Robotic High Throughput Rheology Platform

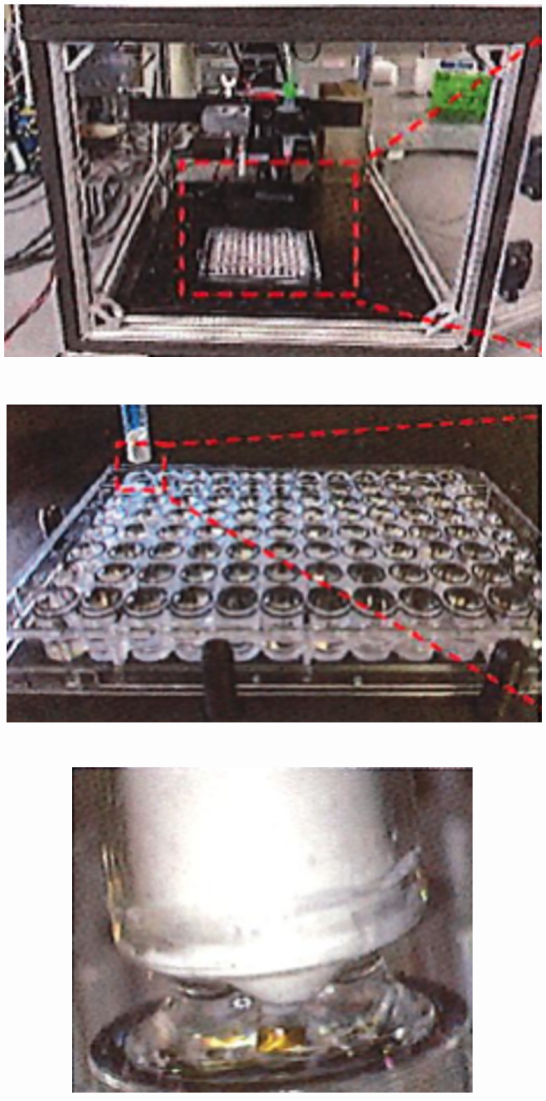
VTIP 20-049: "A Sensor-Based High Throughput Characterization Rheology Platform"

THE CHALLENGE

Current gel material characterization techniques are low throughput, present barriers to process integration, and are limited regarding the frequency range over which rheological properties can be characterized. As a result, they limit the pace of materials discovery shifting the paradigm of material characterization towards the use of automated platforms. Automation is needed to eliminate such bottlenecks and significantly accelerate the pace of materials discovery.

OUR SOLUTION

Blake Johnson and his team in the department of Industrial and Systems Engineering at Virginia Tech have developed a novel robotically guided platform for high-throughput characterization of liquids and gels in multi-well plate formats. This invention will shift the paradigm of rheology analysis toward the high-throughput workflows associated with bioanalysis. The innovative platform can provide material characterization that facilitate the development of products with viscoelastic properties and sol-gel phase transitions, bioanalysis of engineered tissues and gel-based products, fundamental rheology, and characterization of gelatin processes for molecular and material development/discovery. This new platform will enable rapid development of new high performance materials.



Photos of the novel automated high throughput rheology platform at various magnifications.

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