



KTH School of Biotechnology Department of Proteomics

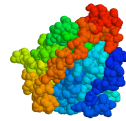
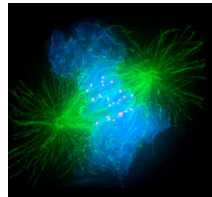
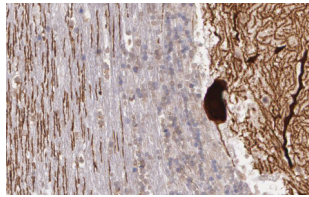
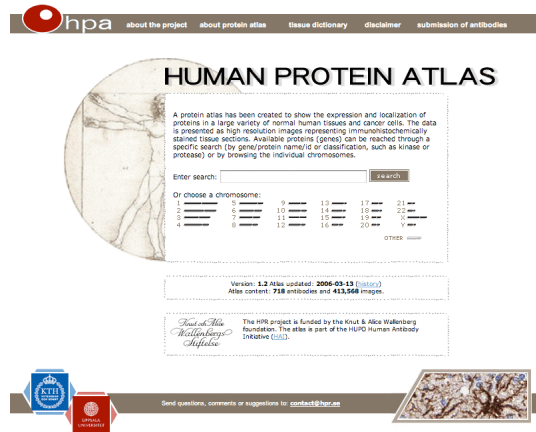
Head of Department: Prof. Mathias Uhlen

Royal Institute of Technology
AlbaNova University Center
SE-106 91 Stockholm
Sweden
www.biotech.kth.se

September 2006

At the Department of Proteomics, research groups are involved in the fields of bioinformatics, bioautomation, protein science, molecular biology, immunotechnology, proteomics, nanotechnology, microfluidics and bioimaging. The main focus of the department is to develop and host a Human Protein Atlas for protein profiles in normal and cancer tissues.

The Swedish Human Proteome Resource (HPR) program funded by the Knut and Alice Wallenberg Foundation, has been set-up to allow the systematic exploration of the human proteome with Affinity (Antibody) Proteomics, combining high-throughput generation of affinity-purified (mono-specific) antibodies with protein profiling using tissue arrays. The project is located at the AlbaNova University Center at the Royal Institute of Technology, Stockholm and the Rudbeck Laboratory, Uppsala University, Uppsala. The Stockholm site is responsible for the high-throughput cloning and expression of the protein fragments (PrESTs) and the affinity purification and quality assurance of the antibodies.



The main objective of the HPR resource centre is to produce specific antibodies to human target proteins using a high-throughput method involving the cloning and protein expression of Protein Epitope Signature Tags (PrESTs). The antibody-based

strategy has been further developed with regard to (i) bioinformatics algorithms that have allowed the identification of coding sequences that are amenable both to recombinant protein expression and the generation of specific antibodies, (ii) a robust E. coli recombinant protein expression system, (iii) systematic antibody production associated with antigen purification of polyclonal sera and, (iv) systematic approaches to utilize these reagents, in particular using tissue arrays. A new Center (Vinnex Center for Protein Technologies) has recently (2007) been established with funding from VINNOVA, KTH and industry. This center will explore protein science using the reagents obtained within the framework of the Human Protein Atlas program.

Recent references: (1) Björling et al (2008) A web-based tool for in silico biomarker discovery based on tissue-specific protein profiles in normal and cancer tissues. *Mol Cell Proteomics* 7(5): 825-44 (2) Barbe et al (2008) Toward a confocal subcellular atlas of the human proteome *Mol Cell Proteomics*. 7(3):499-508 (3) Mathivanan et al (2008) Human Proteopedia enables sharing of human protein data. *Nature Biotechnol.* 2008 26(2):164-7. (4) Uhlen M. (2007) Mapping the human proteome using antibodies *Mol Cell Proteomics* 6(8):1455-6. (5) Strömberg et al (2007) A high-throughput strategy for protein profiling in cell microarrays using automated image analysis. *Proteomics* 7(13):2142-50. (6) Mulder et al (2007) High-throughput screening of systematic generated antibodies against human gene products in the rat nervous system, *Neuroscience* 8;146(4):1689-703 (7) Taussig et al (2007) ProteomeBinders: planning a European resource of affinity reagents for analysis of the human proteome. *Nature Methods* 4(1):13-7. (8) Schwenk et al (2007) Determination of Binding Specificities in Highly Multiplexed Bead-based Assays for Antibody Proteomics. *Mol Cell Proteomics*. 6(1):125-132.

Research Groups



Prof Mathias Uhlen (mathias@biotech.kth.se)
Antibody-based proteomics
12 persons, including 4 graduate students



Assoc prof Sophia Hober (sophia@biotech.kth.se)
Protein engineering and expression
14 persons, including 5 graduate students



Dr Peter Nilsson (nipe@biotech.kth.se)
Array technologies
7 persons, including 1 graduate student



Dr Anja Persson (anja@biotech.kth.se)
Gene cloning and expression
8 persons, including 2 graduate student



Dr Henrik Wernerus (henrik@biotech.kth.se)
Immunotechnology
7 persons, including 1 graduate student

Funding:
KAW, VR, EU, VINNOVA, Industry KTH

Collaborations:
EU MolPage, EU ProteomeBinder
HUPO Antibody Initiative (HAI)

Centra:
Human Proteome Center (HPR)
ProNova Center