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Memorial Sloan Kettering  
Cancer Center

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maligancancies; (2) large clinical databases with long-term clinical follow-up; (3) large-scale fresh tumor tissue banks with patient blood samples; (4) high-caliber basic and translational scientific research programs; and (5) a rich academic environment and culture strongly supportive of basic research, translational research, and clinical trial design.

Under the guidance of a research mentor, the research experience is tailored to accommodate the research interests and career goals of the fellow. A wide range of research opportunities are available to fellows, including clinical trials testing the safety and efficacy of new treatments, translational research bridging discoveries made in the laboratory and the clinic, mathematical and computational research focused on analyzing and interpreting biomedical data, and health outcomes research.

Fellows are expected to present the results of their research at national meetings and to publish their findings in the literature. Fellows also work closely with their research mentors to prepare competitive grant applications. Former fellows have been awarded competitive extramural research funding from the American Cancer Society, the American Urological Association, and the American Society of Clinical Oncology.

# Basic and Translational Research

There are several labs focused on urologic cancers that offer one- to two-year research opportunities for fellows. Depending on the fellow's background and experience, these include opportunities to study in the fields of translational and clinical science.

## The Charles Sawyers Lab

For more than a decade, [The Charles Sawyers Lab](#) has concentrated on defining the molecular basis of prostate cancer and mechanisms of resistance to hormone therapy. This work of this world-renowned lab has focused on the role of the androgen receptor (AR) in prostate cancer disease progression. The lab's current projects share the common goal of deciphering mechanisms of resistance to antiandrogen therapies, such as enzalutamide. Ongoing projects are grouped under four major themes: (1) crosstalk between AR and common molecular lesions in human prostate cancer (e.g., *PTEN* loss, *TMPRSS2-ERG* gene fusions and *FOXA1* mutations); (2) understanding AR structure and function; (3) lineage plasticity in prostate tumors; and (4) the prostate tumor microenvironment.

## The Yu Chen Lab

The major goal of [The Yu Chen Lab](#) is to understand how critical transcription factors —such as *ETS* transcription factors— mediate prostate cancer oncogenesis. The Yu Chen Lab's long-term objective is to generate an integrative understanding of how transcription factors normally guide the prostate lineage determination and how their deregulation leads to cancer. Using biochemistry and genetic screens, the lab is pursuing ways to target the activity of transcription factors that can lead to drug discovery. The lab takes a basic and translational approach to its focus on *ETS* family transcription factors in its efforts to characterize the biologic role of these factors in prostate cancer. This work is currently being carried out in the endogenous tissue context through genetically engineered mouse models built in-lab. Going forward, the lab will use these mouse models to screen for other genetic lesions that cooperate with *ERG* expression and to define the cell of origin of *ERG*-positive prostate cancer.

## The David Solit Lab

[The David Solit Lab](#) is a basic and translational laboratory focused on urothelial cancer (with some translational work in testis cancer, as well). With a focus on defining genomic alterations in urothelial cancer, the lab seeks to model these alterations in preclinical studies to understand the biology and therapeutic implications of these molecular alterations. Through its genomic profiling efforts, the lab has developed a large database of clinically and genomically-annotated bladder tumors with treatment outcomes for translational and correlative studies.

## The Kenneth Offit Lab

Research in [The Kenneth Offit Lab](#) focuses on the discovery and characterization of novel cancer predisposing genes in humans, including both common and rare variants. The lab conducts studies to describe phenotype, penetrance, modifying effect, and clinical outcomes associated with germline genetic alterations in patients with cancer and their families. In addition, the lab's research focuses on the interpretation and clinical translation of results of massive parallel sequencing of germline genomes in cancer-prone kindred.

## The Ari Hakimi Lab

The Ari Hakimi Lab is an active translational and basic science kidney cancer lab aimed at understanding immune infiltration, inflammation, and the tumor microenvironment in renal cell carcinoma (RCC), with the goal of identifying novel therapeutic targets to overcome resistance to systemic therapies. These studies apply bulk and single-cell RNA sequencing, flow cytometry, and immunogenomic analyses in both patient samples and novel immunocompetent mouse models that the lab has developed.

## The Jonathan Coleman Lab

The [Jonathan Coleman Lab](#) is focused on understanding the mechanism of disease recurrence, response to therapies, and disease progression of upper tract urothelial cancer. To interrogate molecular diversity of the disease, the lab employs genomics, transcriptomics, metabolomics, and tumor immune microenvironment profiling of patient samples, as well as patient-derived organoids and xenograft models generated in lab. The lab has also been developing novel photodynamic therapies for local tumor ablation. Its preclinical models are used to support translational studies of ongoing clinical trials across multiple cancer types. Combination studies of photoablation with immunotherapies are another active area of investigation

## Specific Research Opportunities

In addition to the faculty of the Urology Service, research mentors are chosen from other departments with research programs that emphasize or lend themselves to translational research in urologic oncology.

Biostatistics/Epidemiology/Outcomes

+

Erectile Dysfunction

+

Genetics & Genomics

+

Health Outcomes Research

+

Human Oncology and Pathogenesis Program

+

Immunology/Gene Therapy

+

Minimally Invasive Surgery

+

Pathology

+

Psychiatry & Behavioral Sciences

+

Radiology/Imaging

+

Tumor Markers

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