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The NYCU teams once again won gold and silver medals at the 2023 International Genetically Engineered Machine Competition, achieving proud success!



NYCU-Taipei iGEM with the "Vigila Guard" project, secured a silver medal, while NYCU-Formosa achieved the remarkable feat of winning the world gold medal in the 2023 iGEM.

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The 2023 International Genetically Engineered Machine Competition (iGEM) concluded in November in Paris, France, featuring nearly 400 outstanding teams from around the world. Among them, two teams from National Yang Ming



The NYCU-Formosa team used AI to predict adhesive proteins, confirming their functionality through experiments. Integrating



Chiao Tung University (NYCU), namely **NYCU-Taipei iGEM** and **NYCU-Formosa**, made significant achievements. The 'Vigila Guard' project by NYCU-Taipei iGEM secured a silver medal, while NYCU-Formosa achieved the remarkable feat of winning the world gold medal.

The NYCU-Taipei iGEM 'Vigila Guard' project contributes to global health.

Under the direction of postdoctoral researcher Dr. Ching-Fen Chang (Dr. Jane) and professors I-Fang Chung and Yu-Chao Wang, the team of 19 individuals from six departments worked together to enter the competition. With 'Vigila Guard' as their theme, they utilized genetic engineering techniques to develop a non-invasive, portable biological device capable of real-time detection, aiming to enhance personalized health protection and management.

This groundbreaking project involves constructing a 'dual-function' biological device capable of detecting inflammatory factors and emitting fluorescent signals. Simultaneously, it promotes anti-inflammatory effects by measuring the quantity of

bioart, they employed red and green fluorescent proteins, and Petri dishes depicted the NYCU abbreviation with a simplified pattern.

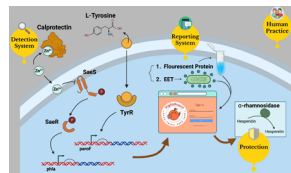
NYCU-Formosa: Advancing from Experimental Research to Promoting Science in Society

The NYCU-Formosa team effectively bridges the realms of science and humanities through the medium of bio art. By integrating a modular platform with bio-cloning techniques, they've engineered genetically modified bacterial strains, each displaying distinct colors. Simultaneously, the team has developed user-friendly instructional materials.

Actively involved in educational outreach across various schools, the team's initiatives aim to broaden students' perspectives on the field of biology, unveiling the diverse facets of synthetic biology. Their work vividly showcases the integrated application of bioengineering, information technology, and humanities, highlighting NYCU's comprehensive strengths in the global iGEM competition across biological, engineering, and social disciplines.



the antioxidant quercetin. The team successfully employed photosensitive resistors and 3D printing technologies to build detection instruments. These instruments transmit real-time signals to users' phones through the cloud, achieving personalized health monitoring. The success of 'Vigila Guard' is expected to profoundly impact global health issues, particularly in the detection and alleviation of inflammation.



The overall conceptual design and schematic diagram of 'Vigila Guard.' And it includes three main components: detection, reporting, and protection.

The NYCU-Taipei iGEM team has been participating in this international competition since 2007, consistently earning numerous international honors for Taiwan and the university. Over the past 17 years, the team has amassed impressive achievements, including a World Championship in the environmental category, a consistent top-six global ranking, a third position in Asia, and a total of 12 gold, 3 silver, and 2 bronze medals.



The pioneering NYCU-Formosa team invites global iGEM teams to record podcasts, merging art and science to promote synthetic biology. They also developed the Foxyprot web software, streamlining the use of complex machine learning models.

The Elite Force of Synthetic Biology in Taiwan

In the 2023 iGEM competition, NYCU showcased Taiwan's outstanding prowess in synthetic biology through the 'Vigila Guard' project by the NYCU-Taipei iGEM team and the modular biological materials developed by the NYCU-Formosa team. This event not only marked a scientific celebration but also served as an exemplary model of interdisciplinary collaboration. The NYCU-Taipei iGEM team, leveraging technology, safeguarded health and contributed a sense of care to global society. Meanwhile, the NYCU-Formosa team, with their modular biological materials, led the biotechnology trend, infusing science's beauty into every corner.

These two teams' success



NYCU-Formosa Drives Innovation with 'Modular Biomaterials.'

In yet another remarkable achievement, the NYCU-Formosa team, guided by Professor Wen-Liang Chen, Assistant Professor Hsiao-Ching Lee, and Dr. Huai-En Lu, clinched a world championship. This accomplishment was realized through the creation of a modular adhesive protein platform, seamlessly integrated with AI technology, resulting in the development of the protein functional prediction software named Foxyprot.

The NYCU-Formosa team undertook interdisciplinary development for "Modular Biomaterials for Various SDGs Issues," introducing innovative and widely applicable modular materials. They successfully demonstrated protein adhesiveness using mathematical models and programming to predict adhesive proteins. The novelty of this modular platform lies in its ability to simultaneously preserve protein functionality and adhesiveness, making it a superior and user-friendly biomaterial.

brought glory and showcased top-notch academic standards in Taiwan. They engaged in international collaboration on the global stage while promoting science to society, broadening students' perspectives, and cultivating cross-disciplinary learning abilities. We express gratitude for the dedication and efforts of the school, mentors, and every team member over the years, enabling NYCU to achieve excellence in the iGEM competition once again.



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