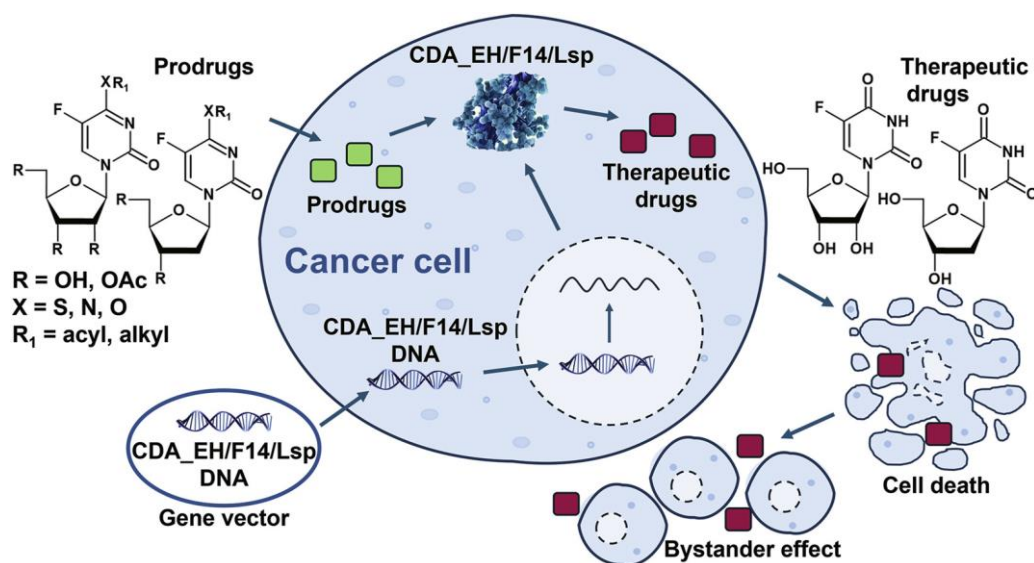


# Hydrolases and uses thereof

## BRIEF DESCRIPTION OF A TECHNOLOGY

This technology presents a novel enzyme-prodrug system for targeted cancer therapy based on bacterial cytidine deaminases CDA\_EH, CDA\_F14, and CDA\_Lsp. These enzymes efficiently activate non-toxic 5-fluoropyrimidine nucleoside prodrugs by converting them into cytotoxic metabolites such as 5-fluorouridine and 5-fluoro-2'-deoxyuridine. In contrast to human CDA, the bacterial variants display broader substrate specificity and higher activity, activating a wider range of modified prodrugs. Tested in cancer cell models, the enzyme-prodrug combinations demonstrated potent, selective cytotoxicity, highlighting their potential as next-generation therapeutic tools for precision oncology.



## PURPOSE

This technology aims to develop a targeted cancer therapy platform in which bacterial cytidine deaminases selectively activate non-toxic prodrugs inside tumor cells, producing cytotoxic metabolites locally to maximize anticancer efficacy while minimizing systemic side effects.

## FIELDS OF APPLICATION

Applications of this technology range from next-generation cancer therapies to the development of innovative fluoropyrimidine drugs. It enables gene-directed approaches, accelerates precision oncology solutions, and offers a versatile platform for screening and validating new prodrug candidates.

## TECHNOLOGY READINESS

Technology validated in lab (TRL 4).

## INTELLECTUAL PROPERTY

Patent application: EP4299736 (A3).  
Applicant: Vilnius University.

## INVENTORS

- Rolandas MESKYS
- Nina URBELIENE
- Daiva TAURAITĖ
- Matas TISKUS
- Viktorija PREITAKAITĖ

## RELEVANT PUBLICATIONS

Preitkaitė et al. (2025) Eur J Med Chem., DOI: [10.1016/j.ejmech.2025.117860](https://doi.org/10.1016/j.ejmech.2025.117860).

## CONTACTS

**Dr. Viktorija Preitkaitė**  
Institute of Biochemistry,  
Life Sciences Center,  
Vilnius University  
E-mail:  
[viktorija.preitakaite@gmc.vu.lt](mailto:viktorija.preitakaite@gmc.vu.lt)  
Phone: +370 6 966 7803

**Dr. Ramūnas Grigonis**  
Innovation Office, Department  
for Research and Innovation,  
Vilnius University  
E-mail:  
[ramunas.grigonis@cr.vu.lt](mailto:ramunas.grigonis@cr.vu.lt)  
Phone: +370 5 268 7006