentinels of the ocular surface'

Langerhans cell

Histiocytes

This one is:

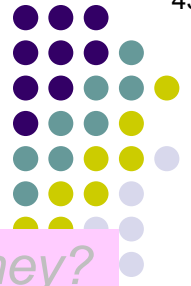
- A type of
 - Associate
 - What type of
- Histiocytes involved in giant-cell formation have a characteristic appearance—specifically, they look like another cell-type. What cell do they look like? (It is an **extremely** common cell type, one with which you are well-acquainted.)*

Histiocytes

Monocytes are found within the vasculature. When a monocyte leaves the circulation and settles down within tissue, it becomes (ie, is re-classified) as a histiocyte.

A

Ocular-Surface Immunology



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Langerhans cell

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 - What type of
- Histiocytes** involved in giant-cell formation have a characteristic appearance—specifically, they look like another cell-type. What cell do they look like? (It is an **extremely** common cell type, one with which you are well-acquainted.)

Epithelial cells

Monocytes are found within the vasculature. When a monocyte leaves the circulation and settles down within tissue, it becomes (ie, is re-classified) as a histiocyte.

Q

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

This one is:

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Langerhans cell

Histiocytes

This one is:

- A type of
 - Associate
 - What type of
- Histiocytes** Epithelial cells

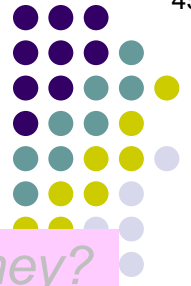
*Histiocytes involved in giant-cell formation have a characteristic appearance—specifically, they look like another cell-type. What cell do they look like? (It is an **extremely** common cell type, one with which you are well-acquainted.)*

By what name are these epithelial cell-looking histiocytes known?

Monocytes are found within the vasculature. When a monocyte leaves the circulation and settles down within tissue, it becomes (ie, is re-classified) as a histiocyte.

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

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Langerhans cell

Histiocytes

This one is:

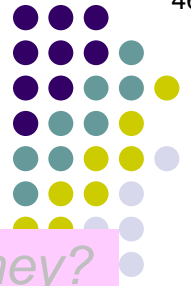
- A type of
 - Associate
 - What type of
- Histiocytes**
- Histiocytes involved in giant-cell formation have a characteristic appearance—specifically, they look like another cell-type. What cell do they look like? (It is an **extremely** common cell type, one with which you are well-acquainted.)*
- Epithelial cells

By what name are these epithelial cell-looking histiocytes known?
They are known as 'epithelioid histiocytes.'

Monocytes are found within the vasculature. When a monocyte leaves the circulation and settles down within tissue, it becomes (ie, is re-classified) as a histiocyte.

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

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Langerhans cell

Histiocytes

This one is:

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 - Associate
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- Histiocytes** involved in giant-cell formation have a characteristic appearance—specifically, they look like another cell-type. What cell do they look like? (It is an **extremely** common cell type, one with which you are well-acquainted.)

Epithelial cells

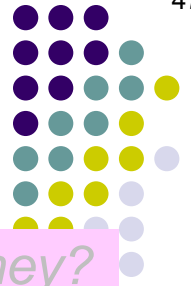
By what name are these epithelial cell-looking histiocytes known?

They are known as 'epithelioid histiocytes.' **All giant cells are composed of epithelioid histiocytes.**

Monocytes are found within the vasculature. When a monocyte leaves the circulation and settles down within tissue, it becomes (ie, is re-classified) as a histiocyte.

Q

Ocular-Surface Immunology



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?

Langerhans cell

Histiocytes

This one is:

- A type of **giant cell** found in granulomas
- Associated with TB

What type of immune cell aggregates to form a giant cell?
Histiocytes (geez, we just said that)

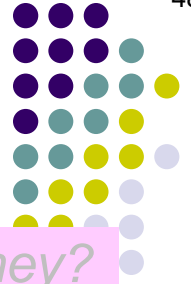
Histiocytes belong to what broad subset of immune cells?

Next question

Langhans cell

A

Ocular-Surface Immunology



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- An *antigen-presenting cell* (APC)
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Myeloid

Langerhans cell

Histiocytes

This one is:

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- Associated with TB

Langhans cell

What type of immune cell aggregates to form a giant cell?

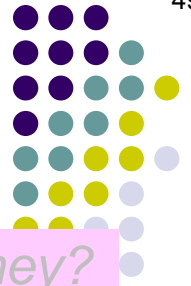
Histiocytes (geez, we just said that)

Histiocytes belong to what broad subset of immune cells?

Myeloid cells

Q

Ocular-Surface Immunology



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Langerhans cell

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Langhans cell

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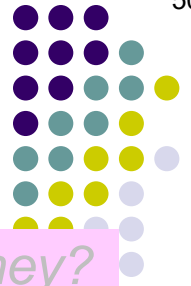
Histiocytes belong to what broad subset of immune cells?

Myeloid cells

What are the other members of the myeloid subset?

Q/A

Ocular-Surface Immunology



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- An *antigen-presenting cell* (APC)
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Myeloid

Histiocytes

PMNs, etc

This one is:

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- Associated with TB

What type of immune cell aggregates to form a giant cell?
Histiocytes (geez, we just said that)

Histiocytes belong to what broad subset of immune cells?
Myeloid cells

What are the other members of the myeloid subset?
PMNs, eos, basos, mast cells, and..

two words

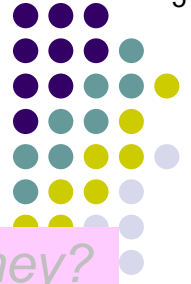
*[You **definitely** know this cell type]*

Langerhans cell

Langhans cell

A

Ocular-Surface Immunology



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Myeloid

Langerhans cell

Histiocytes

PMNs, etc

This one is:

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- Associated with TB

Langhans cell

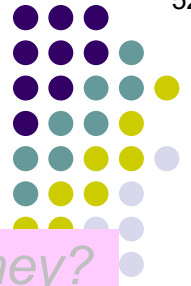
What type of immune cell aggregates to form a giant cell?
Histiocytes (geez, we just said that)

Histiocytes belong to what broad subset of immune cells?
Myeloid cells

What are the other members of the myeloid subset?
PMNs, eos, basos, mast cells, and...Langerhans cells

Q

Ocular-Surface Immunology



The names of these two cell types are confused—what are they?

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Langerhans cell

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Myeloid cells

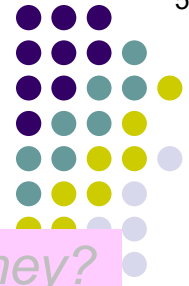
What are the other members of the myeloid subset?
PMNs, eos, basos, mast cells, and...Langerhans cells

Myeloid cells belong to what very broad subset of immune cells?

Langhans cell

A

Ocular-Surface Immunology



The names of these two cell types are confused—what are they?

Leukocytes

This one is:

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Myeloid

Langerhans cell

Histiocytes

PMNs, etc

This one is:

- A type of **giant cell** found in granulomas
- Associated with TB

What type of immune cell aggregates to form a giant cell?
Histiocytes (geez, we just said that)

Histiocytes belong to what broad subset of immune cells?
Myeloid cells

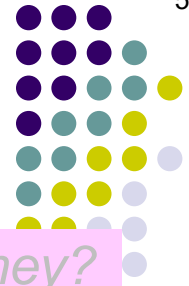
What are the other members of the myeloid subset?
PMNs, eos, basos, mast cells, and...Langerhans cells

Myeloid cells belong to what very broad subset of immune cells?
Leukocytes (as in, WBCs)

Langhans cell

Q

Ocular-Surface Immunology



The names of these two cell types are confused—what are they?

Leukocytes

Myeloid

?

This one is:

- A type of dendritic cell resident on the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'immune sentinels of the ocular surface'

Langerhans cell

Histiocytes

PMNs, etc

This one is:

- A type of **giant cell** found in granulomas
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What type of immune cell aggregates to form a giant cell?
Histiocytes (geez, we just said that)

Histiocytes belong to what broad subset of immune cells?
Myeloid cells

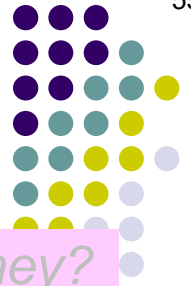
What are the other members of the myeloid subset?
PMNs, eos, basos, mast cells, and...Langerhans cells

Myeloid cells belong to what very broad subset of immune cells?
Leukocytes, ie, WBCs

What is the other very broad subset of leukocytes?

A

Ocular-Surface Immunology



The names of these two cell types are confused—what are they?

Leukocytes

Myeloid

Lymphoid

This one is:

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- Described as the 'immune sentinels of the ocular surface'

Langerhans cell

Histiocytes

PMNs, etc

This one is:

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- Associated with TB

What type of immune cell aggregates to form a giant cell?
Histiocytes (geez, we just said that)

Histiocytes belong to what broad subset of immune cells?
Myeloid cells

What are the other members of the myeloid subset?
PMNs, eos, basos, mast cells, and...Langerhans cells

Myeloid cells belong to what very broad subset of immune cells?
Leukocytes, ie, WBCs

What is the other very broad subset of leukocytes?
Lymphoid cells

Q

Ocular-Surface Immunology

The names of these two cell types are confused—what are they?

Leukocytes

Myeloid

Lymphoid

Histiocytes

PMNs, etc

?

?

Langerhans cell

This one is:

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- An *antigen-presenting cell* (APC)
- Described as the 'immune sentinels of the ocular surface'

This one is:

- A type of **giant cell** found in granulomas
- Associated with TB

What type of immune cell aggregates to form a giant cell?
Histiocytes (geez, we just said that)

Histiocytes belong to what broad subset of immune cells?
Myeloid cells

What are the other members of the myeloid subset?
PMNs, eos, basos, mast cells, and...Langerhans cells

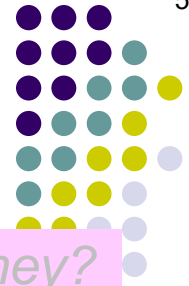
Myeloid cells belong to what very broad subset of immune cells?
Leukocytes, ie, WBCs

What is the other very broad subset of leukocytes?
Lymphoid cells

What are the two broad subsets of lymphoid cells?

A

Ocular-Surface Immunology



The names of these two cell types are confused—what are they?

Leukocytes

Myeloid

Lymphoid

Langerhans cell

Histiocytes

PMNs, etc

B cells

T cells

This one is:

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- An *antigen-presenting cell* (APC)
- Described as the 'immune sentinels of the ocular surface'

This one is:

- A type of **giant cell** found in granulomas
- Associated with TB

What type of immune cell aggregates to form a giant cell?
Histiocytes (geez, we just said that)

Histiocytes belong to what broad subset of immune cells?
Myeloid cells

What are the other members of the myeloid subset?
PMNs, eos, basos, mast cells, and...Langerhans cells

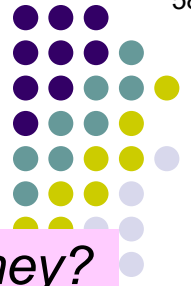
Myeloid cells belong to what very broad subset of immune cells?
Leukocytes, ie, WBCs

What is the other very broad subset of leukocytes?
Lymphoid cells

What are the two broad subsets of lymphoid cells?
B cells and T cells

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

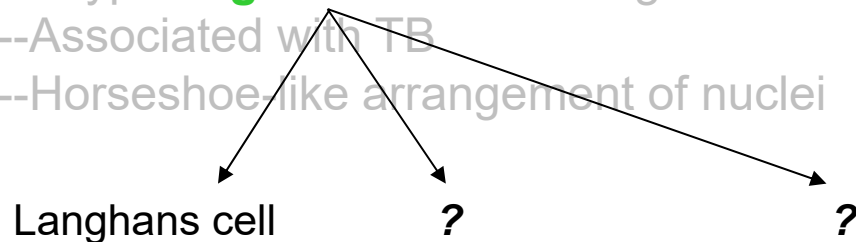
- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'immune sentinels of the ocular surface'

Langerhans cell

This one is:

- A type of **giant cell** found in granulomas
- Associated with TB
- Horseshoe-like arrangement of nuclei

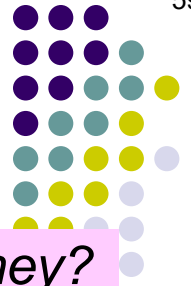
Langhans cell



The BCSC covers three types of giant cells, one being the Langhans cell. What are the other two?

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

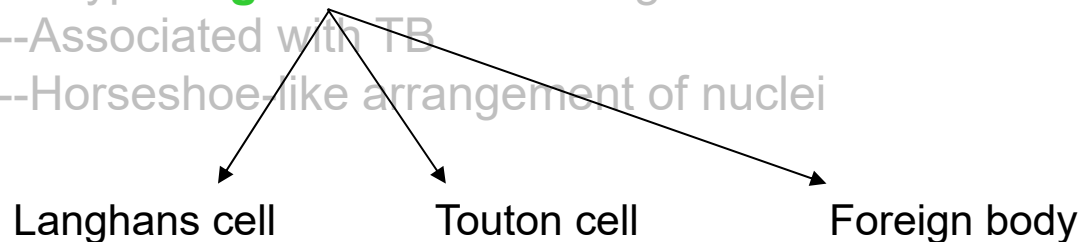
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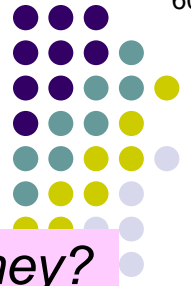
Langhans cell



The BCSC covers three types of giant cells, one being the Langhans cell. What are the other two?

Touton giant cells, and **foreign-body** giant cells

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

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This one is:

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- Associated with TB
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Langhans cell

Langhans cell

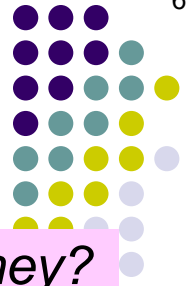
Touton cell

Foreign body

For each type, the way the nuclei are distributed forms a characteristic pattern.

(No question—proceed when ready)

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'immune sentinels of the ocular surface'

Langerhans cell

This one is:

- A type of **giant cell** found in granulomas
- Associated with TB

--Horseshoe-like arrangement of nuclei

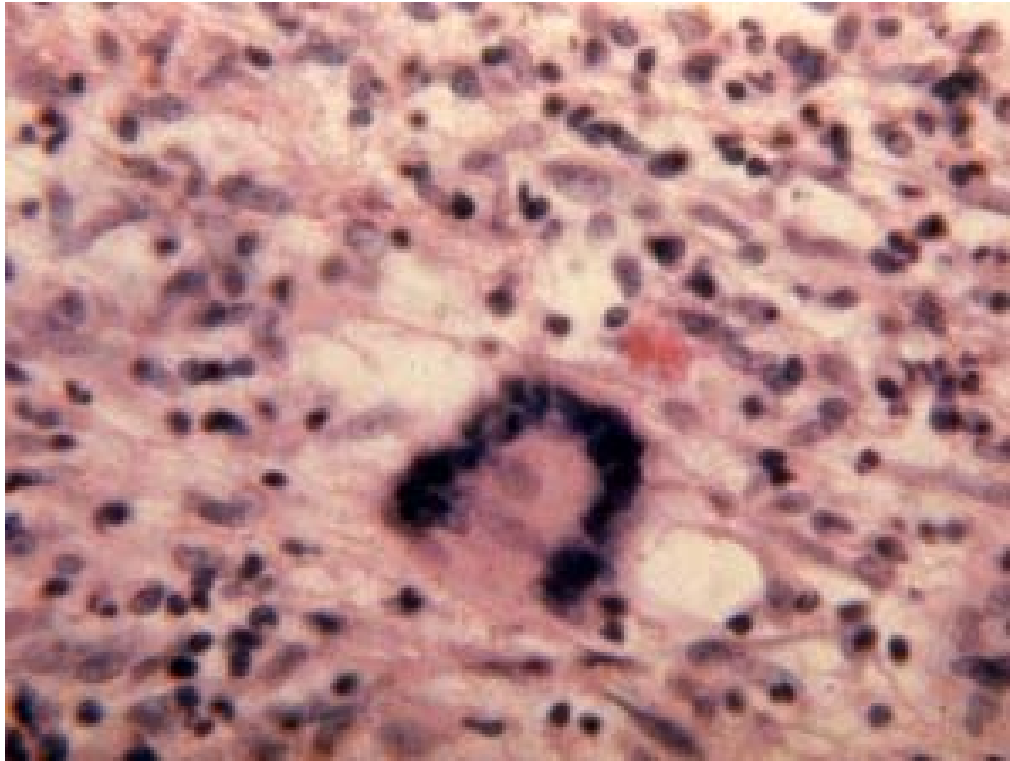
Langhans cell



*For each type, the way the nuclei are distributed forms a characteristic pattern.
For Langhans giant cells, it's a horseshoe.*

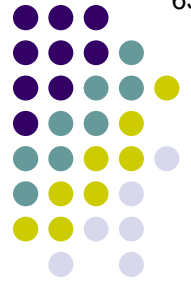
(No question—proceed when ready)

Ocular-Surface Immunology



Note the horseshoe-shaped arrangement of nuclei

Langhans giant cells



Ocular-Surface Immunology

Mnemonic time-out: If you're familiar with the story of 'Clever Hans'—the horse that was famous for seeming to be able to count—you have a ready-made way to remember that Langhans cells have nuclei aggregates that look like **horseshoes**. (If you're not familiar with the story, I got nothing for ya.)

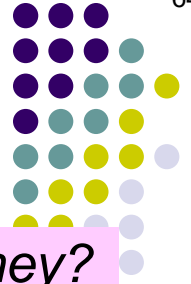


Note the horseshoe-shaped arrangement of nuclei

Langhans giant cells

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'immune sentinels of the ocular surface'

Langerhans cell

This one is:

- A type of **giant cell** found in granulomas
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langhans cell

Langhans cell

└ 'Horseshoe'

Touton cell

└ ?

Foreign body

For each type, the way the nuclei are distributed forms a characteristic pattern.
For Langhans giant cells, it's a horseshoe.

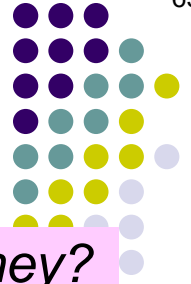
What is the pattern for:

--Touton giant cells?

Next Q

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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- An *antigen-presenting cell* (APC)
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- Associated with TB
- Horseshoe-like arrangement of nuclei

Langhans cell

Langhans cell

└ 'Horseshoe'

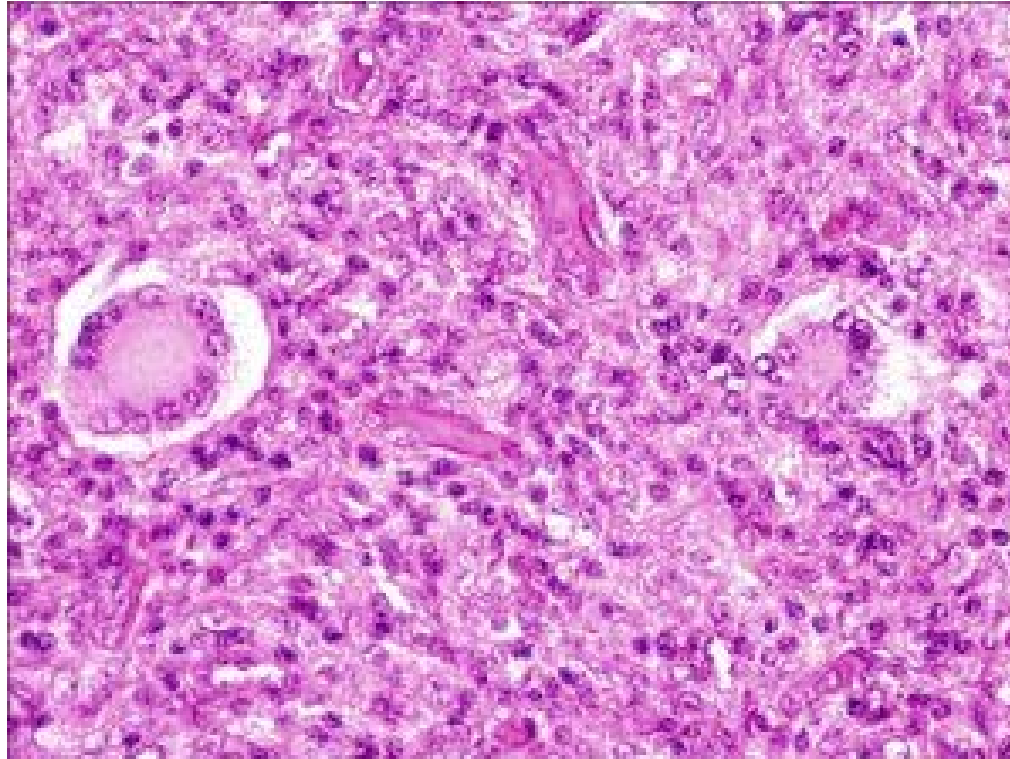
Touton cell

└ 'Peripheral ring'

Foreign body

*For each type, the way the nuclei are distributed forms a characteristic pattern.
For Langhans giant cells, it's a horseshoe.
What is the pattern for:
--Touton giant cells? 'Peripheral ring'*

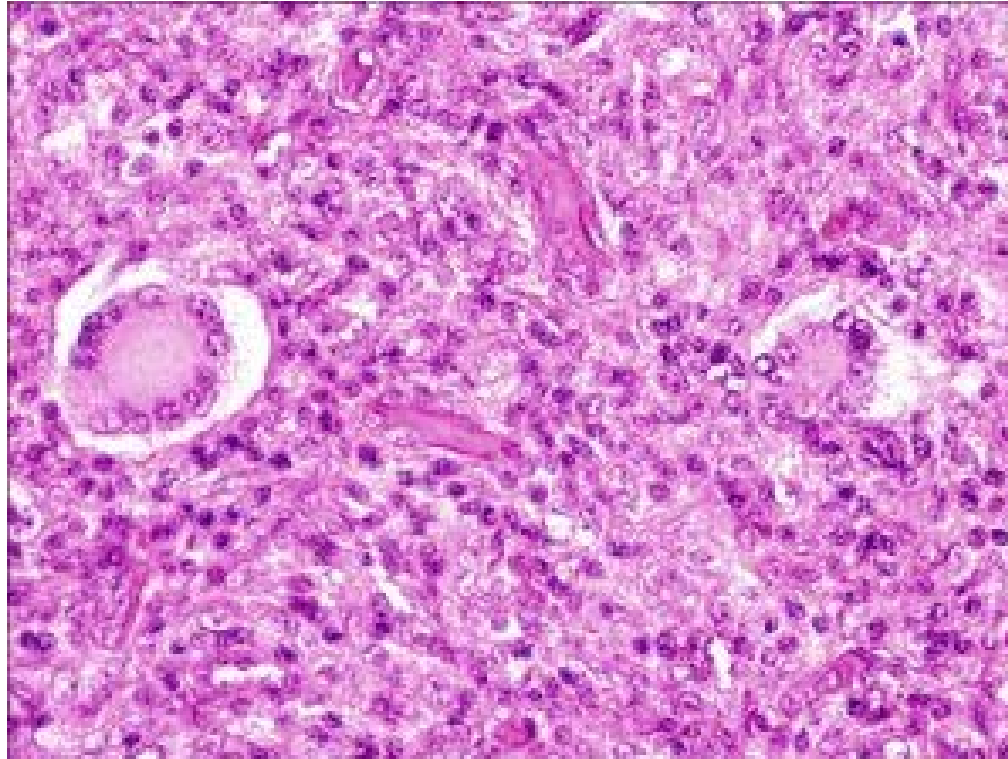
Ocular-Surface Immunology



Note the complete peripheral ring of nuclei

Touton giant cells

Ocular-Surface Immunology

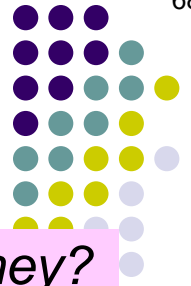


Note the complete peripheral ring of nuclei
(Note also the clear lipid 'halo,' another feature of this type)

Touton giant cells

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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- Associated with TB
- Horseshoe-like arrangement of nuclei

Langhans cell

Langhans cell

└ 'Horseshoe'

Touton cell

└ 'Peripheral ring'

Foreign body

└ ?

*For each type, the way the nuclei are distributed forms a characteristic pattern.
For Langhans giant cells, it's a horseshoe.*

What is the pattern for:

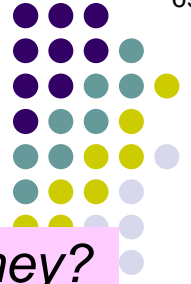
--Touton giant cells? 'Peripheral ring'

--Foreign-body giant cells?

Next Q

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

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This one is:

- A type of **giant cell** found in granulomas
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langhans cell

Langhans cell

└ 'Horseshoe'

Touton cell

└ 'Peripheral ring'

Foreign body

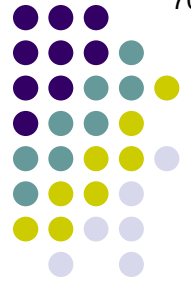
└ 'Haphazard'

*For each type, the way the nuclei are distributed forms a characteristic pattern.
For Langhans giant cells, it's a horseshoe.*

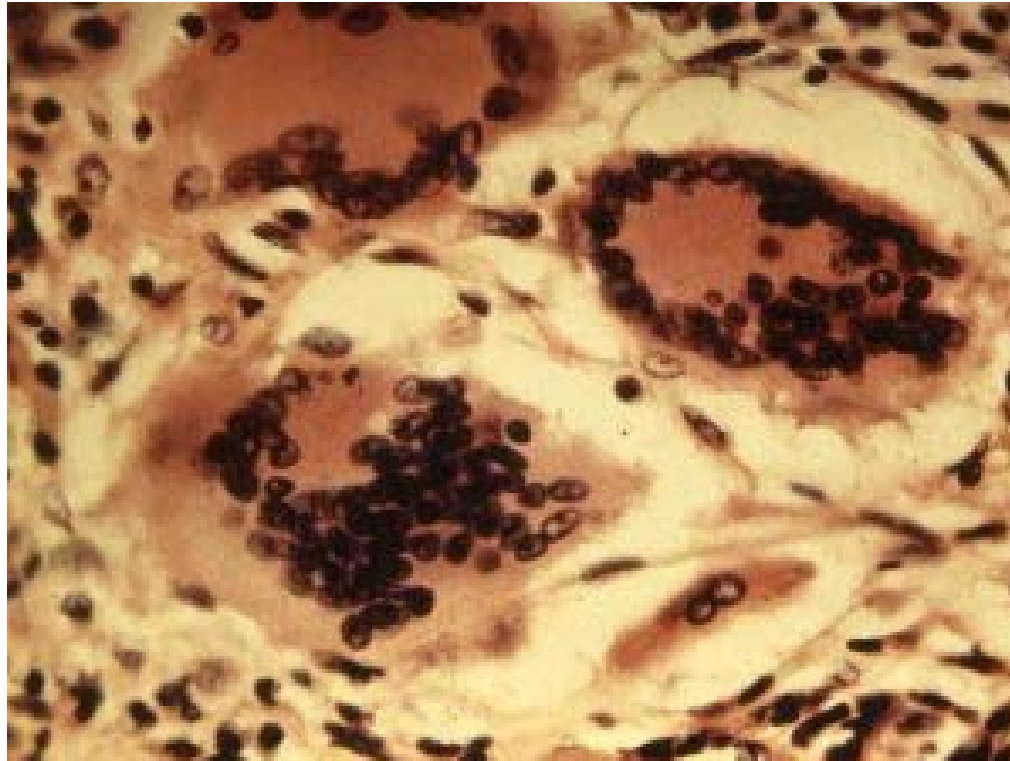
What is the pattern for:

--Touton giant cells? 'Peripheral ring'

--Foreign-body giant cells? 'Haphazard'



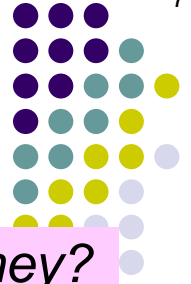
Ocular-Surface Immunology



Note the haphazard arrangement of nuclei

Foreign-body giant cells

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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This one is:

- A type of **giant cell** found in granulomas
- Associated with TB**
- Horseshoe-like arrangement of nuclei

Langhans cell

Langhans cell

└ 'Horseshoe'

Touton cell

└ 'Peripheral ring'

Foreign body

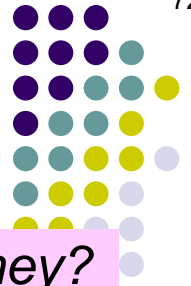
└ 'Haphazard'

Each type has a classic condition with which it's associated.

(No question—proceed when ready)

This part changed—re-read it!

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

This one is:

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Langhans cell

Langhans cell

- └ 'Horseshoe'
- └ TB

Touton cell

- └ 'Peripheral ring'

Foreign body

- └ 'Haphazard'

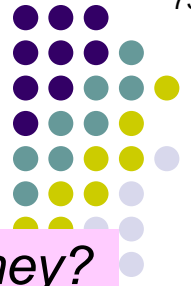
Each type has a classic condition with which it's associated. For Langhans giant cells, it's infections (eg, TB).

(No question—proceed when ready)

This part changed—re-read it!

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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Langhans cell

Langhans cell

- └ 'Horseshoe'
- └ TB

Touton cell

- └ 'Peripheral ring'
- └ ?

Foreign body

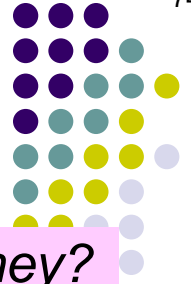
- └ 'Haphazard'

Each type has a classic condition with which it's associated. For Langhans giant cells, it's infections (eg, TB).

*What is the condition for:
--Touton giant cells?*

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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Langhans cell

Langhans cell

- └ 'Horseshoe'
- └ TB

Touton cell

- └ 'Peripheral ring'
- └ JXG

Foreign body

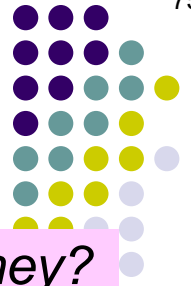
- └ 'Haphazard'

Each type has a classic condition with which it's associated. For Langhans giant cells, it's infections (eg, TB).

*What is the condition for:
--Touton giant cells? JXG*

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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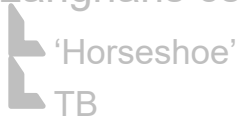
Langerhans cell

This one is:

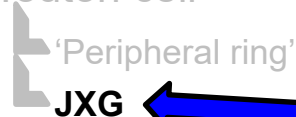
- A type of **giant cell** found in granulomas
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langhans cell

Langhans cell



Touton cell



Foreign body



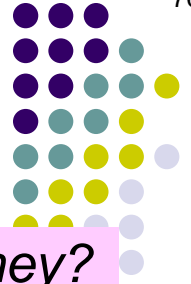
Each type has a classic condition with which it's associated. For Langhans giant cells, it's infections (eg, TB).

What does JXG stand for?

What condition for:
giant cells? JXG

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

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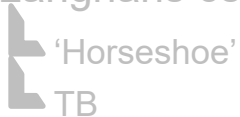
Langerhans cell

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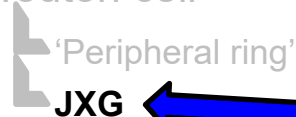
- A type of **giant cell** found in granulomas
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langhans cell

Langhans cell



Touton cell



Foreign body



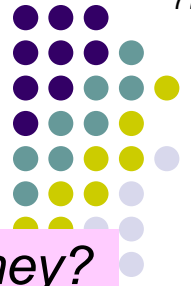
Each type has a classic condition with which it's associated. For Langhans giant cells, it's infections (eg, TB).

What does JXG stand for?
Juvenile xanthogranuloma

What condition is associated for:
Langhans cells? JXG

Q

Ocular-Surface Immunology



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Langhans cell

Langhans cell

- └ 'Horseshoe'
- └ TB

Touton cell

- └ 'Peripheral ring'
- └ JXG

Foreign body

- └ 'Haphazard'
- └ ?

Each type has a classic condition with which it's associated. For Langhans giant cells, it's infections (eg, TB).

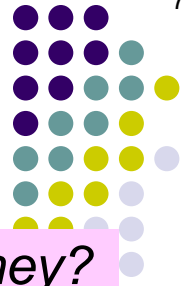
What is the condition for:

- Touton giant cells? JXG
- Foreign-body giant cells?

Next Q

A

Ocular-Surface Immunology



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Langhans cell

Langhans cell

- └ 'Horseshoe'
- └ TB

Touton cell

- └ 'Peripheral ring'
- └ JXG

Foreign body

- └ 'Haphazard'
- └ FBs

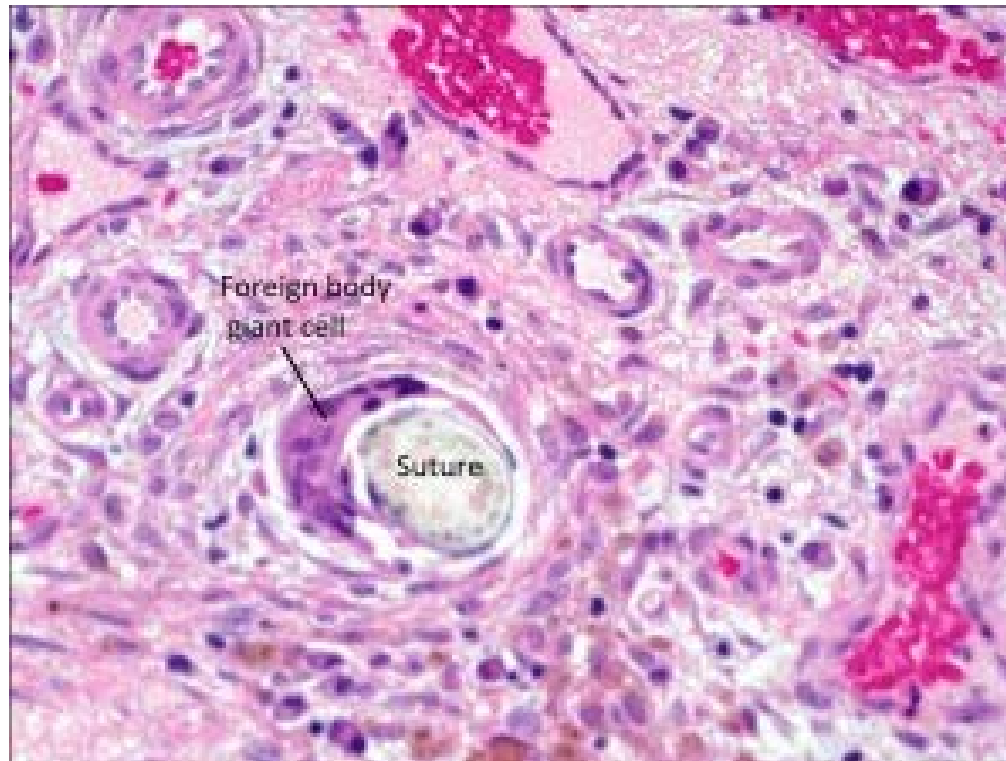
Each type has a classic condition with which it's associated. For Langhans giant cells, it's infections (eg, TB).

What is the condition for:

--Touton giant cells? JXG

--Foreign-body giant cells? Hurr durr, is it foreign bodies?

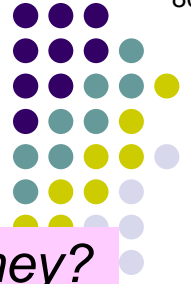
Ocular-Surface Immunology



Foreign-body giant cell in response to a suture

Q

Ocular-Surface Immunology



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Langhans cell

Langhans cell

- 'Horseshoe'
- TB

Touton cell

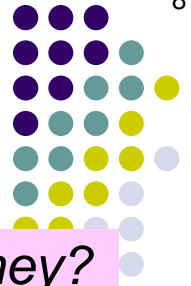
- 'Peripheral'
- JXG

Foreign body

In addition to Touton giant cells, JXG has another classic histologic finding—what is it?

Q/A

Ocular-Surface Immunology



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Langhans cell

Langhans cell

- 'Horseshoe'
- TB

Touton cell

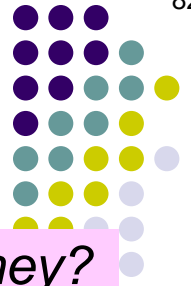
- 'Periphe
- JXG

Foreign body

In addition to Touton giant cells, JXG has another classic histologic finding—what is it?
The presence of macrophages

Q

Ocular-Surface Immunology



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Langhans cell

Langhans cell

- 'Horseshoe'
- TB

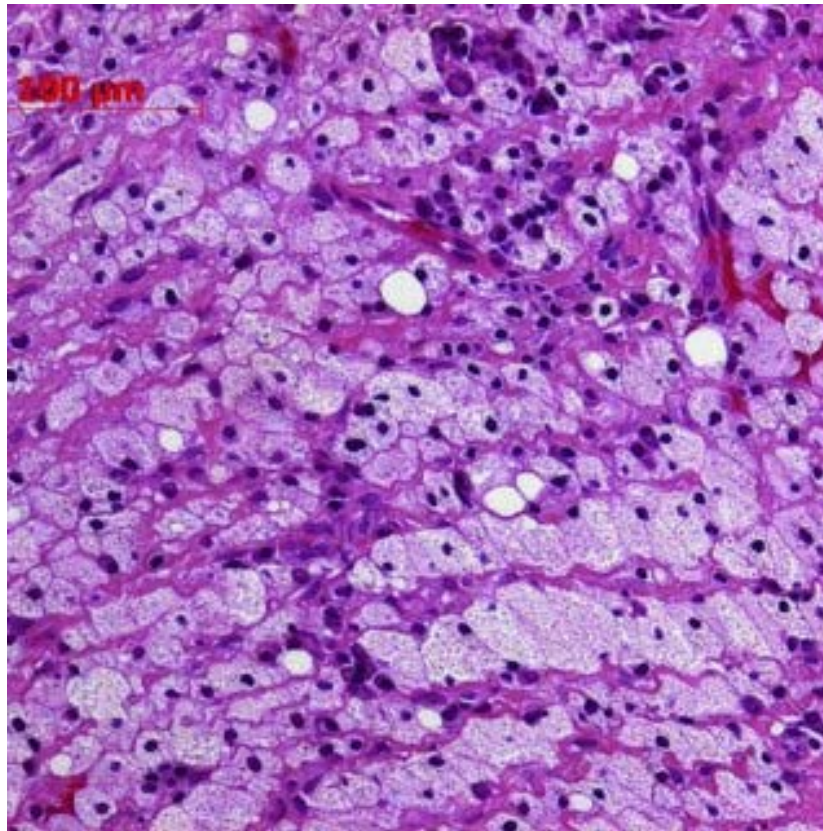
Touton cell

- 'Periphe
- JXG**

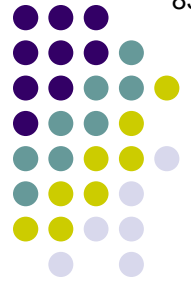
Foreign body

In addition to Touton giant cells, JXG has another classic histologic finding—what is it?
The presence of foamy macrophages

Ocular-Surface Immunology

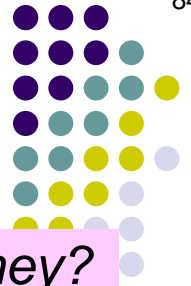


Foamy macrophages



Q

Ocular-Surface Immunology



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- Horseshoe-like arrangement of nuclei

Langhans cell

Langhans cell

- └ 'Horseshoe'
- └ TB

Touton cell

- └ 'Peripheral'
- └ JXG

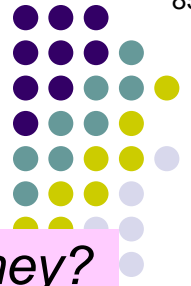
Foreign body

In addition to Touton giant cells, JXG has another classic histologic finding—what is it?
The presence of **foamy** macrophages

What gives these cells their foamy appearance?

A

Ocular-Surface Immunology



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- Horseshoe-like arrangement of nuclei

Langhans cell

Langhans cell

- 'Horseshoe'
- TB

Touton cell

- 'Peripheral'
- JXG

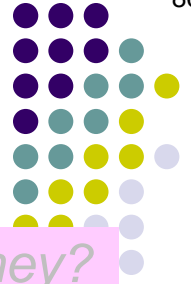
Foreign body

In addition to Touton giant cells, JXG has another classic histologic finding—what is it?
The presence of **foamy** macrophages

What gives these cells their foamy appearance?
They are full of fat (the term of art is 'lipid laden')

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

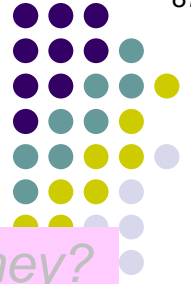
Switching gears, but still on topic: To what does the term Langerhans cell histiocytosis refer?

**Langerhans cell
histiocytosis**

ans cell

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

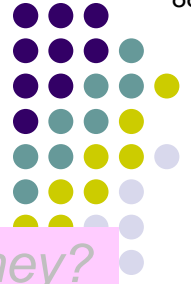
Switching gears, but still on topic: To what does the term Langerhans cell histiocytosis refer?
To a set of proliferative disorders characterized by the accumulation of Langerhans cells

**Langerhans cell
histiocytosis**

Langerhans cell

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Switching gears, but still on topic: To what does the term Langerhans cell histiocytosis refer?
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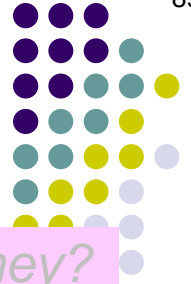
*By what name were these conditions formerly known as?
(TBH, this name is not really 'former'—it's still used a lot.)*

***Langerhans cell
histiocytosis***

Langerhans cell

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Switching gears, but still on topic: To what does the term Langerhans cell histiocytosis refer?
To a set of proliferative disorders characterized by the accumulation of Langerhans cells

*By what name were these conditions formerly known as?
(TBH, this name is not really 'former'—it's still used a lot.)
'Histiocytosis X'*

***Langerhans cell
histiocytosis***

Langerhans cell

Q

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Switching gears, but still on topic: To what does the term Langerhans cell histiocytosis refer?
To a set of proliferative disorders characterized by the accumulation of Langerhans cells

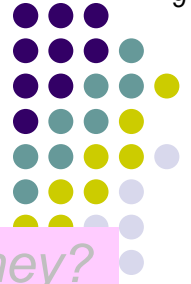
Are these disorders common, or rare?

**Langerhans cell
histiocytosis**

Langerhans cell

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Switching gears, but still on topic: To what does the term Langerhans cell histiocytosis refer?
To a set of proliferative disorders characterized by the accumulation of Langerhans cells

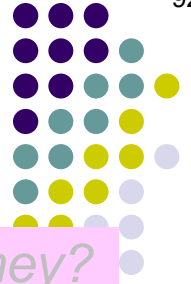
Are these disorders common, or rare?
Rare

***Langerhans cell
histiocytosis***

ns cell

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Switching gears, but still on topic: To what does the term Langerhans cell histiocytosis refer?
To a set of proliferative disorders characterized by the accumulation of Langerhans cells

Are these disorders common, or rare?
Rare

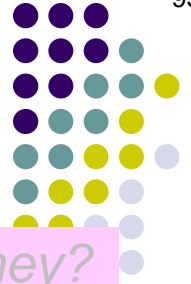
Who is the typical pt?

**Langerhans cell
histiocytosis**

ans cell

Q/A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Switching gears, but still on topic: To what does the term Langerhans cell histiocytosis refer?
To a set of proliferative disorders characterized by the accumulation of Langerhans cells

Are these disorders common, or rare?
Rare

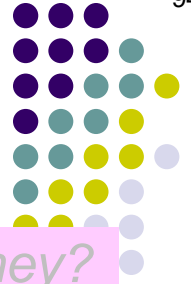
Who is the typical pt?
A child age age range (but it can occur in adulthood)

**Langerhans cell
histiocytosis**

ns cell

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Switching gears, but still on topic: To what does the term Langerhans cell histiocytosis refer?
To a set of proliferative disorders characterized by the accumulation of Langerhans cells

Are these disorders common, or rare?
Rare

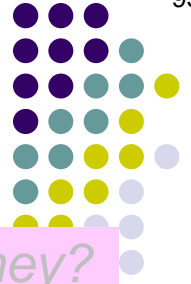
Who is the typical pt?
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**Langerhans cell
histiocytosis**

ans cell

Q

Ocular-Surface Immunology



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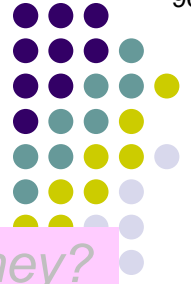
Can it occur in younger children?

**Langerhans cell
histiocytosis**

Langerhans cell

A

Ocular-Surface Immunology



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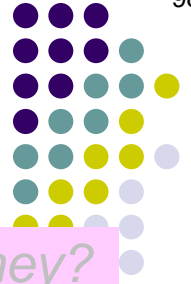
Is younger age at presentation associated with a better, or worse prognosis?

**Langerhans cell
histiocytosis**

Langerhans cell

Q/A

Ocular-Surface Immunology



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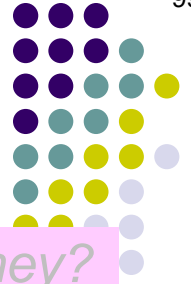
Is younger age at presentation associated with a better, or worse prognosis?
Worse—if under **#** the long-term survival rate is only **%**

**Langerhans cell
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ans cell

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Worse—if under 2, the long-term survival rate is only 50%

**Langerhans cell
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Langerhans cell

Q

Ocular-Surface Immunology

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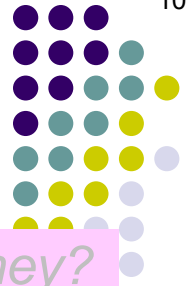
Is younger age at presentation associated with a better, or worse prognosis?
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**Langerhans cell
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ans cell

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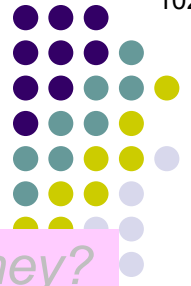
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**Langerhans cell
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ans cell

Q

Ocular-Surface Immunology



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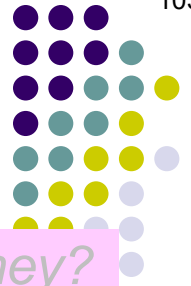
How does it present when the eye is involved?

**Langerhans cell
histiocytosis**

Langerhans cell

Q/A

Ocular-Surface Immunology



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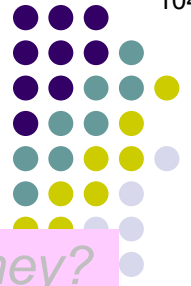
***Langerhans cell
histiocytosis***

two words

ns cell

A

Ocular-Surface Immunology



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**Langerhans cell
histiocytosis**

ns cell



18-year-old woman with ptosis of the right upper eyelid, fullness (*arrow*), and inferior globe displacement

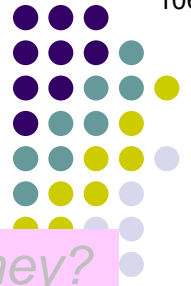


Worm's-eye view demonstrates 2 mm of proptosis of the right eye

Langerhans cell histiocytosis

Q

Ocular-Surface Immunology



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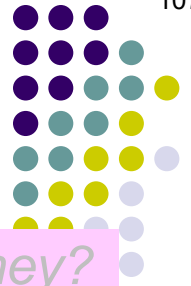
Sounds like imaging is indicated. What does it reveal?

**Langerhans cell
histiocytosis**

Langerhans cell

Q/A

Ocular-Surface Immunology



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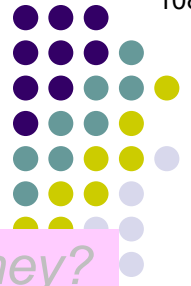
Sounds like imaging is indicated. What does it reveal?
A soft-tissue mass (usually location) with associated lytic bone lesions

**Langerhans cell
histiocytosis**

ns cell

A

Ocular-Surface Immunology



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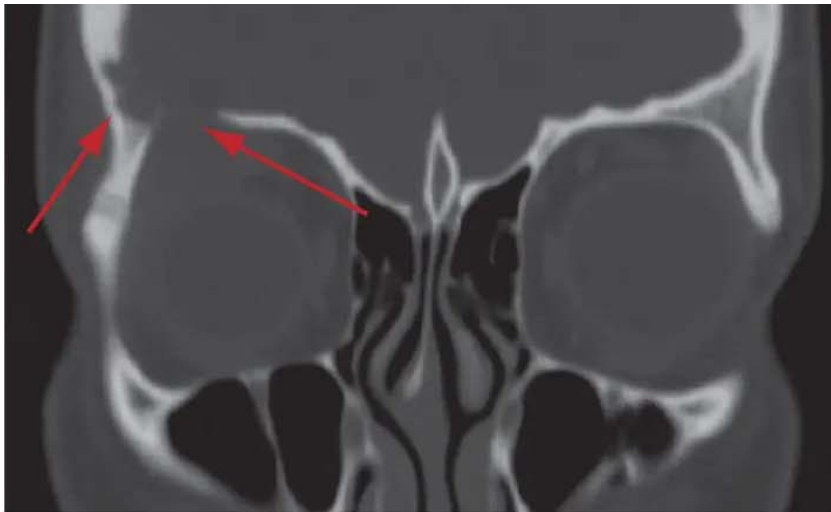
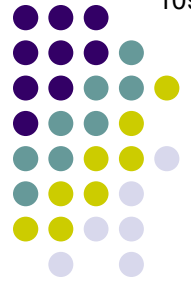
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A soft-tissue mass (usually superotemporal) with associated lytic bone lesions

***Langerhans cell
histiocytosis***

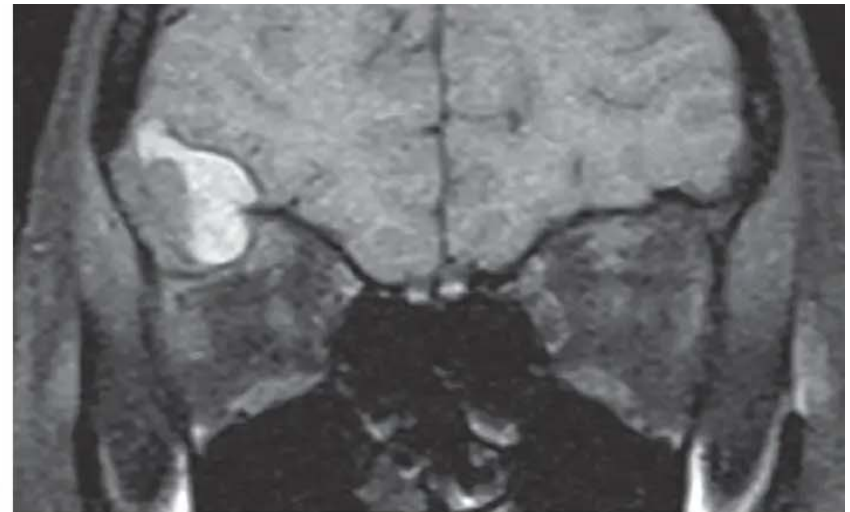
ns cell

Ocular-Surface Immunology

109



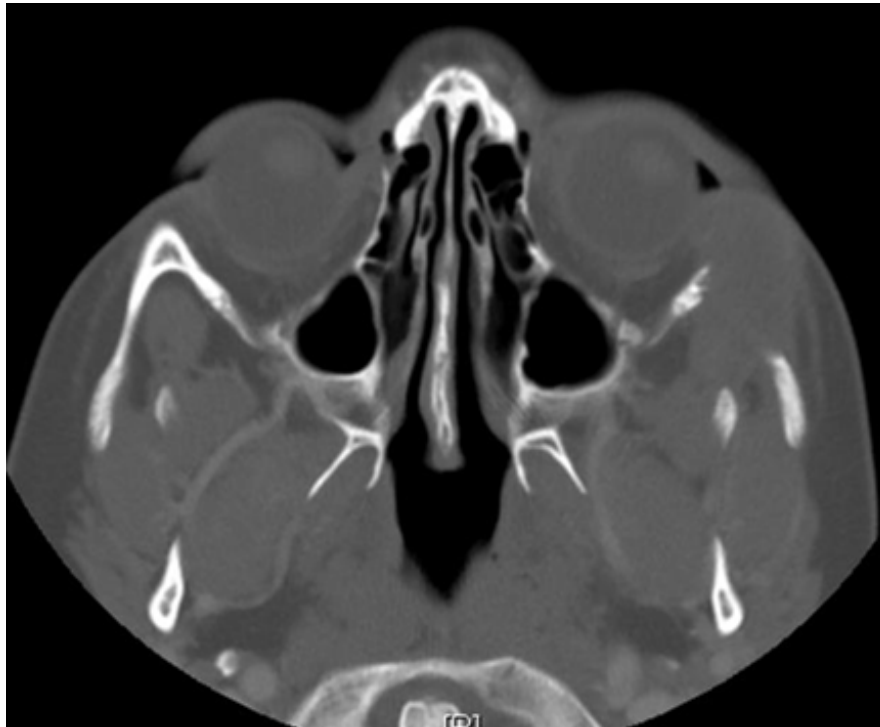
Coronal CT scan shows lytic erosion of the superotemporal orbital bone (*arrows*)



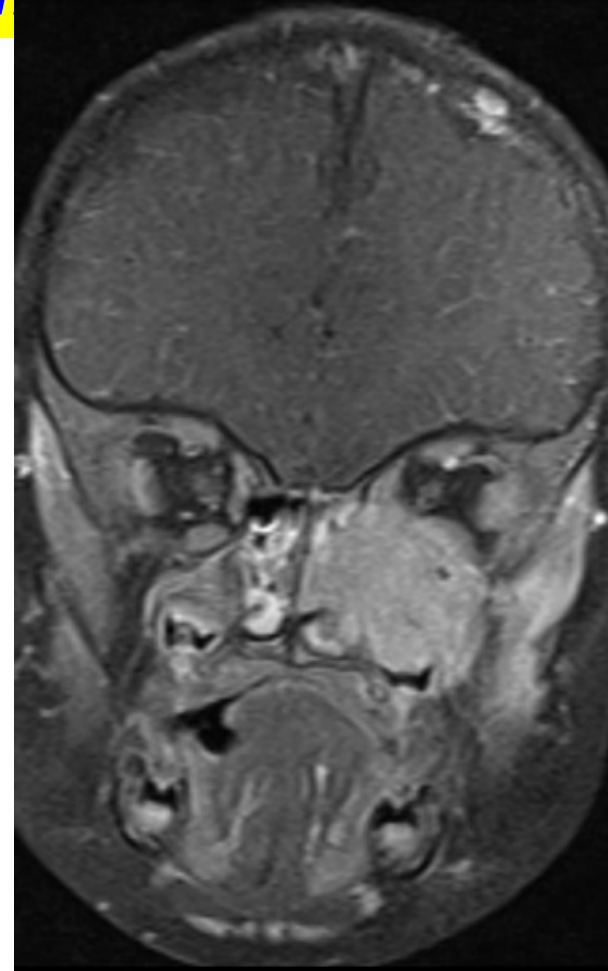
Coronal MRI scan shows the soft tissue with an intracranial and intraorbital component

Langerhans cell histiocytosis

Ocular-Surface Immunology



CT with soft tissue mass-like lesion adjacent to lateral wall of the left orbit. Note the erosion of portions of the lateral orbital wall and zygoma.



Lytic skull lesion and large mass in maxillary sinus and orbit in a 4 yo with Langerhans cell histiocytosis

Langerhans cell histiocytosis

Q

Ocular-Surface Immunology

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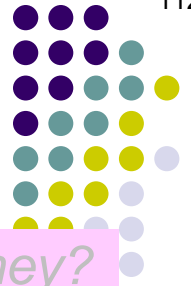
Is this imaging result in a child pathognomonic for LCH?

**Langerhans cell
histiocytosis**

Langerhans cell

A

Ocular-Surface Immunology



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Langerhans cell

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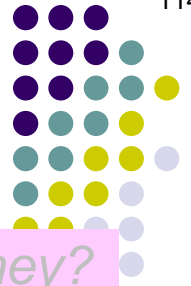
What other conditions should be considered in a young child with an orbital soft-tissue mass and lytic bone lesions?

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Langerhans cell

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Nah

What other conditions should be considered in a young child with an orbital soft-tissue mass and lytic bone lesions?
Neuroblastoma, Ewing sarcoma, and Wilms tumor to start

Langerhans cell histiocytosis

ns cell

Q

Ocular-Surface Immunology

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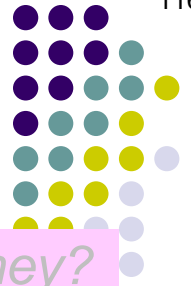
The Plastics book mentions three subtypes. My gunners, where you at?
--?
--?
--?

**Langerhans cell
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Langerhans cell

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Ocular-Surface Immunology



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--**Multifocal** eosinophilic granuloma of bone
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**Langerhans cell
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Langerhans cell

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--**Multifocal** eosinophilic granuloma of bone (aka eponym-eponym-eponym disease)

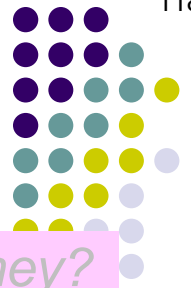
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**Langerhans cell
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**Langerhans cell
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Langerhans cell

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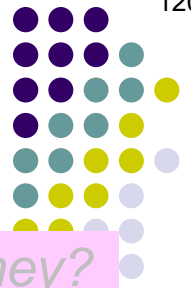
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**Langerhans cell
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Langerhans cell

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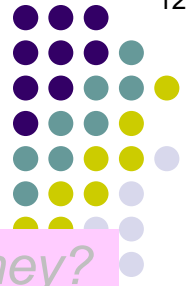
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**Langerhans cell
histiocytosis**

Langerhans cell

Q

Ocular-Surface Immunology



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This one is:

--A type of dendritic cell residing in the ocular surface epithelium

--An *A mass that results from 'an accumulation of proliferating cells'... that can cause lytic bone lesions... and can be fatal...bruh, you sure LCH isn't a form of pediatric cancer?*

--Des

**Langerhans cell
histiocytosis**

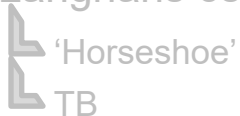
This one is:

--A type of giant cell found in granulomas

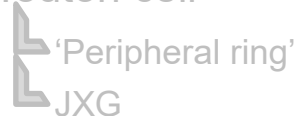
--Associated with TB

--Horseshoe-like arrangement of nuclei

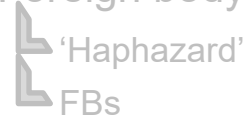
Langhans cell



Touton cell



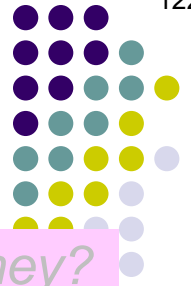
Foreign body



Langhans cell

A

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No I'm not (and neither is anyone else at this juncture)

**Langerhans cell
histiocytosis**

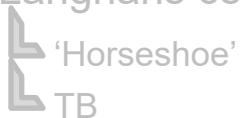
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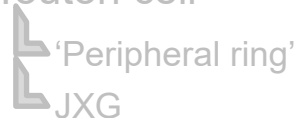
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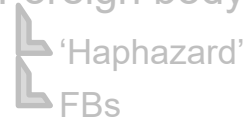
Langhans cell



Touton cell



Foreign body



Langhans cell

Q

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

**non-Langerhans cell
histiocytosis?**

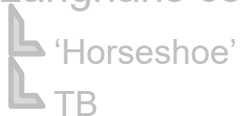
**Langerhans cell
histiocytosis**

This one is:

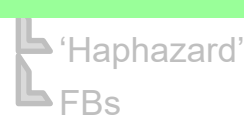
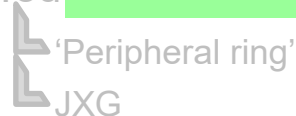
- A type of giant cell found in the ocular surface
- Associated with TB
- Horseshoe-like arrangement

Switching gears part deux: Is **non-Langerhans cell histiocytosis** a thing?

Langerhans cell

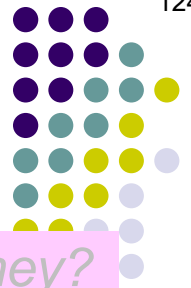


Tou



A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

**non-Langerhans cell
histiocytosis!**

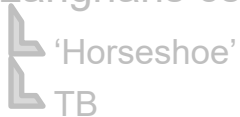
**Langerhans cell
histiocytosis**

This one is:

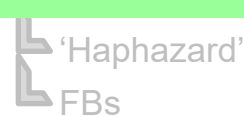
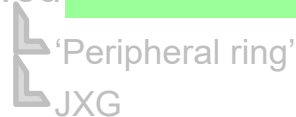
- A type of giant cell found in the ocular surface
- Associated with TB
- Horseshoe-like arrangement

*Switching gears part deux: Is non-Langerhans cell histiocytosis a thing?
Indeed it is*

Langerhans cell



Tou



Q

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

**non-Langerhans cell
histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

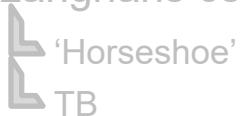
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- Horseshoe-like arrangement

Switching gears part deux: Is non-Langerhans cell histiocytosis a thing?

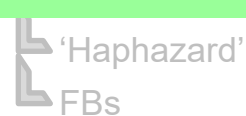
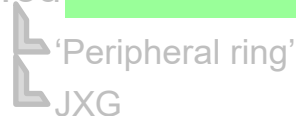
Indeed it is

What is the classic non-LCH condition? (Hint: It's on this page.)

Langerhans cell

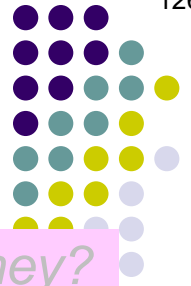


Tou



A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses



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**non-Langerhans cell
histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

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- Horseshoe-like arrangement

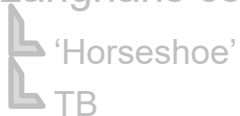
Switching gears part deux: Is non-Langerhans cell histiocytosis a thing?

Indeed it is

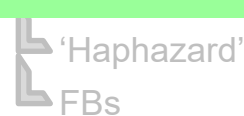
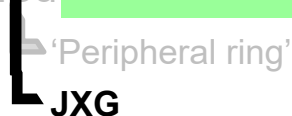
What is the classic non-LCH condition? (Hint: It's on this page.)

JXG

Langerhans cell



Tuberculous



Q

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the

non-Langerhans cell histiocytosis

How does JXG usually present? (It's not ophthalmic.)

This one is:

- A type of giant cell found in granulomatous inflammation
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langerhans cell



'Horseshoe'

TB

Touton cell

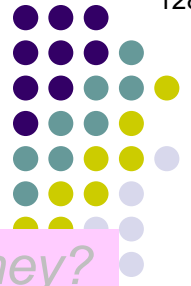


'Peripheral'

JXG

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

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- A type of dendritic cell residing in the ocular surface epithelium
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- Described as the

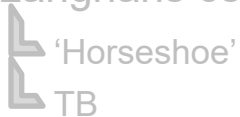
non-Langerhans cell histiocytosis

How does JXG usually present? (It's not ophthalmic.)
As orangish skin papules

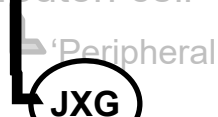
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- Horseshoe-like arrangement of nuclei

Langerhans cell



Touton cell



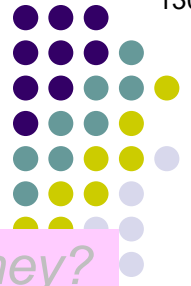
Ocular-Surface Immunology



JXG: Skin papules

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
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- Described as the **non-Langerhans cell**

histiocytosis

How does JXG usually present? (It's not ophthalmic.)

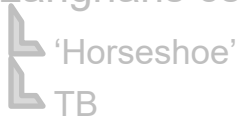
As orangish skin papules

What is the classic ophthalmic presentation?

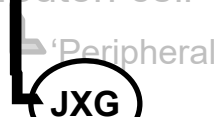
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Langerhans cell

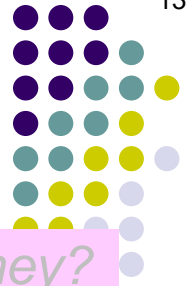


Touton cell



A

Ocular-Surface Immunology



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histiocytosis

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As orangish skin papules

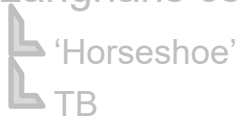
What is the classic ophthalmic presentation?

An iris mass/nodule

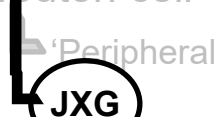
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- Horseshoe-like arrangement of nuclei

Langerhans cell



Touton cell



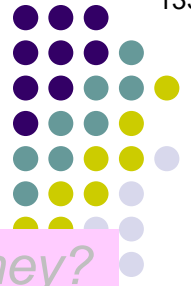
Ocular-Surface Immunology



JXG: Iris mass

Q

Ocular-Surface Immunology



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Histiocytoses

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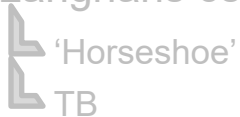
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histiocytosis

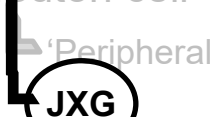
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- Horseshoe-like arrangement of nuclei

Langerhans cell



Touton cell



How does JXG usually present? (It's not ophthalmic.)

As orangish skin papules

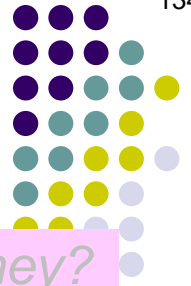
What is the classic ophthalmic presentation?

An iris mass/nodule

At what age does it present?

Q/A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

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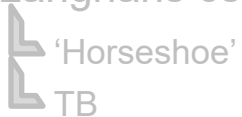
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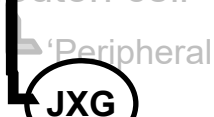
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Langerhans cell



Touton cell



JXG

How does JXG usually present? (It's not ophthalmic.)

As orangish skin papules

What is the classic ophthalmic presentation?

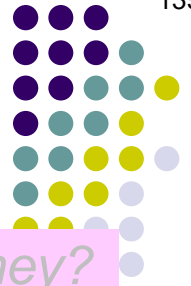
An iris mass/nodule

At what age does it present?

The majority before age , and almost all by

A

Ocular-Surface Immunology



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Histiocytoses

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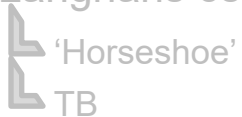
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histiocytosis

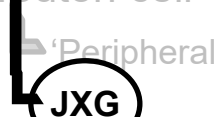
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Langerhans cell



Touton cell



JXG

How does JXG usually present? (It's not ophthalmic.)

As orangish skin papules

What is the classic ophthalmic presentation?

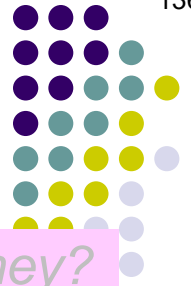
An iris mass/nodule

At what age does it present?

The majority before age 1 year, and almost all by 2

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

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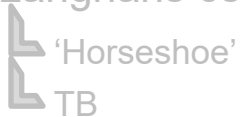
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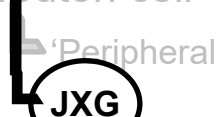
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Langerhans cell



Touton cell



How does JXG usually present? (It's not ophthalmic.)

As orangish skin papules

What is the classic ophthalmic presentation?

An iris mass/nodule

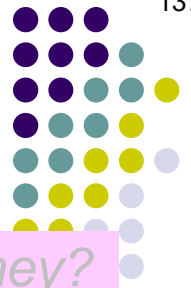
At what age does it present?

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When JXG iris nodules are present, are they uni-, or bilateral?

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

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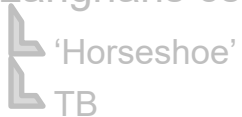
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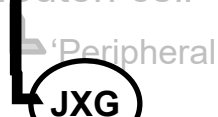
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Touton cell



JXG

How does JXG usually present? (It's not ophthalmic.)

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What is the classic ophthalmic presentation?

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At what age does it present?

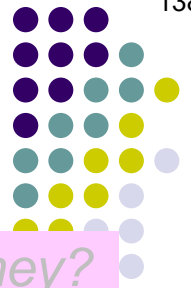
The majority before age 1 year, and almost all by 2

When JXG iris nodules are present, are they uni-, or bilateral?

Unilateral

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

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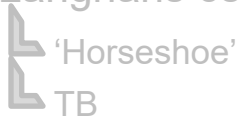
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histiocytosis

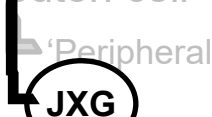
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Langerhans cell



Touton cell



How does JXG usually present? (It's not ophthalmic.)

As orangish skin papules

What is the classic ophthalmic presentation?

An iris mass/nodule

At what age does it present?

The majority before age 1 year, and almost all by 2

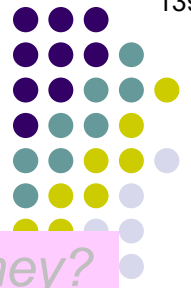
When JXG iris nodules are present, are they uni-, or bilateral?

Unilateral

In what three ways are the iris nodules clinically significant?

Q/A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

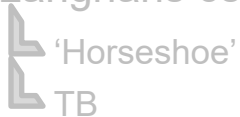
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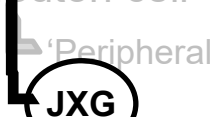
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Langerhans cell



Touton cell



How does JXG usually present? (It's not ophthalmic.)

As orangish skin papules

What is the classic ophthalmic presentation?

An iris mass/nodule

At what age does it present?

The majority before age 1 year, and almost all by 2

When JXG iris nodules are present, are they uni-, or bilateral?

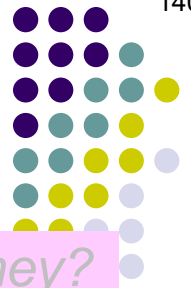
Unilateral

In what three ways are the iris nodules clinically significant?

- 1) They are prone to spontaneous bleeding, with subsequent hyphema and secondary glaucoma
- 2) They are in the DDx as a 'masquerade syndrome' in pediatric uveitis
- 3) If enough nodules are present, two words will result

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

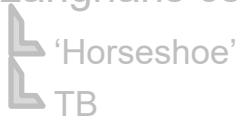
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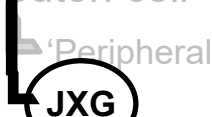
This one is:

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- Horseshoe-like arrangement of nuclei

Langerhans cell



Touton cell



How does JXG usually present? (It's not ophthalmic.)

As orangish skin papules

What is the classic ophthalmic presentation?

An iris mass/nodule

At what age does it present?

The majority before age 1 year, and almost all by 2

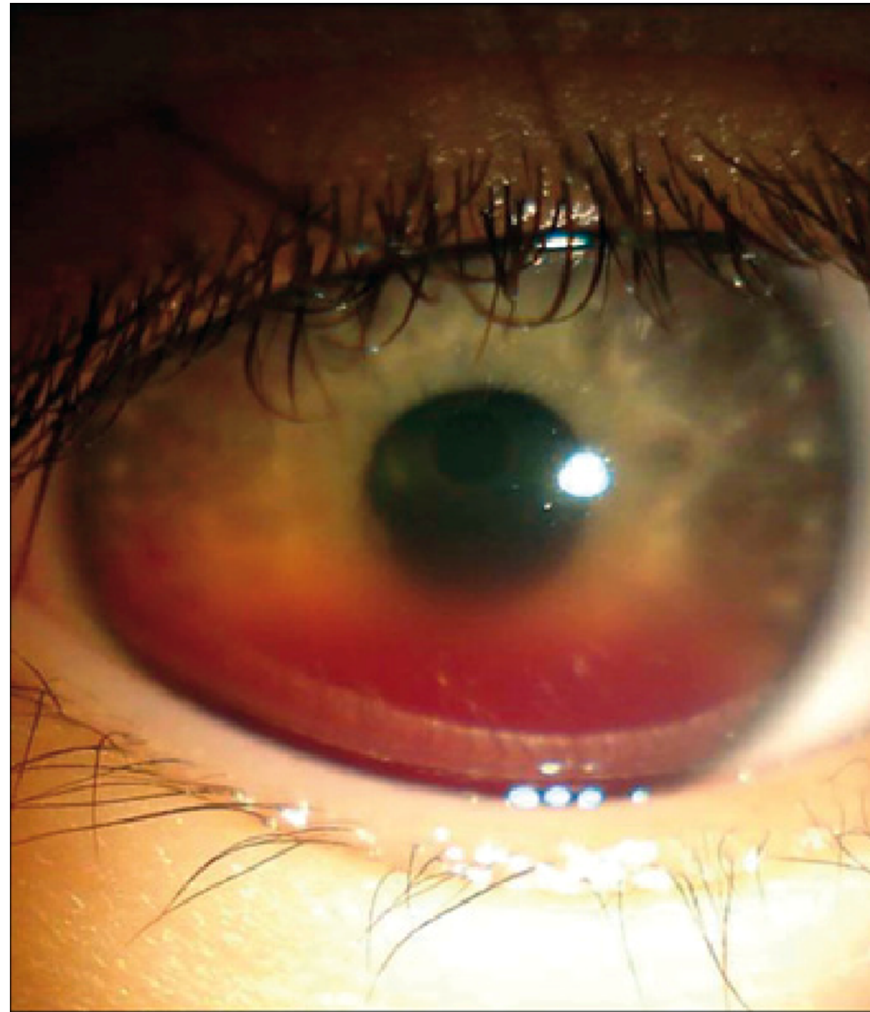
When JXG iris nodules are present, are they uni-, or bilateral?

Unilateral

In what three ways are the iris nodules clinically significant?

- 1) They are prone to spontaneous bleeding, with subsequent hyphema and secondary glaucoma
- 2) They are in the DDX as a 'masquerade syndrome' in pediatric uveitis
- 3) If enough nodules are present, heterochromia iridis will result

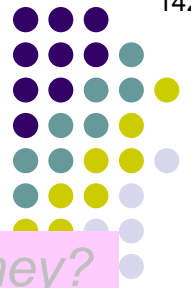
Ocular-Surface Immunology



JXG: Spontaneous hyphema

Q

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

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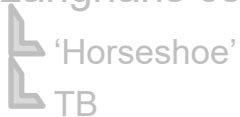
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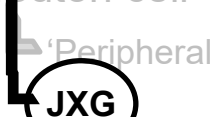
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Langerhans cell



Touton cell



How does JXG usually present? (It's not ophthalmic.)

As orangish skin papules

What is the classic ophthalmic presentation?

An iris mass/nodule

At what age does it present?

The majority before age 1 year, and almost all by 2

When JXG iris nodules are present, are they uni-, or bilateral?

Unilateral

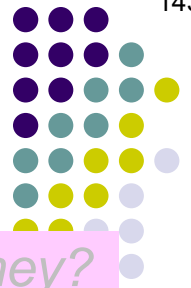
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- 1) They are prone to spontaneous bleeding, with subsequent hyphema and secondary glaucoma
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- 3) If enough nodules are present, heterochromia iridis will result

What is the natural history of JXG?

Q/A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

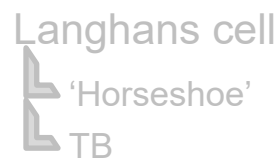
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histiocytosis

This one is:

- A type of giant cell found in granulomatous inflammation
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- Horseshoe-like arrangement of nuclei



How does JXG usually present? (It's not ophthalmic.)
As orangish skin papules

What is the classic ophthalmic presentation?
An iris mass/nodule

At what age does it present?
The majority before age 1 year, and almost all by 2

When JXG iris nodules are present, are they uni-, or bilateral?
Unilateral

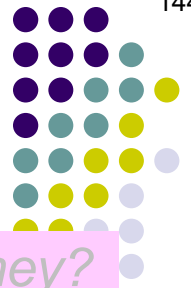
In what three ways are the iris nodules clinically significant?

- 1) They are prone to spontaneous bleeding, with subsequent hyphema and secondary glaucoma
- 2) They are in the DDX as a 'masquerade syndrome' in pediatric uveitis
- 3) If enough nodules are present, heterochromia iridis will result

What is the natural history of JXG?
It is self-limited, usually resolving by age 10

A

Ocular-Surface Immunology



The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

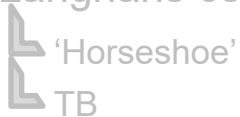
- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the **non-Langerhans cell**

histiocytosis

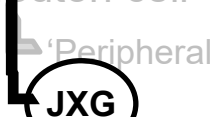
This one is:

- A type of giant cell found in granulomatous inflammation
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langerhans cell



Touton cell



How does JXG usually present? (It's not ophthalmic.)

As orangish skin papules

What is the classic ophthalmic presentation?

An iris mass/nodule

At what age does it present?

The majority before age 1 year, and almost all by 2

When JXG iris nodules are present, are they uni-, or bilateral?

Unilateral

In what three ways are the iris nodules clinically significant?

- 1) They are prone to spontaneous bleeding, with subsequent hyphema and secondary glaucoma
- 2) They are in the DDX as a 'masquerade syndrome' in pediatric uveitis
- 3) If enough nodules are present, heterochromia iridis will result

What is the natural history of JXG?

It is self-limited, usually resolving by age 5 years

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

**non-Langerhans cell
histiocytosis**

Langerhans cell
histiocytosis

This one is:

- A type of giant cell found in granulomas
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langhans cell

The Plastics book mentions four other non-Langerhans histiocytoses. See if you can name them from a brief description...

Touton cell

'Peripheral ring'
JXG

Foreign body

'Haphazard'
FBs

(No question—proceed when ready)

Q

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

**non-Langerhans cell
histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

- A type of giant cell found in the ocular surface
- Associated with TB
- Horseshoe-like arrangement

1) While all four present with skin lesions, this one is notorious for those lesions ulcerating:

2)

3)

4)

The Plastics book mentions four other non-Langerhans histiocytoses. See if you can name them from a brief description...

JXG

FBs

?

A

Ocular-Surface Immunology

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histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

- A type of giant cell found in the ocular surface
- Associated with TB
- Horseshoe-like arrangement

1) While all four present with skin lesions, this one is notorious for those lesions ulcerating: **Necrobiotic xanthogranuloma**

2)

3)

4)

The Plastics book mentions four other non-Langerhans histiocytoses. See if you can name them from a brief description...

JXG

FBs

Necrobiotic xanthogranuloma

Ocular-Surface Immunology



Necrobiotic xanthogranuloma

Q

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

non-Langerhans cell histiocytosis

Langerhans cell histiocytosis

This one is:

- A type of giant cell found in the ocular surface
- Associated with TB
- Horseshoe-like arrangement

1) While all four present with skin lesions, this one is notorious for those lesions ulcerating: **Necrobiotic xanthogranuloma**

2) This one presents with adult-onset asthma and periocular lesions:

3)

4)

The Plastics book mentions four other non-Langerhans histiocytoses. See if you can name them from a brief description...

JXG

FBs

Necrobiotic xanthogranuloma

?

A

Ocular-Surface Immunology

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histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

- A type of giant cell found in the ocular surface
- Associated with TB
- Horseshoe-like arrangement of nuclei

1) While all four present with skin lesions, this one is notorious for those lesions ulcerating: **Necrobiotic xanthogranuloma**

2) This one presents with adult-onset asthma and periocular lesions: **Adult-onset asthma with periocular xanthogranuloma**

3)

4)

The Plastics book mentions four other non-Langerhans histiocytoses. See if you can name them from a brief description...

JXG

FBs

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Ocular-Surface Immunology



It can look like xanthelasma on steroids (well, not on steroids; you know what I mean)

Adult-onset asthma with periocular xanthogranuloma

Q

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
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**non-Langerhans cell
histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

- A type of giant cell found in the ocular surface
- Associated with TB
- Horseshoe-like arrangement of nuclei

- 1) While all four present with skin lesions, this one is notorious for those lesions ulcerating: **Necrobiotic xanthogranuloma**
- 2) This one presents with adult-onset asthma and periocular lesions: **Adult-onset asthma with periocular xanthogranuloma**
- 3) This one presents with isolated xanthogranulomas—no systemic findings whatsoever:

4)

The Plastics book mentions four other non-Langerhans histiocytoses. See if you can name them from a brief description...

JXG

FBs

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

?

A

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
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non-Langerhans cell histiocytosis

Langerhans cell histiocytosis

This one is:

- A type of giant cell found in the ocular surface
- Associated with TB
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- 1) While all four present with skin lesions, this one is notorious for those lesions ulcerating: **Necrobiotic xanthogranuloma**
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- 3) This one presents with isolated xanthogranulomas—no systemic findings whatsoever: **Adult-onset xanthogranuloma**

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The Plastics book mentions four other non-Langerhans histiocytoses. See if you can name them from a brief description...

JXG

FBs

▮ Necrobiotic xanthogranuloma

▮ Adult-onset asthma with periocular xanthogranuloma

▮ Adult-onset xanthogranuloma

Ocular-Surface Immunology



Adult-onset xanthogranuloma

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

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This one is:

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Langerhans cell histiocytosis

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- 3) This one presents with isolated xanthogranulomas—no systemic findings whatsoever: **Adult-onset xanthogranuloma**
- 4)

The Plastics book mentions four other non-Langerhans histiocytoses. See if you can name them from a brief description...

JXG

FBs

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

(No question—proceed when ready)

These two look alike—it's the **asthma** that differentiates them!

Q

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

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histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

- A type of giant cell found in the ocular surface
- Associated with TB
- Horseshoe-like arrangement of nuclei

1) While all four present with skin lesions, this one is notorious for those lesions ulcerating: **Necrobiotic xanthogranuloma**

2) This one presents with adult-onset asthma and periocular lesions:

Adult-onset asthma with periocular xanthogranuloma

3) This one presents with isolated xanthogranulomas—no systemic findings whatsoever: **Adult-onset xanthogranuloma**

4) This one is **awful**—progressive fibrosclerosis of the internal organs and body cavities; often fatal. If that's not bad enough, intraconal involvement is common, and can result in blindness:

The Plastics book mentions four other non-Langerhans histiocytoses. See if you can name them from a brief description...

JXG

FBs

└─ Necrobiotic xanthogranuloma

└─ Adult-onset asthma with periocular xanthogranuloma

└─ Adult-onset xanthogranuloma

└─ ?

A

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
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non-Langerhans cell histiocytosis

Langerhans cell histiocytosis

This one is:

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1) While all four present with skin lesions, this one is notorious for those lesions ulcerating: **Necrobiotic xanthogranuloma**

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3) This one presents with isolated xanthogranulomas—no systemic findings whatsoever: **Adult-onset xanthogranuloma**

4) This one is **awful**—progressive fibrosclerosis of the internal organs and body cavities; often fatal. If that's not bad enough, intraconal involvement is common, and can result in blindness: **Erdheim-Chester dz**

The Plastics book mentions four other non-Langerhans histiocytoses. See if you can name them from a brief description...

JXG

FBs

└─ Necrobiotic xanthogranuloma

└─ Adult-onset asthma with periocular xanthogranuloma

└─ Adult-onset xanthogranuloma

└─ Erdheim-Chester dz

Ocular-Surface Immunology



Erdheim-Chester disease

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

non-Langerhans cell histiocytosis

Langerhans cell histiocytosis

This one is:

- A type of giant cell found in granulomas
- Associated with TB
- Horseshoe

Note that all of the non-Langerhans cell histiocytoses present in adulthood

Langerhans cell Multinucleated giant cell Foreign body

'Horseshoe' 'Peripheral ring' 'Haphazard'

TB JXG FBs

Adult

- ▮ Necrobiotic xanthogranuloma
- ▮ Adult-onset asthma with periocular xanthogranuloma
- ▮ Adult-onset xanthogranuloma
- ▮ Erdheim-Chester dz

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

non-Langerhans cell histiocytosis

Langerhans cell histiocytosis

This one is:

- A type of giant cell found in granulomas
- Associated with TB
- Horseshoe

Note that all of the non-Langerhans cell histiocytoses present in adulthood (except the one with *juvenile* in the name, duh).

Langerhans cell Touton cell Foreign body

'Horseshoe' 'Peripheral ring' 'Haphazard'

TB

Adult

Juvenile xanthogranuloma

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

non-Langerhans cell histiocytosis

Langerhans cell histiocytosis

This one is:

- A type of giant cell found in granulomas
- Associated with TB
- Horseshoe

Note that all of the non-Langerhans cell histiocytoses present in adulthood (except the one with *juvenile* in the name, duh). For this reason, together they are called the *adult xanthogranulomatous diseases*—AXGs for short.

Langerhans cell Touton cell Foreign body

'Horseshoe' 'Peripheral ring' 'Haphazard'

TB

Adult xanthogranulomatous diseases

Juvenile xanthogranuloma

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

Q

Ocular-Surface Immunology

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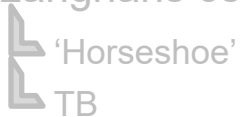
**non-Langerhans cell
histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

- A type of **giant cell** found in granuloma
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langerhans cell



Touton cell?

'Peripheral ring'

Juvenile xanthogranuloma

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

**Adult
xanthogranulomatous
diseases**

Are the AXGs associated with Touton giant cells a la JXG?

Haphazard

A

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

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This one is:

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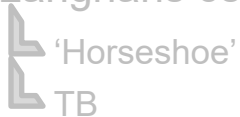
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- Associated with TB
- Horseshoe-like arrangement of nuclei

Are the AXGs associated with Touton giant cells a la JXG?
Indeed they are

Langerhans cell



Touton cell!

'Peripheral ring'

Juvenile xanthogranuloma

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

**Adult
xanthogranulomatous
diseases**

Q

Ocular-Surface Immunology

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histiocytosis**

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This one is:

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Langerhans cell
'Horseshoe'
TB

Touton cell

'Peripheral ring'

Juvenile xanthogranuloma

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

**Adult
xanthogranulomatous
diseases**

Are the AXGs associated with Touton giant cells a la JXG?

Indeed they are

Are the AXGs associated with 'foamy macrophages' a la JXG?

A

Ocular-Surface Immunology

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histiocytosis**

**Langerhans cell
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Langerhans cell
'Horseshoe'
TB

Touton cell

'Peripheral ring'

Juvenile xanthogranuloma

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

**Adult
xanthogranulomatous
diseases**

Are the AXGs associated with Touton giant cells a la JXG?

Indeed they are

Are the AXGs associated with 'foamy macrophages' a la JXG?

Them too, yes

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

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**non-Langerhans cell
histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- Associated with the 'ocular surface'
- Historically, these diseases were considered 'benign' and 'self-limiting'

The adult xanthogranulomatous diseases are not as impenetrable as they seem.
Think of it this way:

Langerhans

'Horseshoe'
TB

'Peripheral ring'

Juvenile xanthogranuloma

'Haphazard'

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

**Adult
xanthogranulomatous
diseases**

Ocular-Surface Immunology

The names of the

what are they?



This one is:

- A type of dendritic cell
- An *antigen-presenting cell* (APC)
- Described as the

**non-Langerhans cell
histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

- A type of
 - Associated
 - Histiocytosis
- The adult xanthogranulomatous diseases are not as impenetrable as they seem. Think of it this way: On one of our tests, I would anticipate they will present as 'super-xanthelasmas.' If that's the end of the story, it's just **adult-onset xanthogranuloma**.

Langerhans

'Horseshoe'
TB

'Peripheral ring'

Juvenile xanthogranuloma

'Haphazard'

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

**Adult
xanthogranulomatous
diseases**

Ocular-Surface Immunology

The names of the

what are they?



This one is:

--A type of dendritic cell

--An *antigen-presenting cell* (APC)

--Described as the 'ocular surface'

**non-Langerhans cell
histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

--A type of

--Associated

--Histiocytosis

The adult xanthogranulomatous diseases are not as impenetrable as they seem. Think of it this way: On one of our tests, I would anticipate they will present as 'super-xanthelasmas.' If that's the end of the story, it's just **adult-onset xanthogranuloma**. If there's a history of **adult-onset asthma**, it's that one.

Langerhans

'Horseshoe'
TB

'Peripheral ring'

Juvenile xanthogranuloma

'Haphazard'

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

**Adult
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diseases**

Ocular-Surface Immunology

The names of the

what are they?



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non-Langerhans cell
histiocytosis

Langerhans cell
histiocytosis

This one is:

- A type of
 - Associated
 - How
- The adult xanthogranulomatous diseases are not as impenetrable as they seem. Think of it this way: On one of our tests, I would anticipate they will present as 'super-xanthelasmas.' If that's the end of the story, it's just **adult-onset xanthogranuloma**. If there's a history of **adult-onset asthma**, it's that one. If the xanthomas are ulcerated, it's **necrobiotic**.

Langerhans

'Horseshoe'
TB

'Peripheral ring'

Juvenile xanthogranuloma

'Haphazard'

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

Adult
xanthogranulomatous
diseases

Ocular-Surface Immunology

The names of the

what are they?



This one is:

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- Described as the 'ocular surface'

**non-Langerhans cell
histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

- A type of
 - Associated with
 - Histiocytosis
- The adult xanthogranulomatous diseases are not as impenetrable as they seem. Think of it this way: On one of our tests, I would anticipate they will present as 'super-xanthelasmas.' If that's the end of the story, it's just **adult-onset xanthogranuloma**. If there's a history of **adult-onset asthma**, it's that one. If the xanthomas are ulcerated, it's **necrobiotic**. Finally, if there is significant intraorbital involvement and/or the pt is very ill, it's **Erdheim-Chester**.

Langerhans
'Horseshoe'
TB

'Peripheral ring' 'Haphazard'

Juvenile xanthogranuloma

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

**Adult
xanthogranulomatous
diseases**

Q

Ocular-Surface Immunology

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**Langerhans cell
histiocytosis**

This one is:

- A type of giant cell found in granulomas
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langhans cell

?

?

?

Remind me—what are the three subtypes of LCH?

La

'Horseshoe'

TB

'Peripheral ring'

JXG

'Haphazard'

FBs

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

A

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This one is:

- A type of giant cell found in granulomas
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langhans cell

Remind me—what are the three subtypes of LCH?

- Unifocal eosinophilic granuloma of bone
- Multifocal eosinophilic granuloma of bone
(Hand-Schüller-Christian disease)
- Diffuse eosinophilic granuloma of bone
(Letterer-Siwe disease)

La

'Horseshoe'

TB

'Peripheral ring'

JXG

'Haphazard'

FBs

Necrobiotic xanthogranuloma

Adult-onset asthma with periocular xanthogranuloma

Adult-onset xanthogranuloma

Erdheim-Chester dz

Ocular-Surface Immunology

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This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

**non-Langerhans cell
histiocytosis**

**Langerhans cell
histiocytosis**

This one is:

- A type of giant cell found in granulomas
- Associated with TB
- Horseshoe-like arrangement of nuclei

Langhans cell

Remind me—what are the three subtypes of LCH?

- Unifocal eosinophilic granuloma of bone
- Multifocal eosinophilic granuloma of bone
(Hand-Schüller-Christian disease)
- Diffuse eosinophilic granuloma of bone
(Letterer-Siwe disease)

It's really not that hard to remember these either if you just note that the LCHs are 'eosinophilic granulomas of bone' that present in *unifocal*, *multifocal*, or *diffuse* fashion. It's the eponyms that are tough.

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

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histiocytosis**

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Langhans cell

Remind me—what are the three subtypes of LCH?

Unifocal eosinophilic granuloma of bone

Multifocal eosinophilic granuloma of bone

Diffuse eosinophilic granuloma of bone

'Horseshoe'

TB

'Peripheral ring'

JXG

'Haphazard'

FBs

It's really not that hard to remember these either if you just note that the LCHs are '*eosinophilic granulomas of bone*' that present in *unifocal*, *multifocal*, or *diffuse* fashion. It's the eponyms that are tough. But as the BCSC downplays these, they can be ignored.

Ocular-Surface Immunology

The names of these two cell types are easily confused—what are they?

Histiocytoses

This one is:

- A type of dendritic cell residing in the ocular surface epithelium
- An *antigen-presenting cell* (APC)
- Described as the 'ocular surface'

non-Langerhans cell histiocytosis

Langerhans cell histiocytosis

This one is:

- A type of giant cell found in
- Associated with TB
- Horseshoe-like arrangement of nuclei

These are all the histiocytoses covered in depth in the *BCSC*. (I think.)

Langerhans cell

Langerhans cell
'Horseshoe'
TB

Touton cell
'Peripheral'

Children

Foreign body
'Haphazard'
FBs

- Unifocal eosinophilic granuloma of bone
- Multifocal eosinophilic granuloma of bone
- Diffuse eosinophilic granuloma of bone

JXG

Adults

- Necrobiotic xanthogranuloma
- Adult-onset asthma with periocular xanthogranuloma
- Adult-onset xanthogranuloma
- Erdheim-Chester dz

(Review slide—no question)