A Warburg effect targeting vector designed to increase the uptake of compounds by cancer cells demonstrates glucose and hypoxia dependent uptake

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*Supporting Information*

# Raw data for Fig 4

Values used to build graph: Relative fluorescence intensity (± standard deviation)

|  |  |
| --- | --- |
|  | Glucose Concentration in Media |
| Compound |  | 0 mg L-1 | 1000 mg L-1 | 4000 mg L-1 | 8000 mg L-1 |
| **2-NBDG** | 100.0 ± 6.4 | 83.4 ± 7.3 | 73.7 ± 5.8 | 63.2 ± 4.2 |
| ***9*** | 100.0 ± 9.3 | 81.4 ± 9.1 | 56.2 ± 7.3 | 29.5 ± 6.1 |
| ***10*** | 100.0 ± 9.6 | 108.4 ±12.3 | 128.9 ± 11.8 | 121.4 ± 17.8 |

Values behind means and standard deviation: Relative fluorescence intensity for cell regions (30 µm x 30 µm)

|  |  |
| --- | --- |
|  | Glucose Concentration in Media |
| Compound |  | 0 mg L-1 | 1000 mg L-1 | 4000 mg L-1 | 8000 mg L-1 |
| **2-NBDG** | 97.9111.798.5102.396.2102.6110.090.2100.496.8 | 71.486.682.190.987.473.991.683.476.890.2 | 67.571.769.766.384.975.580.677.172.072.1 | 53.862.367.264.068.259.967.662.962.663.8 |
| ***9*** | 92.687.0107.695.988.199.1105.9102.5110.8113.2 | 95.688.386.363.9884.084.471.783.082.274.2 | 46.746.255.162.457.863.351.955.569.453.5 | 19.834.136.433.932.829.424.635.520.927.1 |
| ***10*** | 114.2115.6101.8101.199.7102.297.188.488.190.1 | 123.7136.1101.099.9102.7108.3110.5104.197.999.9 | 144.2135.5146.9115.9126.8139.2117.3125.7121.2116.2 | 109.1116.297.9143.7138.6132.7100.2132.8 |

Raw data values of fluorescence intensities for cell regions (30 µm x 30 µm). Fluorescence intensities were determined by quantification with LAS AF Lite.

|  |  |
| --- | --- |
|  | Glucose Concentration in Media |
| Compound |  | 0 mg L-1 | 1000 mg L-1 | 4000 mg L-1 | 8000 mg L-1 |
| **2-NBDG** | 2429277124442538238725452729223824912402 | 1772214920372255216918342273206919062238 | 1675177917291645210618732000191317861789 | 1335154616671588169214861677156115531583 |
| ***9*** | 402378465410383430459445481491 | 401371362269353354301348345311 | 196194231262243266218233291225 | 8314315314213812310314988114 |
| ***10*** | 459464409406401411390355354362 | 497547406401413435444418393401 | 579544590466509559471505487467 | 438467393577557533403534 |

**Data for S1 Fig**

Values used to build graph: Relative rate of HK phosphorylation (*Vi* (substrate)/*Vi*) at increasing concentrations of compound (substrate)

|  |  |
| --- | --- |
|  | Compound |
| Concentration of Compound (µM) | Glucosamine hydrochloride | 2-[2-(2-aminoethoxy)ethoxy]ethanol | ***8*** |
| 36 | 1.00 |  | 0.98 |
| 71 |  | 1.00 | 0.97 |
| 143 | 0.89 | 0.96 | 0.96 |
| 214 |  |  |  |
| 286 | 0.78 |  | 0.90 |
| 357 | 0.79 | 0.97 |  |
| 714 | 0.61 | 0.99 | 0.88 |

# High Resolution Mass Spectra



2-(2-[2-(2-aminoethoxy)ethoxy]ethoxy)-D-glucose (***8***)



2-(2-[2-(2-(N-(7-Nitrobenz-2-oxa-1,3-diazol-4-yl))aminoethoxy)ethoxy]ethoxy)-D-glucose (**9**)



((N-(7-Nitrobenz-2-oxa-1,3-diazol-4-yl)aminoethoxy)ethoxy)ethanol (**10**)

#  1H NMR Spectra



1,2-O-isopropylidene-α-D-glucofuranose (***1***)



3,5,6-tri-O-benzyl-1,2-O-isopropylidene-α-D-glucofuranose (***2***)



Methyl 3,5,6-tri-O-benzyl-α-D-glucofuranoside (***3a***)



Methyl 3,5,6-tri-O-benzyl-β-D-glucofuranoside (***3b***)



Methyl 2-(2-[2-(2-azidoethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-α-D-glucofuranoside (***4a***)

Methyl 2-(2-[2-(2-azidoethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-β-D-glucofuranoside (***4b***)



Methyl 2-(2-[2-(2-aminoethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-α-D-glucofuranoside (***5a***)

Methyl 2-(2-[2-(2-aminoethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-β-D-glucofuranoside (***5b***)



Methyl 2-(2-[2-(2-(tert-butoxycarboxamido)ethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-α-D-glucofuranoside (***6a***)



Methyl 2-(2-[2-(2-(tert-butoxycarboxamido)ethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-β-D-glucofuranoside (***6b***)



Methyl 2-(2-[2-(2-(tert-butoxycarboxamido)ethoxy)ethoxy]ethoxy)-α-D-glucofuranoside (***7a***)

Methyl 2-(2-[2-(2-(tert-butoxycarboxamido)ethoxy)ethoxy]ethoxy)-β-D-glucofuranoside (***7b***)

# 13C NMR Spectra



1,2-O-isopropylidene-α-D-glucofuranose (***1***)



3,5,6-tri-O-benzyl-1,2-O-isopropylidene-α-D-glucofuranose (***2***)



Methyl 3,5,6-tri-O-benzyl-α-D-glucofuranoside (***3a***)



Methyl 3,5,6-tri-O-benzyl-β-D-glucofuranoside (***3b***)



Methyl 2-(2-[2-(2-azidoethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-α-D-glucofuranoside (***4a***)

Methyl 2-(2-[2-(2-azidoethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-β-D-glucofuranoside (***4b***)



Methyl 2-(2-[2-(2-aminoethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-α-D-glucofuranoside (***5a***)

Methyl 2-(2-[2-(2-aminoethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-β-D-glucofuranoside (***5b***)



Methyl 2-(2-[2-(2-(tert-butoxycarboxamido)ethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-α-D-glucofuranoside (***6a***)



Methyl 2-(2-[2-(2-(tert-butoxycarboxamido)ethoxy)ethoxy]ethoxy)-3,5,6-tri-O-benzyl-β-D-glucofuranoside (***6b***)



Methyl 2-(2-[2-(2-(tert-butoxycarboxamido)ethoxy)ethoxy]ethoxy)-α-D-glucofuranoside (***7a***)

Methyl 2-(2-[2-(2-(tert-butoxycarboxamido)ethoxy)ethoxy]ethoxy)-β-D-glucofuranoside (***7b***)