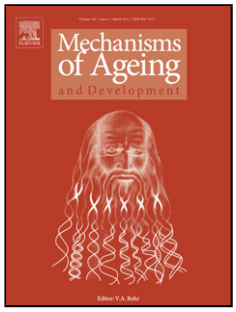

Title: Role of Prion protein in premature senescence of human fibroblasts

Authors: Emmanuelle Boilan, Virginie Winant, Elise Dumortier, Benaissa ElMoualij, Pascale Quatresooz, Heinz D. Osiewacz, Florence Debacq-Chainiaux, Olivier Toussaint

PII: S0047-6374(17)30087-8
DOI: http://dx.doi.org/doi:10.1016/j.mad.2017.08.002
Reference: MAD 10976

To appear in: *Mechanisms of Ageing and Development*

Received date: 31-3-2017
Revised date: 29-6-2017
Accepted date: 3-8-2017

Please cite this article as: Boilan, Emmanuelle, Winant, Virginie, Dumortier, Elise, ElMoualij, Benaissa, Quatresooz, Pascale, Osiewacz, Heinz D., Debacq-Chainiaux, Florence, Toussaint, Olivier, Role of Prion protein in premature senescence of human fibroblasts.Mechanisms of Ageing and Development http://dx.doi.org/10.1016/j.mad.2017.08.002

Role of Prion protein in premature senescence of human fibroblasts

Emmanuelle Boilan[a1], Virginie Winant[a], Elise Dumortier[a], Benaissa ElMoualij[b], Pascale Quatresooz[b], Heinz D. Osiewacz[c], Florence Debacq-Chainiaux[a,*] and Olivier Toussaint[a]

[a] Unité de Recherche en Biologie Cellulaire (URBC) - Namur Research Institute for Life Sciences (Narilis), University of Namur, Belgium

[b] Human Histology-CRPP, University of Liège, Liège, Belgium

[c] Institute of Molecular Biosciences, Johann Wolfgang Goethe University, Frankfurt am Main, Germany

[*] Corresponding author: URBC-Narilis, University of Namur, 61, rue de Bruxelles, B-5000 Namur, Belgium Phone: +32 81 72 44 57, Fax: + 32 81 72 41 35, florence.chainiaux@unamur.be

Highlights

- Prion protein expression is overexpressed in copper-induced premature senescence
- Prion silencing induces appearance of several biomarkers of senescence
- Prion protein has a protective effect on stress and copper-induced senescence

Abstract

Prion protein (PrP) is essentially known for its capacity to induce neurodegenerative prion diseases in mammals caused by a conformational change in its normal cellular isoform (PrP^{C}) into an infectious and disease-associated misfolded form, called scrapie isoform (PrP^{Sc}). Although its sequence is highly conserved, less information is available on its physiological role under normal conditions. However, increasing evidence supports a role for PrP^{C} in the cellular response to oxidative stress. In the present study, a new link between PrP and senescence is highlighted. The role of PrP in premature senescence induced by copper was investigated. WI-38 human fibroblasts were incubated with copper sulfate ($CuSO_4$) to trigger premature senescence. This induced an increase of PrP mRNA level, an increase of protein abundance of the normal form of PrP and a nuclear localization of the protein. Knockdown of PrP expression using specific small interfering RNA (siRNA) gave rise to appearance of several biomarkers of senescence as a senescent

[1] Present address : CESI, Chaussée de Louvain 290, 5004 Bouge, Belgium ; email : emmanuelle.boilan@cesi.be