Dear Colleagues:

The National Institute for Child Health and Development (NICHD) of the National Institutes of Health has launched a collaborative process to revise and updates its strategic plan. This is a unique opportunity for the urologic community to advocate for prioritization of relevant research domains, such as developmental biology, reproductive health, pediatrics, and population health as they pertain to the genitourinary tract.

We call upon your input to advance research interests for our patients. To facilitate the process, we have reproduced below the stated research priorities of the various Branches of the NICHD, and highlighted topics of potential research relevance that may overlap with urologic science.

Please send any feedback by November 30 to Michael Hsieh, MD, PhD, at mhsieh@childrensnational.org.

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**National Institute for Child Health and Development (NICHD) stated research priorities.**

**Child Development and Behavior Branch**

**High-priority research areas** include:

- Social, environmental, and economic factors (precisely operationalized) and biological factors that impact infant and child brain development and function, stress reactivity, adaptive behavior development, and school functioning (both short- and long-term outcomes) Note: How might bladder pain remodel/influence brain development and nociception?

**Contraception Research Branch**

**High-priority research areas** include:

- Developing new methods to deliver pharmacologic agents to the sites of gamete production, maturation, and/or function
- Developing methods that prevent both fertility and the transmission of sexually transmitted infections
• Comprehensive identification, characterization, and/or validation of potential non-steroidal male and female contraceptive targets
• Developing more efficient and/or predictive strategies or methods to validate potential contraceptive targets
• Characterizing testicular stem cells to identify targets for male contraception
• Elucidating the transport mechanism of drugs and/or drug-like molecules across the blood-testis and/or blood-epididymal barrier(s)

**Developmental Biology and Structural Variation Branch**

High-priority research areas include:

Note: potentially relevant to scientists studying genital, renal or bladder (mal)development, environmental interactions / epigenetics

• Novel, exploratory/developmental projects of high potential significance relevant to branch research areas
• Developing tools or new animal models for studying embryonic development or structural birth defects
• Projects using stem cells or iPSCs for understanding human embryonic development and birth defects
• Projects addressing developmental metabolomics as related to embryonic processes or the etiology of structural birth defects

**Fertility and Infertility Branch**

High-priority research areas include:

Note: May be relevant for congenital and childhood-onset syndromes associated with infertility.

• Studies of gamete quality and pre-placental processes as they relate to the etiology of early pregnancy loss
• Studies on transgenerational epigenetic inheritance
• Studies to investigate the relationship of fertility status to overall health and disease
• Genetic basis of idiopathic male and female fertility
• Impact of nutrition and metabolism on fertility
• Identification of biomarkers to study reproductive transitions
• Development of innovative technologies and model systems that can advance progress in reproductive biology and medicine

**Gynecologic Health and Disease Branch**

**High-priority research areas** include:

• Research involving longitudinal studies that include relevant gynecologic questions
• Delineating the genetic, cellular, molecular, environmental, and psychosocial factors underlying the etiology of chronic gynecologic pain syndromes and other gynecologic disorders
• Developing novel, non-hormonal pharmacologic treatments for gynecologic disorders
• Developing novel imaging methods and biomarkers that distinguish normal anatomy and physiology from the presence of gynecologic disorders
• Investigating the genome, epigenome, and/or transcriptome as they impact development, progression, and/or treatment response in gynecologic conditions
• Investigating the role of endogenous stem cells in the etiology or treatment of gynecologic disorders
• Transdisciplinary research based on findings from diverse fields to advance basic and mechanistic understanding of gynecologic health and disease

**Low-priority research areas** include:

• Studies on interstitial cystitis, irritable bowel syndrome, incontinence (fecal or urinary), or sexual dysfunction due to causes other than pelvic floor disorders **Note: pelvic floor disorders should therefore be considered in scope**

**Intellectual and Developmental Disabilities Branch**

**High-priority research areas** include:

**Note: development of bladder dysfunction could be considered a developmental disability**

• Interdisciplinary studies emphasizing the cellular, genetic, epigenetic, and environmental factors that contribute to the cognitive and behavioral manifestations of intellectual and developmental disabilities (IDDs), such as Down, Fragile X, and Rett syndromes; inborn errors of metabolism; and autism spectrum disorders
• Research on one or more comorbid conditions of IDDs, such as disordered sleep, self-injurious behaviors, obesity, **gastrointestinal dysfunction**, seizures/epilepsy, attention deficit/hyperactivity disorder, anxiety, depression, psychosis, and related mental health disorders **Note: GI dysfunction can be argued to include GU dysfunction as well**
• Research on the development and/or implementation of new screening tests for the prenatal, newborn, and early childhood periods that assesses the efficiency and effectiveness of translating these tools into clinical care and the community setting **Note: hydronephrosis and urinary tract obstruction research may be pertinent**
• Research establishing the validity of biomarkers and outcome measures for IDD symptoms, severity assessments, and treatments, especially outcomes targeting cognitive (including language), behavioral (adaptive or maladaptive), social, and medical issues
• Research examining transitional time periods of interest for IDDs, including pre-symptomatic, adolescent to adulthood, middle adulthood to aging (e.g., prevalence of dementia in IDD populations), and causes of mortality
• Developing, disseminating, and implementing treatments for IDDs that impact clinical care and improve quality of life, including physiological, cognitive, and behavioral manifestations

Maternal and Pediatric Infectious Disease Branch

High-priority research areas include:

• HIV: Cure/remission in infants and children
• HIV: Adolescent prevention
• HIV: Adverse pregnancy and infant outcomes related to prevention or treatment
• Emerging and re-emerging infectious diseases, including their impact on the pediatric nervous system
• Immune cross-talk in infant immune system development. Note: UTI research may be relevant

Low-priority research areas include:

• Basic biomedical research focused on neurocognitive dysfunction in HIV/AIDS
• Research applications on HIV and other infectious diseases where the focus and/or impact on infants, children, adolescents, and pregnant women represent only a minority of the work proposed. Note: pediatric UTI biology and epidemiology may be topical
• Research with multiple behavioral and/or biological outcomes that are of relevance to HIV (and/or specified infectious disease), but for which HIV (and/or the specified infectious disease) is not the focus

Obstetric and Pediatric Pharmacology and Therapeutics Branch

High-priority research areas include:

• Developmental pharmacology and pathophysiology of pregnancy
• New drug development and drug repurposing
• Novel alternative designs for pediatric and obstetric clinical trials
• Outcome measures and biomarkers for pediatric and obstetric clinical trials
• Pediatric formulations
• Therapeutic devices
• Developmental pharmacogenomics, toxicogenomics, and epigenomics
• Pharmacokinetics, safety, and efficacy of pharmaceuticals in pregnant/obese pregnant teenagers

**Pediatric Growth and Nutrition Branch**

**High-priority research areas** include:

- Interaction of nutrients and the **microbiome**
- Antimicrobial activity of breast milk
- Implications of and factors influencing breastfeeding
- **Determinants of peak bone mass** and peak bone strength
- Development of tools or new animal models leading to novel treatment methods for congenital endocrine disorders
- Hormonal regulation of bone, muscle, and adipose tissue
- Biological basis and implications of infant feeding practices in term and preterm infants
- Identification of early risk factors for childhood obesity and novel interventions for prevention and treatment during the prenatal period and early childhood

**Pediatric Trauma and Critical Illness Branch**

**High-priority research areas** include:

- Pediatric critical care medicine, epidemiology, pathophysiology, and prevention and management of critical illness
- Ethical, translational, and applied research in pediatric critical care practice
- Injury prevention, trauma, and emergency care
- Psychological trauma, traumatic stress, violence and violence-related injury, and child maltreatment

**Population Dynamics Branch**

**High-priority research areas** include:

- Behavioral research on the use and non-use of contraception
- Health and disease across the lifespan
- Multilevel interactions and inputs to human health and development, including gene–environment interactions