W12: Combating Recurrent UTIs: Latest Developments in Embedded Infections and UTI Vaccines

Workshop Chair: Bob Yang, United Kingdom
17 September 2025 16:30 - 17:30

Start	End	Topic	Speakers
16:30	16:35	Introduction	Bob Yang
16:35	16:45	Embedded Infections: The Science Behind Intracellular Bacterial Reservoirs	Bob Yang
16:45	16:55	UTI vaccines - ideas for future use	Bob Yang Stephen Foley Christopher Blick
16:55	17:05	UTI Vaccines: A Critical Review of Current Clinical Evidence	Stephen Foley
17:05	17:15	Discussion	Bob Yang Stephen Foley Christopher Blick
17:15	17:25	Clinical Application: Real World Use of the UTI Vaccine	Christopher Blick
17:25	17:30	Discussion	Bob Yang Stephen Foley Christopher Blick

Description

Background:

Urinary tract infections (UTIs) are among the most common bacterial infections, affecting millions of people worldwide each year. In the UK, there are 4 million prescriptions for UTIs in women year year, with £400 million spent on UTI related hospital admissions yearly.

While many UTIs are successfully treated with antibiotics, a significant proportion (up to 30%) of individuals experience recurrent infections, often due to the presence of embedded bacterial communities within the bladder wall. These embedded UTIs pose a significant clinical challenge, as they are difficult to eradicate with conventional antibiotic therapies and contribute to increased morbidity, healthcare costs, and the rise of antimicrobial resistance (AMR). Worldwide, 4.95 million deaths are associated with AMR each year, with 1.27 million deaths directed caused by AMR. Within Uropathogens, 92% of bacteria are now resistant to one antibiotic and 80% are resistant to two.

Traditional antibiotic treatment for UTIs primarily targets planktonic bacteria in the urine, leaving intracellular bacterial reservoirs within the bladder wall relatively untouched. These intracellular bacteria can re-emerge, leading to recurrent infections and frustrating cycles of antibiotic use. This challenge has spurred intensive research into alternative strategies, with vaccines emerging as a promising avenue for both preventing and treating embedded UTIs.

UTI vaccines aim to stimulate the body's immune system to effectively target and eliminate both planktonic and intracellular bacteria, providing long-lasting protection against recurrent infections. Several vaccine approaches are currently under investigation, each at different stages of their journey towards full clinical licencing.

However this field of medicine is often poorly researched and taught, despite being ubiquitous within many different specialities and disciplines. This workshop therefore aims to deliver a summary of the latest developments in this field, led by leading experts in a interactive manner in order to fill this knowledge gap.

Key Learning Points

This workshop will delve into the complexities of embedded UTIs and explore the potential of vaccines to transform their prevention and treatment. Key learning points include:
- Understanding Embedded UTIs
- Defining the characteristics and pathogenesis of embedded UTIs.
- Exploring the role of intracellular bacterial communities in recurrent infections.
- Explore the variation within the immunological response in recurrent infections.
- Identifying risk factors and diagnostic challenges associated with embedded UTIs.
Discussing the limitations of current antibiotic therapies in eradicating these persistent infections.

Exploring UTI Vaccine Strategies:
- Examining the different UTI vaccines and their approaches

- Understanding the mechanisms of action of these vaccines
- Analysing pre-clinical and clinical data on the efficacy and safety of various vaccine candidates.
- Discussing the challenges and opportunities in developing effective UTI vaccines

Clinical Implications and Future Directions:
- Evaluating the potential impact of UTI vaccines on public health, antimicrobial resistance, and patient quality of life.
- Discussing strategies for implementing UTI vaccines in clinical practice, including patient selection and vaccination schedules.
- Identifying areas for future research as a group.

Take Home Messages
- Embedded UTIs represent a significant clinical challenge due to their persistence and resistance to conventional antibiotics.
- Vaccines offer a promising approach for preventing and treating embedded UTIs by stimulating the body's immune system to target both planktonic and intracellular bacteria.
- Various vaccine strategies are under development, each with its own advantages and challenges.
- Clinical trials have demonstrated the potential of UTI vaccines to reduce the frequency and severity of recurrent infections.
- Future research will focus on optimising vaccine design, delivery methods, and immune response to maximize efficacy and address the needs of diverse patient populations.
- The introduction of UTI vaccines has the potential to revolutionise UTI management, reduce reliance on antibiotics, and improve the quality of life for millions of individuals worldwide.

Additional References
https://www.youtube.com/watch?v=WRPbQEQ98LQ
https://evidence.nejm.org/doi/full/10.1056/EVIDoa2100018
https://pubmed.ncbi.nlm.nih.gov/28238601/
https://www.science.org/doi/10.1126/sciadv.adi9834
https://pubmed.ncbi.nlm.nih.gov/31806578/
https://pubmed.ncbi.nlm.nih.gov/38644097/
https://pubmed.ncbi.nlm.nih.gov/30378242/

Aims of Workshop

This workshop aims to equip healthcare professionals and researchers with the latest knowledge on embedded infections and UTI vaccines, focusing on the latest research in how such conditions develop, to future directions in combating this challenging condition. Participants will gain a deeper understanding of the complexities of embedded UTIs and their impact on patients, explore emerging vaccine strategies and their mechanisms of action, and analyse clinical trial data to discuss the current state of UTI vaccines.
By attending, participants will gain the latest insights into this common, yet poorly researched area of medicine and discuss future strategies.

Educational Objectives

This workshop provides a unique educational opportunity for healthcare professionals and researchers with an interest in UTI management. By bridging the gap between cutting-edge research and clinical practice, the workshop offers a deep dive into the complexities of embedded UTIs and the promising role of vaccines in their prevention and treatment.

The workshop will be held in a interactive lecture based format. Numbers will be limited to facilitate engagement and interaction between participants and faculty.

Engaging with Leading Experts:
Attendees will have unparalleled access to world-renowned faculty at the forefront of UTI vaccine development. These experts will share their first-hand experiences from the clinical trials but most importantly, their real world experience on using UTI vaccines in treating patients, providing crucial insights into the efficacy and safety of different vaccine candidates. Furthermore, participants will also be able to engage with the pioneers behind the cellular and in vivo bladder models that have transformed our understanding of embedded UTIs, gaining a deeper appreciation for the challenges and opportunities in targeting these persistent infections.

Translating Knowledge into Clinical Practice - from Bench to Bedside:
The workshop fosters a dynamic learning environment where participants can interact directly with faculty, dissect the latest research findings, and critically evaluate the translational potential of various vaccine strategies. Through interactive discussions and case studies, attendees will learn how our faculty has applied this knowledge in their own clinical practice and potentially think about ways on how to translate knowledge learnt into the participants own practice too.

Learning Objectives

1. Understand the latest data on the pathophysiology of embedded UTIs
2. Understand the current state of UTI vaccine development

3. Analyse future directions on the clinical applications for UTI vaccines

Target Audience
Urology, Urogynaecology and Female & Functional Urology, Conservative Management

Advanced/Basic
Intermediate

Suggested Learning before Workshop Attendance
https://evidence.nejm.org/doi/full/10.1056/EVIDoa2100018
https://pubmed.ncbi.nlm.nih.gov/28238601/
https://www.science.org/doi/10.1126/sciadv.adi9834
https://www.youtube.com/watch?v=WRPbQEQ98LQ