

PolyQuant and Fraunhofer IZI develop new codon-precise peptide library

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PolyQuant GmbH, which has taken over technology for the synthesis of codon-precise gene libraries from Entelechon GmbH, and Fraunhofer Institute for Cell Therapy and Immunology (IZI) have developed an advanced new peptide phage display library design. The 16mer phage display peptide library was synthesized with the help of PolyQuant's proprietary "codon-precision" technology. The resulting libraries are based on randomly combined sets of codons instead of individually randomized nucleotides. The significant advantage of this approach is that only desired amino acids are present, i.e. such a library does not contain any undesired or stop codons. Moreover, the desired amino acids are present in uniform distribution. The library has a much better coverage of sequence variants than a single nucleotide randomized library where some amino acids are unavoidably overrepresented. The new 16mer 10^9 codon-precision peptide phage display library is therefore equivalent to an approximately thousandfold larger conventional library

Fraunhofer IZI has been complementing with a carefully designed core sequence to contain crucial residues at strategic positions, which results in further reduction of the library's divergence, and an innovative phagemid vector design. Rigorous controls have validated the high quality of the library technology. Based on over 500 000 sequences obtained by Next Generation Sequencing, the majority of the sequences were confirmed to be correct. In addition a special phagemid vector design has been used that obviously prevented emergence of single dominating sequences in the original library as well as in the initial selection rounds.

The Fraunhofer IZI has confirmed the advantages of the codon-precision synthesis approach in combination with innovative vector design in projects with several different targets. Studying the results achieved, Dr. Szardenings commented: "After 18 years with peptide phage display this is for me the first library generating in 2 selection rounds on a single antibody exclusively binding clones without a single clone being amplified. This means all have reasonable affinities and I have a plethora of binding motif variants! This is only possible with an extremely balanced library DNA generated by PolyQuant's codon-precise synthesis".

Introducing codon-precise peptide libraries to the market, PolyQuant offers it for screening as a fee-for-service. Beyond simple antibody epitope mapping there are many additional applications. For example affinity purification tools, novel peptides targeting receptors or even tissues for imaging, drug targeting and cell sorting.

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The Fraunhofer Institute for Cell Therapy and Immunology IZI

The Fraunhofer Institute for Cell Therapy and Immunology IZI investigates and develops specific problem solutions at the interfaces of medicine, life sciences and engineering. The Institute practices contract research for biotechnological, pharmaceutical and medical-technological companies, hospitals, diagnostic laboratories and research facilities. Within the Business Units of Agents, Cell Therapy, Diagnostic and Biobanking, the Institute develops, optimizes and validates methods, materials and products. The Institute's core competencies are located in the field of Regenerative Medicine, in particular in the indication areas of oncology, ischemia and autoimmune, inflammatory and infectious diseases. The Institute is clinically oriented and conducts quality checks and the GMP-compliant manufacture of investigational medicinal products. Moreover, the Institute provides support in obtaining manufacturing authorizations and approvals.

PolyQuant GmbH

PolyQuant provides services in targeted proteomics and combinatorial biology. It has developed a patented protein quantitation technology, called QconCAT, as well as proprietary technology for the design and synthesis of randomized peptide libraries. Based on these platforms, PolyQuant caters to the needs of pharmaceutical and biotechnological customers world-wide.