To: Medical Faculty, Lund University  
Evaluation of program areas 2008

The objective of the research conducted in the Blood and Defence program area is to understand regulation and coordination of the complex interactions between cells and macromolecules occurring during inflammation and infection. These include interplay between epithelial cells, extracellular components of coagulation and complement and the cells of hematopoetic origin occurring in response to microbial infection or tissue damage.

The network comprises 32 PIs from both Malmö and Lund, clinical and preclinical departments, including both very established and young group leaders. The program area comprises in total more than 200 participants. Together these scientists possess unique, complementary competence in many areas.

Inflammation and infection are important components of a major part of all medical conditions, and thereby of exceptional relevance for society. Therefore, understanding their mechanisms in order to develop successful clinical treatments is a huge and complex research area that is and will be extremely important in coming years. Lund University has an internationally and nationally very strong position in research on inflammation and infection. The Blood and Defence network has already and will continue to facilitate and new interactions between groups, which without a doubt lead to novel findings that would not arise without this platform.

SWOT analysis

Strengths:
- PIs in the network with mixed background – junior, senior, clinical, preclinical, in Malmö and Lund and lead groups of various sizes
- Strong competence in a number of relevant technologies such as recombinant DNA manipulation, protein expression and purification, protein analysis and chemistry, Biacore (surface plasmon resonance), advanced biological imaging at the light and electron microscopy levels, cell isolation, cell biology methods, production of antibodies, transgenic and knockout mice.
- important fields of research, and likely impact of results on diagnosis and treatment of large number of widespread diseases
- a true multidisciplinary network of optimal size that is geared towards generating new collaborations and creativity
- a well functioning board instead of one leader that may at any time leave the faculty
- productive fora for scientific interaction and education in the form of annual retreats, and a graduate course in “Pathogen mediated inflammatory response and innate immunity”

Weakness:
- no own funds to support new interactive projects (as done previously) and graduate or post-doc training, the network is now supported with only 0.5 mln/year
- no funds for own recruitments and little possibility to affect the faculty regarding recruitment of new PIs
- no long-term funding commitment, which prevents a long term plan of action and hampers, for example, recruitment of new network members within the university.

Possibilities:
- to attract more external funding for the network or parts of it such as funding for equipment and Linnegrant from Swedish Research Council
to provide an environment for development of junior PIs who are in very tough situation these days. To help these PIs to form own networks of collaborations, which is crucial for successful scientific carrier.

- to provide platform for education of graduate students – both via general lectures during retreats, whole sessions aimed at techniques and finally a 2 point graduate course, which was given for the first time in autumn 2006 and will be given again in autumn 2008. In the future, the students could be admitted to the network, rather than a specific research group, get common introductory courses within the areas of the network, and then choose a research group for their thesis work (possible after rotation). Such a model is very successfully used at e.g. UC San Francisco under names as Program in the Biological Sciences, Program in Molecular Medicine, Program in Immunology etc. Benefits in Sweden would include a broader base for the graduate students, better security and opportunity for young research groups to have students, and adaptation to the Bologna Process.

- to create contacts and collaborations within the faculty that would not exist otherwise. A network of the type as Blood and Defence, is an inexpensive way to give room for creative interactions among the members that would not otherwise occur. Scientists and teachers of the faculty are usually so fully occupied with their own research and obligations that academic interaction with colleagues is severely hampered. This is noticeable in e.g. the fact that very few attend guest lectures and open advanced courses besides the ones directly involved. Thereby, the intellectual and academic interchange even between closely related areas, which should be a natural ingredient in any Faculty, is minimized. Funding of a network gives an incentive and opportunity to increase such interactions, even better than funding of a more project-based program.

- to relay opinions of member of scientists to the faculty board and dean via regular meetings with board director
- to contribute to development of the faculty, to increase its ability to compete with other universities.

Threats
- shortage of money that prohibits many initiatives
- unclear definition of what is expected of the network from the Medical Faculty and the fact that the Faculty seems to have somewhat lost interest in program areas in general
- unclear how long the program area will exist, which hampers long term planning

Leadership in the program.
Blood and Defence is led by a director and a board composed of the director and four additional members (currently Anna Blom, Anita Sjölander, Kristian Riesbeck, Mårten Selgelmark and Hakon Leffler). From the beginning the program was led by Heiko Herwald, later on by Urban Gullberg who finally was replaced by Anna Blom in 2004 when Urban became chairman of a large department (Laboratory Medicine Lund). These changes were necessary and we did not perceive them as any problem particularly because all directors were also board members from the start and were well acquainted with way Blood and Defence is organized. No further changes are planned at present. The board meets regularly and the whole network is frequently informed via e-mail and discussion during yearly retreats.

Revival of research and stimulation of intellectual climate.
The network has twelve PIs without permanent faculty position who are building their groups and many of which were very successful in the last three years. They are standing for an important part of the renewal within the network. Part of the networks money were used to directly or indirectly support postdoctoral fellows but it is too early to judge direct effects of this action. The network as such did not recruit any new scientist from outside of Lund University simply because there is no funding for such actions.

The intellectual climate was stimulated by several retreats and meetings such as these:
2 September 2002, Åkersberga
23 February 2003, Malmö
28-29 August 2003, Järravallen
6-7 May 2004, Gilleleje
12-13 May 2005 Arild
18-19 May 2006 Ystad
June 07-08, 2007, Båstad
Upcoming meeting: May 15-16 2008, Backafallsbyn, Ven

The retreats focused on various issues. During the first two meetings PIs presented their own research in order to find common interests and generate collaborations. As a result 14 different collaborative projects were created and received funding from Blood and Defence. Each funded project has 3-6 participating PIs. One meeting focused on scientific methods and problems encountered using these. During last three meeting results of latest research in Blood and defence were presented mainly by postdocs and PhD students. The best poster and best presentation were awarded prizes. Furthermore, several lectures regarding general subjects such as Innate and Adaptive immunity, G-coupled receptors, Defensins were given. For the coming meeting 2008 we have additionally invited three external speakers and some sessions, organized by students will focus on advanced techniques. Each meeting comprised over 70 participants.

**Efforts to support development of junior scientists in the network**

The junior PIs receive ample attention from the network and most of them are supported by collaborative grants from the network. We have created and distributed a list of possible grants that can be applied for in our research field. The list contains a large section regarding grants for junior PIs. The very limited budget does not allow us to support the junior PIs directly with positions. However, several of younger PIs in the network were very successful in obtaining positions and large grants. For example Diana Karpman obtained research position from Royal Academy of Sciences, Kristian Riesbeck a 3-year position for clinicians from the Wallenberg Foundation, Anna Blom and Heiko Herwald from Swedish Research Council and Bill Agace from the faculty. Anna Blom and William Agace were granted 6 mln Skr each from Swedish Foundation for Strategic Research (INGVAR grant). Matrin Olsson, Heiko Herwald and William Agace won Fernström’s prizes. Without a doubt some of the best younger scientists from this faculty are members of our network.

**Relationships between Blood and Defence and Departments/Faculty**

Two years ago the directors of all program areas met regularly and discussed general matters concerning the faculty. We were all in agreement that program areas were willing to contribute to the work at the level of the faculty. Board directors met regularly the Dean and members of the faculty board in order to discuss current issues regarding the faculty. The directors have also discussed the present situation at the faculty with Scientific Advisory Board. However, these interactions became much weaker after the change of faculty leadership. Unfortunately, exact role of program areas as such has not been clearly defined.

**Relationship to undergraduate education.**

Many network members are also heavily involved in undergraduate education, as leaders of programs and courses or in teaching in relevant areas such as Microbiology, Immunology and Molecular Medicine for Medical and Biomedical students, and some have won teaching awards. In addition many supervise students who do project works. By this, the network provides a highly enriched teaching environment also for the undergraduate students, and stimulates interest and recruitment of future scientists into in the important area of Inflammation and Infection.

**Translational research**

A number of members of Blood and Defence are clinicians and we have established several collaborative projects of translational nature. However, it is too early to judge results of these projects.

**Linne´-application**

In the autumn 2007, we have submitted a Linne´-application that resulted from Blood and defence entitled “Host-pathogen interactions in severe infections”. This application is more focused than the whole Blood and Defence network, which is required for grant application of this kind. Lund University has prioritized the application at the level of 10 million SEK/year for ten years. Blood and Defence network was crucial in formation of functioning collaborations and development of the application. Research Council will announce their decision regarding which application will be funded in June 2008.

**Graduate training**
In October 2006 we have given for the first time one week-long course in "Pathogen mediated inflammatory response and innate immunity". There were 16 PhD students participating and the course was given very good evaluation. The course will be given next time in October 2008.

**Economy**

The funding was used mainly to support collaborative project that included at least three PIs. The remaining part was used for retreats and PhD course. After the money has arrived on our account this year we have about 1.2 mln SEK left that are reserved for retreats and PhD course. We have no information if the network will be supported by the faculty next and coming years.
Collaborative projects (at least 3 PIs) awarded grants from the Blood and Defense Network, Lund University 2003

Agace, William 210000 kr
Regulation, Trafficking, and Signaling of Seven Transmembrane-domain G protein-coupled Receptors (GPCR) on CD8+ "gut homing" T Lymphocytes

Björck, Lars 350000 kr
Glomerulonephritis

Blom, Anna 70000 kr
Structure-function studies of complement inhibitor Factor I.

Dib, Karim 70000 kr
Insights into the Pathophysiology of Chronic Obstructive Pulmonary Disease: Effects of α1-antitrypsin on leukocyte activation

Gullberg, Urban 280000 kr
Regulation and function of blood cell components

Janciauskiene, Sabina 70000 kr
Structure-function studies of complement inhibitor Factor I.

Karpman, Diana 210000 kr
Toll-like receptor signaling in the pathogenesis of asymptomatic bacteruria and hemolytic uremic syndrome

Leffler, Hakon 140000 kr
Cell surface exposure of phosphatidyl serine: mechanisms and functions

Olsson, Martin 70000 kr
Biochemical and Genetic Characterization of the Vel Blood Group Antigen

Riesbeck, Kristian 140000 kr
"The serum-resistance of the respiratory pathogen Moraxella catarrhalis is mediated by binding of C4b-binding protein"

Sjölander, Anita 140000 kr
The role of small GTPases in endocytosis and nuclear translocation of the G-protein-coupled receptor CysLT1 in epithelial cells: Implications for cell survival.

Tapper, Hans 140000 kr
BIOLOGY AND FUNCTION OF PHAGOCYTIC CELLS

Åkerström, Bo 70000 kr
Defence against heme- and hemoglobin-induced oxidative stress

Collaborative projects (at least 3 PIs) awarded grants from the Blood and Defense Network, Lund University 2004

Biochemical and genetic characterization of the Vel blood group antigen
Martin Olsson (70 000:-)

Defence against heme and hemoglobin induced oxidative stress
Bo Åkerström (70 000:-)
The role of small GTPases in endocytosis and nuclear translocation of the G-protein coupled receptor CysLT1 in epithelial cells: implications for cell survival
Anita Sjölander (210 000:-)

Regulation and function of blood cell components
Urban Gullberg 280 000:-

Biology and function of phagocytic cells
Hans Tapper (70 000:-)

Structure-function studies of complement inhibitor factor I
Anna Blom (70 000:-)

Toll receptor signaling in the pathogenesis of asymptomatic bacteruria and hemolytic uremic syndrome
Diana Karpman (210 000:-)

Glomerulonephritis and aspects of basement membranes
Lars Björck (350 000:-)

Regulation, trafficking and signalling of seven transmembranedomain G protein coupled receptors on CD8+ gut homing T lymphocytes
William Agace (280 000:-)

Insights into pathophysiology of chronic obstructive pulmonary disease
Sabina Janciauskiene (70 000:-)

Moraxella catarrhalis dependent complement factor binding – importance of UspA12 and UspA2 in phagocytosis and B cell activation
Kristian Riesbeck (140 000:-)

Cell surface exposure of phosphatidyserine: mechanisms and function
Hakon Leffler (140 000:-)

Analysis of expression and function of molecules crucial for improved treatment in B cell lymphomas and pancreatic cancer cells
Anette Gjörloff-Wingren (70 000:-)

Collaborative projects (a least 3 PIs) awarded grants from the Blood and Defense Network, Lund University 2005

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Björn Dahlbäck (70 000:-)

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Anette Gjörloff-Wingren (70 000:-)

Collaborative projects (a least 3 PIs) awarded grants from the Blood and Defense Network, Lund University 2006

1. Cell surface exposure of phosphatidylserine: mechanisms and function
Hakån Leffler
Björn Dahlbäck
Anna Blom
75 000 Skr Hakon Leffler Kostnadsställe 314200
38 000 Björn Dahlbäck Kostnadsställe 314615
37 000 Anna Blom Kostnadsställe 314610

2. Respiratory pathogens and interactions with components of the complement pathways
Kristian Riesbeck
Arne Forsgren
Anna Blom
150 000 Skr; kostnadsställe är : 314625 – Kristian Riesbeck

3. Biology and function of phagocytic cells
Hans Tapper
Inge Olsson
Catharina Svanborg
150 000 Skr; Kostnadsställe 314230 - Inge Olsson.
4. Clarification of the role of CysLT receptors in the regulation of epithelial cell motility and survival.
Anita Sjölander
Tommy Andersson
Matthias Mörgelin
Kristian Riesbeck
Anna Blom
150.000 kr på kostnadsställe 314660 – Anita Sjölander

5. Structure-function studies of complement inhibitor factor I
Anna Blom
Sabina Janciauskiene
Anders Sjöholm
75 000 Skr: Kostnadsställe 314610 – Anna Blom
75 000 Skr: Kostnadsställe 314731 – Sabina Janciauskiene

6. Defence against heme and hemoglobin induced oxidative stress
Bo Åkerström
Urban Gullberg
Tor Olofsson
Martin L Olsson
Hans Tapper
150 000 Skr to Bo Åkerström kostnadsställe 314333

7. Regulation, trafficking and signalling of GPCR on CD8+ gut homing T lymphocytes
William Agace
Heiko Herwald
Matthias Mörgelin
Fredrik Leeb-Lundberg
37 000 till kostnadsställe 314011 Fredrik Leeb-Lundberg
37 000 till kostnadsställe 314333 Heiko Herwald
37 000 till kostnadsställe 314333 Matthias Mörgelin
37 000 till kostnadsställe 314043 William Agace

8. Toll receptor signaling in the pathogenesis of asymptomatic bacteruria and hemolytic uremic syndrome
Ulf Sjöbring
Catharina Svanborg
Diana Karpman
Matthias Mörgelin
75 000 Skr – Diana Karpman kostnadsställe 314372
75 000 Skr – Catharina Svanborg, kostnadsställe 314270

9. Biochemical and genetic characterization of the Vel blood group antigen
Martin Olsson
Bo Åkerström
Hakon Leffler
Catarina Svanborg
150 000 kostnadsställe 314233 Martin Olsson

10. Lipoproteins and innate immunity with particular focus on antimicrobial activity of apolipoproteins
Björn Dahlbäck
Lars Björck
Matthias Mörgelin
150 000 Björn Dahlbäck Kostnadsställe 314615

11. Regulation and function of proteinase 3 in disease and health
Thomas Hellmark
Urban Gullberg
Mårten Segelmark
Hans Tapper
Tor Olofson
120.000 kr till Thomas Hellmark K-ställe 314312
30.000 kr till Hans Tapper K-ställe: 314333