

# Antibody and Protein Engineering

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## Members of the research group

### *Doctoral candidates:*

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## Description of the scientific aims

The research activities center around recombinant protein based bioaffinity tools. The group develops methods for engineering of specific binder molecules and uses such methods to produce novel tailor-made binders. One of the focus areas is the development and use of synthetic antibody phage libraries for rapid production human antibodies. The antibodies isolated from our libraries are currently being investigated for a number of applications in the fields ranging from infection disease and cancer diagnostics, to environmental and food quality monitoring, basic research and drug development. The applications of the libraries are also being explored in the area of biomarker discovery. The research group is collaborating with a number of Finnish and international partners both from academy and industry.

## Selected publications 2010-

1. Negi P, Lövgren J, Malmi P, Sirkka N, Metso J, Huovinen T, Brockmann EC, Pettersson K, Jauhiainen M, Lamminmäki U. Identification and analysis of anti-HDL scFv-antibodies obtained from phage display based synthetic antibody library. *Clin Biochem*. Dec 2. pii: S0009-9120(15)00551-2, 2015.
2. Goldgur Y, Susi P, Karelehto E, Sanmark H, Lamminmäki U, Oricchio E, Wendel HG, Nikolov DB, Himanen JP. Generation and characterization of a single-chain anti-EphA2 antibody. *Growth Factors*. Dec;32(6):214-22, 2014.
3. Huovinen T, Syrjänpää M, Sanmark H, Brockmann EC, Azhayevev A, Wang Q, Vehniäinen M, Lamminmäki U. Two ScFv antibody libraries derived from identical VL-VH framework with different binding site designs display distinct binding profiles. *Protein Eng Des Sel*. Oct;26(10):683-93, 2013.
4. Lehmusvuori A, Manninen J, Huovinen T, Soukka T, Lamminmäki U. Homogenous M13 bacteriophage quantification assay using switchable lanthanide fluorescence probes. *Biotechniques*. Nov;53(5):301-3, 2012.
5. Huovinen T, Brockmann EC, Akter S, Perez-Gamarra S, Ylä-Pelto J, Liu Y, Lamminmäki U. Primer extension mutagenesis powered by selective rolling circle amplification. *PLoS One*. ;7(2):e31817, 2012.