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Data Article

Lectin staining and Western blot data showing differential sialylation of nutrient-deprived cancer cells to sialic acid supplementation

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ABSTRACT

This report provides data that are specifically related to the differential sialylation of nutrient deprived breast cancer cells to sialic acid supplementation in support of the research article entitled, "Nutrient-deprived cancer cells preferentially use sialic acid to maintain cell surface glycosylation" [1]. Particularly, breast cancer cells, when supplemented with sialic acid under nutrient deprivation, display sialylated glycans at the cell surface, but non-malignant mammary cells show sialylated glycans intracellularly. The impact of sialic acid supplementation under nutrient deprivation was demonstrated by measuring levels of expression and sialylation of two markers, EGFR1 and MUC1. This Data in Brief article complements the main manuscript by providing detailed instructions and representative results for cell-level imaging and Western blot analyses of changes in sialylation during nutrient deprivation and sialic acid supplementation. These methods

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can be readily generalized for the study of many types of glycosylation and various glycoprotein markers through the appropriate selection of fluorescently-labeled lectins.

Specifications Table

Subject area	*Biology*
More specific subject area	*Nutrient deprivation, cell surface glycosylation*
Type of data	*Cell images, Western blot*
How data was acquired	*Imaging cells on DV elite imaging system from Applied Precision (Applied Precision, USA).* *Western blotting using chemiluminescent substrate (Pierce™ Fast Western Blot Kit and ECL Substrate from Thermo Fisher Scientific Inc.).*
Data format	*Filtered images for cell images, data for Western blot*
Experimental factors	*Cells were grown on the surface of a cover slip and the adherent cells were fixed with 70% ice-cold ethanol. After fluorescent-labeled lectin staining, cells were further treated with Ribonuclease A and the nuclei were counter stained with TO-PRO-3.* *The protein expression and sialylation of EGFR and MUC1 was examined by Pierce ECL Western Blotting system.*
Experimental features	*Cells were stained with different FITC-labeled lectins and the nuclei were counter stained with TO-PRO-3. Images were captured on DV elite imaging system and merged using softWoRx DMS from Applied Precision (Applied Precision, USA).* *Protein extracts of cells were immunoprecipitated and immunoprecipitated proteins were subjected to Western blotting.*
Data source location	*The Delta Vision Elite Imaging System Core Facility at Herbert Wertheim College of Medicine, Florida International University.* *Immunoprecipitation and Western blotting were performed at Florida International University and Zagazig University.*
Data accessibility	*The data are provided in this article.*

Value of the data

- The supplementation with sialic acid (Neu5Ac) resulted in higher expression of Neu5Ac on cancer cells than normal cells. In cancer cells, the expression of Neu5Ac was notably on the cell surface, whereas in normal cells expression of Neu5Ac was intracellular.

1. Data

The data show that cancer cells under nutrient deprivation conditions use sialic acid to maintain cell surface glycosylation and surface glycan display.

1.1. Neu5Ac treatment of nutrient deprived cancer cells enhances sialylation at the cell surface

Supplementation of breast cancer cells (*T47D, MCF7, and MDA MB231) and normal mammary cells (MCF10A and HB4A)* to 10 mM sialic acid (Neu5Ac) under nutrient deprivation for 2 h (optimization of treatment condition described in the main article [1]) resulted enhanced sialylation as *quantitated* by