WHAT IS AUTOIMMUNITY?

Understanding Autoimmune Diseases

MOLECULAR MIMICRY HYPOTHESIS

Molecular mimicry occurs when the structure of a foreign antigen is very similar to antigen present on our own cells or tissues:

- Upon presentation of the foreign antigen, lymphocytes are activated to target this antigen
- These lymphocytes could potentially also react to self-antigen
- This leads to the destruction of one's own cells or tissues

Molecular Mimicry as a Mechanism for Autoimmune Disease

(Cusick, M., Libbey, J., and Fujinami, R. Clin Revmm 2 ´ L

T CELL IMBALANCE & AUTOIMMUNITY

Another potential issue that contributes to the breakdown of tolerance seen in autoimmunity is an imbalance between Th17 and Treg cells

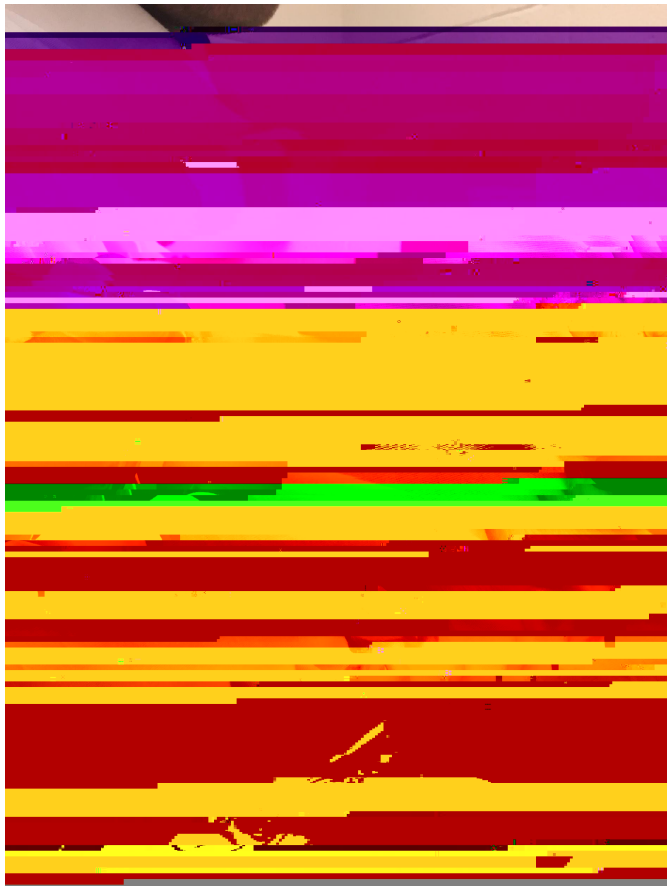
The following autoimmune diseases are known to c tih ϧ ϩ o M Th c etet lls ϥ ϭ ϧ ϩ ЄΘ ЄЄ´ ´

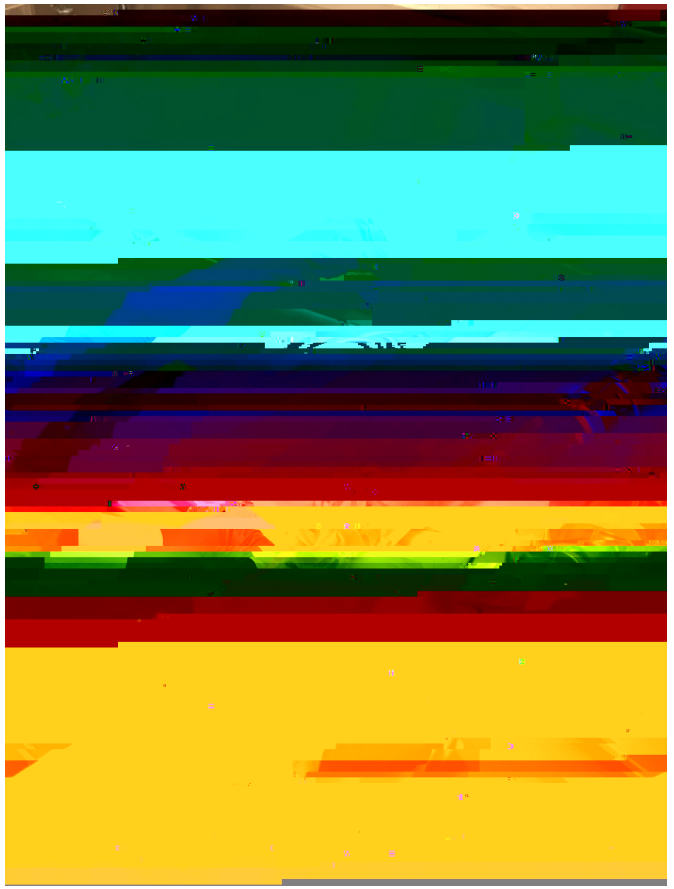
A CLOSER LOOK INTO AUTOIMMUNITY: RHEUMATOID ARTHRITIS

Rheumatoid arthritis (RA) is a chronic inflammatory condition that impacts the lining of the joints. Many of our joints are surrounded by a synovial membrane – and when this area becomes inflamed, it leads to cartilage thinning and bone loss.

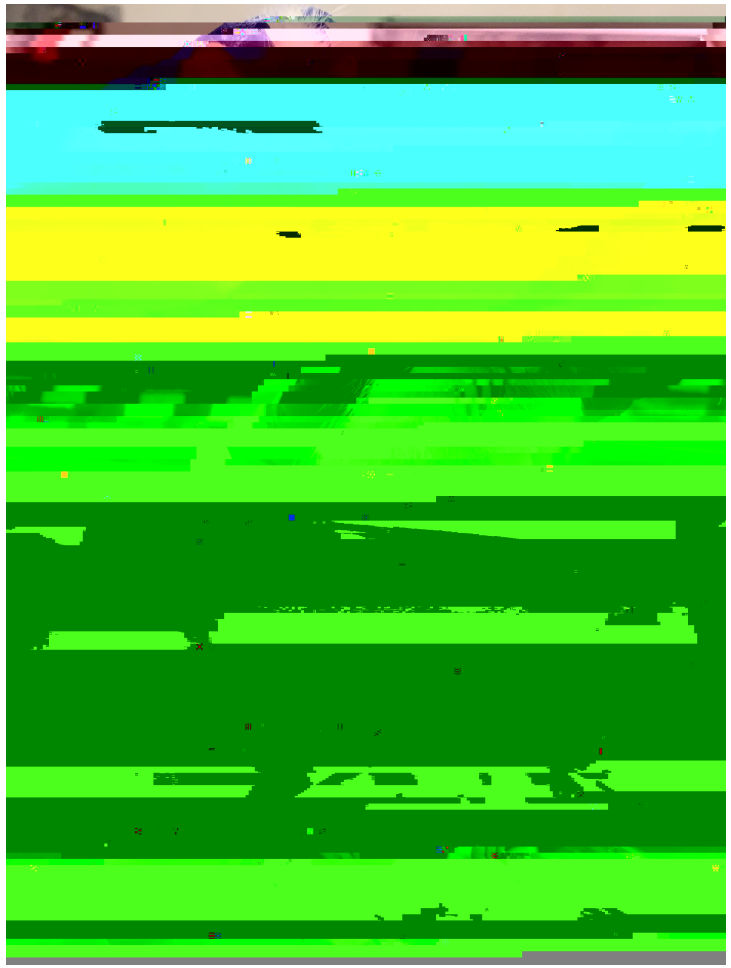
RHEUMATOID ARTHRITIS: ANIMAL MODEL

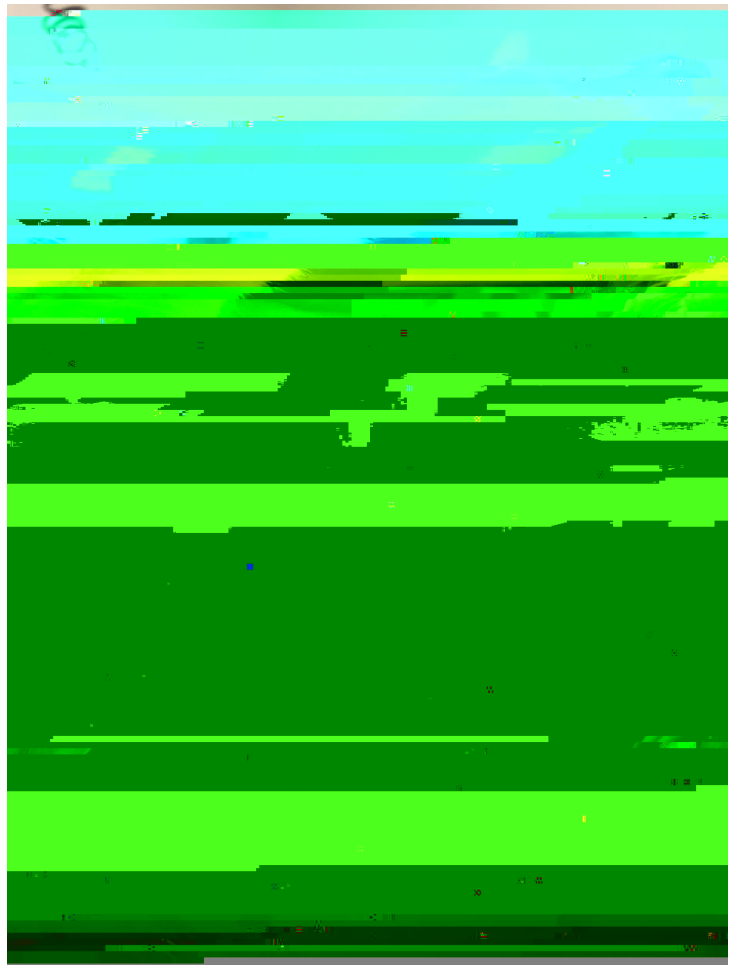
- Adjuvant-induced Arthritis in Lewis Rats





ONSET OF DISEASE & ADMINISTERING TREATMENT





DEVELOPMENT OF DISEASE: CONTROL

ENZYME-LINKED IMMUNOSORBENT ASSAY

The enzyme-linked immunosorbent assay (ELISA) is used to detect the presence of an antibody or antigen in a particular blood sample.

- Presence of antibody can be used to identify allergies or serious infections
- Presence of antigen can be used for drug testing, pregnancy tests (hCG hormone)

http://www.elisa-antibody.com/uploads/Clean_Lilac/ELSIA-Home%20Pregnancy%20Test.jpg

http://www.biology.arizona.edu/immunology/activities/elisa/graphics/elisa_plate.gif

In the case of rheumatoid arthritis, the ELISA technique can be used to look at many markers, including IL-17, rheumatoid factor, and anti-CCP antibodies.

ELISA ANALYSIS

The reaction of the enzyme binding to the substrate produces a color change which can be analyzed **qualitatively or quantitatively.**

Qualitatively, it is possible to see large differences in color production to determine the presence or absence of the target antigen/antibody.

Quantitatively, a special machine can be used to determine the optical density of each sample. Researchers use a standard curve to relate the

DIAGNOSING RA: ANTI-CCP ELISA

We will perform an indirect ELISA to test patient’s serum samples for anti-CCP.