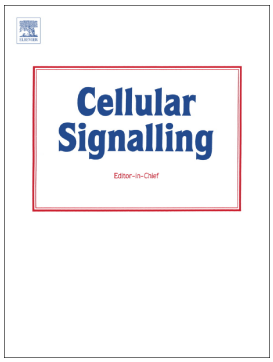

Reduced FAK-STAT3 signaling contributes to ER stress-induced mitochondrial dysfunction and death in endothelial cells

Kalpita Banerjee, Matt P. Keasey, Vladislav Razskazovskiy, Nishant P. Visavadiya, Cuihong Jia, Theo Hagg

PII: S0898-6568(17)30136-5
DOI: doi: 10.1016/j.cellsig.2017.05.007
Reference: CLS 8919

To appear in: *Cellular Signalling*

Received date: 21 February 2017
Revised date: 5 May 2017
Accepted date: 6 May 2017

Please cite this article as: Kalpita Banerjee, Matt P. Keasey, Vladislav Razskazovskiy, Nishant P. Visavadiya, Cuihong Jia, Theo Hagg , Reduced FAK-STAT3 signaling contributes to ER stress-induced mitochondrial dysfunction and death in endothelial cells, *Cellular Signalling* (2017), doi: 10.1016/j.cellsig.2017.05.007

Reduced FAK-STAT3 signaling contributes to ER stress-induced mitochondrial dysfunction and death in endothelial cells

Kalpita Banerjee, Matt P. Keasey, Vladislav Razskazovskiy, Nishant P. Visavadiya, Cuihong Jia, Theo Hagg[1]

All authors:
Department of Biomedical Sciences, Quillen College of Medicine, East Tennessee State University, PO Box 70582, Johnson City, Tennessee 37614, USA

[1] For correspondence:
Dr. Theo Hagg
PO Box 70582
Department of Biomedical Sciences
East Tennessee State University
Johnson City, TN37614

Phone: 423-439-6346
Email address: haggt1@etsu.edu

Highlights

1. ER stress causes mitochondrial dysfunction and cell loss by reducing pS727-STAT3
2. ER stress reduces pFAK via PTPs and calcium, causing reduced pS727-STAT3
3. S727-STAT3 confers protection against ER stress, as shown by mutant studies
4. FAK-STAT3 stimulation may be a therapeutic approach against pathological ER stress

Graphical Abstract

Proposed FAK-STAT pathway involvement in ER stress. Under physiological conditions, the integrin signaling effector FAK promotes phosphorylation of S727-STAT3 which leads to its mitochondrial translocation to promote mitochondrial bioenergetics and integrity, and cell survival. ER stress induced by TM or TG decreases pFAK through protein tyrosine phosphatase (PTP) activity (blocked by bpV) or high calcium levels (blocked by APB), leading to decreased mitochondrial pS727-STAT3 and subsequent dysfunction.