

SPEAKER PRESENTATION

Open Access

Mitochondrial donation by stem cells: potential for novel therapeutics

Anurag Agrawal

From International Conference on Human Genetics and 39th Annual Meeting of the Indian Society of Human Genetics (ISHG)
Ahmadabad, India. 23-25 January 2013

There is increasing interest in whether mesenchymal stem cells (MSC) act as mitochondrial donors for rescuing injured cells. Islam *et al* (Nature Medicine, 2012) showed conclusively, using a mouse model of acute lung injury, that MSC mediated mitochondrial donation can lead to survival benefits (3). Contemporaneous work from Dr. Anurag Agrawal's lab reveals the molecular regulation of mitochondrial movement during donation and shows how this can be engineered to increase therapeutic efficacy of MSC. They find that Miro1, a calcium sensitive mitochondrial Rho-GTPase that attaches mitochondria to KIF5 motor proteins on microtubules and regulates neuronal mitochondrial trafficking, is necessary for mitochondrial transfer by MSC. Overexpressing Miro1 in MSC (MSCmiro^{Hi}) led to increased mitochondrial transfer and therapeutic efficacy in mouse models of lung injury as well as asthma. This is a significant addition to the field of mitochondrial biology and stem cell therapeutics. It is also of general interest to physicians and members of public with interest in regenerative medicine, because this is highly translatable into more effective therapies.

Published: 21 January 2014

doi:10.1186/1755-8166-7-S1-159

Cite this article as: Agrawal: Mitochondrial donation by stem cells: potential for novel therapeutics. *Molecular Cytogenetics* 2014 **7**(Suppl 1):159.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit



Correspondence: a.agrawal@igib.res.in
CSIR-Institute of Genomics & Integrative Biology, New Delhi, India



© 2014 Agrawal; licensee BioMed Central Ltd. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/2.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated.