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Data article

Data on Na,K-ATPase in primary cultures of renal proximal tubule cells treated with catecholamines

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ABSTRACT

This data article is concerned with chronic regulation of Na,K-ATPase by catecholamines. After a chronic treatment, inhibition of Na,K-ATPase activity was observed in cultures with dopamine, while a stimulation was observed in cultures treated with norepinephrine. Following a chronic incubation with guanabenz, an α adrenergic agonist, an increase in Na,K-ATPase α and β subunit mRNAs was observed. This data supports the research article entitled, "Renal proximal tubule Na, K-ATPase is controlled by CREB regulated transcriptional coactivators as well as salt inducible kinase 1" (Taub et al. 2015) [1].

Specifications Table

Subject area	*Biology*
More specific subject area	*Renal transport regulation*
Type of data	*Figure*
How data was acquired	Real-Time PCR on a Biorad Cycler, ^{86}Rubidium uptake studies

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Data format	*Analyzed*
Experimental factors	Primary cultures of rabbit kidney proximal tubule cells treated with catecholamines and control
Experimental features	Rb^+ uptake into intact cells was examined in triplicate, and standardized with respect to protein, to calculate *n*moles of Rb^+ uptake per mg protein; in Real-Time PCR, Ct values of Na,K-ATPase and GAPDH mRNAs were obtained from quadruplicate determinations, and used to calculate the relative increase in Na,K-ATPase in catecholamine treated and control cells.
Data source location	All analyses and experiments were performed in Buffalo, New York, USA
Data accessibility	*Data is with this article*

Value of the data

- This data will have an impact on therapies using catecholamines for blood pressure regulation.
- The data can be compared with other studies of transcriptional regulation of the genes encoding for each of these subunits.

1. Data

The data shown in this report measures changes both in Na,K-ATPase activity and Na,K-ATPase mRNA levels following a chronic incubation of renal proximal tubule cells with catecholamines.

2. Experimental design, materials and methods

2.1. Rubidium uptake studies

Primary cultures of rabbit kidney proximal tubule cells, were prepared as described previously [1,2]. Rabbits employed to obtain the primary cultures were used by procedures approved by the University at Buffalo Institutional Animal Care and Use Committee. The primary cultures were grown

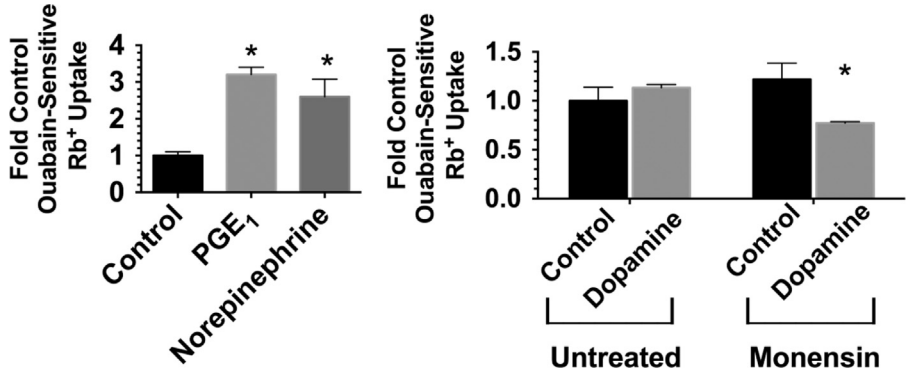

Fig. 1. The effect of PGE_1, norepinephrine and dopamine on transport. A. Primary RPT cells were incubated 30 min with either 280 nM PGE_1, 1 μM norepinephrine or untreated (and +/−ouabain), followed by a 20 min uptake period with 1 mM $^{86}Rb^+$. Uptake values are averages (+/−SEM) of ouabain-sensitive Rb^+ uptake relative to the untreated control. The ouabain-sensitive component of Rb^+ uptake was calculated by subtracting the Rb^+ uptake observed in the presence of ouabain from total Rb^+ uptake. The results were divided by the untreated control value. B. Primary RPT cells were incubated 30 min with either 10 μM dopamine +/−5 μM monensin, or untreated (+/−5 μM monensin). Uptake studies were conducted both in the presence and in the absence of 1 mM ouabain for each of the 4 conditions, followed by a 20 min uptake period with 1 mM $^{86}Rb^+$. The ouabain-sensitive component of Rb^+ uptake was determined as described in part A. $^*p < 0.05$ relative to untreated Control.