Developing a chronic in-vitro model for bladder pain syndrome

Objective
Sustain a chronic deficient urothelial barrier in-vitro

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Introduction
• In bladder pain syndrome (BPS), the urothelial barrier is compromised
• This enables solutes from the urine to leak into the bladder wall and cause irritative symptoms
• Many animal models for BPS use irritants to damage the urothelium
• We set out to prepare a chronic in-vitro model for a deficient urothelial barrier

Methods
• Primary porcine urothelial cells were cultured on Transwell inserts:
  - Different instillation protocols were evaluated, with n=4 in each group:
    • Negative control
    • Protamin 10% daily 8 hour instillation
    • Lipopolysacharide (LPS) 2% continuous instillation
  - The urothelial barrier was measured daily at 7.00 AM and 3.00 PM through TransEpithelial Electrical Resistance (TEER)

Results
• The graph below shows the percentual change in TEER after exposure to protamin and LPS
  - Microscopic evaluation cells
    In the protamin group
    • Apparent debris from dead cells
    • Different shaped cells, less flattened

Conclusion
• The urothelial resistance does not decrease in the negative control group
• The addition of LPS did not result in a decreased urothelial resistance (comparable to negative control)
• It is hypothesized that additional immunologic components are necessary for any response from LPS
• With protamin, the urothelial resistance shows a daily decrease while the cells stay viable and maintain some degree of barrier function

Conclusion
Protamin is suited for a chronic deficient barrier in-vitro

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