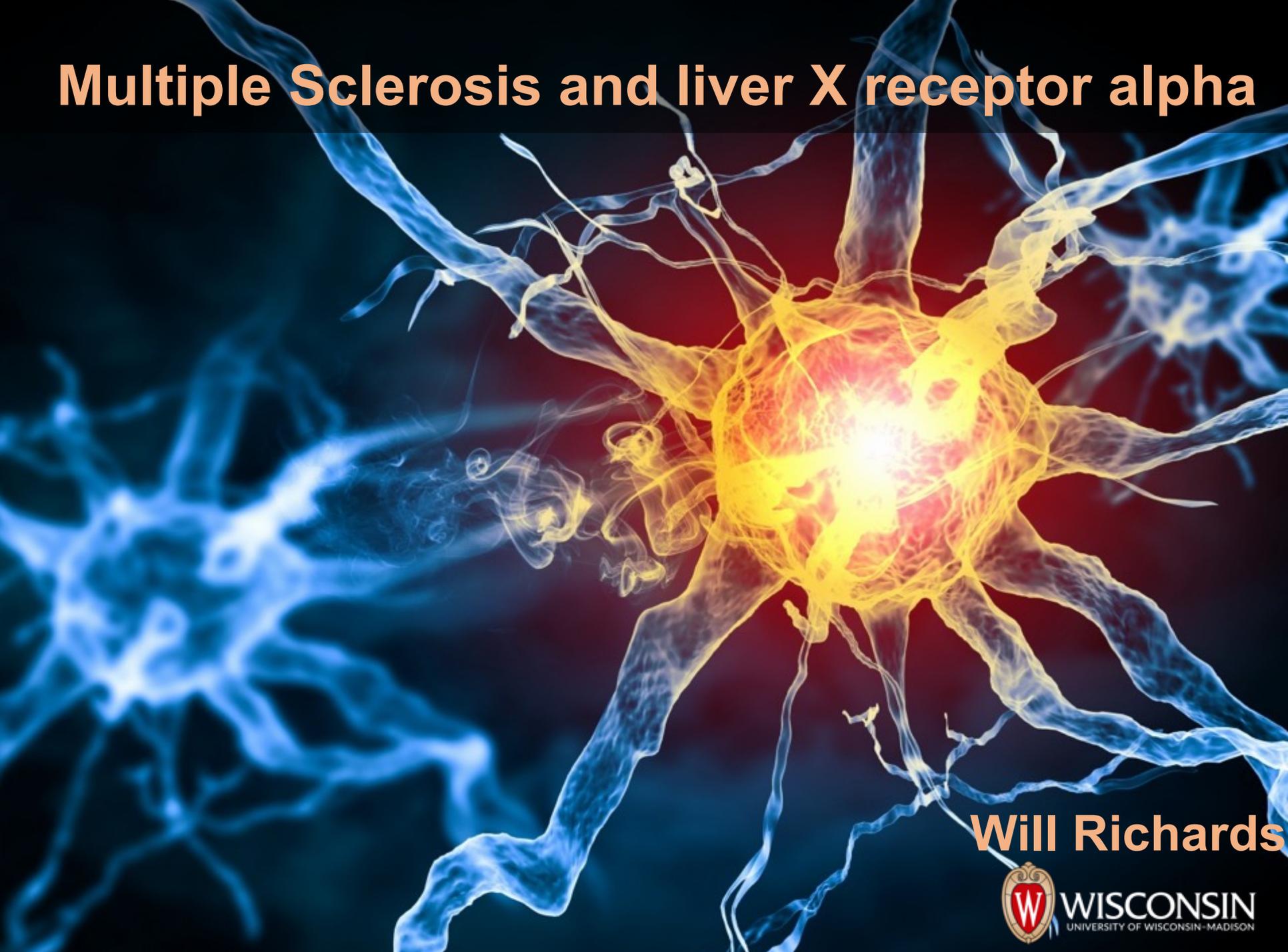


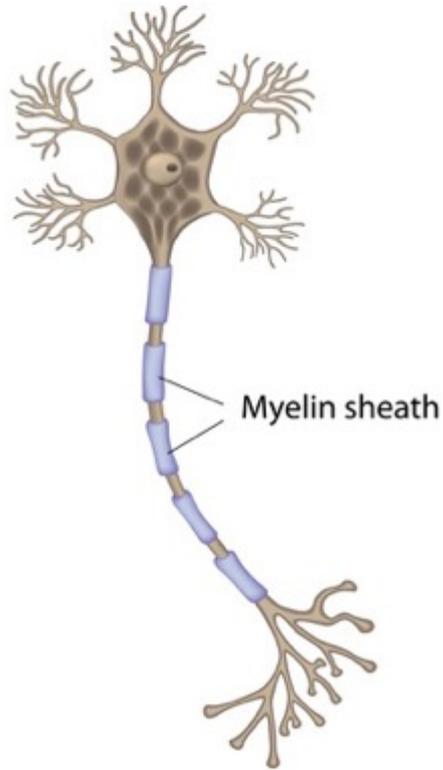
# Multiple Sclerosis and liver X receptor alpha



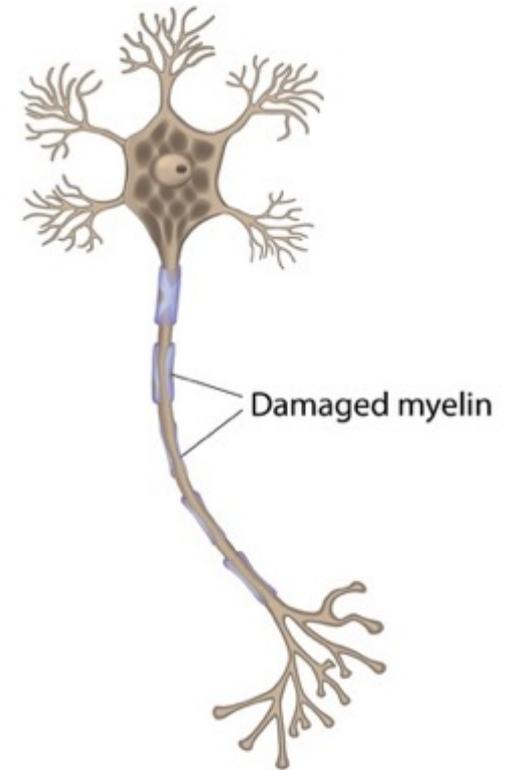
**Will Richards**

# Multiple Sclerosis (MS)

Normal

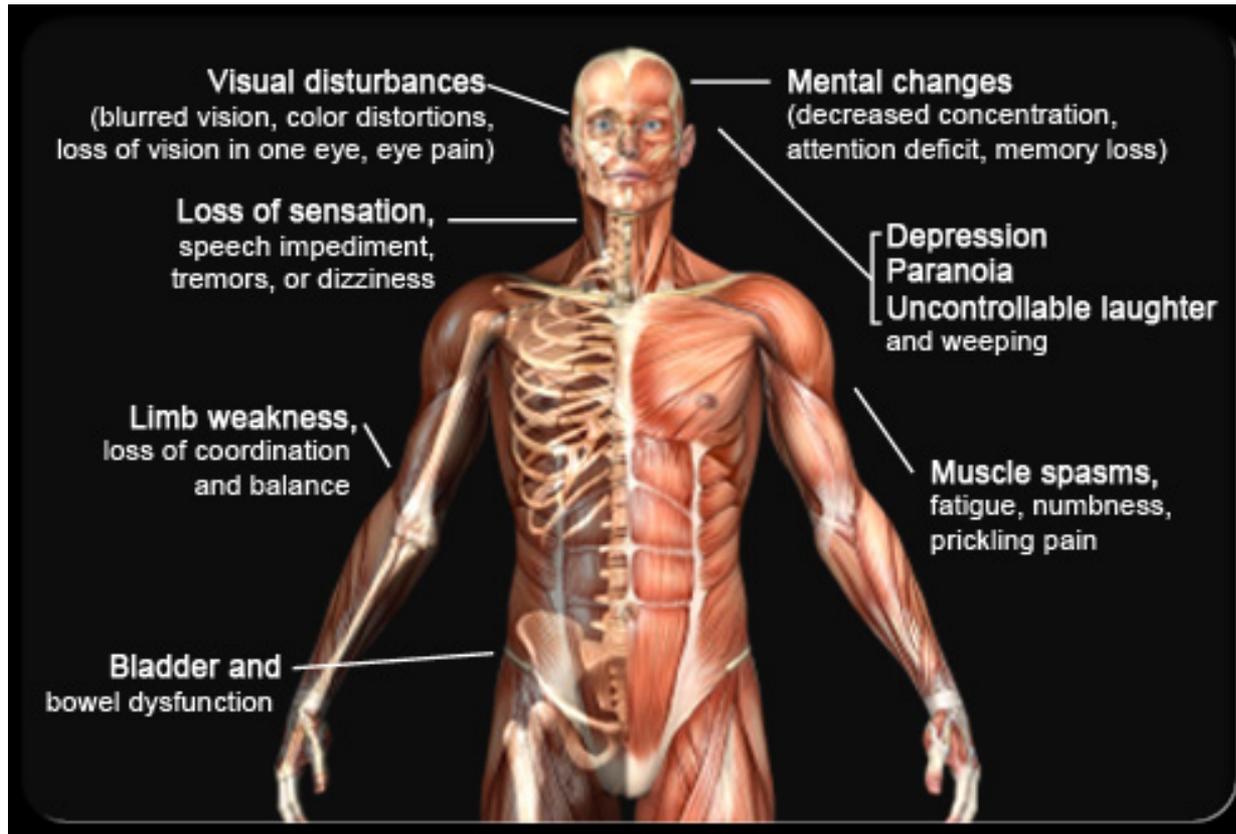


Multiple Sclerosis



**An autoimmune disorder that attacks myelin sheaths**

# Symptoms of MS



# MS associated gene



## Biological Process

- Lipid Homeostasis
- Inflammation
- Innate Immunity

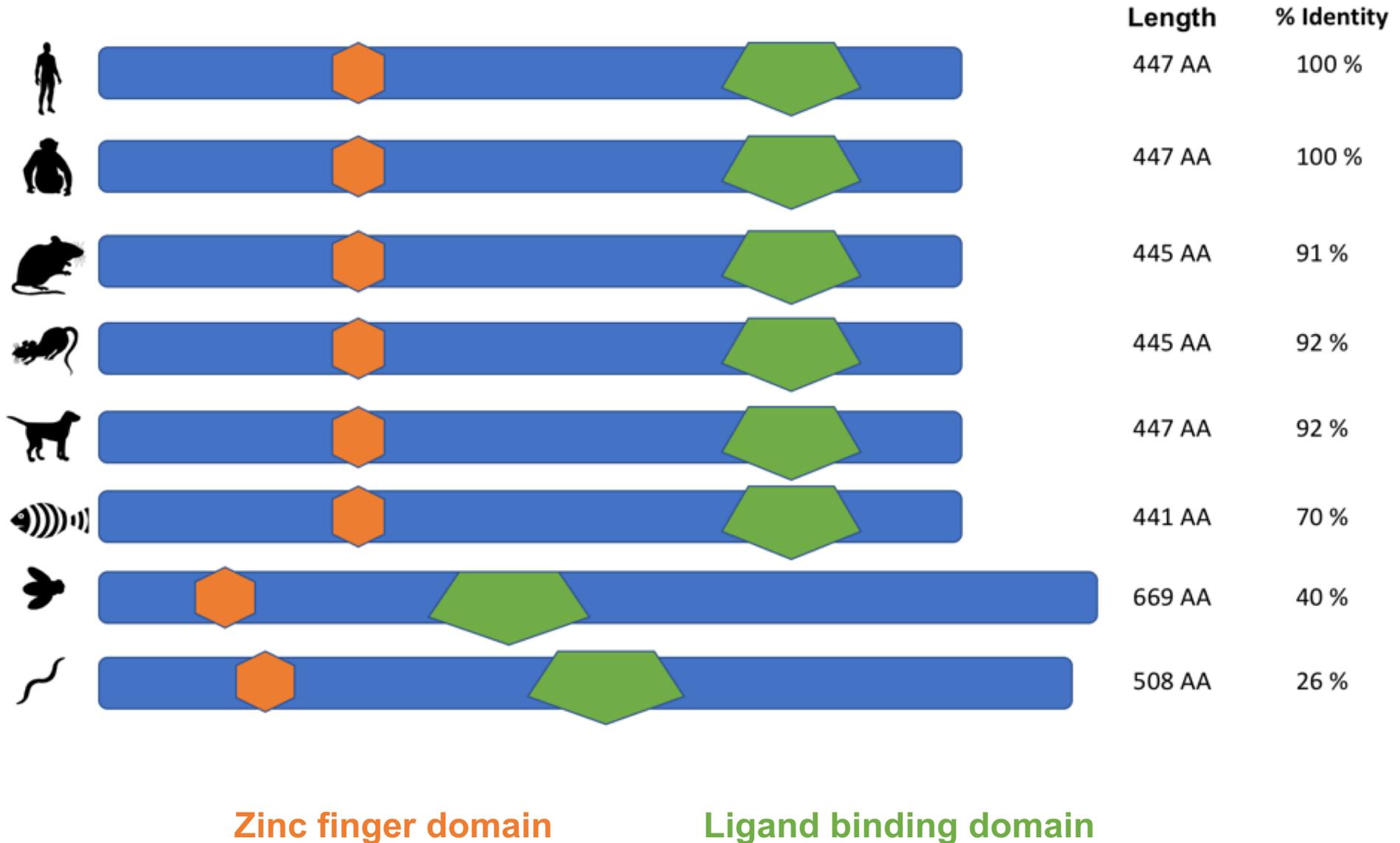
## Molecular Function

- DNA Binding
- Protein Binding
- Hormone Receptor

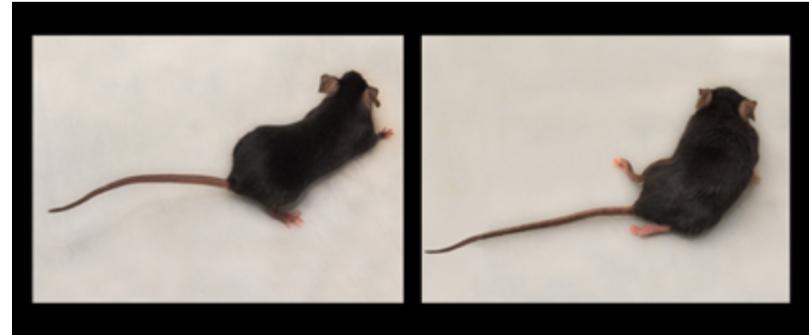
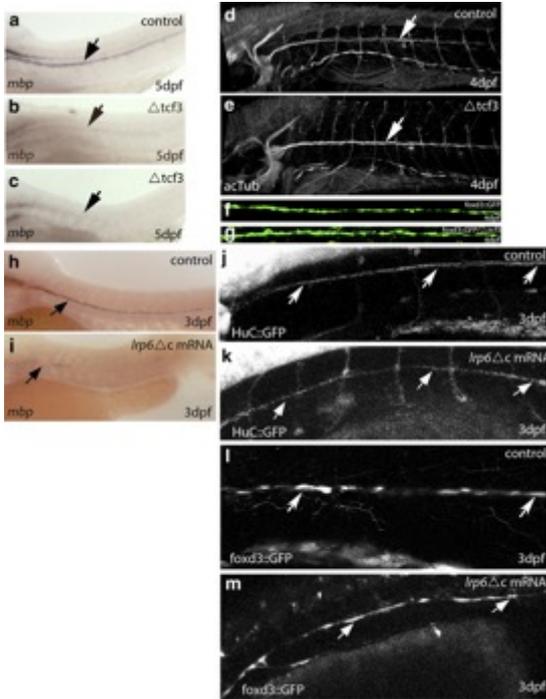
## Cellular Component

- Nucleus

# LXRA throughout time



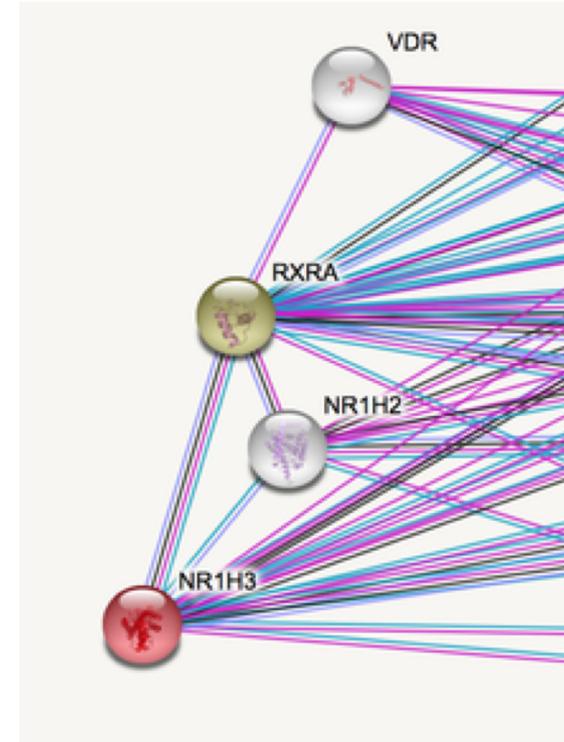
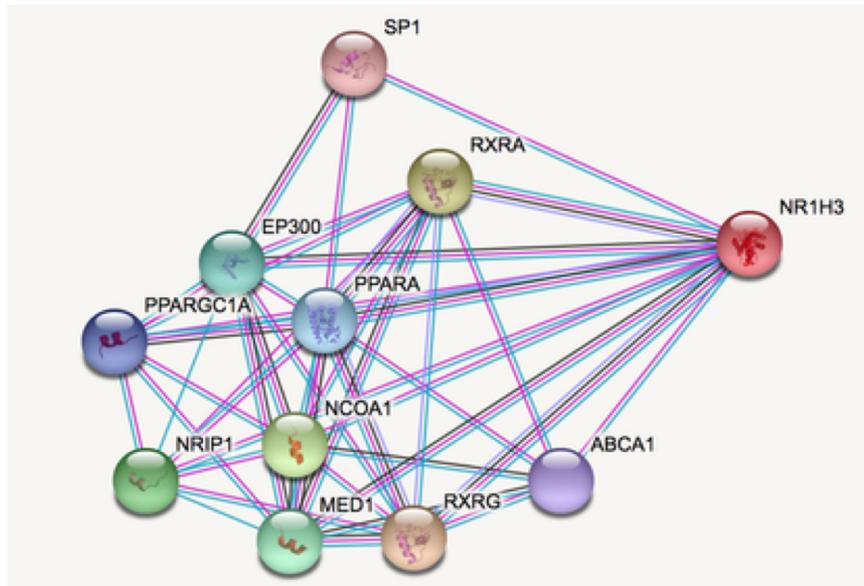
# Why zebrafish and mice?



- Genetic similarity
- Transparent
- Quick development
- High throughput
- Can study myelination

- Genetic similarity
- Disease model for demyelination (EAE)
- Can study myelination

# What proteins does LXRA interact with?

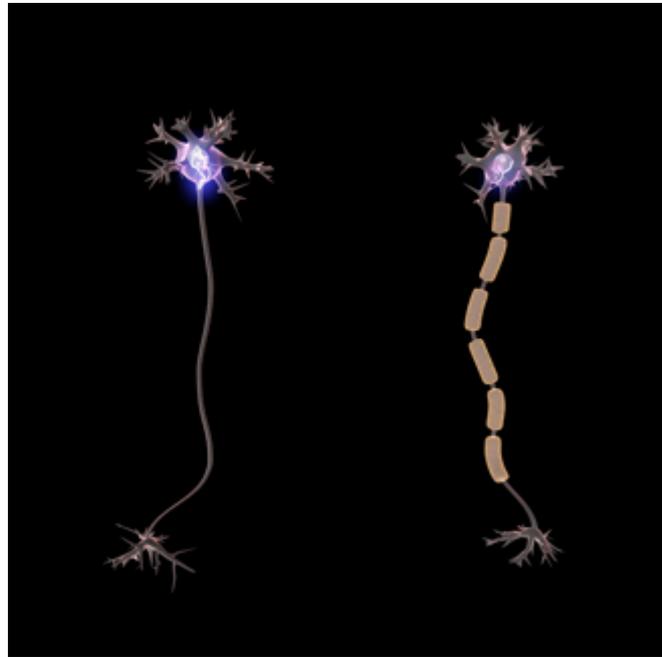


**Interacts with RXR to mediate retinoid response**

# What is the overall goal?



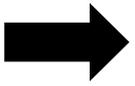
?



To understand the role LXRA has in myelination of nerves.

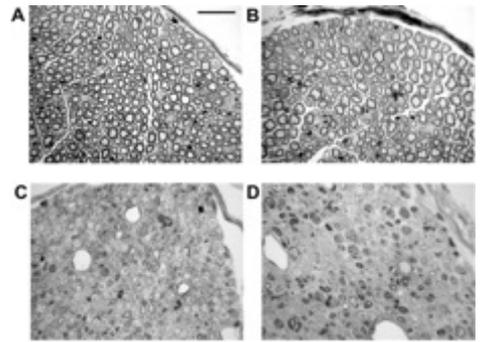
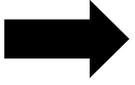
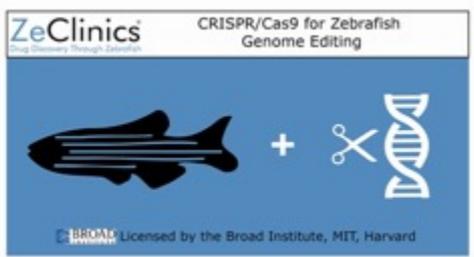
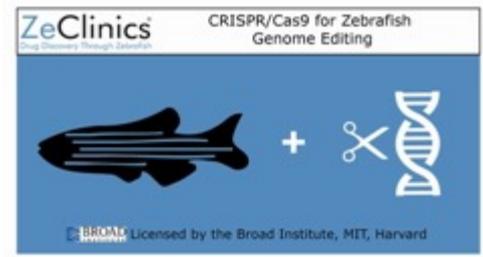
# Aim 1: Identify important conserved amino acids for myelination

Clustal Omega



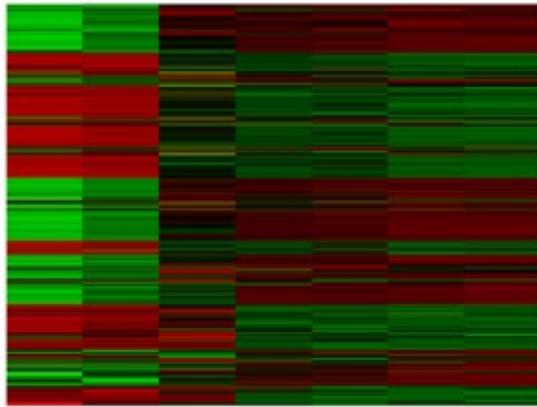
Species/Abbrv
1. Homo_sapiens
2. Mus_musculus
3. Rattus_norvegicus
4. Pan_troglodytes
5. Danio_rerio
6. Drosophila_melanog
7. Caenorhabditis_eleg
8. Canis_lupus_familiar

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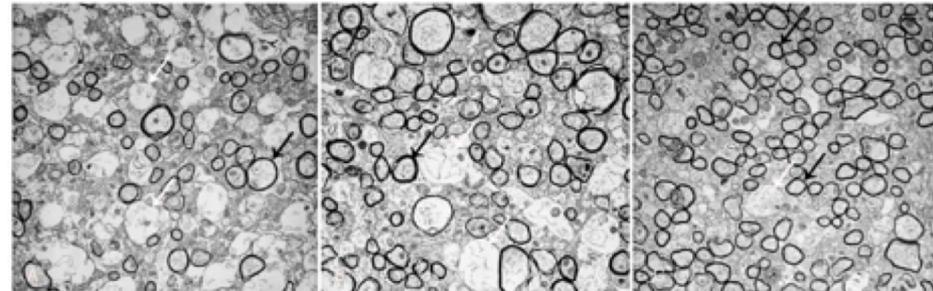


Hypothesis: Mutation of amino acids in the ligand binding domain show a reduction of myelination

# Aim 2: Characterize differentially expressed genes in the CNS in LXRA deficient mice

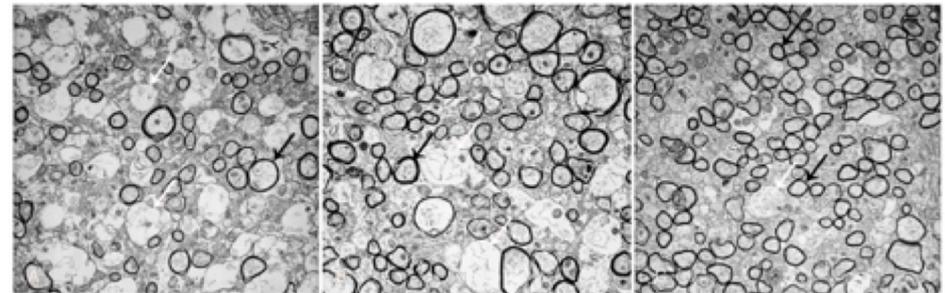
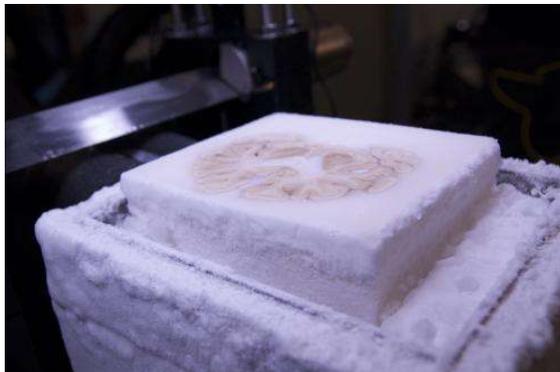
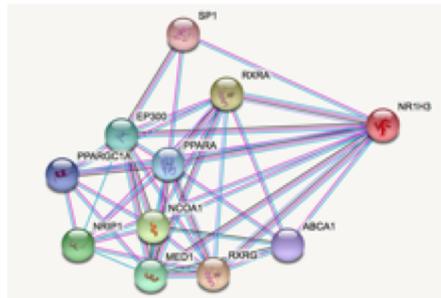
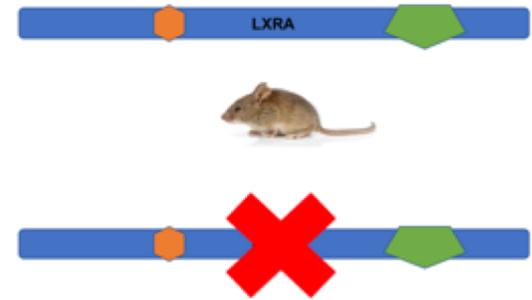
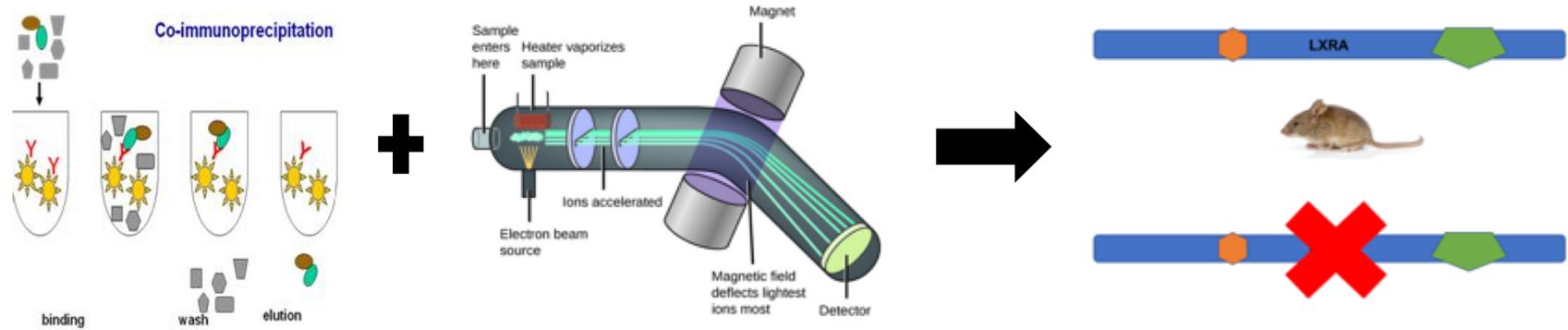


**GENEONTOLOGY**  
Unifying Biology



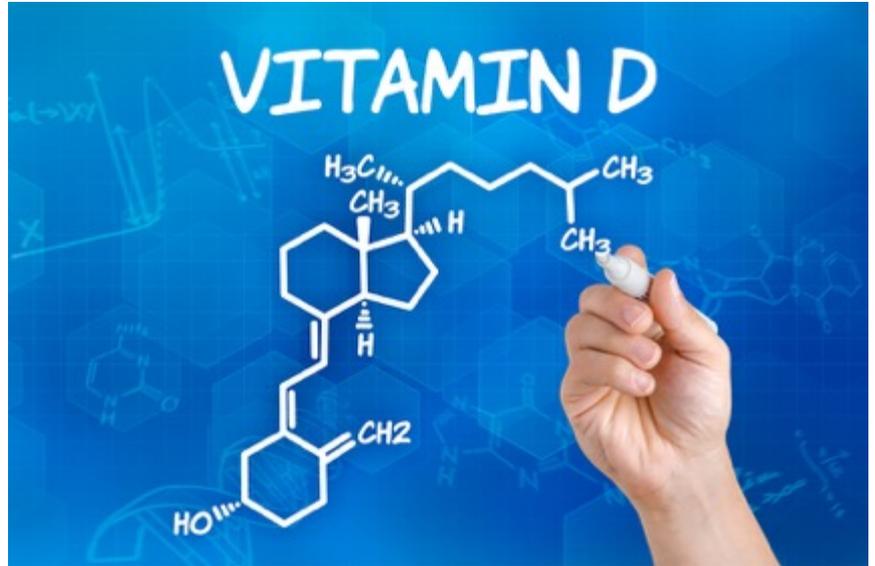
**Hypothesis: Genes involved in lipid homeostasis will be downregulated**

# Aim 3: Determine protein interactions that differ between WT and LXRA mutant mice



**Hypothesis: LXRA interacts with genes involved in lipid homeostasis in WT but not mutant**

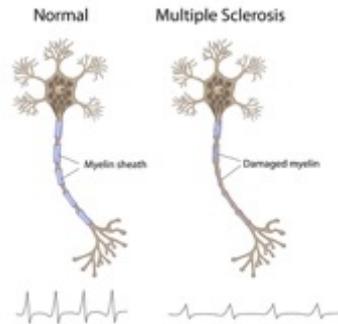
# Future Directions



**Determine the role of LXRA in Vitamin D deficiency in MS patients**

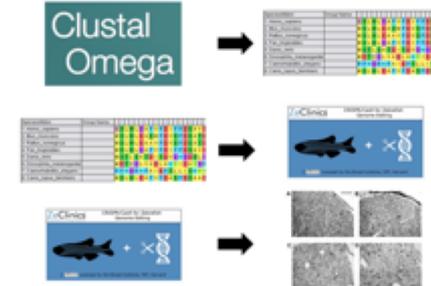
**Determine if LXRA targeting is a possible drug therapy**

# Multiple Sclerosis and LXRA



**Demyelination**

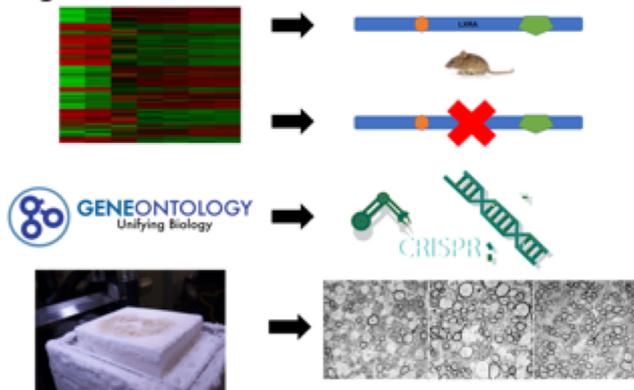
**Aim 1: Identify important conserved amino acids for myelination**



Hypothesis: Mutation of amino acids in the ligand binding domain show a reduction of myelination

**Aim 1**

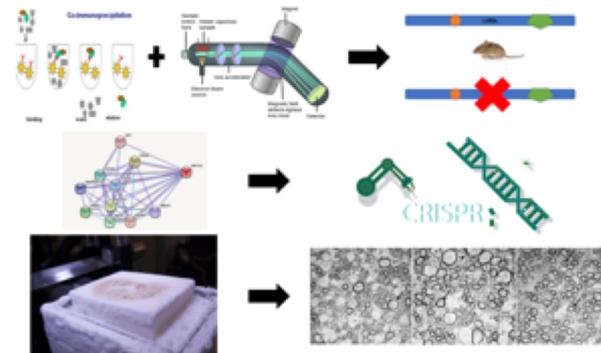
**Aim 2: Characterize differentially expressed genes in the CNS in LXRA deficient mice**



Hypothesis: Genes involved in lipid homeostasis will be downregulated

**Aim 2**

**Aim 3: Determine protein interactions that differ between WT and LXRA mutant mice**



Hypothesis: LXRA interacts with genes involved in lipid homeostasis in WT but not mutant

**Aim 3**

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