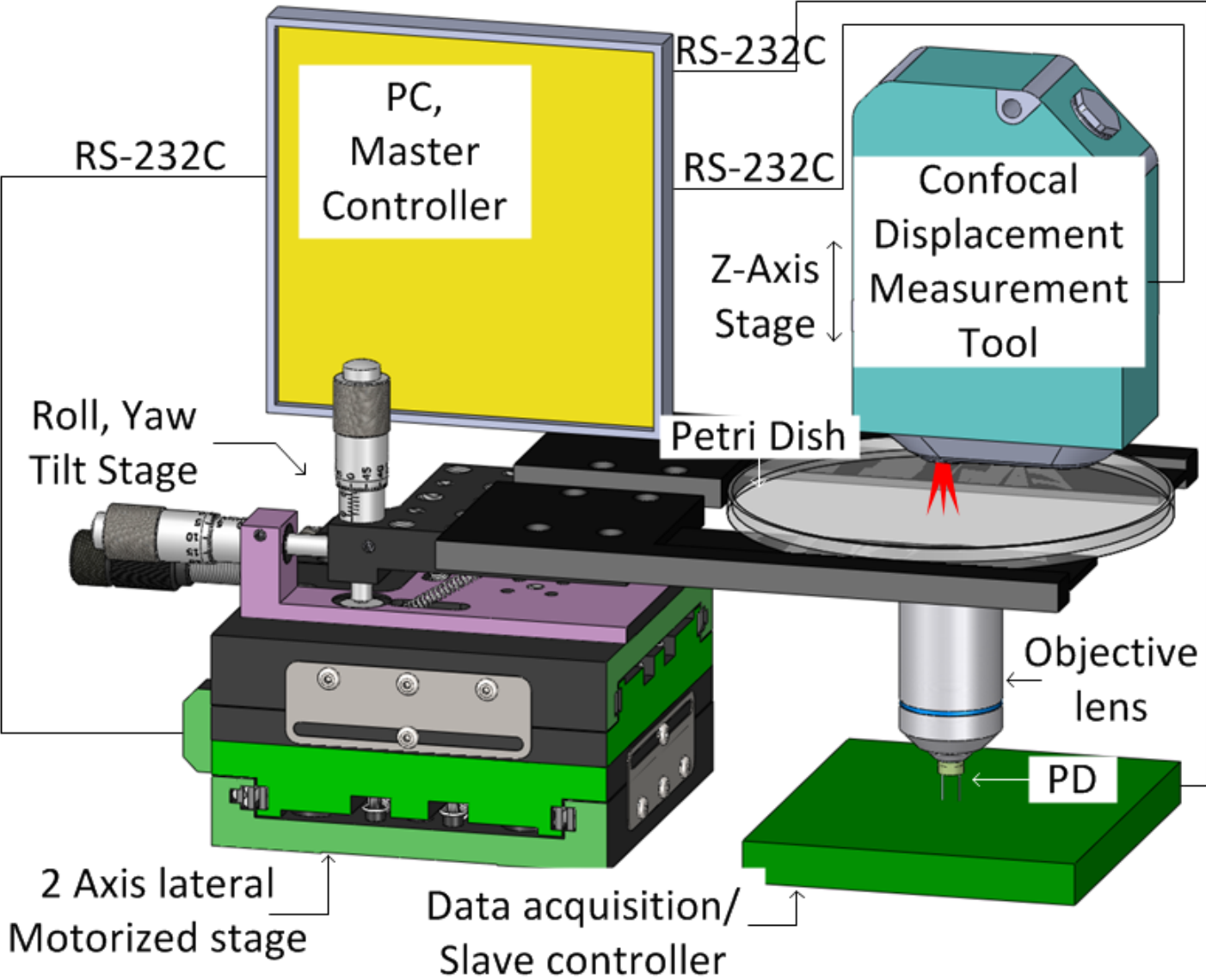


Integrated Colony Morphology Analysis

Bacterial colony consists of myriad of individual bacterium along with some extracellular materials. This means that they form a complex communities of cells behave differently based on physical and chemical environment where their macro and microscopic morphology can be spatially distributed. Recent introduction of the forward scattering patterns from bacterial colonies have indicated their different physical properties during their growth. In order to understand the biophysics behind this phenomenon, a confocal displacement meter was used to measure the profiles of the bacterial colonies, together with a custom built OD (Optical Density) process unit for simultaneous measurement. Using the integrated system, both morphology and OD of two bacterial genera: *Staphylococcus aureus* ATCC 25923 and *Escherichia coli* O157:H7 EDL933 were measured in a time dependent way and two different regions (center and edge) of the colony were selected for comparisons of the growth dynamics. For example, aspect ratio (diameter to the center height ratio) of *S. aureus* was approximately two times higher than the *E. coli* O157:H7 while OD of *S. aureus* was approximately 1/3 higher than *E.coli* O157:H7. In addition, growth rate for *S. aureus* peaked at 0.186 h^{-1} rapidly and plateaued at 0.11 h^{-1} , while that of *E. coli* O157:H7 was varying from 0.018 h^{-1} to 0.11 h^{-1} gradually. The developed system was able to deliver quantitative growth dynamics (height, diameter, aspect ratio, OD, etc) of the bacterial colony which is a foundational to understand the growth mechanisms and relationship to the forward scattering patterns.

[See more at Research area]

ICMA (Integrated Colony Morphology Analyzer) Schematic



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