

## BLADDER

### [Effects of human Muse cells on bladder inflammation, overactivity, and nociception in a chemically induced Hunner-type interstitial cystitis-like rat model](#)

Akira Furuta, Yasumasa Kuroda, Tokunori Yamamoto, Shin Egawa, Mari Dezawa, **Naoki Yoshimura**

We investigated the effects of locally administered human multilineage differentiating stress enduring (Muse) cells, nontumorigenic pluripotent-like endogenous stem cells, on bladder tissues, function, and nociceptive behavior in a chemically induced Hunner-type interstitial cystitis (HIC)-like rat model without immunosuppressant. Chemical cystitis was induced by intravesical instillation of 0.2 N hydrochloride (HCl) for 15 min in female F344 rats. SSEA-3+ Muse cells, SSEA-3-non-Muse cells or Hanks' balanced salt solution (HBSS; vehicle) were injected into the anterior and posterior bladder wall at each  $1 \times 10^4$  cells/ $10 \mu\text{l}$  6 h after HCl application. The sham group received HBSS without HCl instillation. Urinary frequency was assessed using metabolic cages, cystometrograms, nociceptive behavior, and histological analysis of the bladder and L6 spinal cord. The results showed muse cell therapy could be a promising modality for treating HIC.

### [Is Pelvic Floor Muscle Tenderness a Distinct Urologic Chronic Pelvic Pain Syndrome \(UCPPS\) Phenotype?: Findings From the Multidisciplinary Approach to the Study of Chronic Pelvic Pain \(MAPP\) Research Network Symptoms Pattern Study \(SPS\)](#)

Priyanka Gupta, Robert Gallop, Theresa Spitznagle, Henry Lai, Frank Tu, John N Krieger, **J Quentin Clemens**, Catherine S Bradley, Claire Yang, Siobhan Sutcliffe, Robert Moldwin, Karl Kreder, Jason Kutch, Larissa V Rodriguez

85% of women with interstitial cystitis/bladder pain syndrome (IC/BPS) and men with chronic prostatitis/chronic pelvic pain syndrome (CP/ CPPS) have concomitant pelvic floor muscle

tenderness (PFT). The significance of this finding is incompletely understood. This study examines PFT among participants in the MAPP Research Network, and its relationship with urologic chronic pelvic pain syndrome (UCPPS) symptom severity, in order to determine whether this is a phenotypic predictor in UCPPS. Participants in the MAPP Network Symptom Patterns Study (SPS) underwent a standardized pelvic examination (PEX). Trained examiners palpated six locations evaluating the pelvic musculature for PFT. Participants were assigned a 0 to 6 PEX score based on the number of areas with tenderness on PEX. Using regression tree models, PEX scores were divided into low (0-1), mid (2,3,4,5), and high (6). The relationship between PFT and UCPPS symptoms was examined using several validated questionnaires. The results showed UCPPS patients with more widespread PFT have severe pain and urinary symptoms, worse quality of life, and a more centralized pain phenotype.

### [Recurrent Urinary Tract Infection Incidence Rates Decrease in Women With Cystitis Cystica After Treatment With d-Mannose: A Cohort Study](#)

Kimberley Chiu, Fan Zhang, Siobhan Sutcliffe, **Indira U Mysorekar**, **Jerry L Lowder**

d-Mannose is a promising nonantibiotic prophylaxis for recurrent urinary tract infection (rUTI). Recurrent UTI is common in postmenopausal women and may be especially prevalent in those with cystitis cystica (CC) lesions found on cystoscopy. Our objectives were to determine whether CC lesions are associated with a higher UTI incidence rate and whether d-mannose reduces this rate in women with CC. This is a retrospective cohort study of patients with rUTI who underwent cystoscopy at our institution (from which CC status was identified) and who were treated with d-mannose as a single agent for UTI prophylaxis. Participants were required to have at least 1 year of follow-up for UTIs both before and after d-mannose initiation to allow for a pre-post comparison. Patients with rUTI with CC had more frequent UTI episodes than

patients without CC. Patients in both groups had fewer UTI episodes after beginning d-mannose prophylaxis. These findings add to the body of literature supporting d-mannose for the prevention of rUTI in women, including those with CC.

## KIDNEY

### [Calyceal diverticula: Clinical, radiological and histopathological findings of an uncommon entity with presumed congenital origin](#)

Pooja Srivastava, Swati Satturwar, Sheldon Bastacky, **Rajiv Dhir**, Miguel Reyes-Múgica, H Scott Beasley, Gabriela M Quiroga-Garza

Calyceal diverticula (CD) are relatively uncommon urologic conditions that generally follow an asymptomatic course and rarely require medical intervention. CD are thought to have a congenital origin due to abnormalities during the process of ureteral bud formation. Clinically and radiologically, they can mimic multiple neoplastic and non-neoplastic renal processes, with potentially relevant differences in the management of these patients. Symptoms are usually associated with the presence of stones, obstruction to the drainage of the diverticulum, large size, or secondary infection. In chronic cases, surgery might become necessary, creating an opportunity to examine the histopathological characteristics of this condition. Although these are benign in the majority of patients, some rare instances of malignancy arising from the CD have been reported. In this series, we addressed the clinical, radiological, and histopathological findings of CD.

### [Self-Reported Health Outcomes of Children and Youth with Chronic Diseases](#)

Christopher B Forrest, Julia Schuchard, Cortney Bruno, Sandra Amaral, Elizabeth D Cox, **Kathryn E Flynn**, Pamela S Hinds, I-Chan Huang, Michael D Kappelman, Jerry A Krishnan, Rajesh B Kumar, Jin-Shei Lai, Amy S Paller, Wanda Phipatanakul, Laura E Schanberg, Kaharu Sumino, Elissa R Weitzman, Bryce B Reeve

The purpose of this study was to identify pediatric patient-reported outcomes (PROs) that are associated with chronic

conditions and to evaluate the effects of chronic disease activity on PROs. Participants 8-24 years-old and their parents were enrolled into 14 studies that evaluated PROMIS® PROs across 10 chronic conditions--asthma, atopic dermatitis, cancer, cancer survivors, chronic kidney disease, Crohn's disease, juvenile idiopathic arthritis, lupus, sickle cell disease, and type 1 diabetes mellitus. PRO scores were contrasted with the United States general population of children using nationally representative percentiles. PRO-specific coefficients of variation were computed to illustrate the degree of variation in scores within versus between conditions. Condition-specific measures of disease severity and Cohens d effect sizes were used to examine PRO scores by disease activity. The results showed that chronic conditions are associated with symptoms and functional status in children and adolescents across 10 different disorders. These findings highlight the need to complement conventional clinical evaluations with those obtained directly from patients themselves using PROs.

## PROSTATE

### [Benign prostatic hyperplasia/obstruction ameliorated using a soluble guanylate cyclase activator](#)

Irina V Zabbarova, Youko Ikeda, Mark G Kozlowski, Pradeep Tyagi, Lori A Birder, Basu Chakrabarty, Subashan Kpg Perera, Rajiv Dhir, Adam C Straub, Peter Sandner, Karl-Erik Andersson, Marcus J Drake, Christopher H Fry, Anthony J Kanai

Benign prostatic hyperplasia (BPH) is a feature of ageing males. Up to half demonstrate bladder outlet obstruction (BOO) with associated lower urinary tract symptoms (LUTS) including bladder overactivity. Current therapies to reduce obstruction, such as  $\alpha$ 1-adrenoceptor antagonists and 5 $\alpha$ -reductase inhibitors, are not effective in all patients. The phosphodiesterase-5 inhibitor (PDE5I) tadalafil is also approved to treat BPH and LUTS, suggesting a role for nitric oxide (NO•), soluble guanylate cyclase (sGC), and cGMP signalling pathways. However, PDE5I refractoriness can develop for reasons including nitric nerve damage and decreased NO• production, or inflammation-related

oxidation of the sGC haem group, normally maintained in a reduced state by the cofactor cytochrome-b5-reductase 3 (CYB5R3). sGC activators, such as cinaciguat (BAY 58-2667), have been developed to enhance sGC activity in the absence of NO• or when sGC is oxidised. Accordingly, their effects on the prostate and LUT function of aged mice were evaluated. Aged mice ( $\geq$ 24 months) demonstrated a functional BPH/BOO phenotype, compared with adult animals (2-12 months), with low, delayed voiding responses and elevated intravesical pressures as measured by telemetric cystometry. Thus, the aged male mouse is a suitable model for BPH-induced BOO and cinaciguat has a demonstrated ability to reduce prostate-induced obstruction and consequent effects on bladder function.

### [MRI Features Associated with Histology of Benign Prostatic Hyperplasia Nodules: Generation of a Predictive Model](#)

Jessica C Dai, Tara N Morgan, Ramy Goueli, Daniel Parrott, Alexander Kenigsberg, Ryan J Mauck, Claus G Roehrborn, Douglas W Strand, Daniel N Costa, Jeffrey C Gahan

Histologic phenotypic variation of benign prostatic hyperplasia (BPH) has been hypothesized to underlie response to medical therapy. We evaluate preoperative MRI of robot-assisted simple prostatectomy (RASP) specimens and determine imaging features associated with histologic phenotype. All patients undergoing RASP from November 2015 to November 2019 with a multiparametric MRI  $\leq$ 1 year before RASP were included. Patients without identifiable BPH nodules on histologic specimens were excluded. Histology slides were obtained from whole mount adenoma specimens and corresponding MRI were reviewed and graded independently by a blinded expert in BPH histopathology (D.W.S.) and an experienced radiologist specializing in prostate imaging (D.N.C.), respectively. Each nodule was assigned a phenotypic score on a 5-point Likert scale (1 = predominantly glandular; 5 = predominantly stromal) by each reviewer. Scores were compared using the sign test and univariate analysis. The

conclusion showed there is a strong correlation between MRI features and the histologic phenotype of BPH nodules. MRI may provide a noninvasive method to determine underlying BPH nodule histology.

- Jennifer Allmaras, MPH and Muen Wang 4/4/2022

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