Cellular shear stiffness reflects progression of arsenic-induced transformation during G1 - DTU Orbit (16/01/2019)

**Cellular shear stiffness reflects progression of arsenic-induced transformation during G1**

Cancer cells consistently exhibit decreased stiffness, however the onset and progression of this change has not been characterized. To study the development of cell stiffness changes we evaluated the shear stiffness of populations of cells during transformation to a carcinogenic state. Bronchial epithelial cells were exposed to sodium arsenite to initiate early stages of transformation. Exposed cells were cultured in soft agar to further transformation and select for clonal populations exhibiting anchorage independent growth. Shear stiffness of various cell populations in G1 was assessed using a novel non-invasive assay that applies shear stress with fluid flow and evaluates nano-scale deformation using quantitative phase imaging (QPI). Arsenic treated cells exhibited reduced stiffness relative to control cells, while arsenic clonal lines, selected by growth in soft agar, were found to have reduced stiffness relative to control clonal lines, which were cultured in soft agar but did not receive arsenic treatment. The relative standard deviation of the stiffness of Arsenic clones was reduced compared to control clones, as well as to the arsenic exposed cell population. Cell stiffness at the population level exhibits potential to be a novel and sensitive framework for identifying the development of cancerous cells.

**General information**

State: Published
Organisations: Department of Applied Mathematics and Computer Science, Statistics and Data Analysis, New York University School of Medicine, Duke University, University of Copenhagen
Contributors: Muñoz, A., Eldridge, W. J., Jakobsen, N. M., Sørensen, H., Wax, A., Costa, M.
Pages: 109-117
Publication date: 2017
Peer-reviewed: Yes

**Publication information**

Journal: Carcinogenesis
Volume: 39
Issue number: 2
ISSN (Print): 0143-3334
Ratings:
- BFI (2019): BFI-level 2
- Web of Science (2019): Indexed yes
- BFI (2018): BFI-level 2
- Web of Science (2018): Indexed yes
- BFI (2017): BFI-level 2
- Scopus rating (2017): CiteScore 4.95 SJR 2.135 SNIP 1.266
- Web of Science (2017): Impact factor 5.072
- Web of Science (2017): Indexed yes
- BFI (2016): BFI-level 2
- Scopus rating (2016): CiteScore 5.03 SJR 2.247 SNIP 1.401
- Web of Science (2016): Impact factor 5.105
- BFI (2015): BFI-level 2
- Scopus rating (2015): CiteScore 5.18 SJR 2.439 SNIP 1.353
- BFI (2014): BFI-level 2
- Scopus rating (2014): CiteScore 5.32 SJR 2.574 SNIP 1.426
- Web of Science (2014): Impact factor 5.334
- BFI (2013): BFI-level 2
- Scopus rating (2013): CiteScore 5.7 SJR 2.743 SNIP 1.638
- Web of Science (2013): Impact factor 5.266
- ISI indexed (2013): ISI indexed yes
- BFI (2012): BFI-level 2
- Scopus rating (2012): CiteScore 6.17 SJR 2.905 SNIP 1.627
- Web of Science (2012): Impact factor 5.635
- ISI indexed (2012): ISI indexed yes
- BFI (2011): BFI-level 2
- Scopus rating (2011): CiteScore 5.85 SJR 2.916 SNIP 1.512
Web of Science (2011): Impact factor 5.702
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.624 SNIP 1.455
Web of Science (2010): Impact factor 5.402
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 2.421 SNIP 1.384
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.493 SNIP 1.416
Scopus rating (2007): SJR 2.503 SNIP 1.446
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.344 SNIP 1.417
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 2.368 SNIP 1.467
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 2.303 SNIP 1.489
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 2.197 SNIP 1.374
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.8 SNIP 1.382
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 1.851 SNIP 1.31
Scopus rating (2000): SJR 1.787 SNIP 1.245
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.641 SNIP 1.23
Original language: English
Keywords: biomarker, carcinogenesis, cellular stiffness, quantitative phase imaging (QPI)
DOIs:
10.1093/carcin/bgx116
Source: FindIt
Source-ID: 2392258465
Research output: Research - peer-review : Journal article – Annual report year: 2018