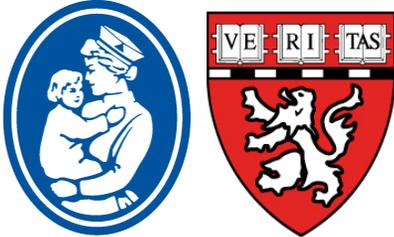


# GENETIC RESEARCH ON THE CONGENITAL MYOPATHIES

Laboratory of Alan H. Beggs, Ph.D.

Boston Children's Hospital  
The first place for children



**HARVARD**  
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## Centronuclear/Myotubular Myopathy: Information for Patients and Families

### Introduction

In the Beggs laboratory at Boston Children's Hospital, we are a group of scientists and doctors studying the genetics of the congenital (present from birth) myopathies (muscle diseases) such as, **myotubular myopathy (MTM)** and **centronuclear myopathy (CNM)**. We are trying to understand the changes that occur in the muscle of patients with MTM/CNM, with the hope that this will lead to improved treatment for these conditions.

Genes are pieces of inherited information that tell our bodies how to grow and develop. There are genes for hair color, eye color, and even how your muscles work. Sometimes individuals inherit a gene that does not work properly, causing them to develop health problems or disease. We currently know of at least four genes associated with CNM/MTM. The first gene to be discovered was the myotubularin gene (*MTM1*) on the X chromosome. This gene is associated with X-linked myotubular myopathy, which typically only affects boys. There are at least three other known genes, termed autosomal genes, responsible for causing CNM that affects both boys and girls equally. The dynamin 2 (*DNM2*) gene is associated with dominant CNM, and the *BINI* gene is associated with a small number of cases of recessive CNM. Recently, changes in the *RYR1* and the *TTN* gene have also been found to be associated with CNM. Our research is focused on trying to learn more about these genes and to locate other disease causing genes.

If you are the parent of a child with MTM or CNM, or if you yourself are affected, you may be able to make a meaningful difference by helping us understand the causes of these myopathies.

### Participation consists of:

*Research Consent:* Each family member who decides to participate will need to review and complete the consent form with our research study coordinator and/or a local clinician. If the participant is a minor, a parent/guardian will be the one who provides consent.

*Medical information and family history:* We will ask your permission to obtain relevant medical records, such as a muscle biopsy report, from your physician. We may also ask you some questions about your family medical history. This can be done through a brief telephone interview.

*Blood or saliva sample:* We ask for a blood or saliva sample from all available and consenting family members. This sample will be used to isolate genetic material (DNA). The DNA will be screened for mutation (changes) in genes that may be involved in myotubular and centronuclear myopathy. We can arrange the blood draw through either a participant's physician or a nearby medical facility. All costs for the blood draw are paid by our lab.

*Muscle tissue from an existing muscle biopsy:* Studying muscle from a person who has myotubular/centronuclear myopathy can tell us a lot about the genes and proteins involved in the disease. We can help find out if any frozen tissue is still available from an existing muscle biopsy and, with your permission, arrange to have it shipped to our laboratory. Alternatively, if you or your child is scheduled to undergo a surgical procedure in the near future, this may provide an opportunity to donate a muscle specimen. With some procedures, it is possible for the surgeon to remove a small piece of muscle without any additional risk or discomfort to the patient.

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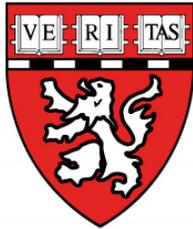
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### Cost and Time Commitment:

Participation in this study is free of charge. Travel to Boston is not required and individuals from anywhere in the world may participate. The telephone interview, blood draw, and paperwork should take no more than 2 hours to complete.

### Reporting of Results:

It is possible that we may identify a gene mutation as the cause of the muscle disease in your family. In this case, and with your permission, we will be happy to make this information available to you via your healthcare provider. As a research laboratory, we are not authorized to release participant's results, but we can refer your physician to a clinical diagnostic laboratory that would confirm our findings and provide clinically useful results.

### Potential Resources

There are several potential resources for individuals and families with CNM:

- The **Muscular Dystrophy Association** ([www.mdausa.org](http://www.mdausa.org)) and **Muscular Dystrophy Campaign** (<http://www.muscular-dystrophy.org>) provide general information about various topics related to neuromuscular conditions.
- The **myotubular myopathy mail group** at (<http://healthsharegroups.org>) you can join the new group by registering to the site and then searching for myotubular. This group provides a good forum for asking questions and discussing experiences.
- The **myopathy mail group** at (<http://health.groups.yahoo.com/group/Myopathy>) is another on-line listserv and support group composed of individuals with all different forms of neuromuscular conditions.
- There are several websites that provide information resources specifically for individuals and families with CNM/MTM, including the **Myotubular Myopathy Resource Group** (<http://www.mtmrg.org>), the **Centronuclear and Myotubular Information Point** (<http://centronuclear.org.uk>), and the **Joshua Frase Foundation** (<http://www.joshuafrase.org>).
- The **X-linked MTM/CNM GeneReview** (<http://www.ncbi.nlm.nih.gov/books/NBK1432>) and (<http://www.ncbi.nlm.nih.gov/books/NBK1432>) contains more detailed clinical information about MTM/CNM and the known genes. Not all of the information in the review is relevant for every family, but it may be a helpful resource for you and/or your physician.
- Our lab may also be a helpful resource. Our website provides general information about congenital myopathies, MTM, and genetics (<http://www.childrenshospital.org/research/beggs>). We may also be able to connect your family with other individuals or families with CNM/MTM. If this possibility interests you, or if you have other questions or concerns, please contact Casie Genetti.

### Contact us:

If you would like to enroll or if you have questions about this study, please contact:

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**We look forward to hearing from you!**