

## NOVA-BOVA PhD course

### ”Principles and practical applications of flow cytometry in biomedical sciences”

Our sponsors:



Time: Distance learning from April 11, 2005; meeting in person **18-22 April 2005**, deadline for registration April 15, 2005.

Venue: Lithuanian Veterinary Academy, Tilžės 18, 47181 Kaunas, Lithuania.

#### Background:

The major aim of NOVA-BOVA is to induce the cooperation between NOVA and BOVA universities. During 2003-2004, special emphasis is given on strengthening institutional capacities on the BOVA side. Taking this into consideration, Lithuanian Veterinary Academy has initiated further development of international collaboration, proposing to carry out a NOVA-BOVA course ”Introduction and practical applications of flow cytometry in biomedical sciences” in 18-22 April 2005.

The aim of the course is to give a theoretical overview and general practical introduction of the principles of flow cytometry, applications and possibilities in biomedical sciences, including immunology, veterinary reproduction, microbiology and others. Practical training will be aiming to demonstrate and practice some basic methods of proper application of flow cytometry. Introduction to various modern methods, selection of appropriate method, method validation will be discussed. Participants will be trained to work with the flow cytometer as well as properly read and evaluate acquired data.

Home task for students: Short presentation (5-10min) of the main scientific topic, research plans and methods to be used in participant’s own research. Student’s achievements, **problems, questions** and **important hints** related to flow cytometry will be discussed in the open discussions among all lectors and participants throughout the course.

Participants: The course is intended for PhD students in Veterinary and Human Medicine, Biology, Microbiology, Animal Technology and others, who are using/intending to use flow cytometry-based methods in their own research.

Prior knowledge required: Basic knowledge in biology, cell biology and immunology.

Language: The course will be conducted in English.

Course organizers: Dr. Rimantas Stakauskas, Lithuanian Veterinary Academy, Lithuania  
Dr. Aloyzas Januskauskas, Lithuanian Veterinary Academy, Lithuania  
Ruta Skinkyte, Lithuanian Veterinary Academy, Lithuania

#### Core lecturers (Preliminary list of proposed candidates):

- Dr. Aloyzas Januskauskas, Lithuanian Veterinary Academy, Lithuania
- Dr. Rimantas Stakauskas, Lithuanian Veterinary Academy, Lithuania
- Sverker Segren (Becton Dickinson, Sweden)
- Prof. Hans-Joachim Schuberth, School of Veterinary Medicine Hannover, Germany
- Assoc. Prof. Anders Johannisson – Swedish University of Agricultural Sciences, Sweden
- Prof. Tatiana Kouzmina, All-Russian Research Institute for Farm Animal Genetics & Breeding, St.Petersburg-Pushkin, Russia
- Dr. Turs Selga, Faculty of Biology University of Latvia, Latvia

**PROGRAM****Monday, 18<sup>th</sup> April**

<b>Time</b>	<b>Lectures</b>	<b>Tutors</b>
9 <sup>00</sup> -9 <sup>45</sup>	Introduction to the course.	Organizers
9 <sup>45</sup> -10 <sup>30</sup>	Flow cytometry - basic principles and technical aspects	Sverker Segren BD
10 <sup>30</sup> -11 <sup>15</sup>		
11 <sup>15</sup> -11 <sup>45</sup>	<b>Coffee break</b>	
11 <sup>45</sup> -12 <sup>30</sup>	DNA analysis and cell proliferation. Multiplex flow cytometry- much information from little sample	Anders Johannisson
12 <sup>30</sup> -13 <sup>15</sup>		
13 <sup>15</sup> -14 <sup>15</sup>	<b>Lunch</b>	
14 <sup>15</sup> -15 <sup>00</sup>	Flow cytometric data analysis - practical demonstration	Rimantas Stakauskas
15 <sup>00</sup> -15 <sup>45</sup>		
18 <sup>00</sup> - ...	<b>Welcome Party</b>	<b>All participants</b>

**Tuesday, 19<sup>th</sup> April**

<b>Time</b>	<b>Lectures</b>	<b>Tutors</b>
9 <sup>00</sup> -9 <sup>45</sup>	Student presentations about their research activities and plans	Students
9 <sup>45</sup> -10 <sup>30</sup>	Theory of knowledge - practical approach.	Turs Selga
10 <sup>30</sup> -11 <sup>15</sup>		
11 <sup>15</sup> -11 <sup>45</sup>	<b>Coffee break</b>	
11 <sup>45</sup> -12 <sup>30</sup>	Flow cytometry – selected applications and future developments	Sverker Segren BD
12 <sup>30</sup> -13 <sup>15</sup>		
13 <sup>15</sup> -14 <sup>15</sup>	<b>Lunch</b>	
14 <sup>15</sup> -15 <sup>00</sup>	Sperm quality control.	Aloyzas Januskauskas
15 <sup>00</sup> -15 <sup>45</sup>		
15 <sup>45</sup> -16 <sup>15</sup>	<b>Coffee break</b>	
16 <sup>15</sup> -17 <sup>00</sup>	Cell proliferation assay - practical demonstration.	Hans-Joachim Schuberth, Rimantas Stakauskas
18 <sup>00</sup> - ...	<b>Excursion</b>	<b>All participants</b>

**Wednesday, 20<sup>th</sup> April**

<b>Time</b>	<b>Lectures</b>	<b>Tutors</b>
9 <sup>00</sup> -9 <sup>45</sup>	Biology of granulocytes	H-J. Schuberth
9 <sup>45</sup> -10 <sup>30</sup>		
10 <sup>30</sup> -11 <sup>00</sup>	<b>Coffee break</b>	
11 <sup>00</sup> -11 <sup>45</sup>	Neutrophil phagocytosis and ROS production - practical demonstration.	Rimantas Stakauskas
11 <sup>45</sup> -12 <sup>30</sup>		
12 <sup>30</sup> -13 <sup>15</sup>		
13 <sup>15</sup> -14 <sup>15</sup>	<b>Lunch</b>	
14 <sup>15</sup> -15 <sup>00</sup>	Measurement of neutrophil phenotype, phagocytosis and ROS production - practical demonstration	H-J. Schuberth, Rimantas Stakauskas
15 <sup>00</sup> -15 <sup>45</sup>		
15 <sup>45</sup> -16 <sup>15</sup>	<b>Coffee break</b>	
16 <sup>15</sup> -17 <sup>00</sup>	Data evaluation - practical demonstration	H-J. Schuberth, Rimantas Stakauskas
17 <sup>00</sup> - ...	<b>Free evening</b>	

### Thursday, 21<sup>st</sup> April

Time	Lectures	Tutors
9 <sup>00</sup> -9 <sup>45</sup>	Flow cytometric assessment of cellular phenotype and functions.	Hans-Joachim Schuberth
9 <sup>45</sup> -10 <sup>30</sup>		
10 <sup>30</sup> -11 <sup>15</sup>	Use of fluorescent probes in monitoring of ovarian cells	Tatiana Kouzmina
11 <sup>15</sup> -11 <sup>45</sup>	Coffee break	
11 <sup>45</sup> -12 <sup>30</sup>	Flow cytometry assays for apoptosis	Aloyzas Januskauskas
12 <sup>30</sup> -13 <sup>15</sup>		
13 <sup>15</sup> -14 <sup>15</sup>	Lunch	
14 <sup>15</sup> -15 <sup>00</sup>	Cellular activation (measuring of Ca <sup>2+</sup> influx) - practical demonstration	Hans-Joachim Schuberth, Rimantas Stakauskas
15 <sup>00</sup> -15 <sup>45</sup>		
15 <sup>45</sup> -16 <sup>15</sup>	Coffee break	
16 <sup>15</sup> -17 <sup>00</sup>	Data evaluation - practical demonstration	Hans-Joachim Schuberth, Rimantas Stakauskas
18 <sup>00</sup> - ...	Farewell dinner	All participants

### Friday, 02<sup>nd</sup> July

Time	Lectures	Tutors
9 <sup>00</sup> -9 <sup>45</sup>	Digital light microscopy - additional information	Turs Selga
9 <sup>45</sup> -10 <sup>30</sup>		
10 <sup>30</sup> -11 <sup>15</sup>		
11 <sup>15</sup> -11 <sup>45</sup>	Coffee break	
11 <sup>45</sup> -12 <sup>30</sup>	Quantitative and qualitative assessment of cellular proliferation and apoptosis - practical demonstration.	Hans-Joachim Schuberth, Rimantas Stakauskas
12 <sup>30</sup> -13 <sup>15</sup>		
13 <sup>15</sup> -14 <sup>15</sup>	Lunch	
14 <sup>15</sup> -15 <sup>00</sup>	Data evaluation - practical demonstration.	Hans-Joachim Schuberth, Rimantas Stakauskas
15 <sup>00</sup> -15 <sup>45</sup>		
15 <sup>45</sup> -16 <sup>15</sup>	Final discussion and course evaluation	All participants

#### Readings and materials:

[http://www.bdbiosciences.com/immunocytometry\\_systems/support/training/online/](http://www.bdbiosciences.com/immunocytometry_systems/support/training/online/)

<http://www.probes.com>

<http://flowcyt.cyto.purdue.edu/flowcyt/books/bookindx.htm>

Intro\_to\_Flow\_Cytometry.pdf

Other materials will be distributed to the participants at the day 1 of the course.

#### Student presentations:

Each student will briefly (5-10 min) introduce his own research project and laboratory methods that are going to be used (or have been used) in their research. There will be an open discussion among all teachers and participants about applications, questions and problems using flow cytometry methods in student's own research.