Protective Role of Complement C3 Against Cytokine-Mediated beta-Cell Apoptosis

Type 1 diabetes is a chronic autoimmune disease characterized by pancreatic islet inflammation and beta-cell destruction by proinflammatory cytokines and other mediators. Based on RNA sequencing and protein-protein interaction analyses of human islets exposed to proinflammatory cytokines, we identified complement C3 as a hub for some of the effects of cytokines. The proinflammatory cytokines interleukin-1 beta plus interferon-gamma increase C3 expression in rodent and human pancreatic beta-cells, and C3 is detected by histology in and around the islets of diabetic patients. Surprisingly, C3 silencing exacerbates apoptosis under both basal condition and following exposure to cytokines, and it increases chemokine expression upon cytokine treatment. C3 exerts its prosurvival effects via AKT activation and c-Jun N-terminal kinase inhibition. Exogenously added C3 also protects against cytokine-induced beta-cell death and partially rescues the deleterious effects of inhibition of endogenous C3. These data suggest that locally produced C3 is an important prosurvival mechanism in pancreatic beta-cells under a proinflammatory assault.

General information
State: Published
Organisations: Department of Bio and Health Informatics, Universite Libre de Bruxelles, Intomics A/S, University of Pisa
Contributors: Dos Santos, R. S., Marroqui, L., Grieco, F. A., Marselli, L., Suleiman, M., Henz, S. R., Marchetti, P., Wernersson, R., Eizirik, D. L.
Pages: 2503-2521
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Journal of Clinical Endocrinology and Metabolism
Volume: 158
Issue number: 8
ISSN (Print): 0021-972X
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 5.15 SJR 2.941 SNIP 1.909
Web of Science (2017): Impact factor 5.789
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.05 SJR 2.872 SNIP 1.892
Web of Science (2016): Impact factor 5.455
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 5.68 SJR 3.071 SNIP 2
Web of Science (2015): Impact factor 5.531
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 6.39 SJR 3.188 SNIP 2.212
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 6.62 SJR 3.205 SNIP 2.325
Web of Science (2013): Impact factor 6.31
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 6.68 SJR 3.107 SNIP 2.374
Web of Science (2012): Impact factor 6.43
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 6.41 SJR 3.383 SNIP 2.344
Web of Science (2011): Impact factor 5.967
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 3.314 SNIP 2.41
Web of Science (2010): Impact factor 6.495
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 3.225 SNIP 2.25
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 3.134 SNIP 1.94
Scopus rating (2007): SJR 3.164 SNIP 2.034
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 3.19 SNIP 1.999
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 2.924 SNIP 1.999
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 2.802 SNIP 1.963
Scopus rating (2003): SJR 2.48 SNIP 1.974
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 2.28 SNIP 1.813
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 2.048 SNIP 1.774
Scopus rating (2000): SJR 2.298 SNIP 1.846
Scopus rating (1999): SJR 2.257 SNIP 1.84
Original language: English
DOIs:
10.1210/en.2017-00104
Source: FindIt
Source-ID: 2371146222
Research output: Research - peer-review › Journal article – Annual report year: 2017