



ProGenosis

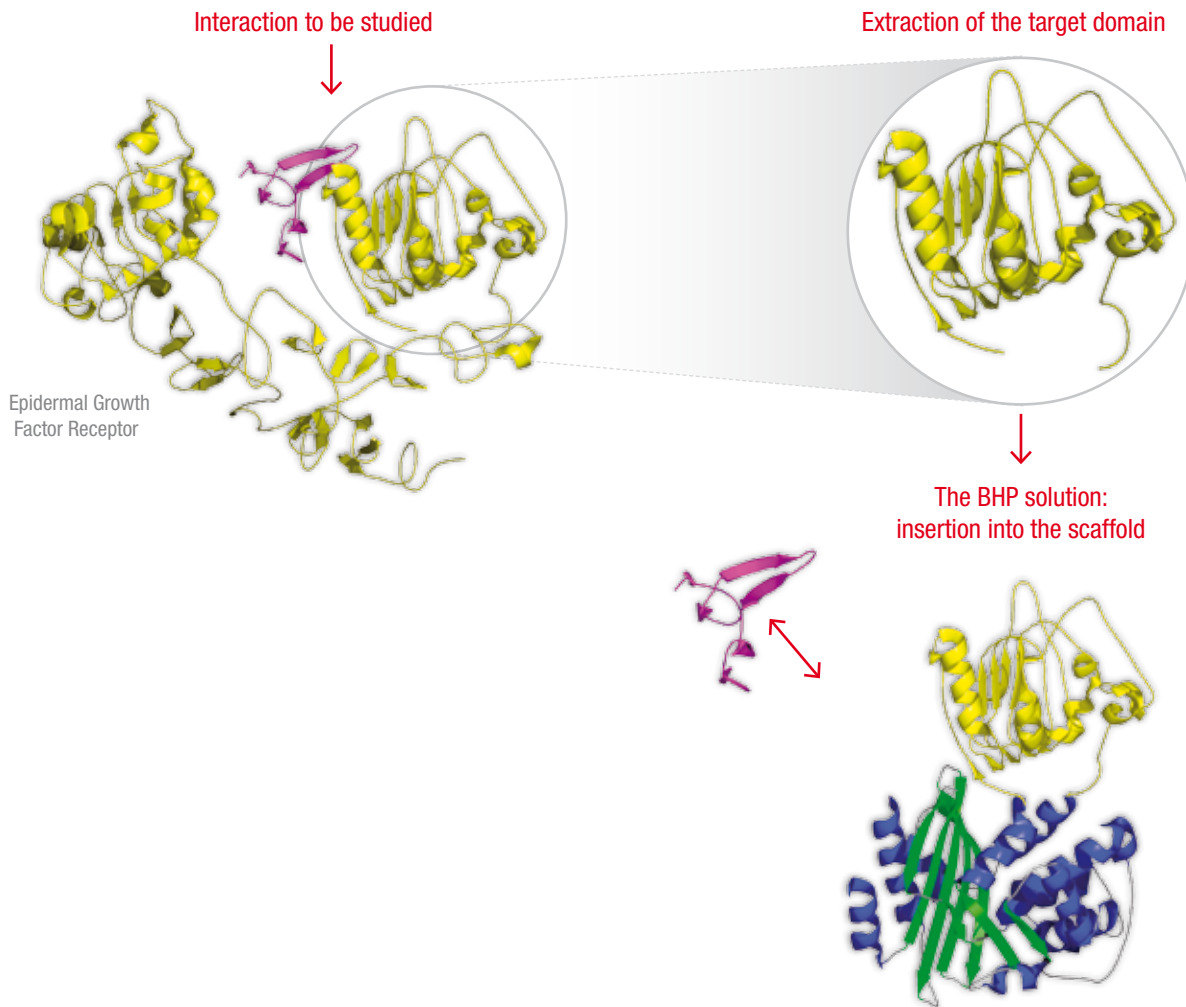
HYBRID PROTEINS PLATFORM

Your partner in

Antibody development

Antibody characterization

Protein engineering & expression



ANTIBODY DEVELOPMENT

- Antigen production & customized antibodies
- Antibodies against non-immunodominant regions
- Antibodies against cryptic regions

ANTIBODY CHARACTERIZATION

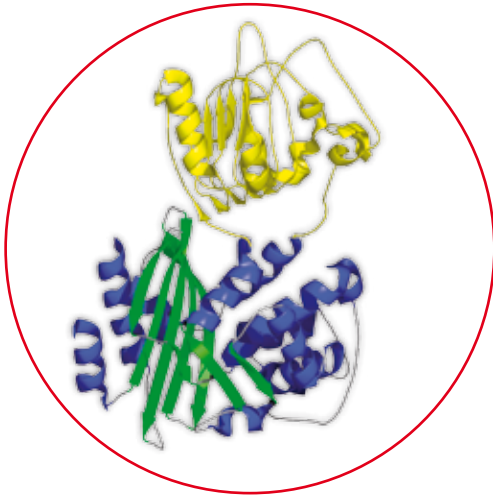
- Epitope mapping (linear and non-linear)
- Key amino acid determination
- Titration assay, dissociation constant

PROTEIN ENGINEERING & EXPRESSION

- GPCR and ion channel loops
- Toxic or low-expressed proteins
- Extra-cellular domains of membrane proteins

Bifunctional Hybrid Protein technology...

... makes your protein domain study easier!



Scientists have always been dealing with quite complex proteins involved in an intricate environment of interactions.

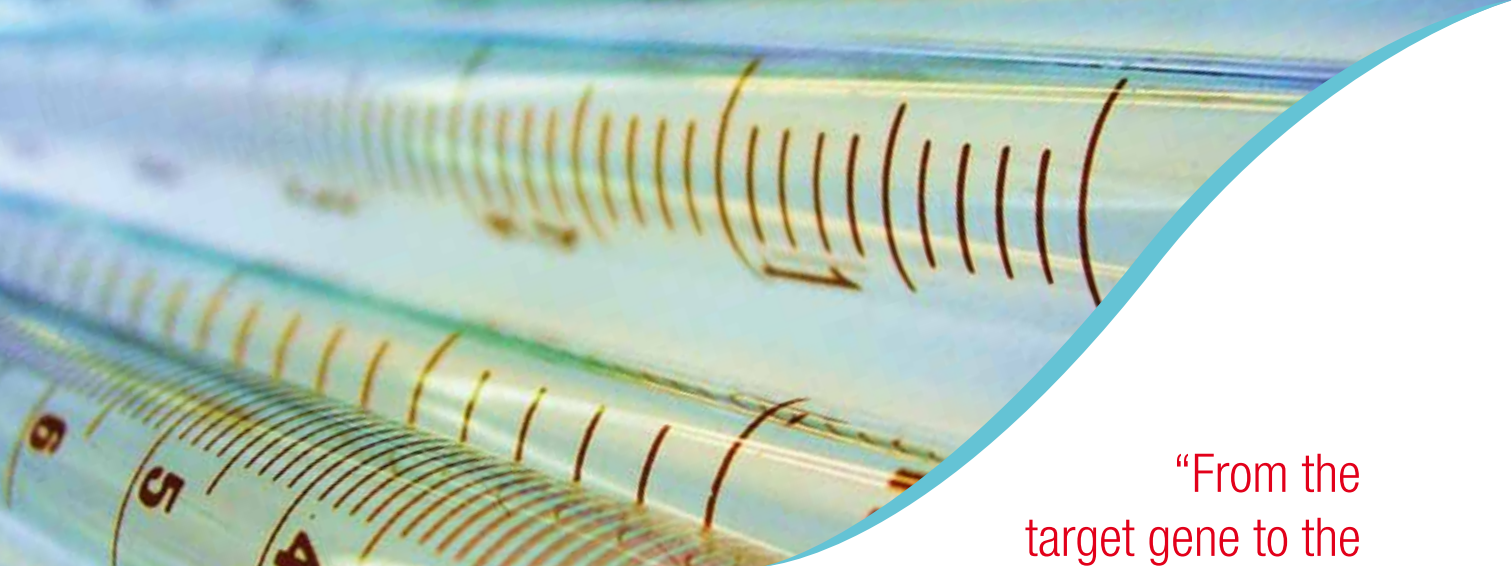
These proteins are sometimes unavailable as functional and suitable material.

Rather than using the whole protein of interest, the **Bifunctional Hybrid Protein** technology (**BHP** technology) allows the dissociation of the different structural elements of a protein.

The target domain (in yellow) is inserted into a protein scaffold (in blue & green).

By doing so, the **protein-protein interaction** environment is simplified and brought into an easily manageable unit, the **BHP**, for **protein domain studies**.

This technology fits perfectly well in application areas for which protein engineering is required or for which interaction characterizations are pivotal.



“From the target gene to the customized antibody”

ANTIBODY DEVELOPMENT

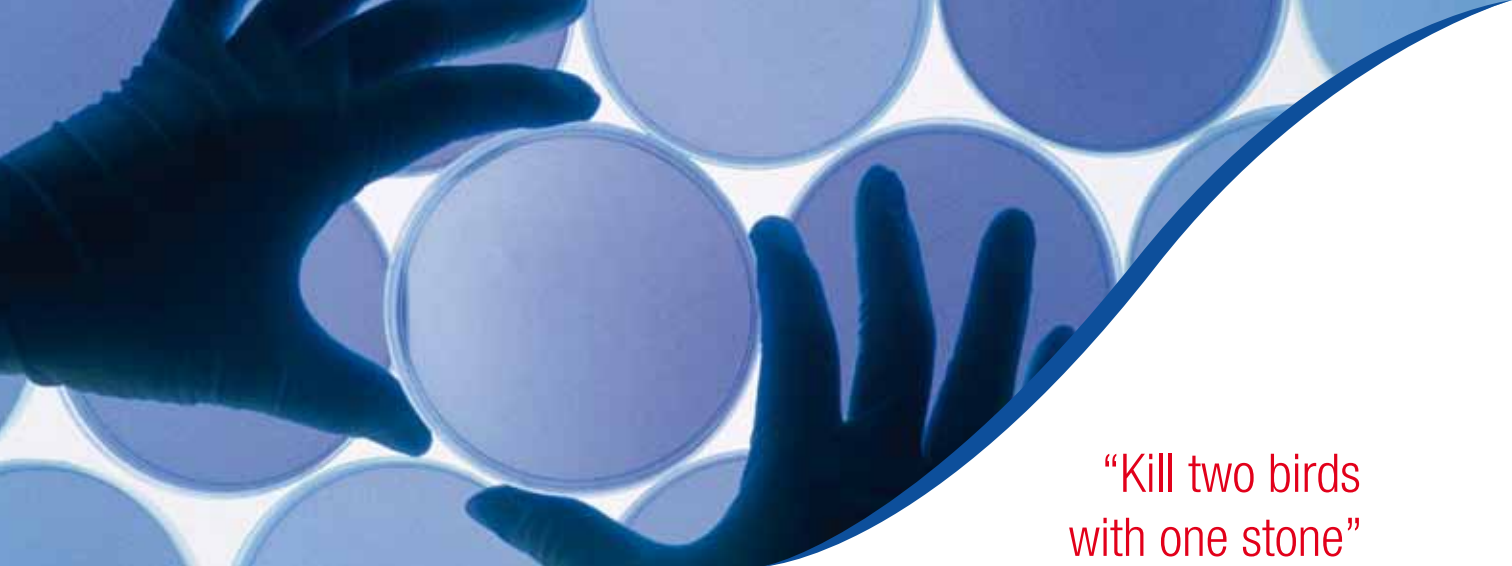
The BHP technology allows the dissociation of an antigen in domains, subdomains or naturally constrained polypeptides.

These *de novo antigens* can be used to generate customized antibodies.

The technology is relevant to raise, among others, antibodies against **cryptic** and **non-immunodominant regions**.

This way, ProGenesis technology enables the development of **matched antibody pairs** as well as neutralizing, agonist, antagonist and inhibitory antibodies for therapeutic purposes.

Moreover, the obtained **hybridoma libraries** are directed against a specific region and are not spread through the entire antigen or focused against an immunodominant region.



“Kill two birds
with one stone”

ANTIBODY CHARACTERIZATION

ProGenesis has developed an innovative approach to identify with high accuracy the region which interacts with an antibody.

The BHP technology enables direct mapping of both **linear** or **non-linear epitopes** in only one assay.

We do not perform the mapping using synthetic overlapping peptides which fail to restore the structural conformation.

ProGenesis constructs an **expression library** in which different fragment lengths of the target gene are produced in fully soluble and folded forms within the scaffold environment. Those different fragments display the same region in multiple folding-units. Consequently, the BHP mapping procedure pinpoints the **best antibody binding target conformation**.

Moreover, the **key amino acids** involved in the antibody binding could be determined by point mutations upon the exogenous insert. The result is cost-effectively used for intellectual property purposes and for therapeutic antibodies characterizations.

Eventually, the created BHPs, providing the epitope regions grafted into an enzymatic carrier, can be used as **biotools** during R&D processes or for QC purposes.



PROTEIN EXPRESSION

“The Sky is the limit”

ProGenesis demonstrated with several proteins that the BHP approach is a powerful tool to produce difficult-to-express proteins.

Using the positive drug-based screening system, some **procaryotic, animal, human and plant** proteins (from 2kDa up to 40kDa) have been successfully expressed in a soluble form.

The technology notably enables the expression of **extra-cellular loops** of GPCRs or ion-channels-related proteins.

The BHP approach can be very relevant in **X-ray crystallography**. Indeed, the technology can help to increase the **solubility** of the protein of interest (i.e. from 1 mg/ml up to 100 mg/ml).

Furthermore, the enzyme activity of the scaffold enables to **discriminate protein crystal** from salt crystal (the BHP specific substrate can diffuse through the crystal).



“Less for your
courtesy and more
for your purse”

BHP TECHNOLOGY BENEFITS

The target subdomain inserted into the proprietary scaffold is displayed within a **protein environment** which mimics wild-type protein constraints. It is often more difficult to achieve this kind of feature with fusions or chemical conjugations.

The enzymatic activity of the scaffold enables a very robust and efficient **positive drug-based screening system**. Indeed, the bacterial growth is BHP activity-dependant which makes the selection of **fully soluble BHPs** easier.

Insertion of an exogenous domain into the scaffold induces a folding-dependant mechanism. Consequently, only **well-folded and active BHPs** are selected.

Moreover, the proprietary scaffold (29 kDa) exhibits a **highly permissive ability** ranging from 2 kDa up to 40 kDa, is naturally **protease-resistant** and shows a high yield of expression. This scaffold is a bacterial protein with no eukaryotic homologue.



YOUR ONE-STOP SHOP

- ProGenesis offers **customized services** to fulfill your R&D project requirements.
- The R&D work is **milestones divided** and you have the lead throughout the project development. You can decide to go on, redirect or stop the project at each step of the study. You will not be charged for the unperformed tasks.
- ProGenesis, a **one-stop shop** for antibody characterization and protein engineering: We can work for you from the gene synthesis to the protein purification.
- In one work procedure, we can map linear and non-linear epitope **without** using **high throughput clone sequencing**. Moreover, this work can lead to key amino acid determination.
- Our epitope mapping technology uses the **wild-type sequence** of your target gene. We don't use synthetic or artificially constrained peptides. So we pinpoint the epitope sequence in its native environment.
- ProGenesis provides **customized biotools** for QC, fermentation monitoring, raising polyclonal or monoclonal antibodies, IVD reagents, drug screening, biosensor reagents. . . .

ABOUT PROGENOSIS

“Quick to act”

ProGenesis is a biotechnology company located in the **heart of Europe** in the Wallonian part of Belgium. Based in Liège, at the centre of the Euregio Meuse-Rhine, the company belongs to the **GIGA cluster** and is an active member of **BioWin**, the Health Cluster of Wallonia.

ProGenesis provides Life Science companies with R&D customized services in its core business field. Our proprietary technology platform is geared to develop efficient, innovative and convenient biotools dedicated to the determination of protein interactions with a primary focus on receptor-ligand interactions and protein domain studies.

ProGenesis technology has been validated by multiple research projects related to industrial final products such as therapeutic antibodies, IVD reagents or vaccine components.





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