Data Article

Data on migration of the non-invasive breast cancer cell line, MCF-7 treated with Bevacizumab using Real Time Cell Analyzer (RTCA)

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A B S T R A C T

Bevacizumab or Avastin® (Av), the recombinant antibody targeting VEGF, improves progression-free but not overall survival of metastatic breast cancer patients due to development of Av resistance. We showed that Av-therapy-induced inflammatory microenvironment contributes to the refractoriness to Av treatment. Here we present data regarding the effect of Av treatment on migration of a non-invasive breast cancer cell line, MCF-7. The data presented here is related to the research article “Bevacizumab induces inflammation in MDA-MB-231 breast cancer cell line and in a mouse model” (Hajjar et al., 2018).

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**Specifications table**

| Subject area           | Biology                  |
|------------------------|--------------------------|
| More specific subject area | Cell Biology             |
| Type of data           | Image, Graph             |
| How data was acquired  | Real Time Cell Analyzer (RTCA) and quantitative PCR (qPCR) |
| Data format            | Analyzed                 |
| Experimental factors   | Samples were treated with Bevacizumab |
| Experimental features  | Cell Proliferation and migration was performed using Real Time Cell Analyzer and gene expression analysis was done by qPCR |
| Data source location   | Lebanon                  |
| Data accessibility     | Data is with this article. |
| Related research article | Layal EL-Hajjar, Nour Jalaleddine, Abdullah Shaito, Kazem Zibara, Jalal Kazan, Jamal El-Saghir and Marwan El-Sabban. “Bevacizumab induces inflammation in MDA-MB-231 breast cancer cell line and in a mouse model”. Available online. [https://doi.org/10.1016/j.cellsig.2018.11.007](https://doi.org/10.1016/j.cellsig.2018.11.007) [1] |

**Value of the data**

- The data reveals the motility behavior of Av-treated MCF-7 cells which may be interesting for researchers studying Av on non-invasive cell lines.
- The data may be relevant for other researchers investigating the potential of this treatment to promote growth and metastasis of cancer cells.
- The data may be important for researchers working on the effect of Av on non-transformed breast epithelial cells.
- The data provides the basis for in vivo and clinical studies.

1. **Data**

MCF-7 cells were treated with 50 μg/ml of Av for 24 h. MCF-7 cells showed no change in their morphology (Fig. 1). RTCA was used to measure the proliferation and migration of treated MCF-7 cells. The interaction of cells with a gold electrode correlated with impedance, which was reported as the cell index. Cells were treated, trypsinized and seeded in RTCA E- and CIM- plates to assess proliferation and migration, respectively. An inhibition of cellular proliferation by 22% in MCF-7 cells was observed. There was an increase in migration which reveals the motility behavior of Av-treated MCF-7 cells. This observation was accompanied by a significant increase in mRNA expression levels of epithelial to mesenchymal transition (EMT) markers (Twist and Snail) (Fig. 2).

2. **Experimental design, materials and methods**

2.1. *Migration and proliferation Real Time Cell Analyzer (RTCA) assays*

Quantitative analysis of the effect of Av treatment on the proliferation and migration of MCF-7 cells was performed as previously described [2] with slight modifications using RTCA (×CELLigence RTCA[A2]DP, Roche Applied Science, USA). Cells were grown in 6-well tissue culture plates at a density of 10,000 cells/cm² and treated or not with 50 μg/ml Av for 24 h. For migration assays, cells were harvested, counted, re-suspended in 120 μl of serum-free media and seeded at a density of 20,000 cells/well in the upper chamber of CIM-plates. For proliferation assays, cells were
seeded similarly, but in an E-plate at a density of 7000 cells/well with an additional 120 μl of media containing 10% serum. Migration and proliferation were monitored every 15 min for a minimum of 18 h by recording the cell impedance produced as the cells attached and detached from the gold electrodes in the CIM and E-plates. The RTCA software generated a survival curve and estimated the cell survival or cell index (CI). CI correlates directly with cell number. Data were expressed as bar graphs of CI % of control.

Fig. 1. Av treatment showed no effect on cell morphology of Av-treated cells.

Fig. 2. Av treatment affects proliferation and migration of MCF-7 cells as detected by RTCA and induces the expression of EMT markers as determined by qPCR. (A) Histograms representing the proliferation and (B) migration of Av-treated cells, after normalizing cell index values relative to controls. Cell impedance readings were recorded every 15 min for a minimum of 18 h. Histograms of Twist (C) and Snail (D) expression in Av-treated cells as detected by qPCR. Results represent three independent experiments. *, **, *** indicate P < 0.05, P < 0.001, P < 0.0001, respectively.
2.2. RNA extraction and qPCR

Total RNA was isolated from cells in culture using Nucleospin® RNA II Kit (Machery-Nagel, USA) according to the manufacturers’ instructions. 1 μg of total RNA was first reverse transcribed to cDNA using RevertAid 1st strand cDNA synthesis kit (Thermo, USA) and then amplified by qPCR using iQ SYBR Green Supermix in a CFX96 system (Bio-Rad Laboratories, USA). Primers were designed against human genes (TIB MOL BIOL, Germany) with the following sequences:

Twist: F: AGCTACGCCTTCTCGGTCT and R: CCTTCTCTGGAAACAATGACATC
Snail: F: CTTCCAGCAGCCCTACGAC and R: CGGTGGGGTTGAGGATCT
GAPDH: F: TGGTGCTCAGTGAGCCAG and R: GGACCTGACCCTGCCGTCTAG

ΔΔCq was used to calculate the relative fold change in gene expression after normalization to the housekeeping gene, GAPDH.

2.3. Statistical analysis

Results are expressed as average ± SEM. Statistical comparisons were done using student’s t-test in order to determine statistical significance. P value was determined and significance level was set at P < 0.05. Microsoft Excel was used to perform statistical analysis.

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Transparency document. Supplementary material

Transparency document associated with this article can be found in the online version at https://doi.org/10.1016/j.dib.2018.12.059.

References

[1] L. El-Hajjar, N. Jalaleddine, A. Shaito, K. Zibara, J. Kazan, J. El-Saghir, M. El-Sabban, Bevacizumab induces inflammation in MDA-MB-231 breast cancer cell line and in a mouse model, Cell. Signal. (2018).
[2] Z. Teng, X. Kuang, J. Wang, X. Zhang, Real-time cell analysis—a new method for dynamic, quantitative measurement of infectious viruses and antiserum neutralizing activity, J. Virol. Methods 193 (2013) 364–370.