

CHEMICAL & BIOMEDICAL ENGINEERING GRAD STUDENT SEMINAR

Unmasking Extraintestinal Pathogenic Escherichia coli: A Fast and Affordable Biomimetic Urothelial Cell Culture Model

Thurs., June 11, 2026
11:00 AM
IRCB 1030

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Extraintestinal pathogenic Escherichia coli can cause severe, sometimes fatal infections. Such strains can be hidden among other commensal E. coli in the human gut. To investigate the E. coli potential for extraintestinal infections, several methods have already been established with minor or major disadvantages. A recently developed simple, fast, and inexpensive biomimetic in vitro model based on normal porcine urothelial (NPU) cells will be presented. The model was tested using a set of control E. coli strains and, subsequently, with human E. coli strains isolated either from patients with urinary infections or from the feces of healthy individuals. A drop in viability of NPU cells was used as a measure of the pathoge-

nicity of the individual strain tested. To visualize the subcellular events, transmission and scanning electron microscopy was performed. The strains were tested for the presence of different virulence-associated genes, phylogroup, type of core lipid, O-serotype, and type of lipopolysaccharide and a statistical analysis of possible correlations between strains' characteristics and the effect on the model was performed. Moreover, the cytokine response of the NPU cells exposed to different E. coli strains was determined. Results showed that our model has the discriminatory power to distinguish extraintestinal pathogenic from non-pathogenic E. coli strains, and to identify new, potentially pathogenic strains.



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