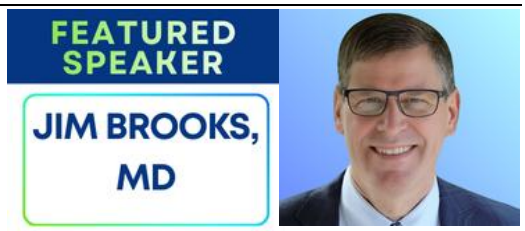
CAIRIBU BPH RESEARCH INTEREST GROUP (BPH RIG)

KNOWLEDGE EXCHANGE

EXECUTIVE SUMMARY 10/14/2026



Goal: Facilitate knowledge exchange and spur collaborations in BPH research and adjacent fields

Jim Brooks, MD

Understanding Heterogeneity in BPH

Potential of Heterogeneity in BPH:

- Dr. Brooks began by noting that the state of the art in BPH treatment has not changed since TURP was invented in 1903. Clinical (medical) management has not progressed much either.
- Heterogeneity is seen in nearly every disease. **BPH has shown to have substantial heterogeneity as well.**
  - This can be measured in a variety of ways and once it is classified, personalized medicine can be used for therapeutic action.

Clinical Heterogeneity:

- Dr. Brooks said in the clinic obvious heterogeneity is observed in the spectrum of symptoms ranging from obstructive (slow stream, urinary retention) to irritative (nocturia, urgency).
- Other physical signs of heterogeneity include the variable response to oral medications and natural progression of the disease.
- He discussed the post-operative side of heterogeneity, citing differences in urinary retention, post-surgical success, complications, and regrowth of prostate requiring reoperation.
- To understand this heterogeneity better; Dr. Brooks advocated for a sophisticated method capable of capturing these measurements, to be tested and validated in clinical studies.
  - Challenges of doing this include that each aspect of heterogeneity requires different measurements, which changes study design and/or assessment features.

Anatomic Heterogeneity:

- Dr. Brooks noted broad anatomical differences seen in BPH, including prostate size, shape, configuration, and function.
  - Usually, he said, higher prostate volume correlates with higher IPSS scores, but there is not a strong enough correlation to confirm it is the main driver.
- He discussed using new MRI methods to capture multiple anatomical dimensions and correlate with urodynamics, symptoms instrument, and medication response to build comprehensive data set.

Histological heterogeneity:

- Dr. Brooks stated that the anterior prostate is full of histological heterogeneity, referring to different histological markers that have variance including stromal nodules and inflammation.

Molecular Heterogeneity:

- Current transcriptomics techniques, Dr. Brooks stated, are limited in their characterization, and there does not appear to be driver mutations or DNA structural alterations.
- A major problem within transcriptomic studies of BPH is the small quantity (only 4 known studies), and two of these data sets are private, inaccessible data.
- Dr. Brooks referred to The Cancer Genome Atlas, a resource that has been invaluable to cancer research, and expressed interest in creating a similar resource for BPH data.

- Dr. Brooks shared BPH data of two gene expression subtypes (stromal and epithelial) and another study where symptomatic and asymptomatic BPH showed varying subtypes in their DNA expression and methylation.
    - He used this to validify the argument that if we had a larger set of data, this may bring out more heterogeneity.

Current Issues in Heterogeneity research:

- Dr. Brooks discussed many limitations within heterogeneity research including small sample sizes, a need to expand to stromal cells, and a need for new technology to assess BPH phenotypes.
- The samples we do have are biased, he noted, as the prostate samples collected for research are often from prostatectomies, which are large in volume and unresponsive to oral and minimally invasive treatments.

Conclusion:

- Understanding the molecular subtypes of BPH is essential in developing molecular biomarkers to detect these subtypes. This may be critical for treatment prior to onset of symptoms and personalized medicine.
- Dr. Brooks encouraged further discussion on research ideas regarding how the CAIRIBU BPH Research Interest Group can approach heterogeneity as a collaborative project.

James D. Brooks, MD is a urologist whose clinical practice focuses primarily on the diagnosis and treatment of prostate cancer. He is the Keith and Jan Hurlbut Professor, Vice-Chair and Chief of Urologic Oncology in the Department of Urology. Much of his work has focused on prostate and kidney cancer, and his laboratory has recently expanded research into benign urological conditions including benign prostatic hyperplasia, renal obstruction, and urinary infections. He is the PI and Director of the NIDDK-funded Stanford University Urology O'Brien Center, which is focused on research into benign urologic conditions. He has participated in several cancer research consortia including The Cancer Genome Atlas (TCGA), the Early Detection Research Network (EDRN) where he was Associate Chair of the Prostate Cancer Working Group, and the Molecular and Cellular Characterization Center Consortium for which he served as Co-Chair.