

**Singapore Stanford Partnership Programme**

**MS Project MS08-29**

**Microbial Study on Hydrogen Producing Reactor of A Novel Three-Phase Anaerobic Digestion System for Co-Production of Biohydrogen and Biomethane from Organic Solid Waste**

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A novel three-phase anaerobic digestion system to enhance co-production of biohydrogen and biomethane from organic solid waste has currently been developed in NTU. In this system, a hydrogen producing reactor is added into the methane-producing two-phase Hybrid Anaerobic Solid-Liquid (HASL) digestion system. The additional reactor is specifically cultivated with hydrogen producing bacteria, mainly *Clostridia*, either in the suspended-growth mode of a continuous stirred tank reactor (CSTR) or in the attached-growth mode as biofilm of an upflow fixed-bed reactor (UFBR). The student is required to characterize the properties of microorganisms in these two reactors under different conditions such as cultivation stage with pure carbohydrate substrate and operating stage with hydrolyzed leachate from the carbohydrate-rich food waste. The student may be required to have some background on microbiology to perform DNA extraction and PCR-DGGE operation on the selected microbes.