

Severity of cardiomyopathy associated with adenine nucleotide translocator-1 deficiency correlates with mtDNA haplogroup

Submitted by Emmanuel Lemoine on Tue, 02/24/2015 - 16:12

Titre	Severity of cardiomyopathy associated with adenine nucleotide translocator-1 deficiency correlates with mtDNA haplogroup
Type de publication	Article de revue
Auteur	Strauss, K. A [1], DuBiner, L. [2], Simon, M. [3], Zaragoza, M. [4], Sengupta, P. P [5], Li, P. [6], Narula, N. [7], Dreike, S. [8], Platt, J. [9], Procaccio, Vincent [10], Ortiz-Gonzalez, X. R [11], Puffenberger, E. G [12], Kelley, R. I [13], Morton, D. H [14], Narula, J. [15], Wallace, D. C [16]
Editeur	National Academy of Sciences
Type	Article scientifique dans une revue � comit� de lecture
Ann�e	2013
Langue	Anglais
Date	2013
Num�ro	9
Pagination	3453 - 8
Volume	110
Titre de la revue	Proceedings of the National Academy of Sciences of the United States of America
ISSN	1091-6490
Mots-cl�s	Adenine Nucleotide Translocator 1/deficiency/genetics [17], Adolescent [18], Cardiomyopathies/genetics/pathology/physiopathology [19], Disease Progression [20], DNA, Mitochondrial/genetics [21], Female [22], Haplotypes/genetics [23], Homozygote [24], Humans [25], Male [26], Mutation [27], Myocardium/pathology/ultrastructure [28], Pedigree [29]

Mutations of both nuclear and mitochondrial DNA (mtDNA)-encoded mitochondrial proteins can cause cardiomyopathy associated with mitochondrial dysfunction. Hence, the cardiac phenotype of nuclear DNA mitochondrial mutations might be modulated by mtDNA variation. We studied a 13-generation Mennonite pedigree with autosomal recessive myopathy and cardiomyopathy due to an SLC25A4 frameshift null mutation (c.523delC, p.Q175RfsX38), which codes for the heart-muscle isoform of the adenine nucleotide translocator-1. Ten homozygous null (adenine nucleotide translocator-1(-/-)) patients monitored over a median of 6 years had a phenotype of progressive myocardial thickening, hyperalaninemia, lactic acidosis, exercise intolerance, and persistent adrenergic activation. Electrocardiography and echocardiography with velocity vector imaging revealed abnormal contractile mechanics, myocardial repolarization abnormalities, and impaired left ventricular relaxation. End-stage heart disease was characterized by massive, symmetric, concentric cardiac hypertrophy; widespread cardiomyocyte degeneration; overabundant and structurally abnormal mitochondria; extensive subendocardial interstitial fibrosis; and marked hypertrophy of arteriolar smooth muscle. Substantial variability in the progression and severity of heart disease segregated with maternal lineage, and sequencing of mtDNA from five maternal lineages revealed two major European haplogroups, U and H. Patients with the haplogroup U mtDNAs had more rapid and severe cardiomyopathy than those with haplogroup H.

Résumé en anglais

URL de la notice

<http://okina.univ-angers.fr/publications/ua8411> [30]

DOI

10.1073/pnas.1300690110 [31]

Lien vers le document

<http://dx.doi.org/10.1073/pnas.1300690110> [31]

Titre abrégé

Proc Natl Acad Sci U S A

Liens

- [1] [http://okina.univ-angers.fr/publications?f\[author\]=14930](http://okina.univ-angers.fr/publications?f[author]=14930)
- [2] [http://okina.univ-angers.fr/publications?f\[author\]=14931](http://okina.univ-angers.fr/publications?f[author]=14931)
- [3] [http://okina.univ-angers.fr/publications?f\[author\]=14932](http://okina.univ-angers.fr/publications?f[author]=14932)
- [4] [http://okina.univ-angers.fr/publications?f\[author\]=14933](http://okina.univ-angers.fr/publications?f[author]=14933)
- [5] [http://okina.univ-angers.fr/publications?f\[author\]=14934](http://okina.univ-angers.fr/publications?f[author]=14934)
- [6] [http://okina.univ-angers.fr/publications?f\[author\]=14935](http://okina.univ-angers.fr/publications?f[author]=14935)
- [7] [http://okina.univ-angers.fr/publications?f\[author\]=14936](http://okina.univ-angers.fr/publications?f[author]=14936)
- [8] [http://okina.univ-angers.fr/publications?f\[author\]=14937](http://okina.univ-angers.fr/publications?f[author]=14937)
- [9] [http://okina.univ-angers.fr/publications?f\[author\]=14938](http://okina.univ-angers.fr/publications?f[author]=14938)
- [10] <http://okina.univ-angers.fr/v.procaccio/publications>
- [11] [http://okina.univ-angers.fr/publications?f\[author\]=14939](http://okina.univ-angers.fr/publications?f[author]=14939)
- [12] [http://okina.univ-angers.fr/publications?f\[author\]=14940](http://okina.univ-angers.fr/publications?f[author]=14940)
- [13] [http://okina.univ-angers.fr/publications?f\[author\]=14941](http://okina.univ-angers.fr/publications?f[author]=14941)
- [14] [http://okina.univ-angers.fr/publications?f\[author\]=14942](http://okina.univ-angers.fr/publications?f[author]=14942)
- [15] [http://okina.univ-angers.fr/publications?f\[author\]=14943](http://okina.univ-angers.fr/publications?f[author]=14943)
- [16] [http://okina.univ-angers.fr/publications?f\[author\]=14289](http://okina.univ-angers.fr/publications?f[author]=14289)
- [17] [http://okina.univ-angers.fr/publications?f\[keyword\]=13898](http://okina.univ-angers.fr/publications?f[keyword]=13898)
- [18] [http://okina.univ-angers.fr/publications?f\[keyword\]=1214](http://okina.univ-angers.fr/publications?f[keyword]=1214)
- [19] [http://okina.univ-angers.fr/publications?f\[keyword\]=13899](http://okina.univ-angers.fr/publications?f[keyword]=13899)
- [20] [http://okina.univ-angers.fr/publications?f\[keyword\]=6090](http://okina.univ-angers.fr/publications?f[keyword]=6090)
- [21] [http://okina.univ-angers.fr/publications?f\[keyword\]=12971](http://okina.univ-angers.fr/publications?f[keyword]=12971)
- [22] [http://okina.univ-angers.fr/publications?f\[keyword\]=1075](http://okina.univ-angers.fr/publications?f[keyword]=1075)
- [23] [http://okina.univ-angers.fr/publications?f\[keyword\]=13900](http://okina.univ-angers.fr/publications?f[keyword]=13900)

- [24] [http://okina.univ-angers.fr/publications?f\[keyword\]=11681](http://okina.univ-angers.fr/publications?f[keyword]=11681)
- [25] [http://okina.univ-angers.fr/publications?f\[keyword\]=991](http://okina.univ-angers.fr/publications?f[keyword]=991)
- [26] [http://okina.univ-angers.fr/publications?f\[keyword\]=968](http://okina.univ-angers.fr/publications?f[keyword]=968)
- [27] [http://okina.univ-angers.fr/publications?f\[keyword\]=1133](http://okina.univ-angers.fr/publications?f[keyword]=1133)
- [28] [http://okina.univ-angers.fr/publications?f\[keyword\]=13901](http://okina.univ-angers.fr/publications?f[keyword]=13901)
- [29] [http://okina.univ-angers.fr/publications?f\[keyword\]=13394](http://okina.univ-angers.fr/publications?f[keyword]=13394)
- [30] <http://okina.univ-angers.fr/publications/ua8411>
- [31] <http://dx.doi.org/10.1073/pnas.1300690110>

Publié sur *Okina* (<http://okina.univ-angers.fr>)