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STRAIGHTFORWARD IMMOBILIZATION OF CHIMERIC PROTEINS

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A key step of the development of many bio-devices is the immobilization of biologically active molecules. In the case of proteins, homogeneous coverage of surfaces and optimal orientation of the molecules play key roles in the optimization of the process. However, a general immobilization strategy is difficult to formulate, since the methods used are extremely dependent not only on the protein of interest, but also on the target application.
The immobilization strategy we developed is versatile, since it can be applied, in principle, to every recombinant protein and to different applications. We designed and produced chimeric proteins built by a self-assembling adhesive moiety- the class I fungal hydrophobin Vmh2- and various biotechnologically relevant proteins [1].
Hydrophobins are a large family of very active surface proteins produced at different growth stages by filamentous fungi. Class I hydrophobins form extremely robust fibrillar structures sharing structural properties with amyloid fibrils and efficiently adhere to several surfaces [2].
The produced chimeric proteins are endowed with both the ability to adhere on different surfaces and to exploit the own function of the selected target proteins. As proof of our concept, we tested three enzymes, *i.e.* the glutathione-S-transferase, a multicopper oxidase, and a thermostable Arsenate reductase, and three proteins endowed with specific features- the green fluorescent protein, an antibody, and an antimicrobial peptide. Our results demonstrate that these chimeric proteins are an invaluable tool for the functionalization of many surfaces, useful for application in the biosensing and biomedical fields [1, 3, 4].

References

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