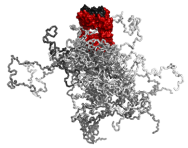
XL-protein
Superior Biopharmaceuticals



XL-protein announces publication of key scientific data on its PASylation® technology

FREISING, GERMANY, August 30, 2013 – XL-protein GmbH announced today that key scientific data have been published in the journal *Protein Engineering, Design & Selection* (2013, Vol. 26, No. 8, pp. 489–501, 2013). The Open Access Publication "PASylation: a biological alternative to PEGylation for extending the plasma half-life of pharmaceutically active proteins" is also available for download at XL-protein's web site (http://www.xl-protein.com/publications.html).

A major limitation of biopharmaceutical proteins is their fast clearance from circulation via kidney filtration which strongly hampers efficacy in human therapy. XL-protein has developed conformationally disordered polypeptide chains with expanded hydrodynamic volume comprising the small residues Pro, Ala and/or Ser (PAS). PAS sequences are hydrophilic, uncharged, genetically encodable amino acid polymers with biophysical properties very similar to poly-ethylene glycol (PEG), whose conjugation to drugs is a well known method for plasma half-life extension.

In contrast, beside chemical coupling PAS polypeptides offer fusion to a therapeutic protein on the genetic level, permitting production of fully active proteins in *E. coli* and other widely used host organisms (including cell culture secretion) without any *in vitro* modification steps. Importantly, PAS polypeptides are biodegradable, thus avoiding organ accumulation, while showing stability in serum and lacking toxicity or immunogenicity in animals. The publication describes that PASylation® furnishes typical biologics, such as interferon, growth hormone or antibody Fab fragments, with considerably prolonged circulation *in vivo*.

This work is complemented by another publication "High-yield production of PASylated human growth hormone (hGH) using secretory *E. coli* technology" that has appeared in the journal *BioProcess International* (2013, Vol. 11, No. 4, pp. 30–38) and is also available for download at XL-protein's web site.

"PASylation offers unique advantages, that is, surprisingly similar biophysical behavior compared with PEGylation, strong and tunable PK extending effects and conservation of high target-binding activity," stated Uli Binder, CTO of XL-protein GmbH.

Arne Skerra, CEO of XL-protein GmbH, said: "PASylation enables the preparation of biologically and/or pharmaceutically functional proteins with prolonged and enhanced *in vivo* activity, which constitutes a bottleneck in current biological drug development and opens exciting commercial opportunities."

XL-protein's proprietary PASylation® technology can be applied both to existing biologics, yielding *biobetters*, or to innovative therapeutic proteins or peptides, leading to tunable prolonged plasma half-life by a factor 10-100 as demonstrated in numerous animal studies up to now.

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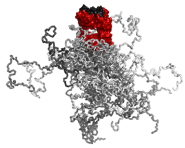

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About XL-protein GmbH

XL-protein is a privately owned biopharmaceutical company based in Freising, Germany, which exploits its proprietary PASylation® technology to develop second generation biopharmaceuticals with extended plasma half-life and improved *in vivo* activity. PASylation® is a fully biological technology that can be applied both to approved biologics to yield follow-on drug products ('biobetters') or to innovative therapeutic proteins or peptides, allowing less frequent and lower dosing combined with better patient tolerability. XL-protein pursues the preclinical and the clinical development of PASylated protein drugs in commercially attractive disease areas. Furthermore, XL-protein is engaged in various collaborations with the Pharma and Biotech industry and offers licenses. XL-protein's proprietary preclinical pipeline encompasses, among other projects, a PASylated growth hormone, cytokines, Fab fragments and peptides, as well as a bispecific product candidate with a PAS polypeptide serving as linker. For more information, please visit: www.xl-protein.com

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Bundesministerium für Bildung und Forschung