



Arthritis in C57BL/6 mice



C57BL/6 mice are the most widely “mice” used to develop genetically modified mice for gene function analyses. With regard to arthritis models, these mice are relatively resistant to collagen-induced arthritis and collagen antibody-induced arthritis. Here we propose three very efficient protocols for inducing arthritis in C57BL/6 mice.

1. Delayed-Type Hypersensitivity (DTH) Arthritis

DTH, also known as Type IV hypersensitivity, is distinct from the other hypersensitivity reactions, because it is not antibody mediated but rather is a type of cell-mediated response (T-cells).

Immunization and footpad injection of cationic BSA (cBSA) leads to the development of DTH, inducing transient paw swelling by cBSA-activated T-cells. Furthermore, a combination of cBSA-induced DTH and a low dose of Arthrogen-CIA[®] arthritogenic 5-clone monoclonal antibody cocktail develops a sustained inflammatory DTH arthritis.

Standard Protocol

	C57BL/6 mice, Male; 7-8 weeks old
Day 0	Immunize 100 µg cBSA (Cat # 9058) emulsified with Complete Freund's adjuvant at the abdomen by ID injection
Day 4	Inject 100 µl (1 mg) of 5 clone cocktail (Cat # 53010) by IV injection
Day 7	Inject 50 µl (50 µg) of cBSA to the footpads
After Day 8	Evaluate the severity of arthritis

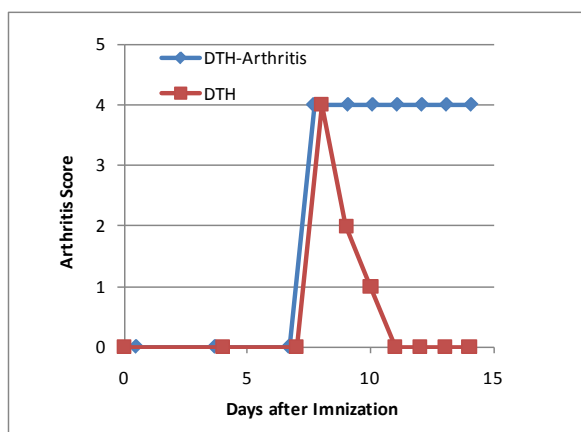
Benefits:

No LPS injection is required to induce arthritis.

Only 1 mg of 5-clone cocktail is required.

Arthritis is developed within 8 days.

Ability to choose specific paws to induce arthritis.

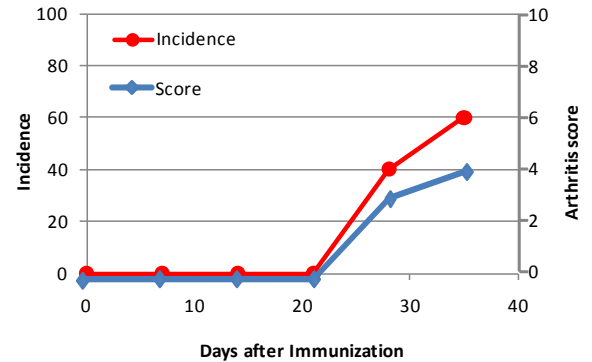


2. Collagen-Induced Arthritis (CIA)

C57BL/6 mice exhibit low susceptibility to CIA due to their MHC haplotype (H-2b). Therefore, a unique protocol is required to induce arthritis in these mice. Moreover, these mice make IgG2c subtype antibodies rather than IgG2b antibodies, indicating that complement fixable anti-collagen IgG2a and IgG2c autoantibody levels should be measured for the evaluation of procedures and immune responses.

Standard Protocol

- Day 0** C57BL/6 mice, Male; 7-8 weeks old
- Day 0** Immunize 100 µg of chick type II collagen emulsified with Complete Freund's adjuvant (TB; 5 mg/ml, Cat # 7023) at the base of tail.
- Day 21** Immunize 100 µg of chick type II collagen emulsified with Complete Freund's adjuvant (TB; 5 mg/ml, Cat # 7023) at the base of tail.
- After Day 24** Evaluate the severity of arthritis



3. Collagen Antibody-Induced Arthritis (CAIA)

C57BL/6 mice are also a CAIA-low responder mouse strain, requiring a higher dose of ArthroGen-CIA® 5-clone cocktail to induce arthritis. However, choosing an appropriate dose and injection route can consistently induce severe arthritis in these mice.

Standard Protocol

- Day 0** C57BL/6 mice, Male; 7-8 weeks old
- Day 0** Inject 2.5 or 5 mg of 5 clone cocktail (Cat # 53010) by IV injection
- Day 3** Inject 0.1 ml (50 µg) of LPS solution by IP injection
- After Day 4** Evaluate the severity of arthritis

