



Duchenne Muscular Dystrophy Research Program

VISION

To preserve and improve the function and quality of life, and to extend the life span of all individuals with Duchenne

MISSION

To better support discovery and development of therapeutics, devices, and other interventions, and to promote their rigorous clinical testing for the benefit of military beneficiaries and the general public

PROGRAM HISTORY

Duchenne Muscular Dystrophy (DMD) is the most common childhood form of muscular dystrophy, affecting approximately 1 in every 3,600 to 5,000 male infants. Boys living with DMD experience devastating muscle weakness affecting the skeletal muscles, heart, and respiratory

muscles. Unfortunately, there is no cure for DMD, and muscle weaknesses progress to heart and respiratory failure that eventually lead to death before or during an individual's 30s.

The Duchenne Muscular Dystrophy Research Program (DMDRP) was established in fiscal year 2011 (FY11) and has received \$29.6 million (M) in Congressional appropriations through FY19. The DMDRP has built a research portfolio of over 25 projects that include studies on cardiac issues, research to improve clinical care and quality of life, assessment of clinical trial tools and outcome measures, and preclinical translational research to support therapeutic development. There is no treatment that can stop or reverse the progression of DMD. With the lack of any curative treatments, the DMDRP has placed

its greatest emphasis on developing or improving treatments and clinical trial readiness.

RELEVANCE TO MILITARY HEALTH

According to the Defense Health Agency *Medical Surveillance Monthly Report*, musculoskeletal diseases were the third leading cause of medical encounters of active duty Service members in 2015.¹ In non-Service member beneficiaries of the military health system musculoskeletal diseases were the leading cause of medical encounters in 2015.¹ Development of novel advanced technologies to improve muscle strength and function after injury and/or disease is relevant to the military's overarching mission and to enabling Service members to be mission-ready.

¹ Medical Surveillance Monthly Report, Vol 23, No. 4, April 2016.

HIGH-IMPACT TRANSLATIONAL ADVANCES SUPPORTED BY THE DMDRP

IMPROVE GLUCOCORTICOID TREATMENT

- The DMDRP funded preclinical studies demonstrating that compound VBP15 (renamed vamorolone) dissociated the harmful side effects of glucocorticoid steroids from their beneficial anti-inflammatory effects. Vamorolone is now in Phase 2b clinical trial testing (NCT03439670; ReveraGen BioPharma) as a potential replacement for glucocorticoid therapy.

GENE THERAPY

- The DMDRP supported research to optimize delivery vectors, micro-gene constructs, and delivery methods for DMD gene therapy. Promising results from these studies have led to a clinical trial studying adeno-associated virus vector micro-dystrophin gene transfer in adolescents and children with DMD (NCT03368742; Solid Biosciences).

EXON SKIPPING

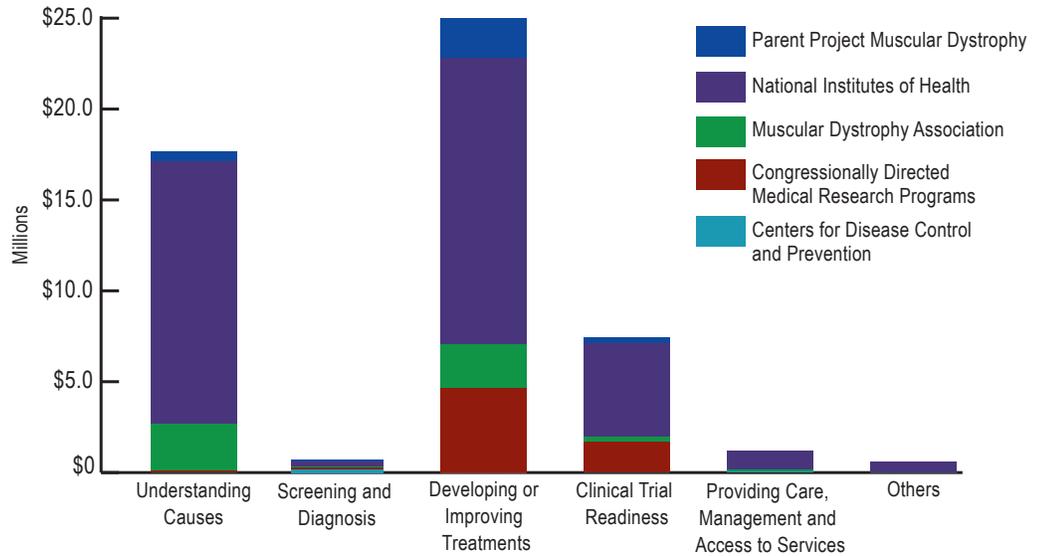
- The DMDRP funded studies that successfully demonstrated exon skipping of exon 51 in vitro and in vivo and produced a truncated functional dystrophin protein and optimized the chemistry for the anti-sense RNA drug used for exon skipping. This exon-skipping drug, Exondys 51™ (Sarepta Therapeutics), has since been granted accelerated approval by the Food and Drug Administration.



INTERAGENCY COLLABORATION

The Congressionally Directed Medical Research Programs partners with multiple federal and non-federal organizations on the Muscular Dystrophy Coordinating Committee (MDCC) to coordinate muscular dystrophy activities, compare research portfolios, identify gaps in research funding, and improve existing research efforts. The MDCC developed an Action Plan that contains specific objectives that are appropriate to the missions of MDCC member agencies and organizations and has served as a central focus for coordination of efforts in muscular dystrophy.

Current funding for DMD projects in 2017 from MDCC partners is shown in the graph above.

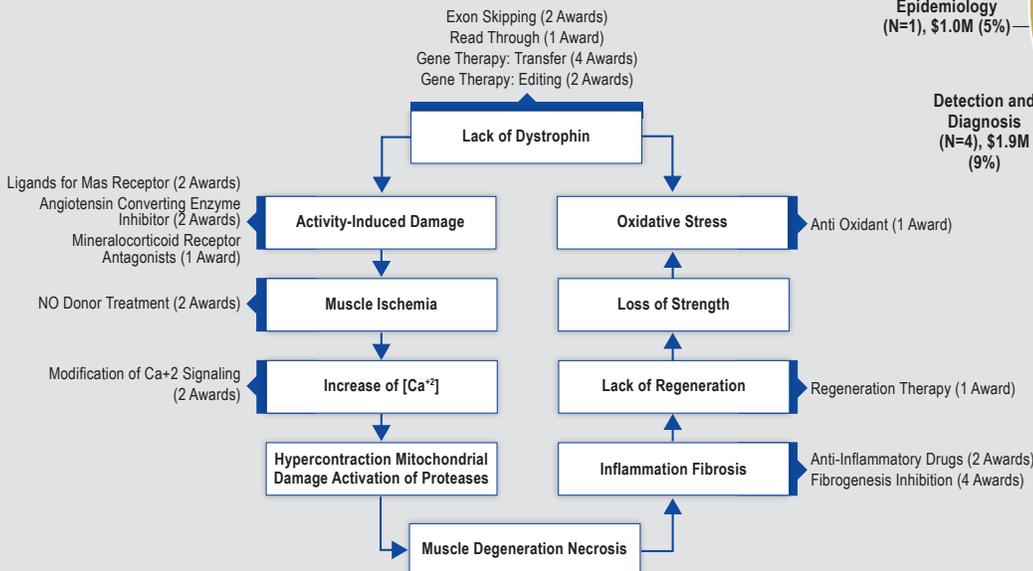
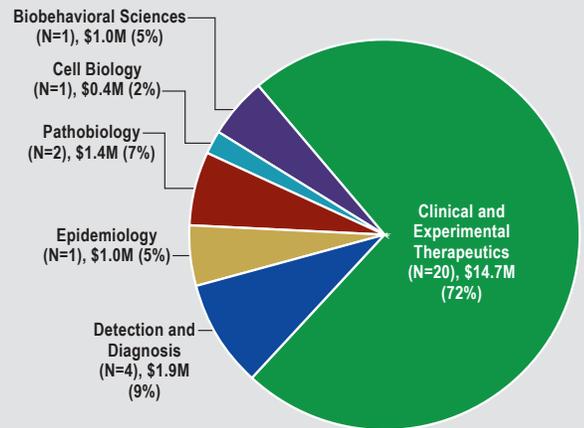


The DMDRP has invested a majority of its funding in Developing or Improving Treatments (71%) and Clinical Trial Readiness (26%). These are the two priority areas where the DMDRP believes it can make its greatest impact for the DMD research field and patient communities, particularly considering the limited research funding available from government and non-government organizations across the entire muscular dystrophy field. The resources required to produce a novel therapy/treatment are significant, and relying on only one organization to carry out this task is unrealistic; therefore, a considerable level of cooperation is required among all stakeholders in the field.

PROGRAM PORTFOLIO

The majority of the DMDRP research portfolio is invested in many promising therapeutic approaches for treating DMD, from projects focused on restoring functional dystrophin to potential treatments addressing the various effects of lack of functional dystrophin expression. The following chart and figure illustrate the DMDRP investment portfolio by research area, as well as the various approaches being explored to treat DMD.

FY11-FY17 Investment by Research Area



Point of Contact: CDMRP Public Affairs, 301-619-9783

usarmy.detrick.medcom-cdmrp.mbx.cdmrp-public-affairs@mail.mil