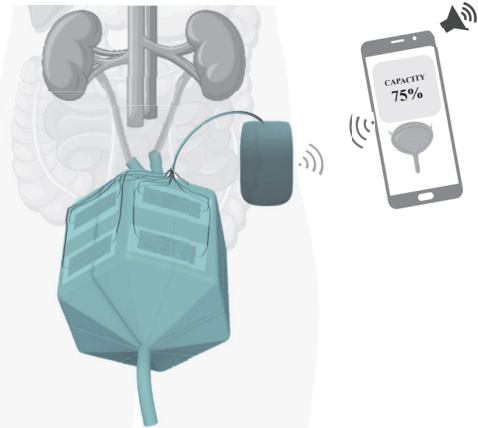


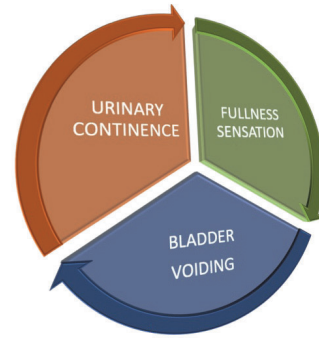


A fully implantable sensorized artificial urinary bladder to restore continence and fullness sensation

F. Semproni, V. Iacovacci, S. Musco, S. Onorati, M. Ibrahimi, A. Menciasci

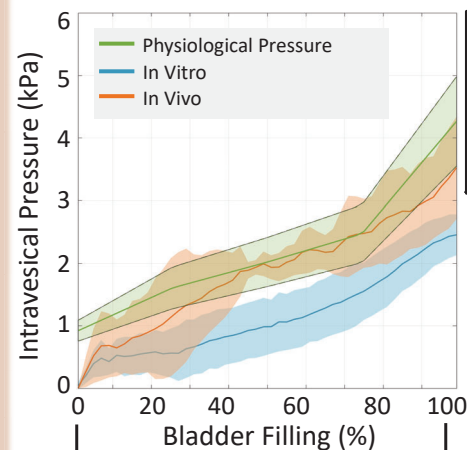
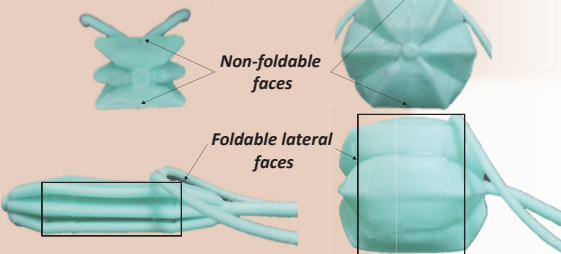


Developing a **robotic device to replace the native urinary bladder** could significantly improve quality of life for radical cystectomy patients by restoring the three bladder's key functions, unlike current clinical solutions that compromise comfort, self-management, and sensory feedback. We propose a **sensorized, origami-based artificial bladder** that accommodate urine coming from the kidneys, while continuously monitoring the filling volume to alert the patient as bladder capacity is approached.

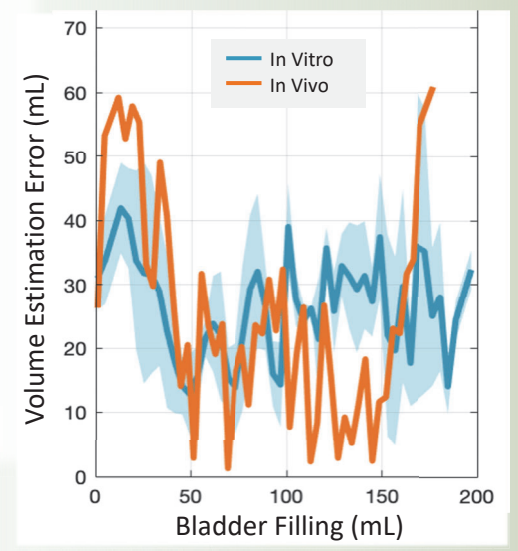
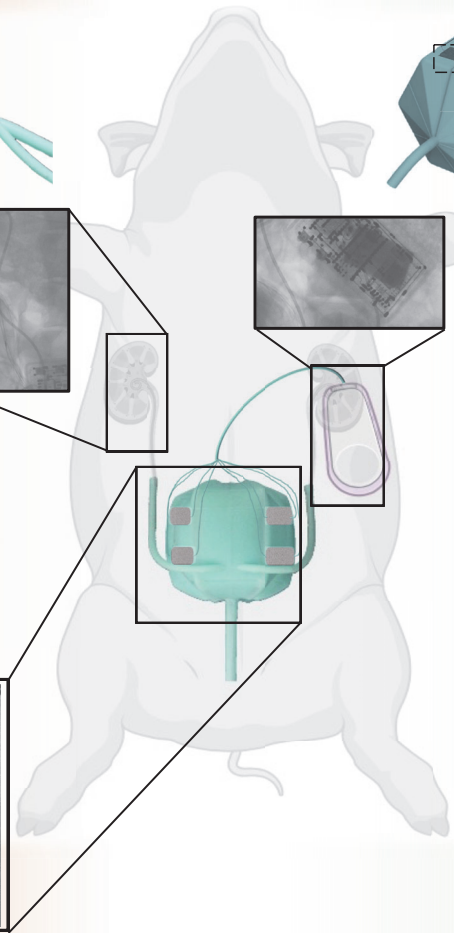
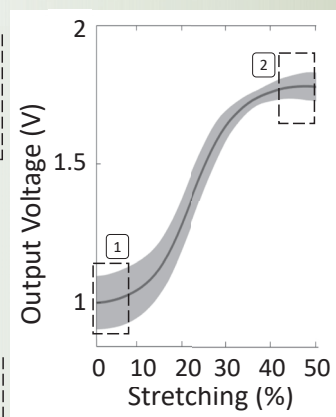
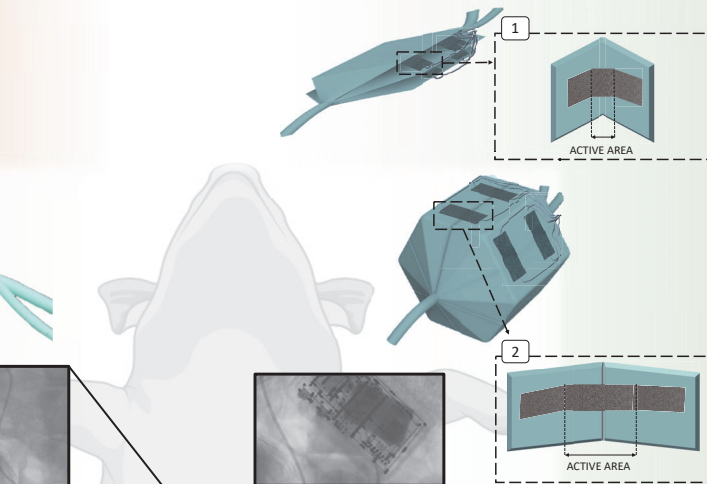


ORIGAMI-INSPIRED SILICONE BLADDER DESIGN FOR ANATOMICAL COMPATIBILITY, MADE WITH SOFT MATERIALS TO MAINTAIN SAFE INTRAVESICAL PRESSURE

VOLUME 0 mL: collapsed shape
VOLUME 200 mL: spherical shape



RESISTIVE TEXTILE SENSORS INCORPORATED INTO THE ARTIFICIAL BLADDER STRUCTURE TO ENABLE REAL-TIME MONITORING OF BLADDER VOLUME.



ONGOING WORK FOCUSES ON DEVELOPING SOFT SILICONE-BASED ARTIFICIAL DETRUSORS, EMBEDDED WITHIN THE ARTIFICIAL BLADDER STRUCTURE, TO ENABLE CONTROLLED VOIDING WITH A CURRENT VOIDING EFFICIENCY OF LESS THAN 50 mL. Future plans include long-term in vivo testing to assess the device's durability and sustained performance.