Background: Wilms’ tumor (WT), the most common renal pediatric tumor, serves as a model for a malignancy formed by renal precursor cells that have failed to differentiate properly.

Research Hypothesis: Wilms' tumor are initiated and sustained by a subset of cancer stem cells (CSCs) with lineage similarities to normal renal stem cells.

Results/Discussion: We discovered that the tumors’ heterogeneous cell population contains a small fraction of cancer stem cells (CSC) identified by two markers: Neural Cell Adhesion Molecule 1 (NCAM1) expression and Aldehyde dehydrogenase 1 (ALDH1) enzymatic activity. In vivo studies show these CSCs to both self-renew and differentiate to give rise to all tumor components. The identification of a specific CSC fraction in WT has allowed the examination of a novel anti-NCAM1 targeted therapy, aimed at eradicating the CSC population. The loss of WT CSCs by anti-NCAM1 targeted therapy abolishes the tumor’s ability to sustain and propagate, hence, causing tumor degradation with minimal damage to normal tissue.

Conclusions: This study affords novel therapeutics for children and adults diagnosed with WT.

Key words: cancer stem cells, cancer initiating cells, targeted therapy, wilms tumor, renal stem cells
Publications associated with the project:


**Targeted therapy aimed at cancer stem cells: Wilms’ tumor as an example.** Shukrun R, Pode Shakked N, **Dekel B.** Pediatr Nephrol. 2013 Jun 13. [Epub ahead of print]