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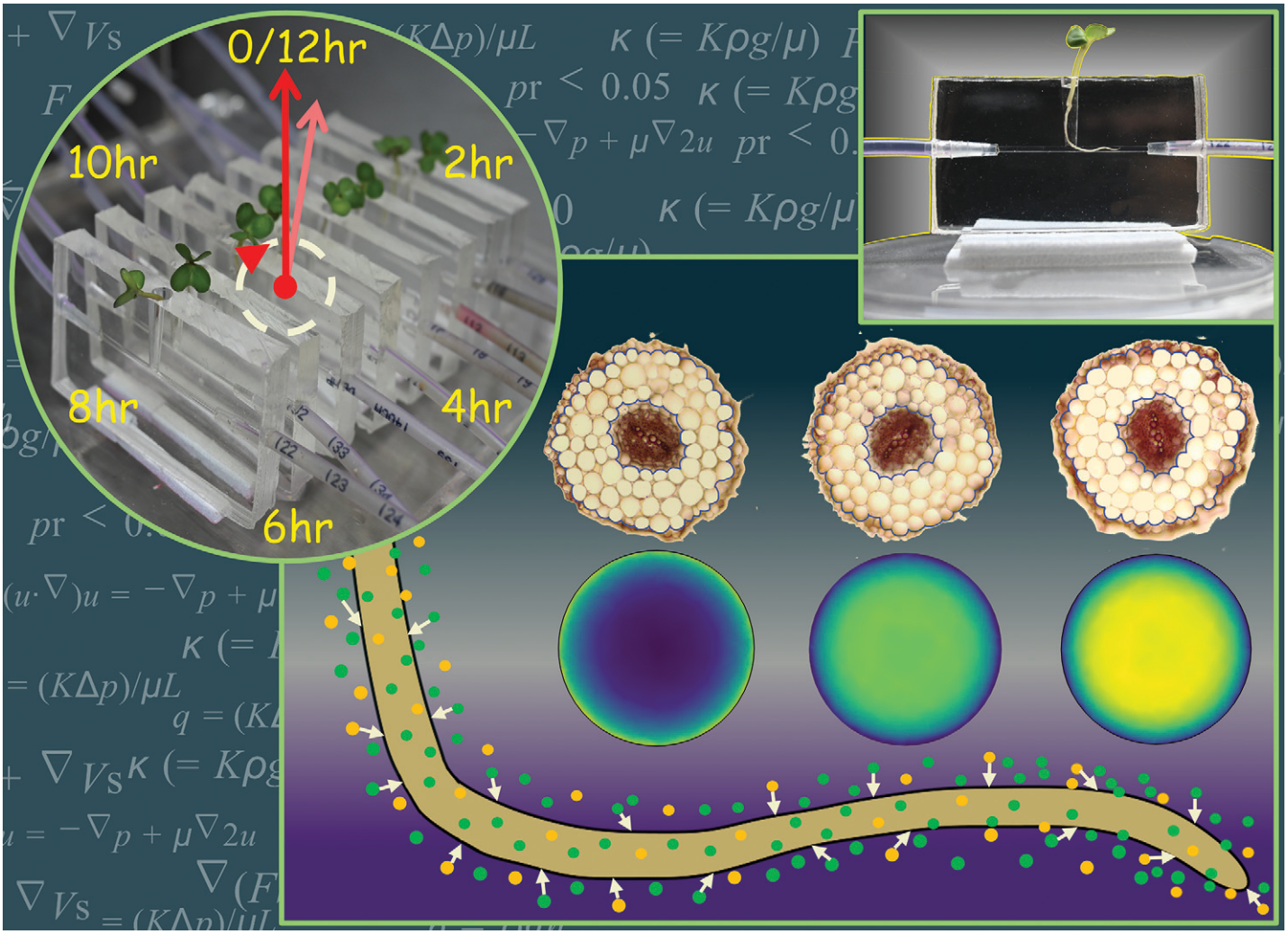

Showcasing research from Dr. Pranab Kumar Mondal's laboratory (Micro/Phyto fluidics Laboratory), Indian Institute of Technology, Guwahati, India.

Unveiling nutrient flow-mediated stress in plant roots using an on-chip phytofluidic device

The study employs PDMS-based Plant Root Fluidic Device (PRFD) for on-chip growth and real-time morphological micrography of plant roots, specifically as a miniaturized hydroponic device. Off-chip anatomical studies, numerical simulations, and nitrogen uptake analyses were conducted to examine both plant and mechanical stresses. The research explores how nutrient flow affects early root development and thigmomorphogenesis in Brassica *juncea* using PRFD to simulate soil-like conditions. Optimal flow boosts root length and nitrogen uptake, while excess flow stresses and reduces growth. These insights aid hydroponics and soil-less agriculture. Copyright holders: Kaushal Agarwal, Sumit Kumar Mehta, Pranab Kumar Mondal.

As featured in:

See Pranab Kumar Mondal *et al.*, *Lab Chip*, 2024, **24**, 3775.

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