Abstract

The C57BL/6 mouse: Common spontaneous diseases associated with behavior and genetics

The C57BL/6 mouse

1. Originated at the Jackson Labs 1921
2. Most widely used background genetic strain and the best selling mouse
3. Genome is sequenced and published

Common Background Lesions

1. Hydrocephalus
2. Microophthalmia
3. Ulcerative Dermatitis
4. Disease Resistance : a. Th1 driven acquired immune response
5. Eosinophillic Crystalline Pneumonia
6. Amyloidosis
7. Osteoporosis
8. Atherosclerosis
9. Low Tumor Strain – except for Lymphosarcoma and Histiocytic Sarcoma

My independent studies at UCLA have been directed toward finding answers to problems that arise in regards to animal husbandry, frequently identified spontaneous conditions, animal models (BLT NSG immune compromised mouse model) that could have a negative impact on funded research studies.

The first condition I encountered was Ulcerative Dermatitis in C57L/6 mice.

1. At the time, causes of the syndrome included: Fur Mites, Vasculitis, Feeding High Fat Diets (mouse chow 11% fat or greater, age and behavior.
2. Clinically, these mice were pruritic and scratching resulted in skin excoriation and ulceration
3. Though Trimming the toe nails of these mice lessened the self inflicted skin damage, I wanted to determine a cause and a treatment that would be easy for investigators to comply with (regulations, animal welfare).

Hypothesis: Ulcerative Dermatitis is Secondary to Inflammation

1. Specific Aim #1: Drugs directed at reducing Free Radical and Arachidonic Acid activation would effectively stop the itch/scratch/itch cycle
   a. Treatment with Essential Fatty Acids
   b. Treatment with the antioxidant Vit E
2. Specific Aim #2: Beta Oxidation of the dorsal fat pad results in free radical production thus activating the itch/scratch/itch cycle
   a. Examine the skin and subcutaneous fat for free radical reducing enzymes
3. Specific Aim #3: Ulcerative Dermatitis associated with the face and ventral cervical region are associated with a different cause – secondary to oral inflammation
   a. Gross and Histologic evaluation of mice with facial UD