Studies Highlight Significant Environmental, Lifestyle-Related Bladder Cancer Risks

CHICAGO, May 3, 2019 /PRNewswire/ -- E-cigarettes, exposure to certain environmental factors, as well as human papillomavirus infection can increase the risk of developing bladder cancer, according to new data being presented this week during the 2019 Annual Meeting of the American Urological Association (AUA). Abstracts will be shared with the media during a special press session on May 3 at 9 a.m. Dr. Sam Chang, the Patricia and Rodes Hart Endowed Chair of Urologic Surgery at Vanderbilt University Medical Center, will moderate this session.

Abstracts presented include:

**Publication # MP66-01**
Proximity to Oil Refineries and Risk of Bladder Cancer: A Population-Based Analysis

Exposure to certain aromatic compounds generated by oil refineries – including benzene and aromatic amines – is a known risk factor for bladder cancer. Using data from the Texas Cancer Registry, U.S. Census data, researchers identified more than 45,500 patients diagnosed with bladder cancer and mapped their location relative to the locations of 28 active refineries in the state. Cancer incidence was compared based on proximity to the refineries.

Key findings include:

- More than 5,500 of cases were within 10 miles of an oil refinery.
- Bladder cancer risk was greater among those living within a 10 mile radius of a refinery than for those living further than 10 miles away.
- Bladder cancer risk was significantly greater for males than females.

**Publication # MP63-02**
E-cigarette Smoke is Potentially Bladder Carcinogenic – It Induces DNA Damage and Urothelial Hyperplasia in Mice

Tobacco smoke is a known risk factor for bladder cancer, with smoking being directly related to about half of bladder cancers in men and women. Electronic cigarettes are a popular new alternative to combustible cigarettes, and are thought to be safer. In this early study on a mouse model, researchers in New York built on their previous studies on the potential of electronic cigarette smoke (ECS) to induce DNA damage and tested their hypothesis that ECS was cancer-inducing, examining both direct and secondary exposures after 52 weeks.

Key findings include:

- No tumors were found; however, simple urothelial hyperplasia – a pre-cancerous lesion – was more evident in mice exposed to ECS compared to those who were not.
- 60 percent (18/30) of mice exposed directly to ECS and 6.3 percent (1/16) exposed to secondary ECS developed urothelial hyperplasia.
- Urothelial hyperplasia lesions were found to have significant expansion of Krt5-positive basal urothelial cells and marked elevation of certain cell proliferation markers (MCM2 and PCNA).
Re-Examining an Old Trend: The Association of Human Papillomavirus and Bladder Cancer

There are more than 100 types of human papillomavirus (HPV), and some (HPV16 and HPV18) are recognized as risk factors for certain cancers – including cervical cancer and anal cancer while others are identified as non-cancer causing (HPV11 and HPV6). Researchers used data from the National Health and Nutrition Examination Survey (NHANES) to assess whether serum levels of HPV18, HPV16, HPV11 and HPV6 could be correlated with bladder cancer incidence. From 2007-2010, out of 155.6 million Americans, HPV-positive rates were as follows:

- HPV18: 5.5 percent
- HPV16: 13.2 percent
- HPV11: 6.4 percent
- HPV6: 17.4 percent

Researchers then identified 443,948 cases of bladder cancer in this population.

Key findings include:

- After controlling for race, gender and smoking status, increasing body weight and HPV6 positivity were associated with an increased risk of bladder cancer diagnosis.
- HPV6 positive serology was associated with a higher prevalence of bladder cancers (18.1 percent vs. 17.6 percent).
- Bladder cancer prevalence was higher among males (80 percent vs. 53 percent) and those of Caucasian race (93 percent vs. 66 percent).
- HPV11 was associated with decreased odds of bladder cancer diagnosis.

"We've known for some time that smoking cigarettes can increase the risk of developing bladder cancer, and that certain environmental exposures are also risk factors," Dr. Chang said. "These studies take a new approach to examining risks – including vaping – and highlight new insights into who may be at greater risk of developing this cancer."

**About the American Urological Association:** Founded in 1902 and headquartered near Baltimore, Maryland, the American Urological Association is a leading advocate for the specialty of urology, and has more than 22,000 members throughout the world. The AUA is a premier urologic association, providing invaluable support to the urologic community as it pursues its mission of fostering the highest standards of urologic care through education, research and the formulation of health policy.

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