



FSHD model organisms: Human FSHD xenograft mice

Mice can be generated that grow a human muscle in place of a mouse muscle.

These xenograft mice are engineered to have a human FSHD or healthy TA muscle.

Thus, we can study an intact, innervated and vascularized human muscle in a living organism and test putative FSHD therapeutics.

This is particularly important because it is the only way to maintain the natural regulation of the FSHD genetic region since it is not evolutionarily conserved.

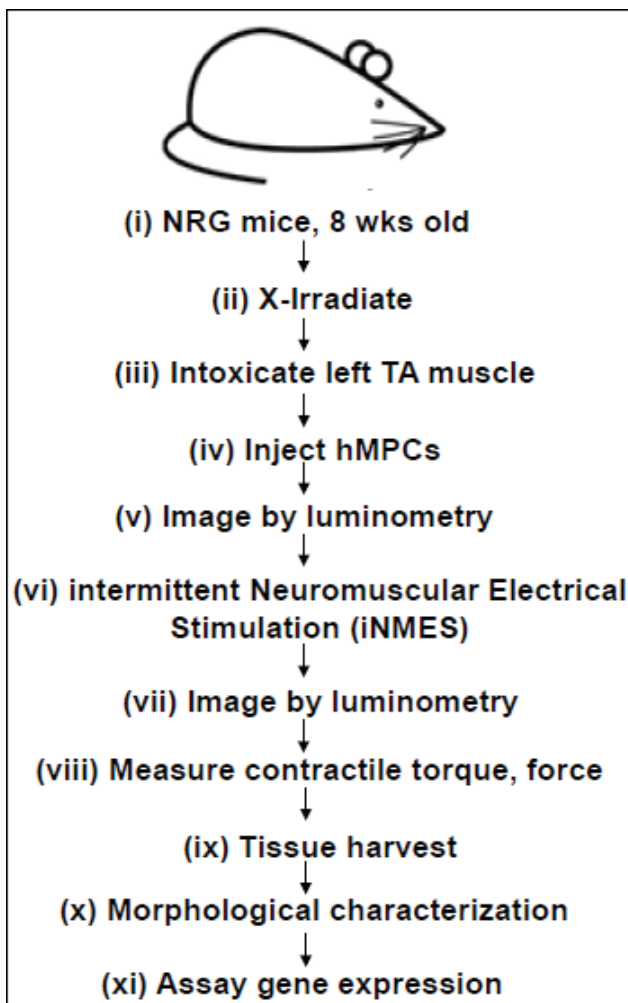
Human FSHD xenograft mice are excellent models to test many FSHD therapeutics.

How to make human FSHD xenograft mice, from the Robert Bloch lab, University of Maryland School of Medicine

Muscle xenografts reproduce key molecular features of facioscapulohumeral muscular dystrophy

Experimental Neurology (2019) 320:113011.

Amber L. Mueller^a, Andrea O'Neill^a, Takako I. Jones^b, Anna Llach^{a,1}, Luis Alejandro Rojas^c, Paraskevi Sakellariou^{a,d}, Guido Stadler^{e,2}, Woodring E. Wright^e, David Eyerman^c, Peter L. Jones^b, Robert J. Bloch^{a,*}



NRG mice, which are lacking an immune system, are used so that the grafting cells are not rejected.

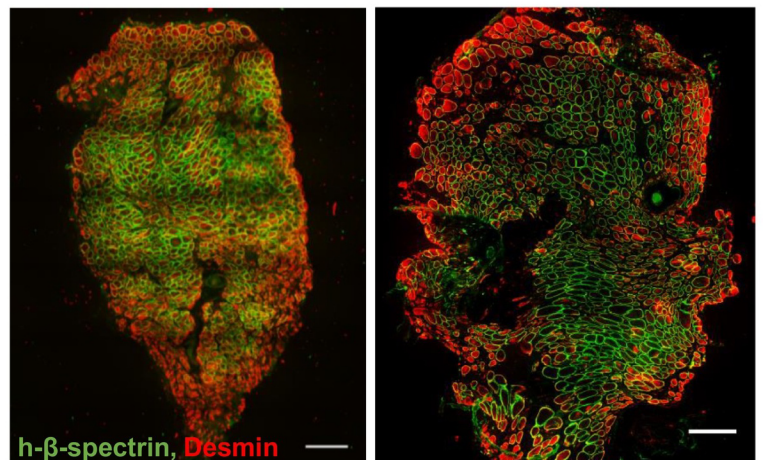
The hindlimbs are irradiated to kill off the mouse muscle stem cells.

The mouse TA muscle is killed with a toxin.

Human muscle precursor cells (hMPCs) are injected and grow in the TA muscle compartment into muscles, helped by electrical stimulation.

Healthy

FSHD



Cross-section of the Tibialis anterior human xenograft muscle grown in mice. Green shows human muscle cells.