What are the Ehlers-Danlos syndromes (EDS)?

- Usually involves joint hypermobility, skin elasticity, and tissue fragility to varying degrees
- May affect internal organs (uterus, bladder, etc.)
- Often involves chronic musculoskeletal pain/instability
- Has MANY secondary issues (immune, dysautonomia, etc.)
What are the Ehlers-Danlos syndromes (EDS)?

- Currently 13 recognized types of EDS
- Many associated with mutations in collagen or collagen pathway-related genes
- Majority of types are very rare
- Hypermobile EDS (hEDS) comprises approx. 80% of the EDS population
- hEDS is the only type of EDS that has no known associated mutations
- Classic EDS (cEDS) makes up approx. 20%
- Prevalence overall probably ranges 1-500 per 100,000 people
- This estimate is probably much higher in certain clinical populations

What is the joint hypermobility spectrum?

- JHS spectrum has varying degrees of hypermobility (localized or generalized)
- Varying levels of impairment from asymptomatic to severe musculoskeletal impairment
- Can vary over the lifetime

What is the joint hypermobility spectrum?

- HSDs have significant musculoskeletal impairment in affected joints
- Generalized HSD is essentially subclinical hEDS
28 types of collagen in humans
7 are fibrillar (I, II, III, V, XI, XXIV, XXVII)

Fibrillar collagens

Collagen fibers in EDS skin

Shape
Size
Density
Ultrastructural differences in collagen in "unaffected" family members in hEDS families

The EDS Spectrum?

How often does autism co-occur alongside EDS?
How often does autism co-occur alongside EDS?

Hereditary relationship between EDS/HSD and autism

- Mothers with EDS/HSD seem to have increased risk of having autistic children
- Likelihood appears to be common across different forms of EDS
- EDS mothers with autistic children report more immune symptoms
- EDS mothers with EDS/HSD children also report more immune symptoms
Hereditary relationship between EDS/HSD and autism

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EDS, autism, and the maternal immune system

- Maternal immune activation (MIA) has been implicated in autism risk
- Changes in fetal brain gene expression during infection appear to be a protective mechanism but also disrupt normal brain development
Immune symptoms in EDS/HSD

Mast Cell Activation Syndrome (MCAS)
Mast Cell Activation Syndrome (MCAS)

Lessons from Marfan syndrome & TGF-beta

Non-fibrillar collagen as a defense mechanism against bacterial pathogens

Contains Von Willebrand Factor (VWF) Type A domain:
- Collagen VI
- Collagen XXII
- Collagen XXVIII

Non-fibrillar collagen as a defense mechanism against bacterial pathogens

How else is collagen involved in immune system function???


Hormonal symptoms in EDS/HSD

- Hirsutism
- Unusually heavy/prolonged menstruation
- Unusually painful menstruation
- Endometriosis
- Polycystic Ovary Syndrome (PCOS)
Autonomic symptoms in EDS/HSD

- Dizziness, vertigo, fainting
- Fatigue
- Headaches
- Gastrointestinal distress
- Shortness of breath

Postural Orthostatic Tachycardia Syndrome (POTS)

What about connective tissue in the brain?
What about connective tissue in the brain?

* Meninges are involved:
  * in maintaining the stem cell pool
  * orchestrating cell migration

What about connective tissue in the brain?

- Do collagens play roles in these processes?
- If so, how?

* Collagen 18 is non-fibrillar
Thank you!! Any questions?

I'm not WEIRD
I'm limited edition