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Data Article

Further intracellular proteins and signaling pathways regulated by angiotensin-(1–7) in human endothelial cells



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ABSTRACT

In 2016, Meinert et al. (doi: 10.1016/j.jprot.2015.09.020) published the first 25 proteins in a protein array regulated in Human Umbilical Vein Endothelial Cells (HUVEC) by the heptapeptide angiotensin (Ang)-(1–7) and the first 10 intracellular signaling cascades at different time points. This supporting data article shows further proteins and pathways stimulated by Ang-(1–7) in human endothelial cells at time points of 1 h, 3 h, 6 h, and 9 h. HUVECs were stimulated with Ang-(1–7), and regulated proteins were identified via antibody microarray. Bioinformatics software IPA was used for association of regulated proteins to metabolic pathways.

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Specifications Table

Subject area	<i>Cardiovascular</i>
More specific subject area	<i>Renin-angiotensin system</i>
Type of data	<i>5 tables</i>
How data was acquired	<i>Antibody microarray for regulated proteins using a GenePix 4100A Microarray Scanner (Molecular Devices, Sunnyvale, USA), and the program IPA (Ingenuity Systems, Redwood City, USA) for the identification of potential metabolic pathways.</i>
Data format	<i>analyzed</i>
Experimental factors	<i>Human Umbilical Vein Endothelial Cells were stimulated with angiotensin-(1–7)</i>
Experimental features	<i>Screening of proteins and pathways in angiotensin-(1–7) stimulated Human Umbilical Vein Endothelial Cells</i>
Data source location	<i>Cork, Ireland</i>
Data accessibility	<i>Data within this article</i>

Value of the data

- First screening of 725 proteins potentially regulated by angiotensin (Ang)-(1–7) in endothelial cells via antibody microarray.
- As often slightly regulated proteins have already dramatic biological effects, identification of further proteins altered by Ang-(1–7) might have significant scientific relevance.
- Detailed description of Ang-(1–7) effects on intracellular signaling pathways under non-pathophysiological circumstances can identify further areas of benefit using Ang-(1–7).
- The understanding of intracellular network signaling initiated by Ang-(1–7) might allow conclusions on how the heptapeptide can oppose the effects of the detrimental Ang II.

1. Data

The antibody microarray identified 110 regulated proteins in human umbilical vein endothelial cells (HUVEC) cells after 1-h stimulation with Ang-(1–7), 119 after 3 h, 31 after 6 h, and 86 after 9 h. The first 25 regulated proteins have been published in Meinert et al. [1] in Tables 1–4. Here the name and ranking of the next regulated proteins are shown (Tables 1–4). Additionally, further intracellular pathways affected by Ang-(1–7) are shown in Table 5A–D.

2. Experimental design, materials and methods

2.1. Cell culture and cell stimulation

HUVEC were grown on 100-mm dishes in EBM (Endothelial basal medium)-2 medium under standard conditions of 37 °C in a humidified incubator and 5% CO₂ [2]. Cells were used in passage 6. When they reached 70% confluence, they were washed twice with DPBS (Dulbecco's phosphate-buffered saline) and serum starved for 1 h in supplements-free medium. HUVECs were stimulated with 10⁻⁷ M Ang-(1–7) for 1 h, 3 h, 6 h and 9 h. Control cells were treated only with DPBS (solvent).

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