

# STRONG CHILDREN'S RESEARCH CENTER

## Summer 2014 Research Scholar

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### ABSTRACT

**Title:** Bicarbonate secretion in immature rabbits is deficient despite pendrin expression in beta-intercalated cells

**Background:** The kidney is responsible for maintaining blood pH via acid/base transport which occurs in the cortical collecting duct (CCD).  $\beta$ -intercalated cells secrete bicarbonate ( $\text{HCO}_3^-$ ) while  $\alpha$ -intercalated cells secrete protons.  $\text{HCO}_3^-$  secretion is accomplished through pendrin, a  $\text{Cl}^-/\text{HCO}_3^-$  anion-exchanger expressed apically in  $\beta$ -intercalated cells. Peanut agglutinin (PNA) apically binds  $\beta$ -intercalated cells. Previous studies have shown that  $\text{Cl}^-/\text{HCO}_3^-$  exchange in  $\beta$ -intercalated cells is diminished in immature rabbits ( $\leq 4$  weeks).

**Objective:** To determine whether lack of pendrin expression accounts for the observed bicarbonate secretion deficiency in immature rabbits.

**Results:** We assessed the number of PNA+ cells by staining CCDs for PNA and found that 9-day-old rabbits contain  $\beta$ -intercalated cell at amounts comparable to adults per CCD. We then assessed pendrin expression of  $\beta$ -intercalated cells by staining CCDs for pendrin and observed comparable numbers of pendrin-expressing cells per CCD in 9-day rabbits and adults. To quantify pendrin mRNA abundance we conducted a real time reverse transcriptase polymerase chain reaction (qRT-PCR) which indicated that pendrin mRNA levels were not significantly different in 9-day rabbits versus adults.

**Conclusions:** Diminished bicarbonate secretion in immature rabbits is not due to lack of pendrin expression.