

Chemically Inducible Split Protein Actuators (CISPA)

Fields of use

Biotechnology, Diagnostics tests

Intellectual property

Patent pending

Technology Readiness Level

TRL4

Partner sought

R&D collaboration to further develop the technology.

Licensing or sell of IP rights.

Next steps needed

Partner search for prototype development

Developed by

Department of Synthetic Biology and Immunology

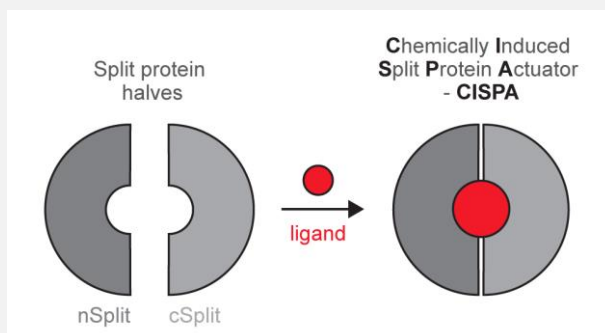
Contact

Knowledge Transfer Office

Phone: + 386 1 47 60 529

E-mail: knowledge.transfer@ki.si

More information about the invention



The invention relates to chemically inducible split protein actuators (CISPA), particularly to their design, manufacture, structure, and uses. The method of engineering CISPAs utilizes ligand-binding proteins or protein domains originating from humans or other organisms, which are rationally split into two fragments that reassemble only in the presence of a cognate ligand, which is typically a small molecule. The designed CISPAs can be used to regulate cellular processes such as gene expression, conditionally reconstitute of the function of a protein such as enzyme activity, as biological sensors, or for other applications.

Technology

The designed CISPAs are based on preferably human derived ligand binding proteins, which are divided into two fragments that reassemble in the presence of a cognate ligand. Thus, interaction between the split protein fragments is controlled by the presence of the selected ligand. This strategy of CISPA design is inspired by rationally designed split proteins, but unlike previous split proteins we use ligands that originally bind these intact proteins to induce reassembly of split protein fragments. CISPAs can be used as biological actuators or as sensors for *in vitro* or *in vivo* detection of selected ligands and respond directly using different reporter output signals or function or change of property.

Main advantages

- Engineered CISPAs are based on human derived proteins or protein domains which are suitable for therapeutic applications
- The engineering principle to design CISPAs is universal and could be used to create novel CISPAs based on almost any ligand binding domain