BIO CITY LEIPZIG
Biotechnologisch-Biomedizinisches Zentrum

UNIVERSITÄT LEIPZIG

PROTEIN ENGINEERING AND BIOANALYTICS

Peptide and Protein Hormones: Production, Characterisation, Identification of the Mechanisms of Activity and Their Application in Therapy and Diagnostics

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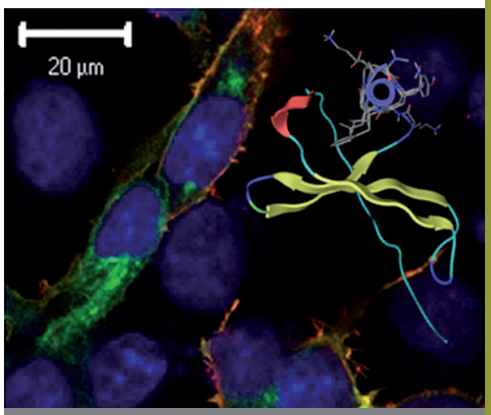
Keywords

- **G-protein coupled receptors**
- **Production/characterisation of bioactive peptides and proteins**
- **Identification of the function of peptide/protein hormones and their application in therapy and diagnostics**
- **Biofunctionalizing of surfaces**

The main focus of the group is the elucidation of the mechanisms of the activity of peptide and protein hormones and their application for the development of therapeutics and diagnostics. Bioactive proteins that currently are investigated include neuropeptides, gastrointestinal peptides, chemokines and adipocytokines. Chemically modified and mutated peptides and proteins are produced by means of solid phase peptide synthesis and/or heterologous recombinant expression, and both, their structure and their biological activity are characterized. The first protein, in which a full secondary structure element was fully replaced by a foldamer, has been described for interleukin 8 in 2008 by the group. Semisynthetic, artificial and bioactive molecules additionally are applied for the modification of surfaces and subsequently used in diag-nostic or therapeutic applications.
Receptors that recognize the ligands are modified by mutagenesis and subsequently expressed in eukaryotic cells. There, they are used to identify ligand binding sites, characterize signal transduction cascades or elucidate the mode of action in order to develop selective drugs against adipositas, cancer or epilepsy. Receptor subtype specific differences could be recently identified for the multi-ligand/multi-receptor system of the Y-receptor family – both, in the binding and the internalisation mode.



Selected References

Haack, M.; Enck, S.; Seger, H.; Geyer, A.; Beck-Sickinger , A. G.
Novel Backbone Scan to Elucidate Struc-tural Properties of a Flexible Peptide Segment. J. Am. Chem. Soc. 130 (2008), 8326–8336.

Holland-Nell, K.; Beck-Sickinger, A. G.
Specifically immobilised aldo/keto reductase AKR1A1 shows a dramatic increase in activity relative to the randomly immobilised enzyme. ChemBioChem. 8 (2007), 1071–1076.

Merten, N.; Lindner, D.; Rabe, N.; Römpler, H.; Mörl, K.; Schöneberg, T.; Beck-Sickinger, A. G.
Receptor Subtype Specific Docking of Asp6.59 with C-terminal Arginine Residues in Y-Receptor Ligands. J. Biol. Chem 282 (2007), 7543–7551.

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