Overview

Product name: Glucose Uptake Assay Kit (Fluorometric)
Sample type: Adherent cells, Suspension cells
Assay type: Quantitative
Sensitivity: = 0.05 nmol/well
Species reactivity: Reacts with: Other species, Mammals

Product overview: Glucose Uptake Assay Kit (Fluorometric) ab136956 is a highly sensitive and easy to use non-radioactive kit which can detect glucose uptake as low as 50 pmol/well in a variety of cell types.

2-deoxyglucose (2-DG) is used in glucose uptake assay protocols because of its structural similarity to glucose. 2-DG is taken up by glucose transporters and metabolized to 2-DG-6-phosphate (2-DG6P). 2-DG6P cannot be further metabolized, and thus accumulates within cells. The accumulated 2-DG6P is directly proportional to 2-DG (or glucose) uptake by cells. In this assay, the accumulated 2-DG6P is enzymatically oxidized and coupled to a probe, which generates fluorescence in the presence of NADPH.

Glucose uptake assay protocol summary:
- prepare cells with suitable glucose starvation / uptake stimulation depending on experimental set-up
- add 2-DG to cells and incubate for 20 mins at 37°C
- wash cells with PBS to remove exogenous 2-DG
- lyse cells with extraction buffer and repeated pipetting
- freeze/thaw lysates and optionally heat at 85°C for 40 min
- cool on ice for 5 min
- add neutralizing buffer, spin and retain supernatant
- add supernatants and standards to wells
- add reaction mix and incubate for 40 min at 37°C

Notes: If you want a more sensitive assay, we recommend using Glucose Uptake Assay Kit (Colorimetric) (ab136955), which contains an amplification step that allows the kit to detect < 10 pmol/well.

Storage instructions: Store at -20°C. Please refer to protocols.
Glucose (C₆H₁₂O₆; FW: 180.16) is a ubiquitous energy source in most organisms, from bacteria to humans. The breakdown of carbohydrates produces mono- and disaccharides, most of which is glucose. Through glycolysis and TCA (citric acid cycle), glucose is oxidized to eventually form CO₂ and water, generating the universal energy molecule ATP. Glucose is a primary source of energy for the brain and a critical component in the production of proteins and in lipid metabolism and therefore measurement of glucose level is a key diagnostic parameter for many metabolic disorders.

<table>
<thead>
<tr>
<th>Components</th>
<th>Identifier</th>
<th>100 tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Deoxyglucose</td>
<td>Purple</td>
<td>1 x 1ml</td>
</tr>
<tr>
<td>2-DG Uptake Assay Buffer</td>
<td>WM</td>
<td>1 x 10ml</td>
</tr>
<tr>
<td>2-DG6P Standard (Lyophilized)</td>
<td>Yellow</td>
<td>1 vial</td>
</tr>
<tr>
<td>Enzyme Mix (lyophilized)</td>
<td>Green</td>
<td>1 vial</td>
</tr>
<tr>
<td>Extraction Buffer</td>
<td>NM</td>
<td>1 x 17ml</td>
</tr>
<tr>
<td>Neutralizing Buffer</td>
<td>Clear</td>
<td>1 x 1ml</td>
</tr>
<tr>
<td>PicoProbe</td>
<td>Blue</td>
<td>1 x 0.2ml</td>
</tr>
</tbody>
</table>

Relevance

Glucose is a ubiquitous energy source in most organisms, from bacteria to humans. The breakdown of carbohydrates produces mono- and disaccharides, most of which is glucose. Through glycolysis and TCA (citric acid cycle), glucose is oxidized to eventually form CO₂ and water, generating the universal energy molecule ATP. Glucose is a primary source of energy for the brain and a critical component in the production of proteins and in lipid metabolism and therefore measurement of glucose level is a key diagnostic parameter for many metabolic disorders.

Images

Glucose Uptake measured in 3T3-L1 Adipocytes; I = Insulin.

Functional Studies - Glucose Uptake Assay Kit (Fluorometric) (ab136956)
Standard curve: mean of duplicates (+/- SD) with background reads subtracted

2-DG6P Standard curve (a) and 2-DG uptake in Human adipocytes (b), HeLa Cells (c) and 3T3-L1 cells (d) respectively. I=Insulin; P=Phloretin.

Example data

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