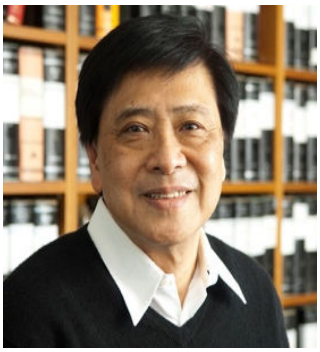
Disruptive & Sustainable Technologies for Agricultural Precision (DiSTAP)

Programme Leaders

Prof Michael Strano, Massachusetts Institute of Technology



Prof Chua Nam Hai,Temasek Life Sciences Laboratory

Disruptive & Sustainable Technologies for Agricultural Precision (DiSTAP) Interdisciplinary Research Group (IRG) is one of the five IRGs in the Singapore-MIT Alliance for Research and Technology (SMART) Centre. DiSTAP started in January 2018 and is a research programme funded by the National Research Foundation (NRF), under its Campus for Research Excellence and Technological Enterprise (CREATE) programme.

Research

DiSTAP aims to revolutionize how food is produced to meet the demands of a growing population in an increasingly resource constrained world. DiSTAP will:

(1) Develop tools that will allow scientists to study how plants adapt and develop. We are using nanotechnology and microelectronics to create sensors that can measure, in real-time, the flow of nutrients and hormones within plants.

(2) Leverage on these knowledge and tools to select and develop plant varieties that are richer in nutrients and can grow in high density.

(3) Develop complementary technologies for producing nutrients and high-value food components at high volume.

(4) Apply these technologies to improve urban farming.

Researchers

DiSTAP is a highly collaborative effort that will bring together 4 primary entities: **MIT**'s expertise in nanosensor development, optical sensor fabrication, microbial engineering and biosynthesis with the **Temasek Life**

Sciences Laboratory's expertise in plant engineering and gene discovery, **NTU**'s capabilities in polymer synthesis, and **NUS**'s know-how in protein engineering and microbial engineering.

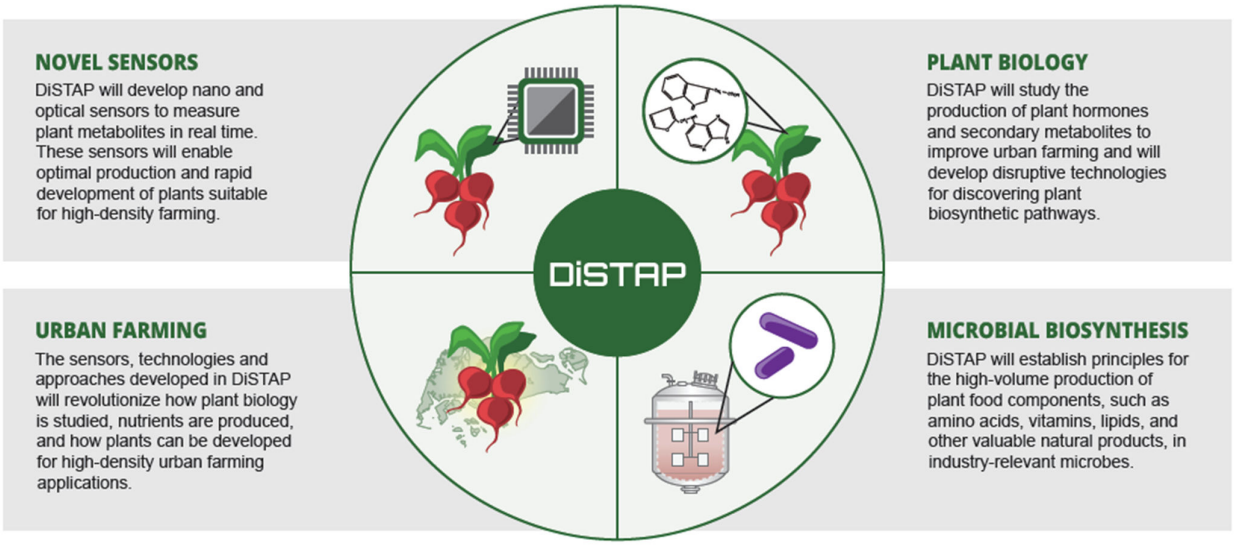
Highlights

Develop new tools to study and engineer plant systems to improve the yield of leafy vegetables

The overarching goal of Thrust 1 is to design, fabricate, validate and apply a new generation of analytical methods, including nanosensors and portable Raman instruments, to transform the science and engineering of plant systems. These sensors will revolutionize how plant biology is studied and how plants are engineered and developed for high-density urban farming applications.

Advance urban farming using DiSTAP analytics and engineering food components into microbes

In Thrust 2, we aim to use the novel DiSTAP analytics developed in Thrust 1 to understand the production of plant hormones and secondary metabolites to improve urban farming and to develop disruptive technologies for discovering and mutating plant biosynthetic genes, and to establish principles for producing hydrophobic plant food components in industry-relevant microbes.



For more information about the SMART DiSTAP IRG, please contact: Dr Farzad Olfat, Senior Program Manager (farzad@smart.mit.edu) or Dr. Min Hao Wong, Dy Sci. Director (smrwmh@nus.edu.sg) Website: http://smart.mit.edu/

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