

**New Jersey State Commission on Cancer Research
LAY ABSTRACT OF RESEARCH PROJECT**

NAME OF PRINCIPAL INVESTIGATOR/PROGRAM DIRECTOR: **Rebecca Burdine**

Project Title: **Analysis of the Zebrafish Cystic Kidney Mutant switch hitter**

Description: **We are characterizing a gene involved in kidney cyst formation in the zebrafish to better understand how cysts are formed, and how they relate to renal cancer.**

According to the American Cancer Society's 2002 report on cancer statistics in New Jersey (1), kidney and urinary cancers account for 6.5% of cases in this state. In this country, renal cancers will account for 2% of all cancer deaths (2). While the clinical importance of understanding how renal cancer occurs is clear, we do not have a full understanding of how renal cancer develops. Renal cancer often occurs in patients that have acquired or hereditary renal cyst diseases. In fact a high number of patients receiving dialysis for renal cyst conditions will go on to develop renal cancer (3). Renal cysts are fluid filled sacs that form in the kidney. The formation of large numbers of cysts can occur spontaneously, or be the results of hereditary syndromes, and can lead to renal failure. Previous work has shown that cells in renal cysts have an uncontrolled rate of cell growth and cell death, similar to that seen in cancer cells. In fact, cells in renal cysts often express genes known to be involved in human cancers at abnormally high levels. We hypothesize that renal cyst formation shares characteristics similar to those in renal cancer, and may be a first step in renal carcinogenesis. A thorough understanding of the biology behind renal cyst formation will clarify how cysts form, and how they contribute to renal cancers seen in patients with renal cyst disease. We are using the zebrafish as a model system to study renal cyst formation. In this proposal we aim to characterize a new mutation that causes renal cysts in the embryonic zebrafish larvae. Since genes involved in zebrafish development have been shown to play similar roles in higher vertebrates, the lessons we learn from our studies will help us understand similar processes in humans. A better understanding of genes involved in renal cyst formation will help us in the design of therapeutic agents to prevent or delay renal cyst disease and renal cancers.

(1)American Cancer Society, New Jersey Cancer Facts and Figures 2002

(2)Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Mariotto A, Fay MP, Feuer EJ, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2000, National Cancer Institute.

Bethesda, MD, http://seer.cancer.gov/csr/1975_2000, 2003.

(3)Grantham JJ. 1990. Polycystic kidney disease: neoplasia in disguise. Am J Kidney Dis 15:110-116.