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Escherichia coli

Escherichia coli is a Gram-negative, rod-shaped bacteria of the family Enterobacteriaceae. Most *E. coli* are abundant in the gut of humans and animals and reside as commensals without pathology (Lim et al 2010). Some variants however can be highly pathogenic by the nature of their acquired virulence factors; others can cause disease in a susceptible host at extra-intestinal locations. Acquisition may be through contact with contaminated water, food or the environment, but may simply be autoinoculation or haematogenous spread from colonised areas.

Members can be serotyped based on O (somatic), H (flagellar) and K (surface/capsular) antigens allowing more rapid identification of specific pathogenic strains (for example O157:H7) and for easy epidemiological tracing. Those that commonly cause gastroenteritis may also be defined by their pathogenic mechanism (e.g. enteroinvasive *E. coli* (EIEC), enteroaggregative *E. coli* (EAEC), and adherent invasive *E. coli* (AIEC) are found in humans only, whereas enterotoxigenic *E. coli* (ETEC), enteropathogenic *E. coli* (EPEC), and enterohaemorrhagic *E. coli* (EHEC) are also found in animal hosts (Lim et al 2010).

Common infections caused by *E. coli* include urinary tract infections, gastroenteritis (particularly those with specific virulence factors such as toxins), sepsis/bacteraemia and neonatal sepsis/meningitis (>5 days after birth); less commonly *E. coli* may also cause wound and abscess infections and aspiration pneumonia. *E. coli* is predominantly identified using culture methods, however, molecular methods such as PCR may be useful to quickly differentiate particular pathogenic strains within stool specimens where many other non-pathogenic strains will also be present; and to rapidly detect *E. coli* in normally sterile sites such as CSF and blood where *E. coli* is suspected.

Micropathology Ltd uses semi-nested PCR assay for qualitative detection of *E. coli* DNA (and closely related *Shigella sp.*). This assay is UKAS accredited for detection of *E. coli* DNA in CSF and EDTA whole blood. Other samples types will be accepted for testing but will be reported with a caveat stating that the assay is not UKAS accredited for this sample type.

References:

Lim, J. Y., Yoon, J. W., & Hovde, C. J. (2010). A Brief Overview of *Escherichia coli* O157:H7 and Its Plasmid O157. *Journal of Microbiology and Biotechnology*, *20*(1), 5–14.