

## Press release

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## New method shows promise for the design of more robust microbial strains in biotechnology

From sourdough starters to biotechnological bugs, micro-organisms make the products society wants and needs. The new [European Green Deal](#) is dependent on engineered microbes to make biochemicals to replace oil and synthetic chemicals as building blocks for consumer goods. Microbes can be repurposed to make useful products but one limitation is that many microbes are not able to cope with the stressful conditions of industrial production. Scientists are searching for ways to increase the strength and resilience of industrial microbes like yeast. This will accelerate the development of clean sustainable processes for industry.

Researchers in the EU-funded project [CHASSY](#) took an innovative approach to find ways of increasing the stress tolerance of yeasts. They used high-end computational studies to identify genes that were extra active in yeast under stress. The function of most of these genes was not known, so the researchers developed a new gene-sorting method to try and understand them. In an unexpected twist, the most important genes were all young genes that evolved recently. That means in the last 25 million years or so! These findings have just been published in the scientific journal *Nature Communications* ([www.nature.com/articles/s41467-020-16073-3](http://www.nature.com/articles/s41467-020-16073-3)).

This result is a game-changer since it now points scientists in a new direction for biotechnology. By inserting these new genes into industrial yeasts, it will be possible to construct more robust strains that will perform better in large industrial fermentations. According to the project lead, Dr John Morrissey (University College Cork) “*Up to now, everybody focused on ancient genes that are shared among all species. Our results indicate that the more relevant genes are those that evolved recently to help yeasts adapt to harsh environments. This really represents a paradigm shift*”. This work will lead to more rapid development of alternatives to current unsustainable industrial production and benefits both the economy and the European citizen.

This international study, which took place over the course of three years is a collaboration between University College Cork (IE), Delft University of Technology (NL), the French National Research Institute for Agriculture, Food and Environment (FR), and Chalmers University of Technology (SE), as part of the Horizon 2020 Industrial Leadership project [CHASSY](#). For more information about this study, contact the CHASSY coordinator and study lead, Dr John Morrissey, University College Cork ([J.Morrissey@ucc.ie](mailto:J.Morrissey@ucc.ie)).

nova-Institute is proud to be in the CHASSY consortium for its dissemination and communication activities.

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Dipl.-Phys. Michael Carus (Managing Director)  
nova-Institut GmbH, Chemiepark Knapsack, Industriestraße 300, DE-50354 Hürth (Germany)

Internet: [www.nova-institute.eu](http://www.nova-institute.eu) – all services and studies at [www.bio-based.eu](http://www.bio-based.eu)

Email: [contact@nova-institut.de](mailto:contact@nova-institut.de)

Phone: +49 (0) 22 33-48 14 40

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