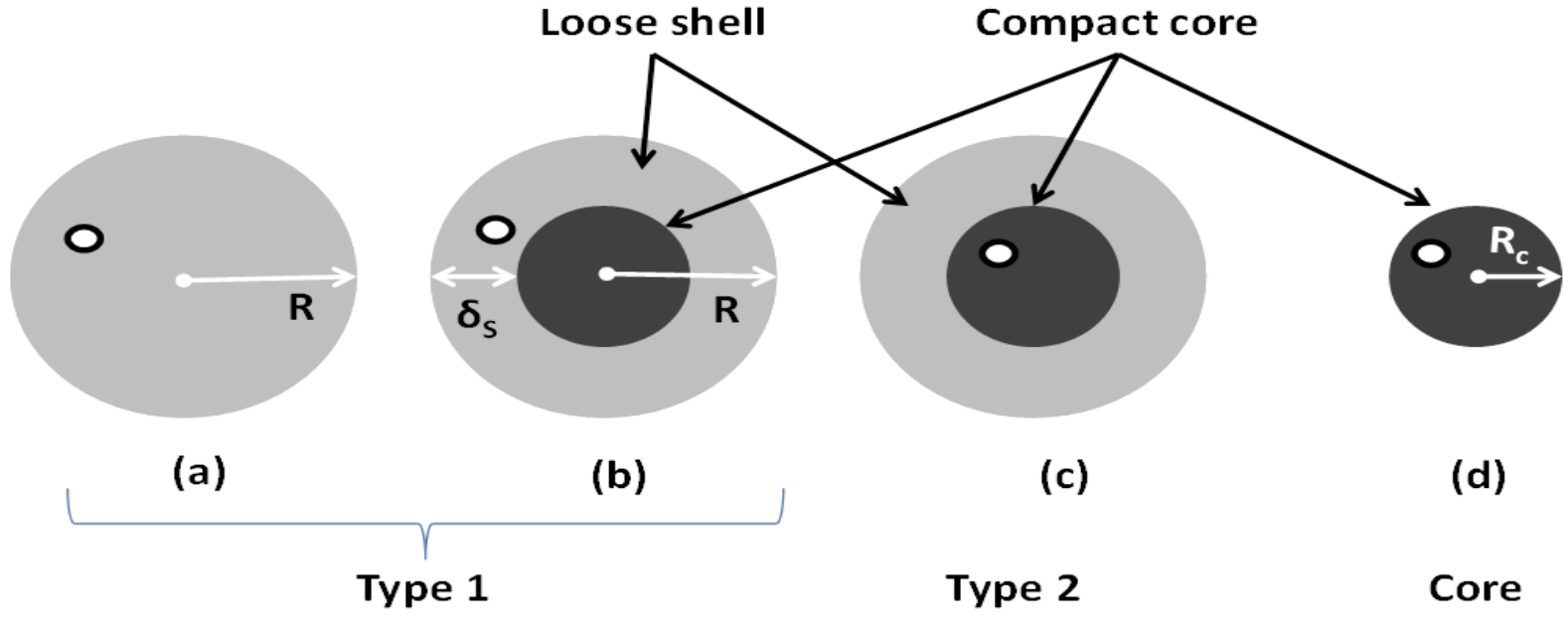
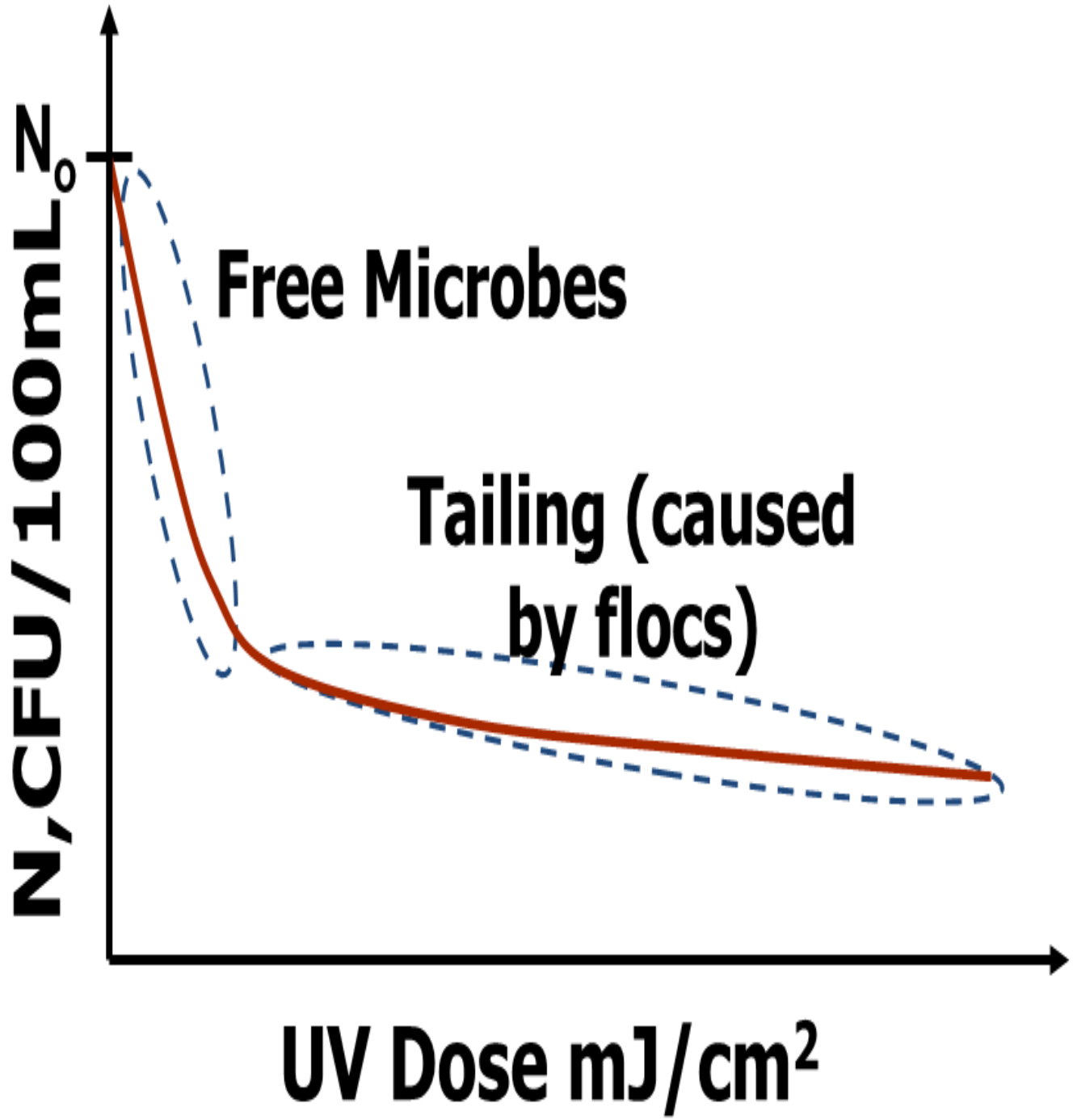
Wastewater Treatment Processes

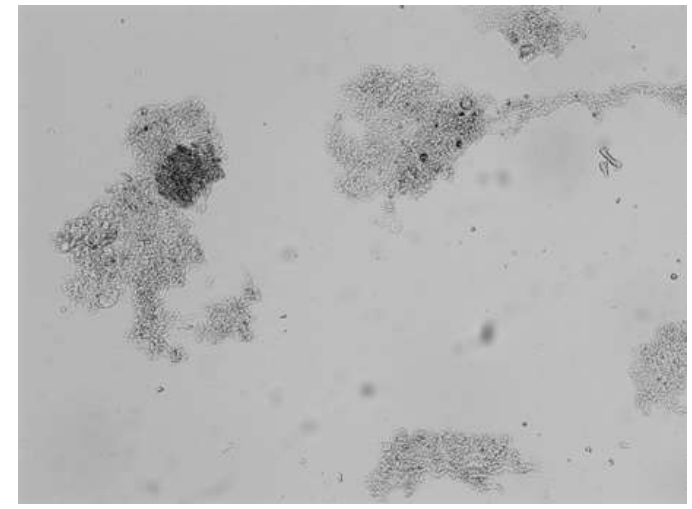
UV Disinfection & Flocs Physicochemical Properties

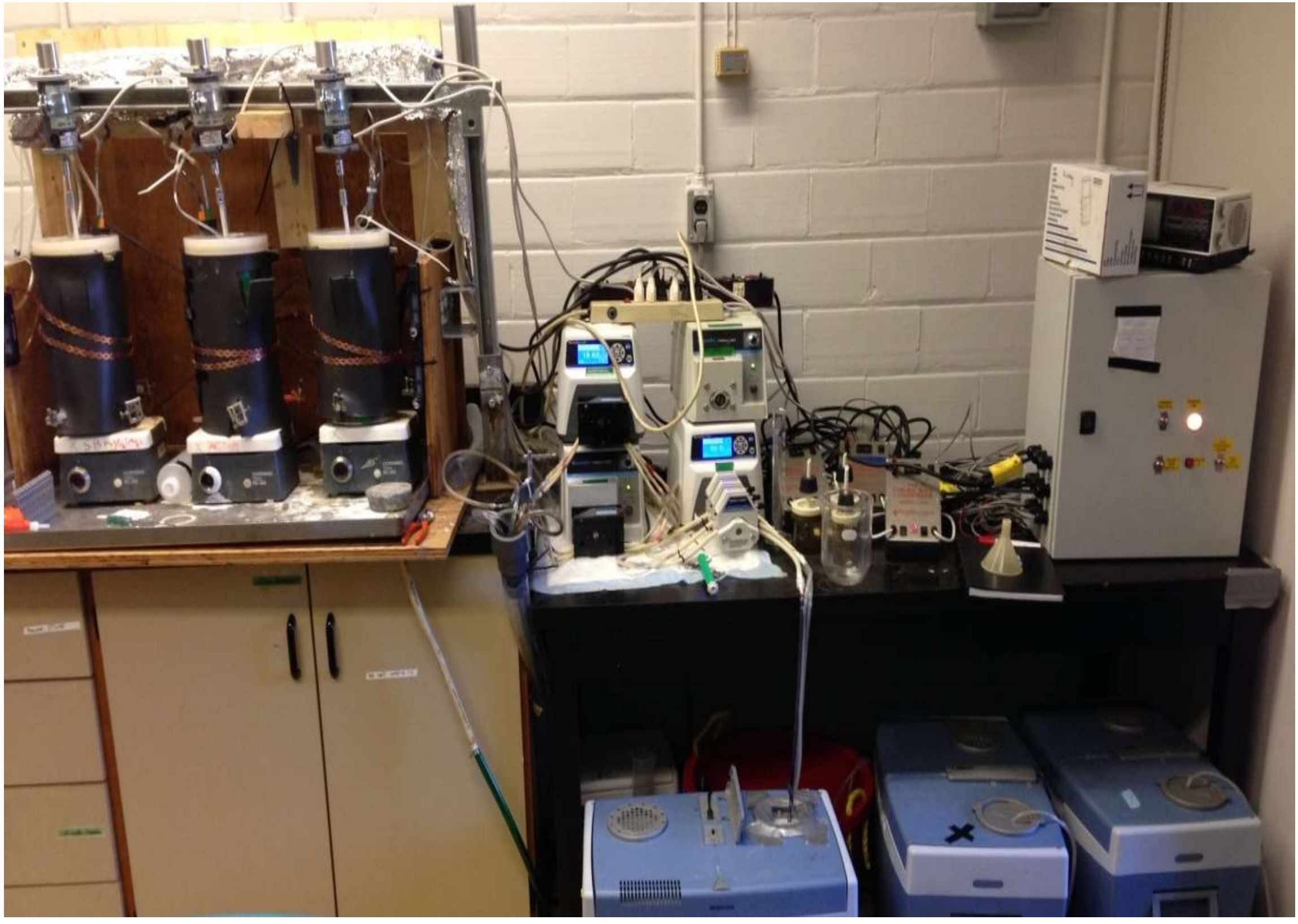
- Ultraviolet disinfection efficiency decreases in the presence of microbial flocs
- Secondary biological treatment conditions affect microbial aggregates structure and composition which affect UV disinfection
- Conceptual and mathematical models are developed to predict disinfection

Floc Model




N_o
Free Microbes
Tailing (caused by flocs)
N, CFU / 100mL
UV Dose mJ/cm²





Combined Sewer Overflow Treatment

High Rate Chemically-Aided Settling (CAS) and Ballasted Flocculation

Rapid Settling

- Investigate the retention time in the coagulation, polymer injection, maturation, and settling phases

- The optimum type and dosage of coagulant, polymer, and micro-sand

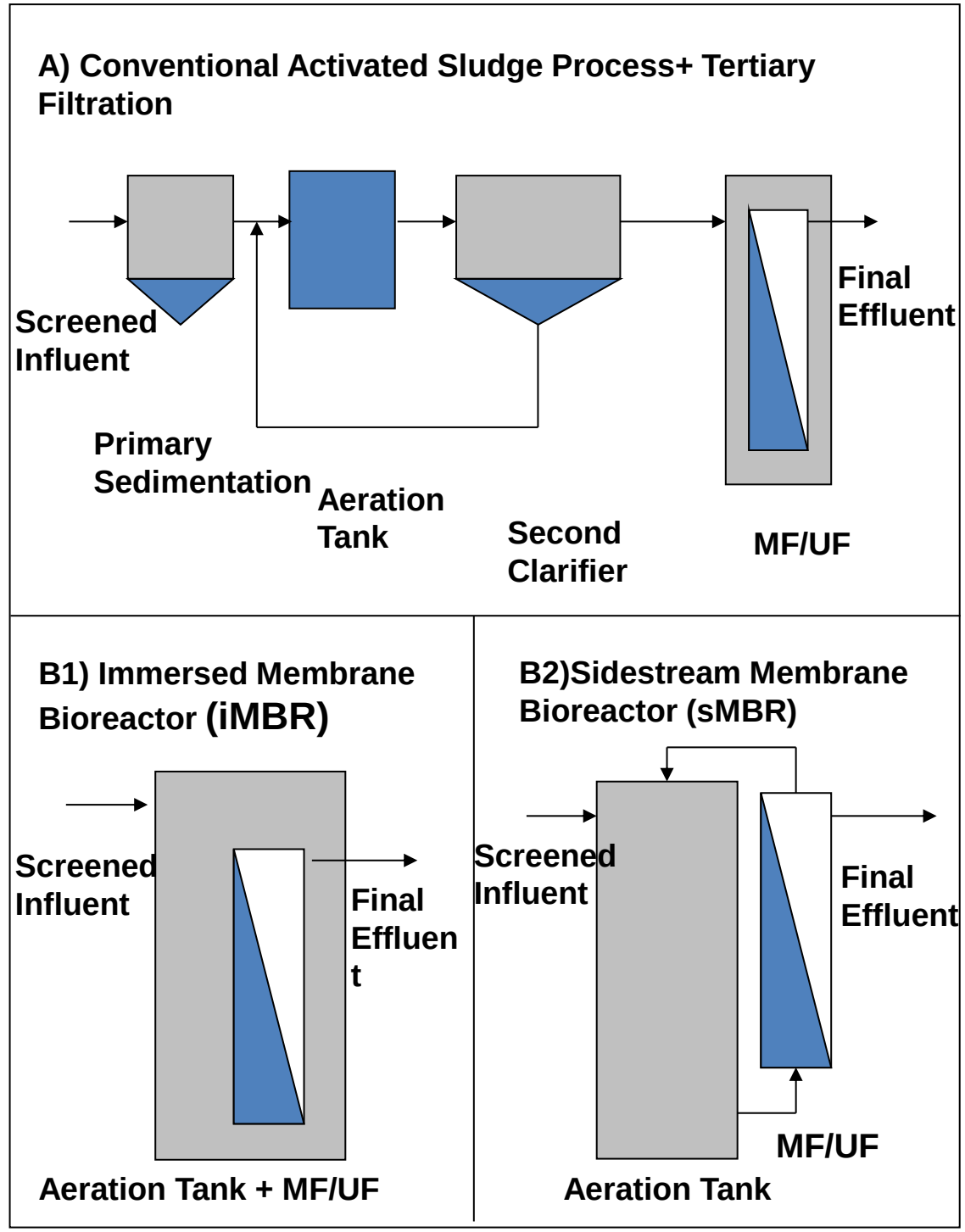
Study the fundamentals of Cake Filtration

- Investigate the permeability of different cake and media
- TSS removal efficiency
- Particle size effect

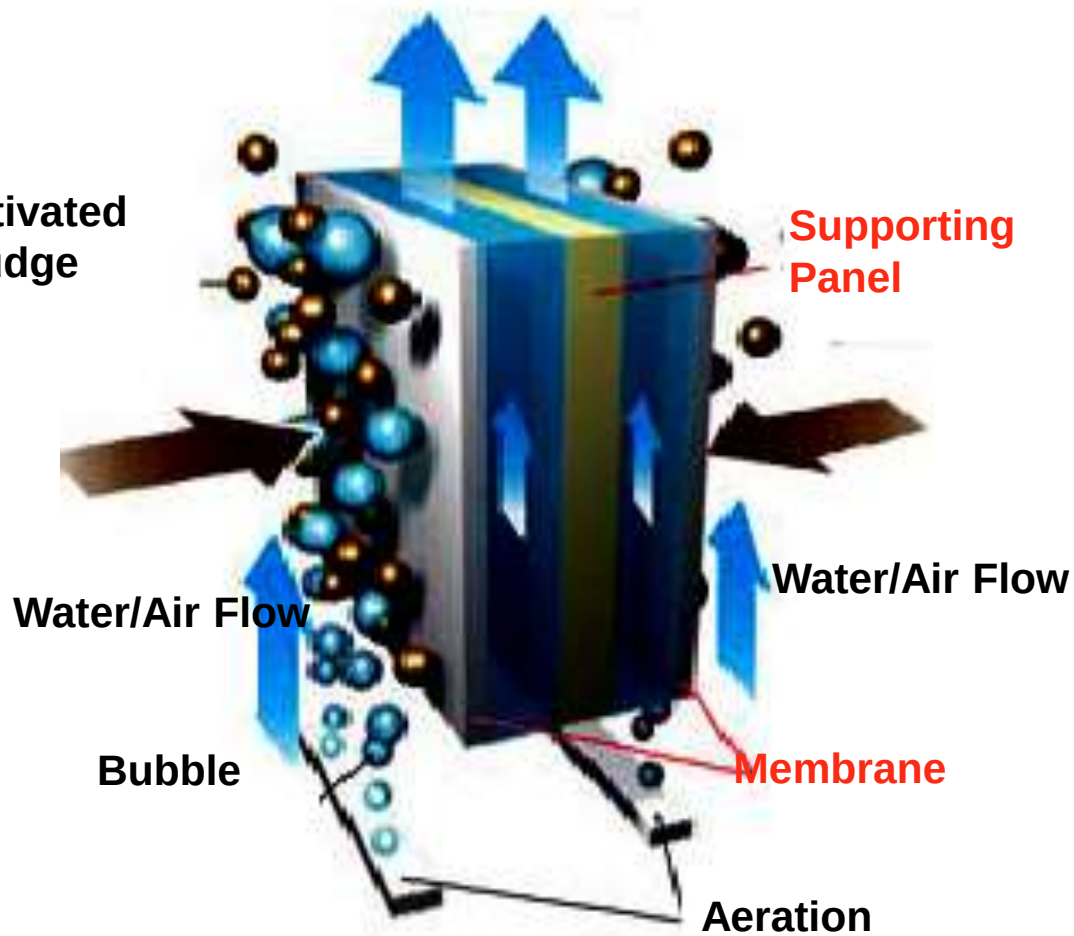
Rapid Filtration

Cellulose-Based Membrane and It's Applications

- Developing new composite membranes through additive adding, refining, calendaring and cross-linking to appropriate pore size from MF applications & through coating for preparing cellulose based UF membrane
- The new composite membrane has good mechanical strength, is cheaper, is biodegradable and made from renewable resources.



Conceptual Drawing of filtration



Module