Folate and Methylation cycle metabolites (5-MTHF, SAM, SAH, methionine, betaine, choline and cystathionine).

The methylation cycle is an important pathway that controls cell function. The primary role is the synthesis of S-adenosylmethionione (SAM), the sole methyl (CH3) group donor to numerous methyltransferase enzymes involving the post-translational modification of DNA, Proteins, phospholipids, amino acids, neurotransmitters and many other compounds. Central to this pathway is the methylation of homocysteine to methionine, a reaction that is requires 5-methyltetrahydrofolate (5-MTHF) and vitamin B12 as regulatory cofactors. Homocysteine may also be converted to cystathionine in a reaction that is dependent on vitamin B6. Choline and betaine are secondary methyl donors for salvage pathways that may convert homocysteine to methionine. The methylation cycle is a highly regulated and can be influenced by genetic and dietary factors as well as a variety of drugs.

**Methodology:** Liquid Chromatography - Tandem Mass Spectrometry