



Press release

Gold medal for the Genopole Évry Paris-Saclay team at iGEM 2024

At the 2024 edition of the international synthetic biology competition iGEM, the Évry Paris-Saclay team won gold with PHAGEVO, a project focused on the directed evolution of proteins to better detect compounds resulting from plastics degradation. The team's work was also nominated for the Best Foundational Advance Project Award, boosting it into the Top 10 of the best "overgrad"¹ teams and helping it shine among the 400 teams in all participating in the competition.

Évry-Courcouronnes, 4 November 2024 - The University of Évry-Paris Saclay and Genopole are proud to announce the success of their team at the 2024 edition of iGEM, a world-renowned international competition for synthetic biology. This year's team was composed of 13 university bachelor & master degree and engineering school students, supervised by 2 PhD students and headed by Associate Professor Ioana Popescu, who has guided iGEM teams since 2017. They competed in the "Foundational Advance" category (or "village" in iGEM parlance).

Their 2024 project involved the directed evolution of proteins, a technology aimed at optimizing genetic mutations to improve the effectiveness of resulting proteins for a given task. By employing two complementary methods, the team combined both random and targeted mutation techniques to select pertinent mutations and eliminate deleterious ones. Their proof-of-concept protein, the XylS transcription factor, can detect certain benzoic acids resulting from hydrocarbon degradation. The team's at-term objective is to create XylS mutants able to detect other compounds, notably those resulting from plastics degradation, with an aim to developing enzymes able to break them down.

"The team has been working on the project since last January and this is a unique opportunity for the students to deploy their competencies acquired during their studies in an international setting," underlines **Ioana Popescu, teaching researcher at the University of Évry-Paris Saclay**. *"We seek to develop innovative technologies while increasing the visibility of the university for the synthetic biology field. We plan to publish our work if its results continue to be promising. The objective is always to have a concrete scientific impact and allow the students to participate in advanceable research."*

The Genopole Évry Paris-Saclay teams have won many distinctions over the years, including gold medals every year since 2017 and the *Best Hardware* prize in 2023. The 2024 team competed in the "Model," "Software Tool," and "Part Collection" categories, in coherence with its advances in the current project.

"Jury's Favorite" prize at the D4Gen Hackathon

An earlier form of what would become the PHAGEVO project had already won a *Coup de cœur* prize at Genopole's D4Gen Hackathon held in March. Through that event, the project was able to benefit from the support of bioinformaticians who enabled the artificial intelligence for mutation predictions. The Wet Lab team tested the AI's predictions in the lab, in parallel with the directed evolution experiments. These partnerships have already produced promising results that the team hopes will lead to scientific publication in the future.

Participating in iGEM is part of the continuing initiatives by the University of Évry-Paris Saclay and Genopole to promote the fast-emerging field of synthetic biology. These actions confirm the two institutions' commitment to forming future experts for the sector while also strengthening their international renown in it.

- PHAGEVO project promotion video (2 min): https://youtu.be/yfifAle87_4
- PHAGEVO project presentation video (15 min): <https://youtu.be/BPHAbYuT1h4>

¹ *Overgrad* describes the student teams comprising at least one member aged greater than 23 years.

A propos de Genopole

Biocluster français dédié à la recherche en génétique et aux biotechnologies appliquées à la santé et à l'environnement, Genopole rassemble 66 entreprises de biotechnologies, 17 laboratoires de recherche, 24 plateformes technologiques, ainsi que des formations universitaires (Université d'Évry - Paris Saclay).

Son objectif : soutenir les entreprises de biotechnologies et le transfert de technologies vers le secteur industriel, favoriser le développement de la recherche dans les sciences de la vie, développer des enseignements de haut niveau dans ces domaines. Présidé par Stéphane Beaudet, Vice-président de la Région Île-de-France et maire d'Évry-Courcouronnes, et dirigé par Gilles Trystram, Genopole est principalement soutenu par l'État, la Région Ile-de-France, l'agglomération Grand Paris Sud et l'AFM-Téléthon.

En savoir plus : <https://www.genopole.fr>



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About the University of Évry-Paris Saclay:

The University of Évry-Paris Saclay (Paris-Saclay University, ranked 12th in the world and 1st in Europe in the Shanghai Ranking) counts 19 laboratories and nine research platforms in close association with Genopole in particular. Every year, the University welcomes more than 11,000 students, who are accompanied by 1,000 staff members (administrative and research) on the road to their success.

The University of Évry-Paris Saclay is France's second-leading vocational learning institution, with 16% of its students in apprenticeships. The university's curricula enable diplomas across all fields (excepting health) and an excellent employment outcome rate.

The University of Évry-Paris Saclay is a springboard for the ambitions of today's students, a vital accompaniment for revealing talent, a culture for opening minds and a mission to create the world of tomorrow.

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