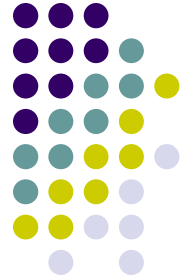
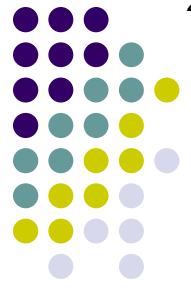


Q

- **Peters Anomaly**

- An abnormality of embryologic cell line cell migration

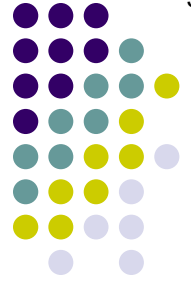




A

- **Peters Anomaly**

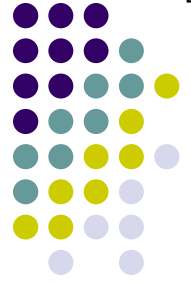
- An abnormality of **neural-crest** cell migration



Q

- Peters Anomaly
 - An abnormality of **neural-crest cell** migration

What are neural crest cells?

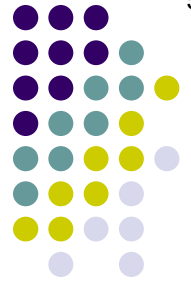


Q/A

- Peters Anomaly
 - An abnormality of **neural-crest cell** migration

What are neural crest cells?

A special subpopulation of **embryologic cell type** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

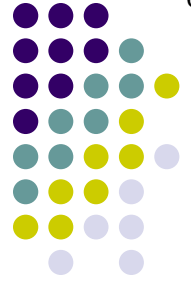


A

- Peters Anomaly
 - An abnormality of **neural-crest cell** migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues



Q

- Peters Anomaly
 - An abnormality of **neural-crest cell** migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?



A

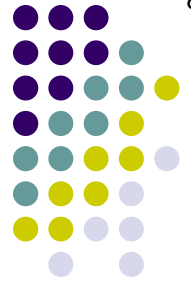
- Peters Anomaly
 - An abnormality of **neural-crest cell** migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?

A neurocristopathy



Q

- **Peters Anomaly**
 - An abnormality of **neural-crest cell** migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?

A neurocristopathy

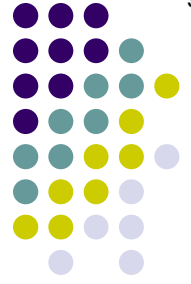
Neural-crest-cell migration concerning the anterior segment occurs in three 'waves.'

Which wave involves which future structure?

First wave →

Second wave →

Third wave →



A

- Peters Anomaly
 - An abnormality of **neural-crest cell** migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?

A neurocristopathy

Neural-crest-cell migration concerning the anterior segment occurs in three 'waves.'

Which wave involves which future structure?

First wave → Corneal endothelium

Second wave →

Third wave →



Q

- **Peters Anomaly**
 - An abnormality of **neural-crest cell** migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?

A neurocristopathy

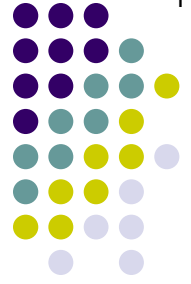
Neural-crest-cell migration concerning the anterior segment occurs in three 'waves.'

Which wave involves which future structure?

First wave → Corneal endothelium

Second wave →

Third wave →



A

- Peters Anomaly
 - An abnormality of **neural-crest cell** migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?

A neurocristopathy

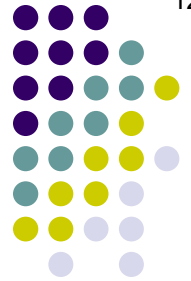
Neural-crest-cell migration concerning the anterior segment occurs in three 'waves.'

Which wave involves which future structure?

First wave → Corneal endothelium

Second wave → Iris stroma

Third wave →



Q

- Peters Anomaly
 - An abnormality of **neural-crest cell** migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?

A neurocristopathy

Neural-crest-cell migration concerning the anterior segment occurs in three 'waves.'

Which wave involves which future structure?

First wave → Corneal endothelium

Second wave → Iris stroma

Third wave →



A

- Peters Anomaly
 - An abnormality of **neural-crest cell** migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?

A neurocristopathy

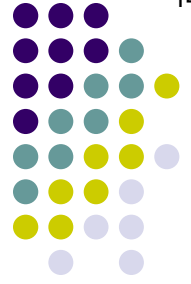
Neural-crest-cell migration concerning the anterior segment occurs in three 'waves.'

Which wave involves which future structure?

First wave → Corneal endothelium

Second wave → Iris stroma

Third wave → Corneal stroma (keratocytes)



Q

● Peters Anomaly

- An abnormality of **neural-crest cell** migration

What about the iris epithelium—is it neural-crest derivative as well?

*What are ne
A special su
deposit the
distinct tissu*

*oryo and
many*

*What is the
neural-crest
A neurocris*

ntiation of

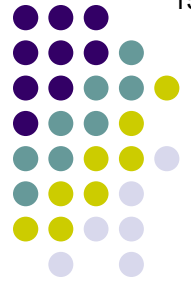
*Neural-crest
Which wave*

aves.'

First wave → Corneal endothelium

Second wave → Iris stroma *epithelium?*

Third wave → Corneal stroma (keratocytes)



Q/A

● Peters Anomaly

- An abnormality of **neural-crest cell** migration

What about the iris epithelium—is it neural-crest derivative as well?
 No, it derives from the [] cells that line the [two words]
 (the embryologic outpouching off of the [two words])

*What are ne
 A special su
 deposit ther
 distinct tissu*

*oryo and
 many*

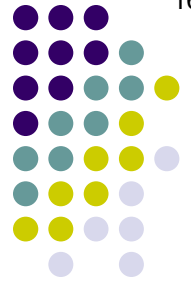
*What is the
 neural-crest
 A neurocris*

ntiation of

*Neural-crest
 Which wave*

aves.'

- First wave** → Corneal endothelium
- Second wave** → Iris stroma — epithelium? *No!*
- Third wave** → Corneal stroma (keratocytes)



A

● Peters Anomaly

- An abnormality of **neural-crest cell** migration

What about the iris epithelium—is it neural-crest derivative as well?

No, it derives from the neuroectodermal cells that line the optic vesicle (the embryologic outpouching off of the neural tube)

*What are ne
A special su
deposit the
distinct tissu*

*oryo and
many*

*What is the
neural-crest
A neurocris*

ntiation of

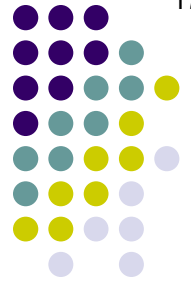
*Neural-crest
Which wave*

aves.'

First wave → Corneal endothelium

Second wave → Iris stroma ~~epithelium?~~ **No!**

Third wave → Corneal stroma (keratocytes)



Q/A

● Peters Anomaly

- An abnormality of **neural-crest cell** migration

What about the iris epithelium—is it neural-crest derivative as well?
 No, it derives from the neuroectodermal cells that line the optic vesicle (the embryologic outpouching off of the neural tube). In addition to the iris epithelium, the optic vesicle gives rise to the [two words] epithelium, as well as to the [two words], [abb.] and []

What are ne...
 A special su...
 deposit the...
 distinct tiss...

...oryo and
 ... many

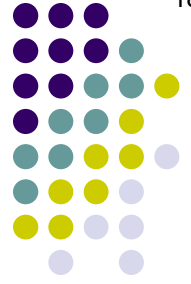
What is the...
 neural-crest...
 A neurocris...

...ntiation of

Neural-crest...
 Which wave...

...aves.'

- First wave** → Corneal endothelium
- Second wave** → Iris stroma *epithelium? No!*
- Third wave** → Corneal stroma (keratocytes)



A

● Peters Anomaly

- An abnormality of **neural-crest cell** migration

What about the iris epithelium—is it neural-crest derivative as well?

No, it derives from the neuroectodermal cells that line the optic vesicle (the embryologic outpouching off of the neural tube). In addition to the iris epithelium, the optic vesicle gives rise to the ciliary body epithelium, as well as to the optic nerve, RPE and retina.

*What are ne
A special su
deposit the
distinct tissu*

*oryo and
many*

*What is the
neural-crest
A neurocris*

ntiation of

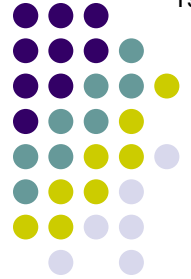
*Neural-crest
Which wave*

aves.'

First wave → Corneal endothelium

Second wave → Iris stroma ~~epithelium?~~ *No!*

Third wave → Corneal stroma (keratocytes)



Q

● Peters Anomaly

- An abnormality of **neural-crest cell** migration

What about the iris epithelium—is it neural-crest derivative as well?

No, it derives from the neuroectodermal cells that line the optic vesicle (the embryologic outpouching off of the neural tube). In addition to the iris epithelium, the optic vesicle gives rise to the ciliary body epithelium, as well as to the optic nerve, RPE and retina.

How many epithelial layers are present on the posterior iris?

What are ne
A special su
deposit the
distinct tissu

What is the
neural-crest
A neurocris

Neural-crest
Which wave

First wave → Corneal endothelium

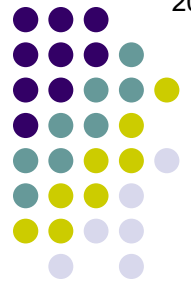
Second wave → Iris stroma — epithelium? **No!**

Third wave → Corneal stroma (keratocytes)

oryo and
many

ntiation of

aves.'



A

● Peters Anomaly

- An abnormality of **neural-crest cell** migration

What about the iris epithelium—is it neural-crest derivative as well?
 No, it derives from the neuroectodermal cells that line the optic vesicle (the embryologic outpouching off of the neural tube . In addition to the iris epithelium, the optic vesicle gives rise to the ciliary body epithelium, as well as to the optic nerve , RPE and retina .

How many epithelial layers are present on the posterior iris?
 Two

*What are ne
 A special su
 deposit the
 distinct tiss*

*oryo and
 many*

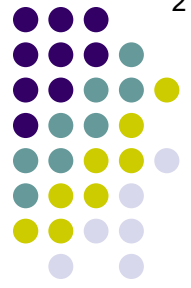
*What is the
 neural-crest
 A neurocris*

ntiation of

*Neural-crest
 Which wave*

aves.'

- First wave* → Corneal endothelium
- Second wave* → Iris stroma ~~epithelium?~~ **No!**
- Third wave* → Corneal stroma (keratocytes)



Q

● Peters Anomaly

- An abnormality of **neural-crest cell** migration

What about the iris epithelium—is it neural-crest derivative as well?
 No, it derives from the neuroectodermal cells that line the optic vesicle (the embryologic outpouching off of the neural tube). In addition to the iris epithelium, the optic vesicle gives rise to the ciliary body epithelium, as well as to the optic nerve, RPE and retina.

How many epithelial layers are present on the posterior iris?
 Two

By definition, epithelial cells rest on a basement membrane, and thus have an orientation—specifically, a basal portion (= the side in contact with the BM) and an apex (the side opposite). With respect to one another, how are the two iris epithelial layers oriented?

*What are ne...
 A special su...
 deposit the...
 distinct tiss...*

*What is the...
 neural-crest...
 A neurocris...*

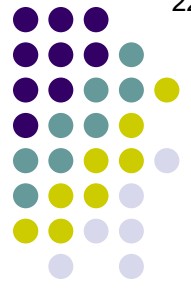
*Neural-crest...
 Which wave...*

- First wave* → Corneal endothelium
- Second wave* → Iris stroma ~~epithelium?~~ **No!**
- Third wave* → Corneal stroma (keratocytes)

*...oryo and
 ...many*

...ntiation of

...aves.'



A

● Peters Anomaly

- An abnormality of **neural-crest cell** migration

What about the iris epithelium—is it neural-crest derivative as well?
 No, it derives from the neuroectodermal cells that line the optic vesicle (the embryologic outpouching off of the neural tube). In addition to the iris epithelium, the optic vesicle gives rise to the ciliary body epithelium, as well as to the optic nerve, RPE and retina.

How many epithelial layers are present on the posterior iris?
 Two

By definition, epithelial cells rest on a basement membrane, and thus have an orientation—specifically, a basal portion (= the side in contact with the BM) and an apex (the side opposite). With respect to one another, how are the two iris epithelial layers oriented?
 Apex to apex

*What are ne...
 A special su...
 deposit the...
 distinct tiss...*

*What is the...
 neural-crest...
 A neurocris...*

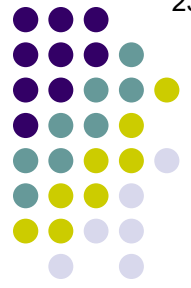
*Neural-crest...
 Which wave...*

- First wave* → Corneal endothelium
- Second wave* → Iris stroma ~~epithelium?~~ **No!**
- Third wave* → Corneal stroma (keratocytes)

*...oryo and...
 ...many*

...ntiation of

...aves.'



Q

● Peters Anomaly

- An abnormality of **neural-crest cell** migration

What about the iris epithelium—is it neural-crest derivative as well?
 No, it derives from the neuroectodermal cells that line the optic vesicle (the embryologic outpouching off of the neural tube). In addition to the iris epithelium, the optic vesicle gives rise to the ciliary body epithelium, as well as to the optic nerve, RPE and retina.

How many epithelial layers are present on the posterior iris?

Two

By definition, epithelial cells rest on a basement membrane, and thus have an orientation—specifically, a basal portion (= the side in contact with the BM) and an apex (the side opposite). With respect to one another, how are the two iris epithelial layers oriented?

Apex to apex

Of the two iris epithelial layers, which is/are pigmented?

*What are ne...
 A special su...
 deposit the...
 distinct tiss...*

*What is the...
 neural-cres...
 A neurocris...*

*Neural-cres...
 Which wave...*

First wave → Corneal endothelium

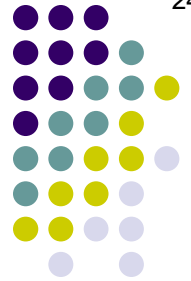
Second wave → Iris stroma ~~epithelium?~~ **No!**

Third wave → Corneal stroma (keratocytes)

*...oryo and
 ...many*

...ntiation of

...aves.'



A

● Peters Anomaly

- An abnormality of **neural-crest cell** migration

What about the iris epithelium—is it neural-crest derivative as well?

No, it derives from the neuroectodermal cells that line the optic vesicle (the embryologic outpouching off of the neural tube). In addition to the iris epithelium, the optic vesicle gives rise to the ciliary body epithelium, as well as to the optic nerve, RPE and retina.

How many epithelial layers are present on the posterior iris?

Two

By definition, epithelial cells rest on a basement membrane, and thus have an orientation—specifically, a basal portion (= the side in contact with the BM) and an apex (the side opposite). With respect to one another, how are the two iris epithelial layers oriented?

Apex to apex

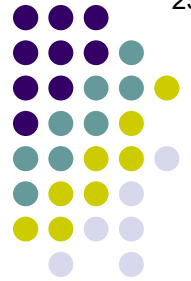
Of the two iris epithelial layers, which is/are pigmented?

Both are pigmented

First wave → Corneal endothelium

Second wave → Iris stroma — epithelium? **No!**

Third wave → Corneal stroma (keratocytes)



Q

- **Peters Anomaly**
 - An abnormality of **neural-crest** cell migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

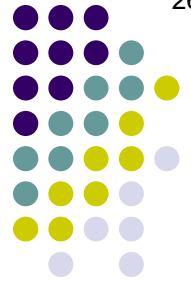
What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?

A neurocristopathy

When do neural-crest cells swoop in to form the primordial corneal epithelium? Migration occurs in three 'waves.'

Third wave → Corneal stroma (keratocytes)

A later wave → Corneal epithelium?



Q/A

- **Peters Anomaly**
 - An abnormality of **neural-crest** cell migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?

A neurocristopathy

*When do neural-crest cells swoop in to form the **primordial corneal epithelium**?*

*They don't. The corneal epithelium derives from the **ectoderm** of the outer 'body' wall of the embryo*

Third wave → Corneal stroma (keratocytes)

A later wave → Corneal epithelium? No!



A

- **Peters Anomaly**
 - An abnormality of **neural-crest** cell migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many distinct tissues

What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?

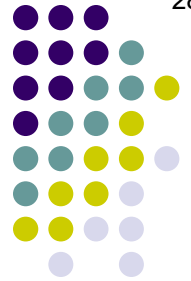
A neurocristopathy

*When do neural-crest cells swoop in to form the **primordial corneal epithelium**?* Segment occurs in three 'waves.'

*They don't. The corneal epithelium derives from the **surface ectoderm** of the outer 'body' wall of the embryo*

Third wave → Corneal stroma (keratocytes)

A later wave → *Corneal epithelium? No!*



- **Peters Anomaly**
 - An abnormality of **neural-crest** cell migration

What are neural crest cells?

A special subpopulation of **neuroectodermal** cells that migrate across the embryo and deposit themselves at a wide variety of locations, eventually differentiating into many

Vexed by all this embryology? There's a slide-set for that (FELT21)

What is the term for a condition arising from the abnormal migration or differentiation of neural-crest cells?

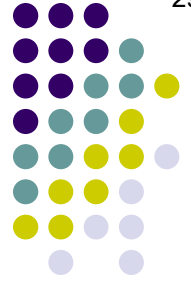
A neurocristopathy

*When do neural-crest cells swoop in to form the **primordial corneal epithelium**?*

*They don't. The corneal epithelium derives from the **surface ectoderm** of the outer 'body' wall of the embryo*

Third wave → Corneal stroma (keratocytes)

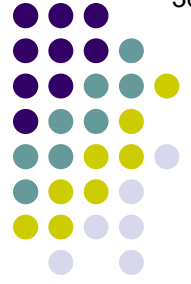
A later wave → Corneal epithelium? No!



Q

- **Peters Anomaly**

- An abnormality of **neural-crest** cell migration
- A form of

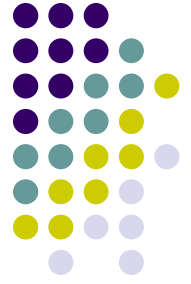


A

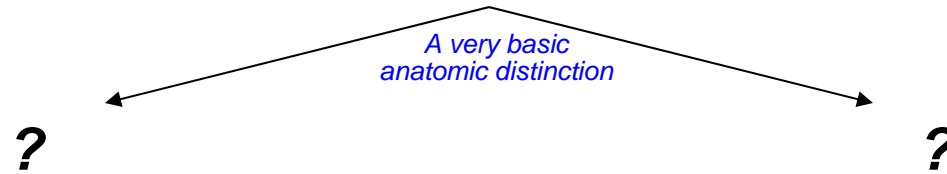
- **Peters Anomaly**

- An abnormality of **neural-crest** cell migration
- A form of ***anterior segment dysgenesis***

Q

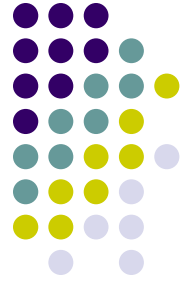
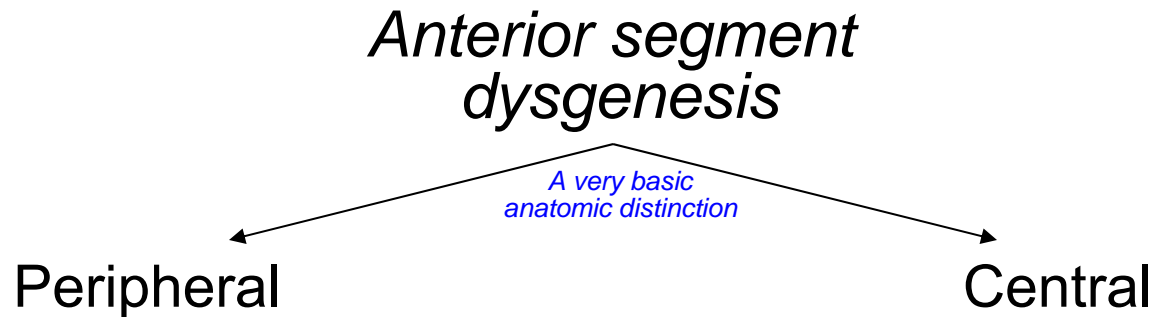


Anterior segment dysgenesis



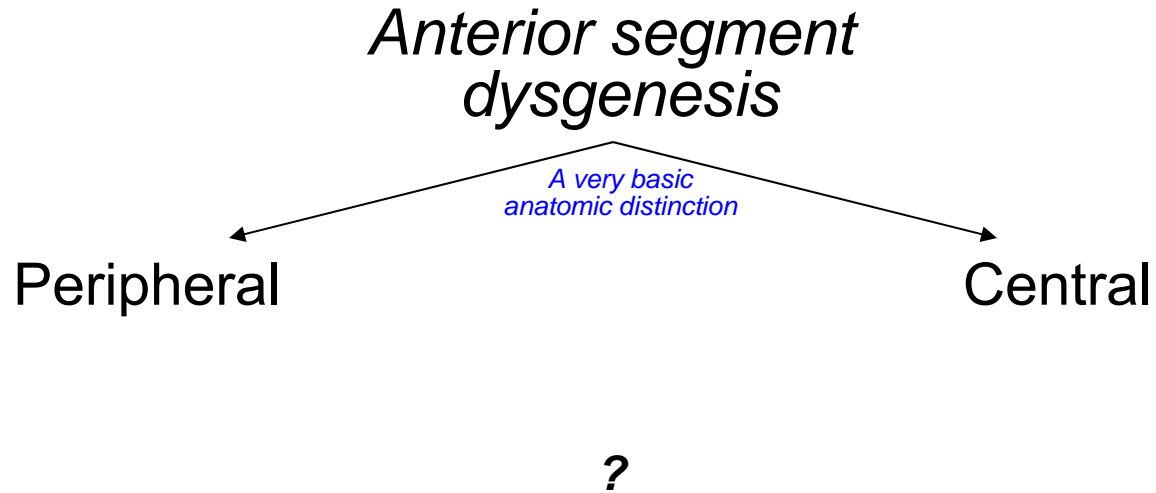
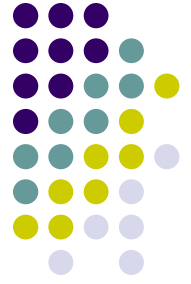
Let's take a moment to overview the anterior segment dysgeneses. We divvy them up into two broad categories based on a very basic anatomic consideration—what is that consideration?

A



*Let's take a moment to overview the anterior segment dysgeneses. We divvy them up into two broad categories based on a very basic anatomic consideration—what is that consideration? It is whether the dysgenesis involves the **peripheral** vs **central** portion of the anterior segment*

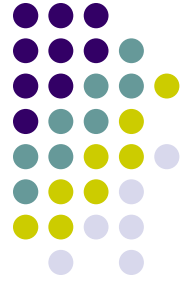
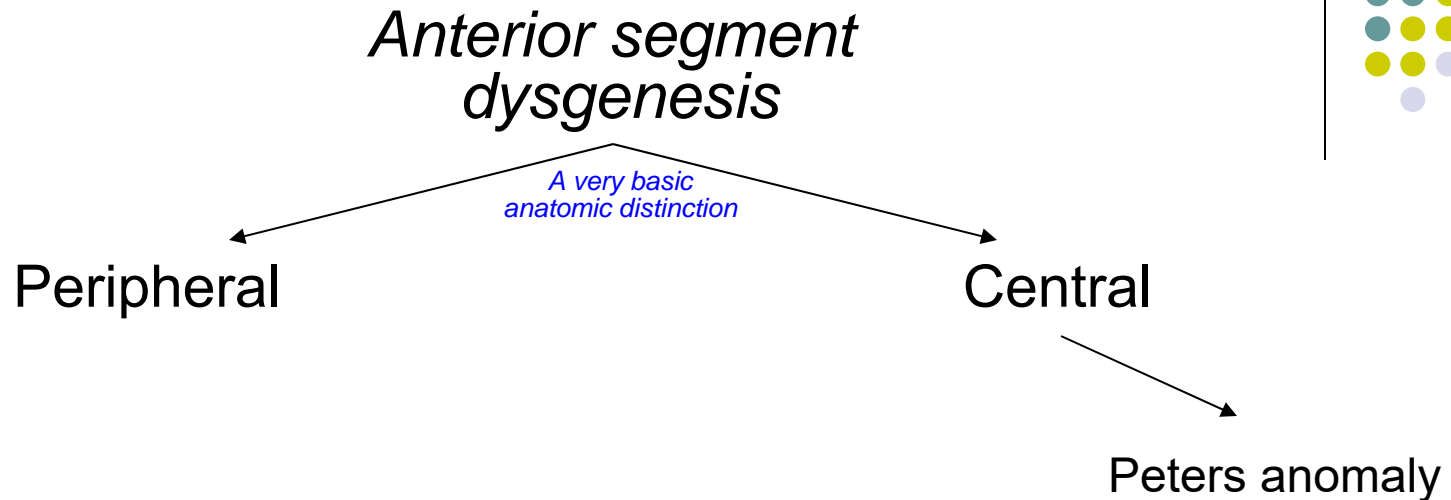
Q



*Let's take a moment to overview the anterior segment dysgeneses. We divvy them up into two broad categories based on a very basic anatomic consideration—what is that consideration? It is whether the dysgenesis involves the **peripheral** vs **central** portion of the anterior segment*

To which category does Peters anomaly belong?

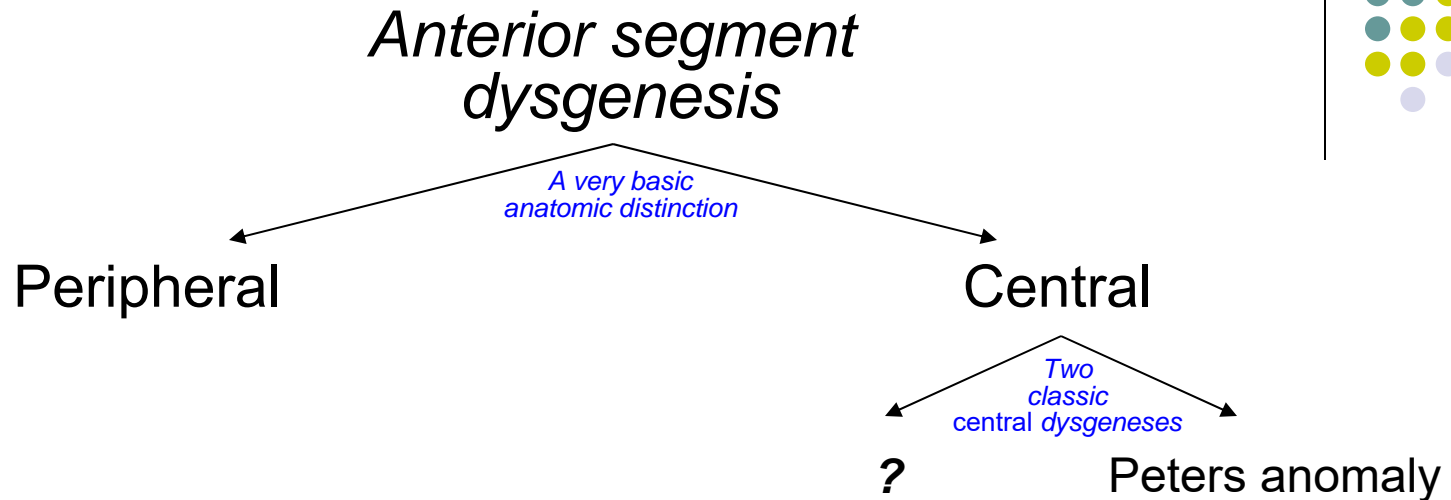
A



*Let's take a moment to overview the anterior segment dysgeneses. We divvy them up into two broad categories based on a very basic anatomic consideration—what is that consideration? It is whether the dysgenesis involves the **peripheral** vs **central** portion of the anterior segment*

To which category does Peters anomaly belong?
Peters is a **central** form of anterior segment dysgenesis

Q



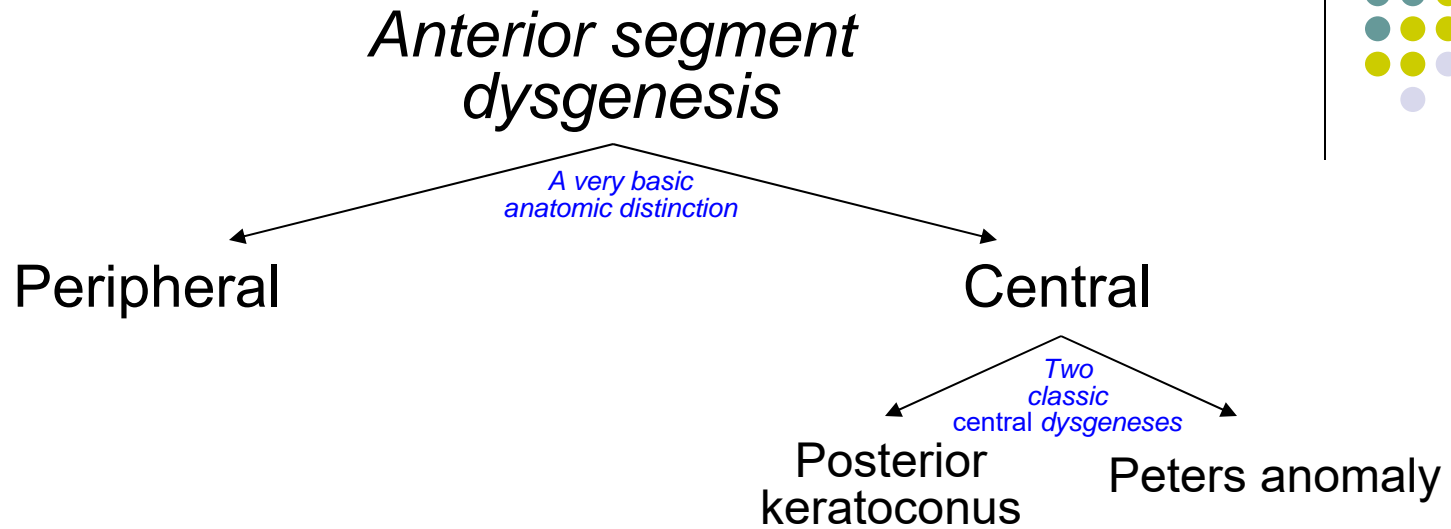
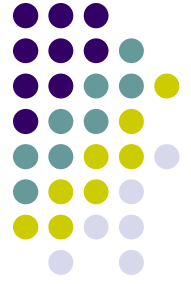
*Let's take a moment to overview the anterior segment dysgeneses. We divvy them up into two broad categories based on a very basic anatomic consideration—what is that consideration? It is whether the dysgenesis involves the **peripheral** vs **central** portion of the anterior segment*

To which category does Peters anomaly belong?

Peters is a **central** form of anterior segment dysgenesis

What is the other classic form of central anterior segment dysgenesis?

A



*Let's take a moment to overview the anterior segment dysgeneses. We divvy them up into two broad categories based on a very basic anatomic consideration—what is that consideration? It is whether the dysgenesis involves the **peripheral** vs **central** portion of the anterior segment*

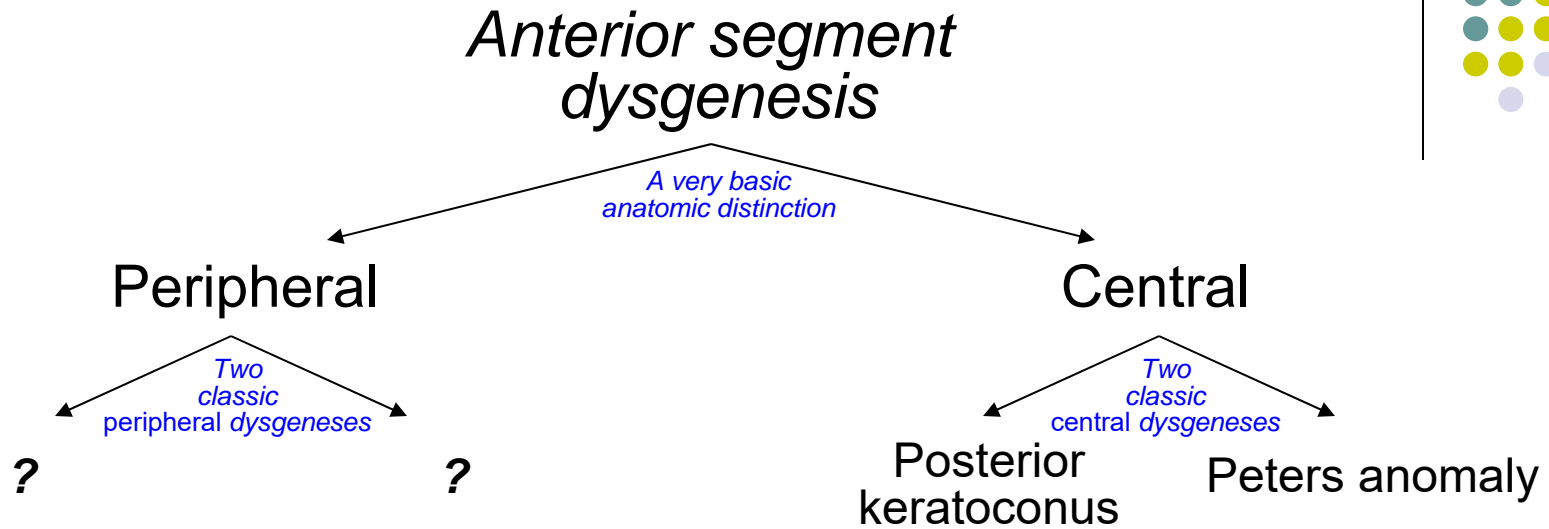
To which category does Peters anomaly belong?

Peters is a **central** form of anterior segment dysgenesis

What is the other classic form of central anterior segment dysgenesis?

Posterior keratoconus (Note: This is nothing like the anterior form you're familiar with)

Q



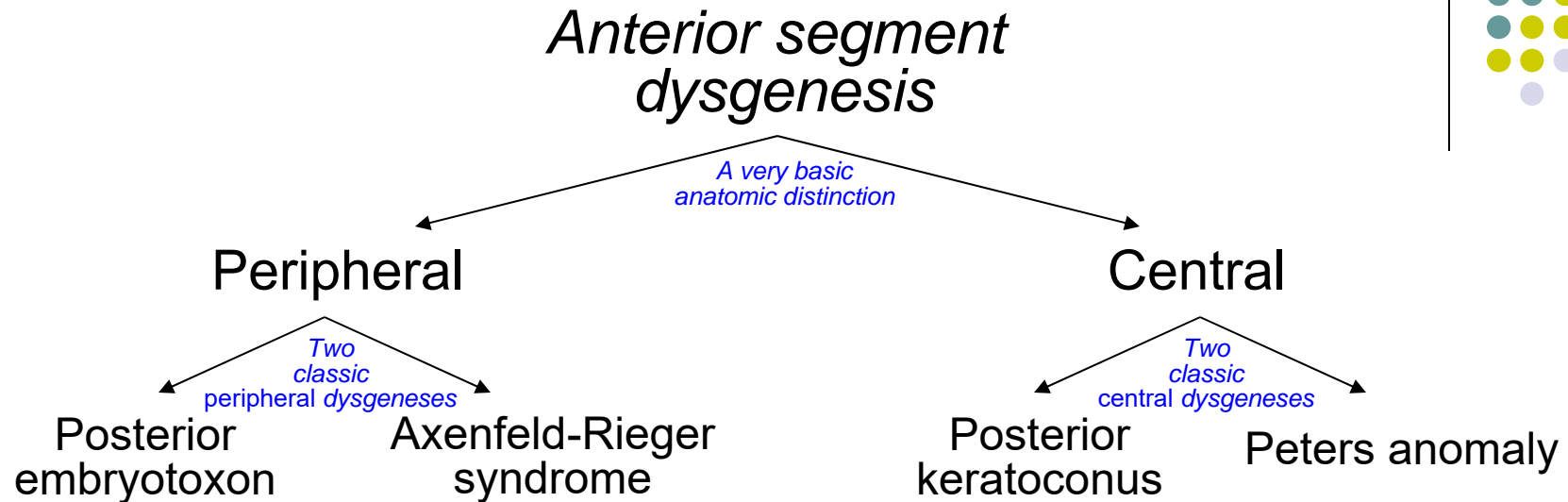
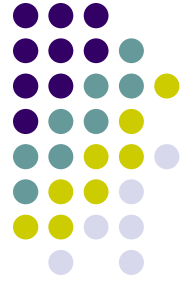
*Let's take a moment to overview the anterior segment dysgeneses. We divvy them up into two broad categories based on a very basic anatomic consideration—what is that consideration? It is whether the dysgenesis involves the **peripheral** vs **central** portion of the anterior segment*

To which category does Peters anomaly belong?
Peters is a **central** form of anterior segment dysgenesis

What is the other classic form of central anterior segment dysgenesis?
Posterior keratoconus (Note: This is nothing like the anterior form you're familiar with)

What are the two classic forms of peripheral anterior segment dysgenesis?

A

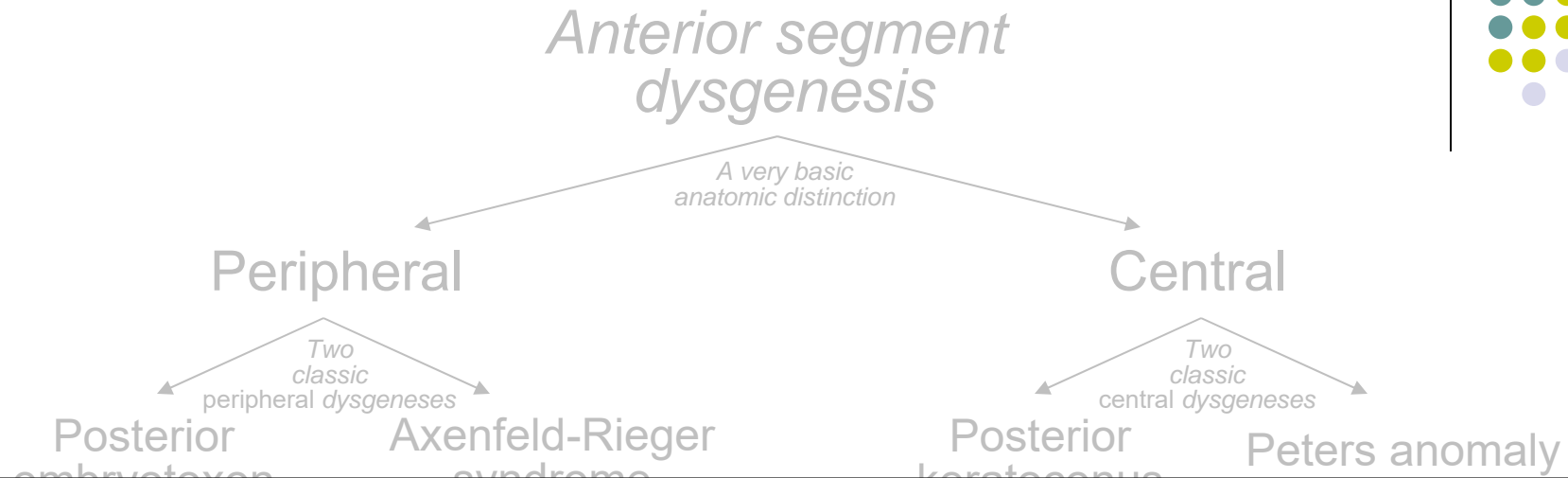
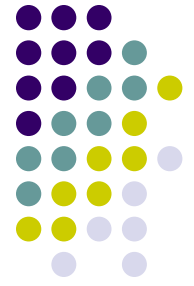


*Let's take a moment to overview the anterior segment dysgeneses. We divvy them up into two broad categories based on a very basic anatomic consideration—what is that consideration? It is whether the dysgenesis involves the **peripheral** vs **central** portion of the anterior segment*

To which category does Peters anomaly belong?
Peters is a **central** form of anterior segment dysgenesis

What is the other classic form of central anterior segment dysgenesis?
Posterior keratoconus (Note: This is nothing like the anterior form you're familiar with)

What are the two classic forms of peripheral anterior segment dysgenesis?
Posterior embryotoxon and **Axenfeld-Rieger syndrome**



For more on anterior segment dysgenesis, see slide-set FELT7

*Let's take a moment to overview the anterior segment dysgeneses. We divvy them up into two broad categories based on a very basic anatomic consideration—what is that consideration? It is whether the dysgenesis involves the **peripheral** vs **central** portion of the anterior segment*

To which category does Peters anomaly belong?

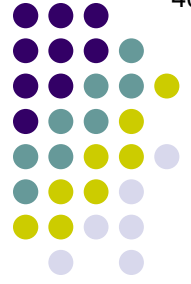
Peters is a **central** form of anterior segment dysgenesis

What is the other classic form of central anterior segment dysgenesis?

Posterior keratoconus (Note: This is nothing like the anterior form you're familiar with)

What are the two classic forms of peripheral anterior segment dysgenesis?

Posterior embryotoxon and **Axenfeld-Rieger syndrome**



Q

● Peters Anomaly

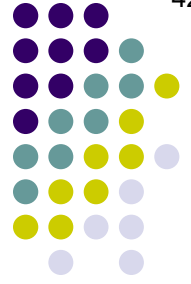
- An abnormality of **neural-crest** cell migration
- A form of ***anterior segment dysgenesis***
- Hallmarks:
 - 1) A central corneal



A

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of ***anterior segment dysgenesis***
- Hallmarks:
 - 1) A central corneal **opacity**

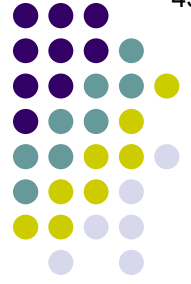


Q

● Peters Anomaly

- An abnormality of neural-crest cell migration
- A form of anterior segment dysgenesis
- Hallmarks:
 - 1) A central corneal opacity

What's the classic Peters presentation?

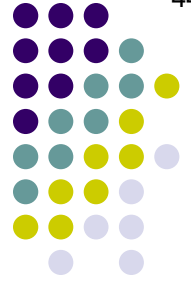


A

- **Peters Anomaly**

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A **central corneal opacity**

What's the classic Peters presentation?
As a cloudy cornea at birth (it's in the STUMPED mnemonic)



Q

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A **central corneal opacity**

What's the classic Peters presentation?
As a cloudy cornea at birth (it's in the **STUMPED mnemonic**)

What is the **STUMPED mnemonic** for a cloudy cornea in an infant?

S
T
U
M
Peters anomaly
E
D

Note: There are two
S's
and two
E's



A

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A **central corneal opacity**

What's the classic Peters presentation?
As a cloudy cornea at birth (it's in the **STUMPED mnemonic**)

Note: There are two
S's
and two
E's

What is the **STUMPED mnemonic** for a cloudy cornea in an infant?

Sclerocornea; **S**tromal dystrophy (CHSD)
Trauma (eg, forcep injury)
Ulcer
Mucopolysaccharidosis
Peters anomaly
Endothelial dystrophy (CHED); **E**levated IOP (congenital glaucoma)
Dermoid of the cornea



Q

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A **central corneal opacity**

What's the classic Peters presentation?
 As a cloudy cornea at birth (it's in the **STUMPED mnemonic**)

Note: There are two S's and two E's

*What is the **STUMPED** mnemonic for a cloudy cornea in an infant?*

Sclerocornea; **Stromal dystrophy (CHSD)**

Trauma

Ulcer

Mucopolysaccharidosis

Peters anomaly

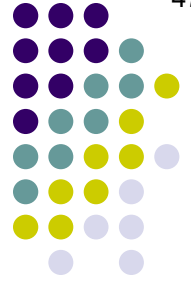
Endothelial dystrophy (CHED); Elevated IOP (congenital glaucoma)

Dermoid of the cornea

In the present context, what do these acronyms stand for?

CHSD:

CHED:



A

● Peters Anomaly

- An abnormality of neural-crest cell migration
- A form of anterior segment dysgenesis
- Hallmarks:
 - 1) A central corneal opacity

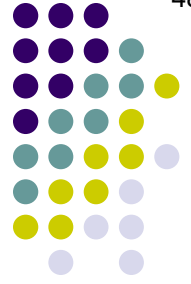
What's the classic Peters presentation?
 As a cloudy cornea at birth (it's in the **STUMPED mnemonic**)

Note: There are two S's and two E's

What is the **STUMPED mnemonic** for a cloudy cornea in an infant?

Sclerocornea; Stromal dystrophy (**CHSD**)
 Trauma
 Ulcer
 Mucopolysaccharidosis
 Peters anomaly
 Endothelial dystrophy (**CHED**); Elevated IOP (congenital glaucoma)
 Dermoid of the cornea

In the present context, what do these acronyms stand for?
CHSD: Congenital hereditary **stromal** dystrophy
CHED: Congenital hereditary **endothelial** dystrophy



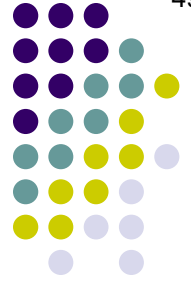
Q

● Peters Anomaly

- An abnormality of neural-crest cell migration
- A form of anterior segment dysgenesis
- Hallmarks:
 - 1) A central corneal opacity

*What's the classic Peters presentation?
As a cloudy cornea at birth (it's in the
STUMPED mnemonic)*

How cloudy is cloudy?



A

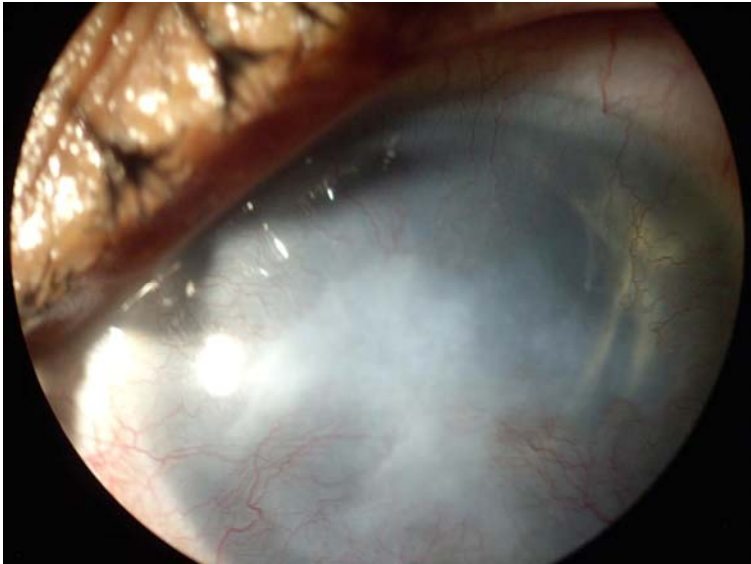
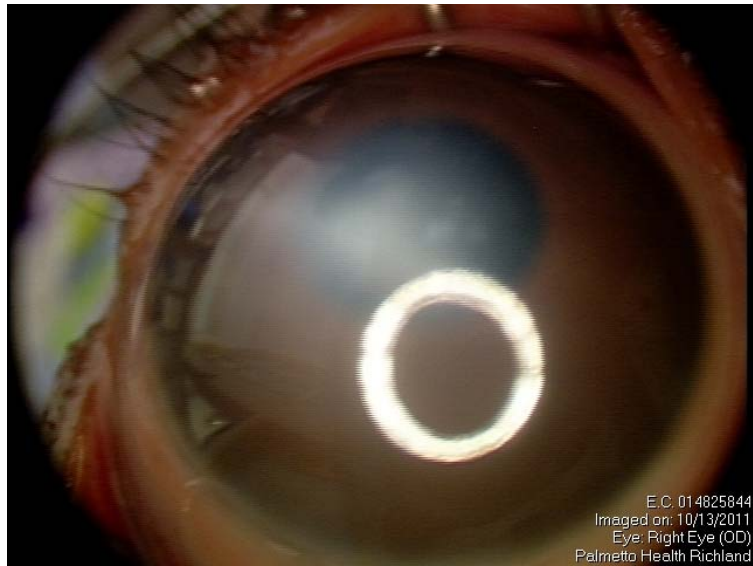
- **Peters Anomaly**

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A **central corneal opacity**

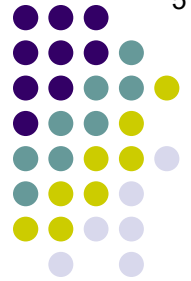
What's the classic Peters presentation?
As a cloudy cornea at birth (it's in the STUMPED mnemonic)

How cloudy is cloudy?

The opacity ranges in severity from a faint haze to an opaque, elevated and vascularized mess



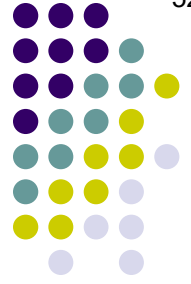
Peters anomaly: Cloudy cornea



Q

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of ***anterior segment dysgenesis***
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea



A

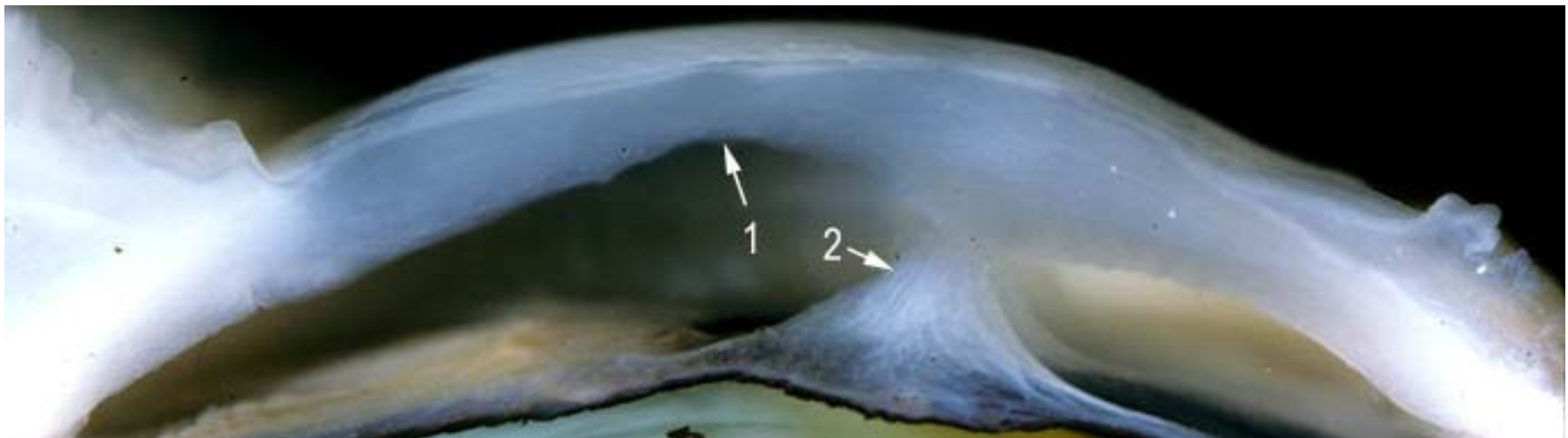
● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of ***anterior segment dysgenesis***
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**

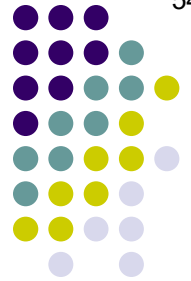


1. Defect of the posterior central cornea, including the absence of Descemet's and subjacent endothelium

2. Adhesions extending from the iris to the posterior corneal defect



Peters anomaly: Iris-cornea adhesions



● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central **corneal opacity**
 - 2) Iris-cornea and/or **lens-cornea adhesions**

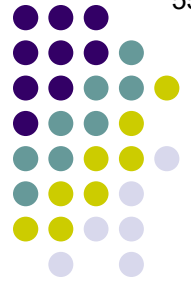
Recall the question below...Now you can see how the main hallmarks of Peters anomaly derive from a failure of first-wave migration to properly cleave between the primitive cornea and lens

*Neural-crest-cell migration concerning the anterior segment occurs in three 'waves.'
Which wave involves which future structure?*

First wave → **Corneal endothelium**

Second wave → Iris stroma

Third wave → Corneal stroma (keratocytes)

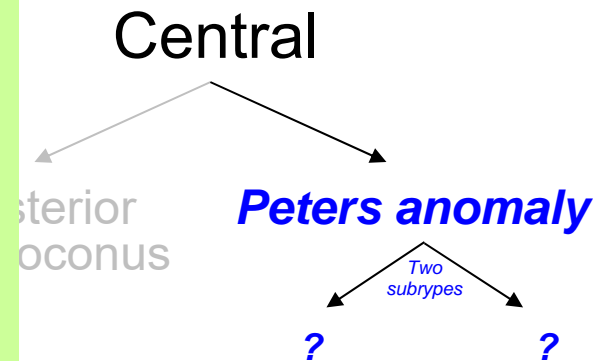


Q

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**

There are two subtypes of Peters—what are they called?



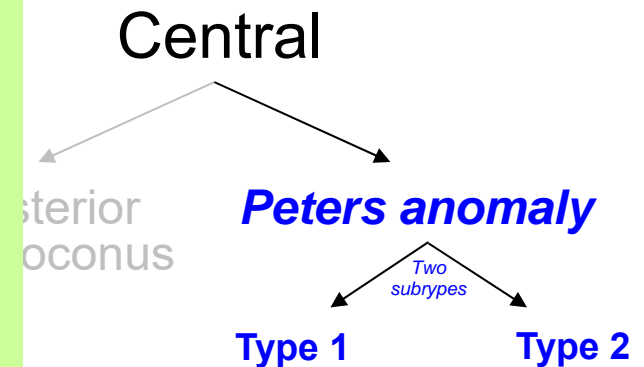


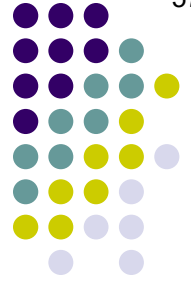
A

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**

*There are two subtypes of Peters—what are they called?
They are called 'Type 1 and Type 2'*





Q

● Peters Anomaly

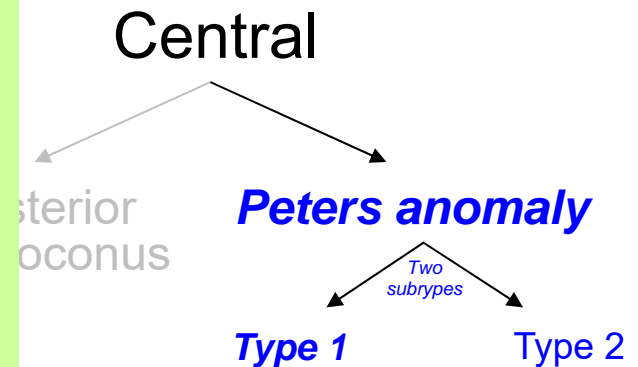
- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**

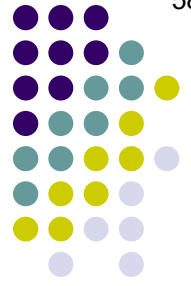
*There are two subtypes of Peters—what are they called?
They are called 'Type 1 and Type 2'*

How do they differ clinically?

Type 1:

Type 2:





A

● Peters Anomaly

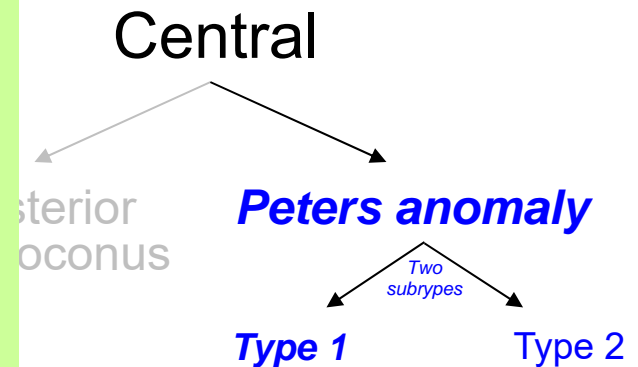
- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) **Iris-cornea** and/or lens-cornea **adhesions**

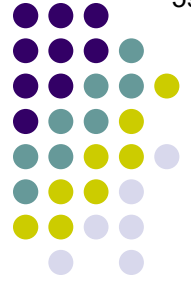
*There are two subtypes of Peters—what are they called?
They are called 'Type 1 and Type 2'*

How do they differ clinically?

Type 1: Iridocorneal adhesions present

Type 2:





Q

● Peters Anomaly

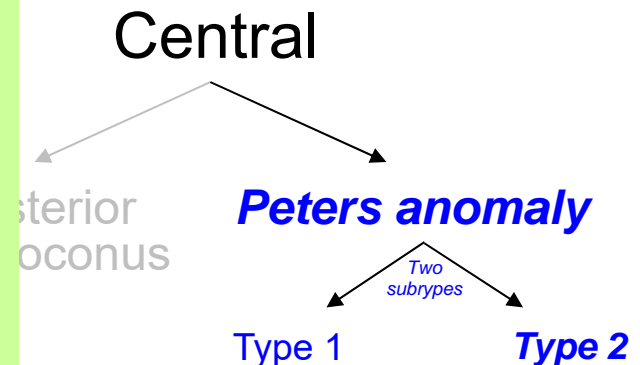
- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) **Iris-cornea** and/or lens-cornea **adhesions**

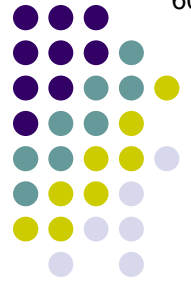
*There are two subtypes of Peters—what are they called?
They are called 'Type 1 and Type 2'*

How do they differ clinically?

Type 1: Iridocorneal adhesions present

Type 2:





A

● Peters Anomaly

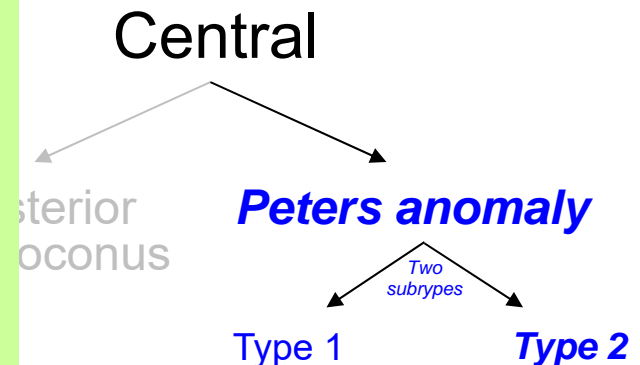
- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) **Iris-cornea** and/or **lens-cornea adhesions**

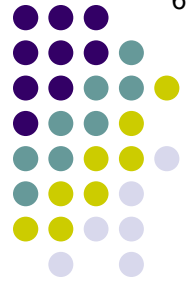
*There are two subtypes of Peters—what are they called?
They are called 'Type 1 and Type 2'*

How do they differ clinically?

Type 1: Iridocorneal adhesions present

Type 2: Corneolenticular adhesions present





Q

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) **Iris-cornea** and/or **lens-cornea adhesions**

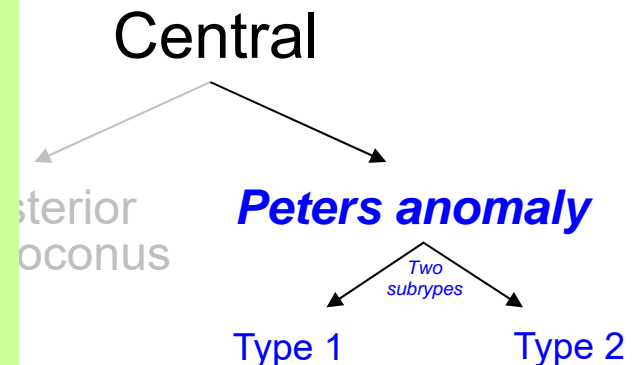
*There are two subtypes of Peters—what are they called?
They are called 'Type 1 and Type 2'*

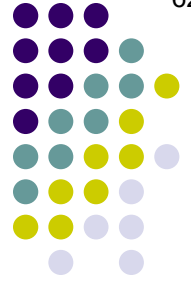
How do they differ clinically?

Type 1: Iridocorneal adhesions present

Type 2: Corneolenticular adhesions present

Which type carries a more ominous ophthalmic prognosis?





A

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) **Iris-cornea** and/or **lens-cornea adhesions**

*There are two subtypes of Peters—what are they called?
They are called 'Type 1 and Type 2'*

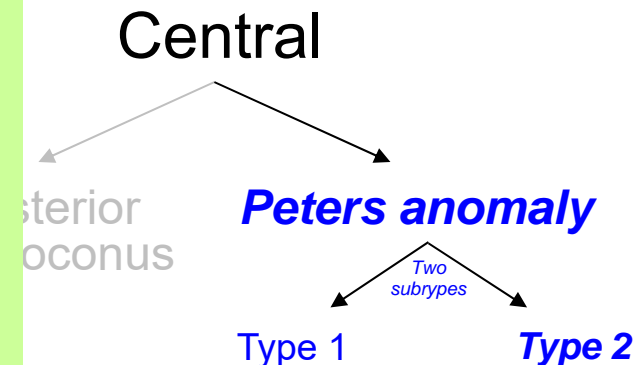
How do they differ clinically?

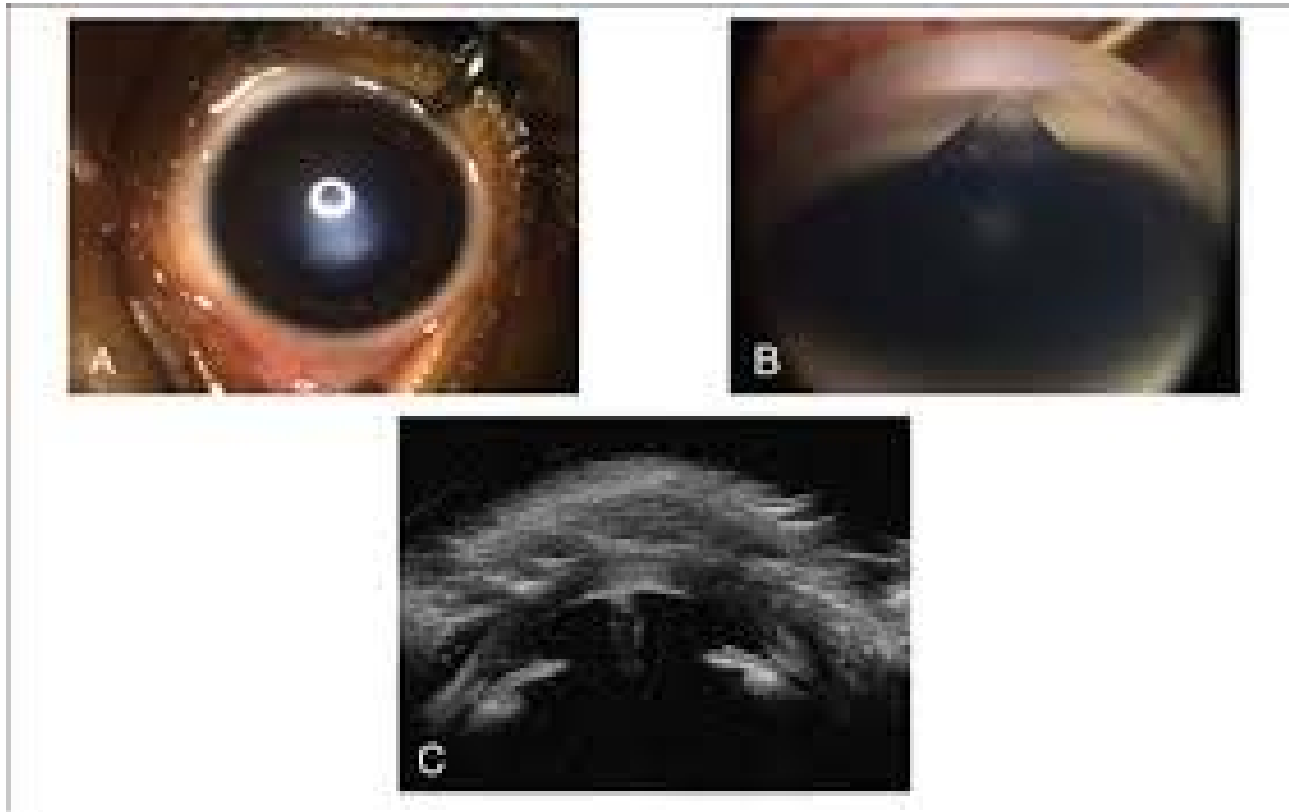
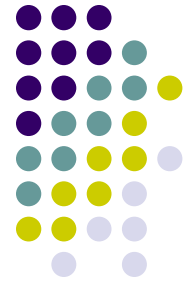
Type 1: Iridocorneal adhesions present

Type 2: Corneolenticular adhesions present

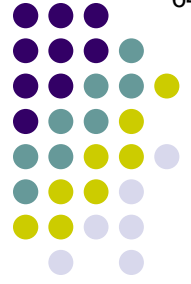
Which type carries a more ominous ophthalmic prognosis?

Type 2





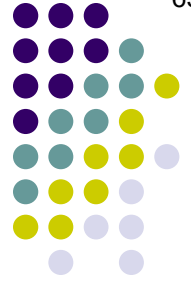
Peters anomaly Type 2: Lens-cornea adhesions



Q

● Peters Anomaly

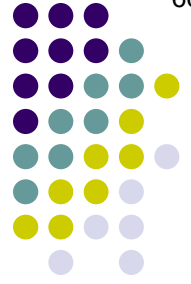
- An abnormality of **neural-crest** cell migration
- A form of ***anterior segment dysgenesis***
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) Anterior



A

- **Peters Anomaly**

- An abnormality of **neural-crest** cell migration
- A form of ***anterior segment dysgenesis***
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) Anterior **cataract**

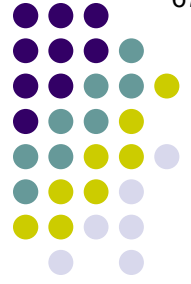


Q

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of ***anterior segment dysgenesis***
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) **Anterior cataract**

Which specific types of anterior cataract?

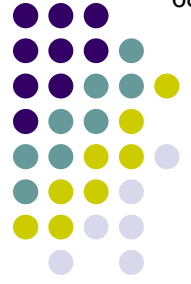


A

- **Peters Anomaly**

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) **Anterior cataract**

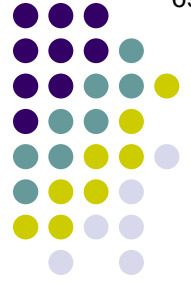
Which specific types of anterior cataract?
Anterior cortical, and anterior polar



Q

● Peters Anomaly

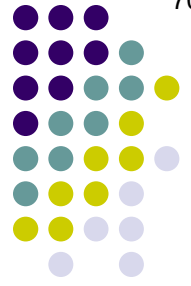
- An abnormality of **neural-crest** cell migration
- A form of ***anterior segment dysgenesis***
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) Anterior **cataract**
 - 4) **absent** lens



A

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of ***anterior segment dysgenesis***
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) Anterior **cataract**
 - 4) **Misshapen** lens

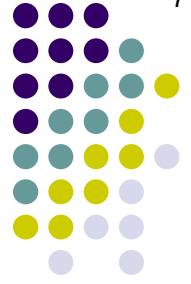


Q

● Peters Anomaly

- An abnormality of neural-crest cell migration
- A form of *anterior segment dysgenesis*
- Hallmarks:
 - 1) A central corneal opacity
 - 2) Iris-cornea and/or lens-cornea adhesions
 - 3) Anterior cataract
 - 4) **Misshapen lens**

If the 'misshapen' lens were smaller and rounder than normal, what particular condition would that evoke?



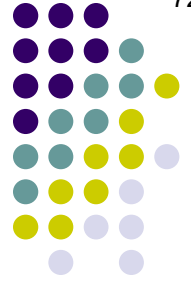
A

- **Peters Anomaly**

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) Anterior **cataract**
 - 4) **Misshapen lens**

If the 'misshapen' lens were smaller and rounder than normal, what particular condition would that evoke?

Microspherophakia



Q

● Peters Anomaly

- An abnormality of neural-crest cell migration
- A form of *anterior segment dysgenesis*
- Hallmarks:

1) A central corneal opacity

2) Iris-cornea and/or lens-cornea adhesions

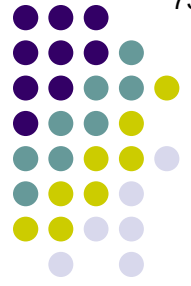
3) Anterior cataract

If the 'misshapen' lens were smaller and rounder than normal, what particular condition would that evoke?

4) **Misshapen lens**

Microspherophakia

Is microspherophakia associated with Peters anomaly?



A

● Peters Anomaly

- An abnormality of neural-crest cell migration
- A form of *anterior segment dysgenesis*
- Hallmarks:

1) A central corneal opacity

2) Iris-cornea and/or lens-cornea adhesions

3) Anterior cataract

If the 'misshapen' lens were smaller and rounder than normal, what particular condition would that evoke?

4) **Misshapen lens**

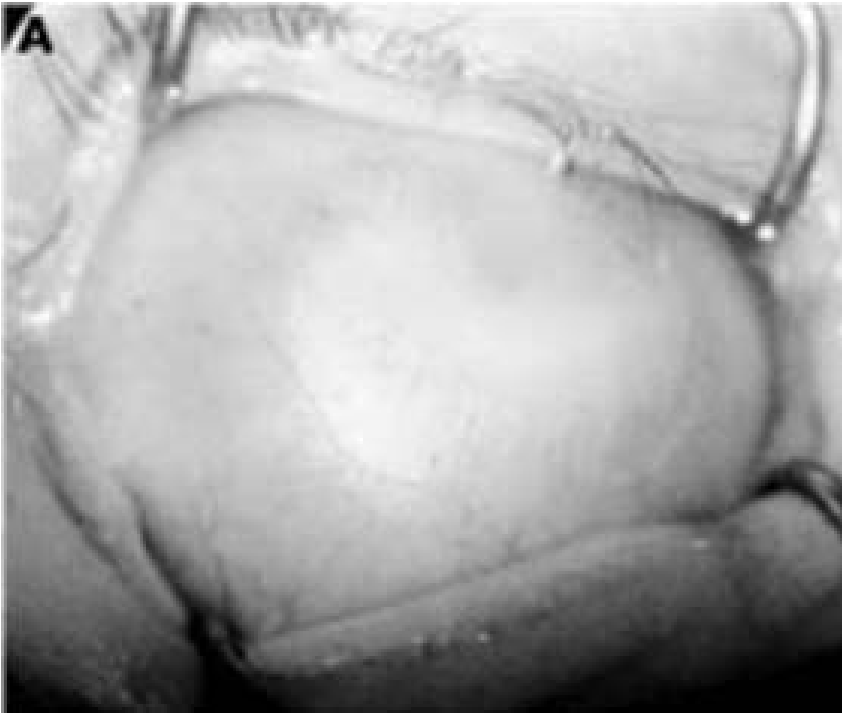
Microspherophakia

Is microspherophakia associated with Peters anomaly?

Yes (although only "occasionally" per the BCSC *Lens* book)

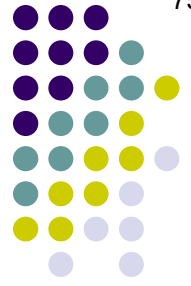


Peters anomaly: Small, cataractous and misshapen lens



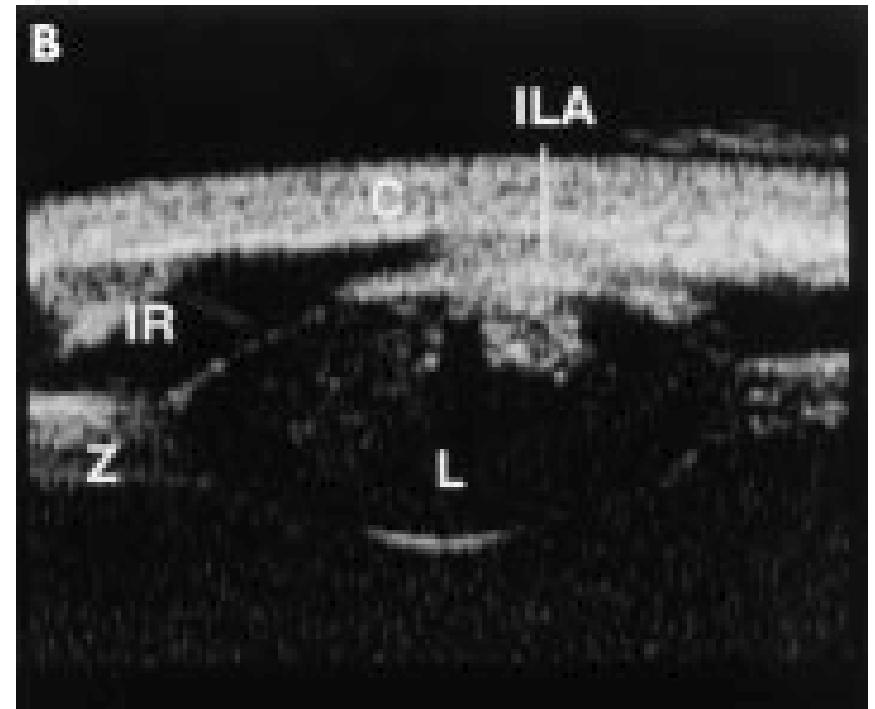
This image shows complete corneal opacification thought clinically to be sclerocornea

Peters anomaly



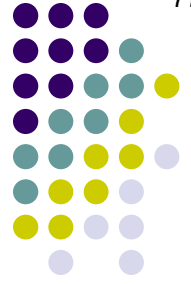


This image shows complete corneal opacification thought clinically to be sclerocornea



UBM of the same eye shows keratolenticular adhesion (ILA), aniridia with an iris stump (IR), and a small lens, revealing the correct diagnosis as Peters anomaly. [This case demonstrates the importance of a complete anterior segment exam with UBM to make an accurate diagnosis.](#)

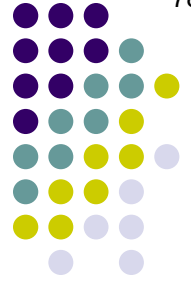
Peters anomaly



Q

● Peters Anomaly

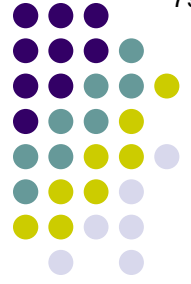
- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) Anterior **cataract**
 - 4) **Misshapen** lens
- Usually **uni- vs bilateral**, usually **inheritance**



A

● Peters Anomaly

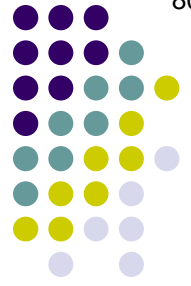
- An abnormality of **neural-crest** cell migration
- A form of ***anterior segment dysgenesis***
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) Anterior **cataract**
 - 4) **Misshapen** lens
- Usually **bilateral**, usually **sporadic**



Q

● Peters Anomaly

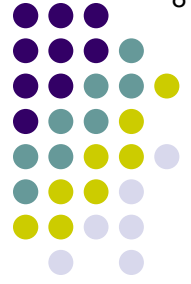
- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) Anterior **cataract**
 - 4) **Misshapen** lens
- Usually **bilateral**, usually **sporadic**
 - Bilateral cases → do this, doc



A

● Peters Anomaly

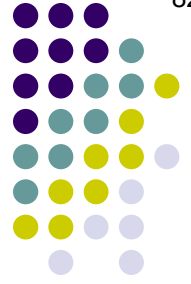
- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) Anterior **cataract**
 - 4) **Misshapen** lens
- Usually **bilateral**, usually **sporadic**
 - Bilateral cases → **complete genetic workup**



Q

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) Anterior **cataract**
 - 4) **Misshapen** lens
- Usually **bilateral**, usually **sporadic**
 - Bilateral cases → **complete genetic workup**
- *Peters-plus* syndrome: Peters anomaly + short , short , abnormal including word word/word and two words abnormalities



A

● Peters Anomaly

- An abnormality of **neural-crest** cell migration
- A form of **anterior segment dysgenesis**
- Hallmarks:
 - 1) A central corneal **opacity**
 - 2) Iris-cornea and/or lens-cornea **adhesions**
 - 3) Anterior **cataract**
 - 4) **Misshapen** lens
- Usually **bilateral**, usually **sporadic**
 - Bilateral cases → **complete genetic workup**
- *Peters-plus* syndrome: Peters anomaly + short **stature**, short **digits**, abnormal **facies** including **cleft lip/palate** and **external ear** abnormalities



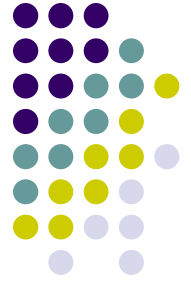
Peters Plus syndrome: Cleft lip/palate

Peters plus syndrome



Facial features of four patients with Peters Plus syndrome. Note the Peters anomaly, the long face, and the Cupid's bow shape of the upper lip in all patients. Patients B and D have a repaired cleft lip and/or palate. Patient A is female; the rest are male.

Peters plus syndrome



Peters Plus syndrome: Cleft lip/palate

Peters plus syndrome