PURDUE UNIVERSITY MATHEMATICS

2025 JOHNNY L. HOUSTON LECTURE

TUESDAY, FEBRUARY 25, 2025 – 3:30-4:20 PM MATH 175

Reception Tuesday, February 25, 2025, 5-6:30PM, Black Cultural Center

MOBILIZING MATHEMATICS FOR THE FIGHT AGAINST CANCER

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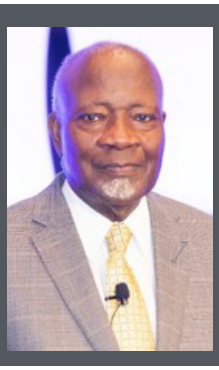
Mathematical oncologists apply mathematical and computational modeling approaches to every aspect of cancer biology, from tumor initiation to malignant spread and treatment response. A substantial amount of medical research is now focusing on the molecular biology of individual tumors to selectively target pathways involved in tumor progression. Increased understanding of molecular mechanisms that mediate the pathogenesis of cancers is leading to careful manipulation of these pathways and new cell-specific approaches to cancer therapy are now being developed. At the same time, advances in cancer immunotherapies have led to a reemergence of their use and effectiveness. Using data-driven computational models is a powerful and practical way to investigate the therapeutic potential of novel combinations of these two very different strategies for clinical cancer treatment. This talk will showcase a suite of mathematical models designed to optimize the use of targeted drug treatment strategies in combination with immunotherapy. The goal is to gain a more robust understanding of how specific tumor mutations affect the immune system and ultimately impact the efficacy of combination therapy. Combined with existing and newly generated experimental data, these mathematical models are poised to improve the ability to connect promising drugs for clinical trials and reduce the time and costs associated with transitioning novel therapeutic approaches from "equations to bench to bedside."



ABOUT THE JOHNNY L. HOUSTON LECTURE SERIES: Dr. Johnny L. Houston received his Ph.D. in Mathematics at Purdue University in 1974. He attended Purdue after earning a B.S. at Morehouse College and an M.S. at Atlanta University (now Clark Atlanta University). In 1969 he was one of the founders of Purdue's Black Cultural Center, and served as its first director. He was one of the founding members of the National Association of Mathematicians (NAM), also in 1969. NAM is a professional society promoting excellence in the mathematical sciences among underrepresented minority groups, and in particular African-Americans. Dr. Houston served as the Executive Secretary of NAM from 1975 until 2000. The Purdue Mathematics Department has an annual Johnny L. Houston lecture to honor and recognize Dr. Houston's lifelong contributions to mathematics, the profession, and to Purdue University.

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