Research Projects in the SMART DiSTAP IRG
(August 4, 2018)

1. **High Specificity Carbon-nanotube-Polymer Plant NanoBiosensors**
   These projects will develop novel nanosensors that will be used for in-plant monitoring or genetic engineering. The student will work in a highly interdisciplinary environment with plant biologists, chemical engineers, materials scientists and physicists to develop important solutions toward precision agriculture in urban city centers.

   **MIT Principal Investigator(s):**
   Michael STRANO (Chemical Engineering)

   **Singapore Co-Investigator(s):**
   Mary CHAN (NTU, Chemical & Biomedical Engineering)

2. **Nanomaterial enabled delivery of genetic cargo for the transformation of plant cells and organelles**
   These projects will develop novel nanosensors that will be used for in-plant monitoring or genetic engineering. The student will work in a highly interdisciplinary environment with plant biologists, chemical engineers, materials scientists and physicists to develop important solutions toward precision agriculture in urban city centers.

   **MIT Principal Investigator(s):**
   Michael STRANO (Chemical Engineering)

   **Singapore Co-Investigator(s):**
   Mary CHAN (NTU, Chemical & Biomedical Engineering)

3. **Production of plant-origin vitamins by using engineered microbes**
   These projects will develop engineered microbes to produce important biological products such as plant-origin vitamins. Students will interact with a large number of cross-disciplinary staff at NUS and MIT and develop bioprocess engineering, genetic engineering, chemistry and analytical skills.

   **MIT Principal Investigator(s):**
   Gregory STEPHANOPOULOS (Chemical Engineering)
   Anthony SINSKEY (Biology)

   **Singapore Co-Investigator(s):**
   Zhou KANG (NUS, Chemical Engineering)
4. Discovering biosynthetic genes for value-added natural products
These projects will develop engineered microbes to produce important biological products such as plant-origin vitamins. Students will interact with a large number of cross-disciplinary staff at NUS and MIT and develop bioprocess engineering, genetic engineering, chemistry and analytical skills.

**MIT Principal Investigator(s):**
Gregory STEPHANOPOULOS (Chemical Engineering)
Anthony SINSKEY (Biology)

**Singapore Co-Investigator(s):**
Zhou KANG (NUS, Chemical Engineering)

5. Investigating alternative biosynthetic pathways for isoprenoid production
These projects will develop engineered microbes to produce important biological products such as plant-origin vitamins. Students will interact with a large number of cross-disciplinary staff at NUS and MIT and develop bioprocess engineering, genetic engineering, chemistry and analytical skills.

**MIT Principal Investigator(s):**
Gregory STEPHANOPOULOS (Chemical Engineering)
Anthony SINSKEY (Biology)

**Singapore Co-Investigator(s):**
Zhou KANG (NUS, Chemical Engineering)

6. Genome reduction to improve microbial fitness for biotechnological applications
These projects will develop engineered microbes to produce important biological products such as plant-origin vitamins. Students will interact with a large number of cross-disciplinary staff at NUS and MIT and develop bioprocess engineering, genetic engineering, chemistry and analytical skills.

**MIT Principal Investigator(s):**
Gregory STEPHANOPOULOS (Chemical Engineering)
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