

Welcome to the summer school:

“Livestock Conservation Genomics: Data, Tools and Trends“

October 1-7, 2012, in Pag Island, Croatia



The event is sponsored by the **European Science Foundation (ESF)**, **GENOMIC-RESOURCES; Advances in Farm Animal Genomic Resources program** (<http://genomic-resources.epfl.ch/>). ESF provides platform for its Member Organisations to advance European research and explore new directions for research at the European level. Established in 1974 as an independent non-governmental organisation, the ESF currently serves 75 Member Organisations across 30 countries.

GENERAL INFORMATION

Genetic markers play an important role in conservation of livestock genetic resources. The age of high throughput genotyping and whole genome sequencing provides new views on old problems and allows addressing problems that were considered infeasible so far. The summer school (6 days of intensive scientific program + 1 day excursion) aims to provide researchers with a toolbox (methods and software) to address research questions related to effective population size, population structure, inbreeding and crossbreeding and other population genetic concepts. It will consist of lectures, practical computer exercises and paper discussions. Summer school is targeted to PhD students as well as scientists of all age groups willing to start working on genomic data analysis in livestock.

• **Course subject:**

Introduction: Importance of Livestock Conservation Genomics. Why is it important, what are main factors involved and general information required and where can we apply this type of analysis and tools.

Population Genetics:

- Linkage Disequilibrium (LD): Concept, estimation and importance.
- Effective Population Size (N_e): Concept, estimation and importance.
- Inbreeding and Relationships: Concepts, F-statistics, Identity by State (IBS), Identity by Descent (IBD), Runs of Homozygosity (ROH's).
- Population Structure and major demographic events: genetic drift, mutation, recombination, bottlenecks, isolated populations, migration, extinction vortex theory.
- Admixture

Genetic Data:

- Introduction to genetic data: Basic DNA and genetic concepts reminder, related terminology, types of data, sequencing and SNP genotyping techniques
- Structural variants: Copy number variations, insertions, deletions, Polymorphic sites.
- Basic Data manipulation: Data reading, understanding different data formats, transforming data formats for specific requirements.
- Imputation and Phasing: understanding the concepts and application
- Databases and Resources: Online data bases for genomic data and other resources for genomic data analysis.

Applications and trends:

- Signatures of selection
- Genome-wide association studies (GWAS) and Autozygosity mapping.
- Assignment of individual to breeds, reconstruction of breed histories

Scientific Discussions:

- Paper discussions: importance of research discussions and critical reading and writing of scientific papers

Organisers:

Faculty of Agriculture, University of Zagreb, Svetosimunska 25, 10 000 Zagreb, Croatia, <http://www.agr.unizg.hr/>, Prof. Ino Curik, tel. +385 1 239 4010, e-mail. icurik@agr.hr &

University of Natural Resources and Life Sciences Vienna, Gregor Mendel Str. 33, A-1180 Vienna, Austria, <http://www.boku.ac.at/>, Prof. Johann Sölkner, tel. +43 1 47654 3271, e-mail. soelkner@boku.ac.at.

Dates:

October 1st to 7th 2012.

Venue:

Hotel Luna, Pag Island, Croatia (<http://www.valamar.com/hr/luna-hotel-pag>): A four star hotel well equipped with congress facilities and accommodation for a decent price. Hotel is placed on a secluded place at the very seafront and facing surrounding

islands, quietly nestled among old olive trees, offering good ambient for whole day devoted work.

- **Deadlines & grants**

There will be a limit of 40 participants. Registration will be strictly on a first come first serve basis. Notification of acceptance will be given within a week of transfer of the registration fee. A total number of **8 grants will be provided** by the organizers. Applicants are expected to submit the following documents: (CV, PhD or recent work summary up to 300 words, and motivation letter for participation). Priority will be given to applicants who come from countries that financially support the programme (Austria, Belgium, Croatia, Finland, France, Germany, Netherlands, Norway, Sweden, Switzerland and United Kingdom). Each grant covers school fee (€600) plus a flat rate of €300. Each application will be evaluated separately. Grants will be given according to the ranking provided by “grant panel” with decision made on September 3rd, 2012. Note that grant applications are expected until August 20th, 2012, by e-mail to livcongen2012@gmail.com.

- **Fee:**

The fee for Summer School is €600 and includes access to the program with full accommodation in a double rooms for 7 days/nights (breakfast, lunch and dinner), course materials, tea/coffee breaks and excursion. Single room accommodation can only be provided for a limited number of persons, at a fee of €800.

- **Requirements and prerequisites:**

All participants are required to bring their own laptops for the practical workshops. Data, software and programs will be supplied by the organizers at the beginning of the school. Additionally, participants are required to prepare and submit in advance a presentation based on a scientific publication related to the topics covered by the school (3 choices of papers will be supplied by the organizers in advance) for the Paper discussions that will take place during the week.

- **Visa Requirements (potential):**

Notice to the potential participants who need visas to enter Croatia: We are sorry to inform you that we are not able to provide a guaranty letter for visa request if we are asked to provide financial and other responsibilities imposed by the Croatian immigration office.

For registration details, check the web-site of the summer school;
<http://www.agr.unizg.hr/>

For further information, please contact livcongen2012@gmail.com or the secretary of the school mrs Ivana Kovac (e-mail. ikovac@agr.hr, tel. +385 1 239 3797).

Draft program and lecturers:

Monday 1st of October

8:00 - 9:00	Registration and Welcome
9:00 - 10:30	Introduction to Livestock Conservation Genomics Presenter: Ino Curik
10:30 - 11:00	Tea / Coffee Break
11:00 - 12:30	Introduction to Genetic Data Presenter: Paolo Ajmone-Marsan
12:30 - 14:00	Lunch Break
14:00 - 15:30	Basic Data Manipulation - Practical Workshop Presenter: Gabor Mezsaros
15:30 - 16:00	Tea / Coffee Break
16:00 - 18:00	Descriptive Statistics and Quality Control - Practical Workshop Presenter: Ana María Pérez O'Brien

Tuesday 2nd of October

9:00 - 10:30	Linkage Disequilibrium and Effective Population Size Presenter: Henner Simianer
10:30 - 11:00	Tea / Coffee Break
11:00 - 12:30	Inbreeding and Relationships Presenter: Ino Curik
12:30 - 14:00	Lunch Break
14:00 - 15:30	Linkage Disequilibrium and Effective Population Size - Practical Workshop Presenter: Henner Simianer / María Pérez O'Brien
15:30 - 16:00	Tea / Coffee Break
16:00 - 18:00	Inbreeding and Relationships - Practical Workshop Presenter: Ino Curik / Maja Ferencakovic
18:00 - 20:00	Dinner Break
20:00 - 21:30	Paper Discussion - Inbreeding

Wednesday 3th of October

9:00 - 10:30	Population Structure and Breed History Presenter: Johannes Lenstra
10:30 - 11:00	Tea / Coffee Break
11:00 - 12:30	Admixture Presenter: Johann Sölkner
12:30 - 14:00	Lunch Break
14:00 - 15:30	Imputation and Phasing - Practical Workshop Presenter: Gregor Gorjanc

15:30 - 16:00 Tea / Coffee Break
16:00 - 18:00 Admixture - Practical Workshop
Presenter: Anamarija Frkonja
18:00 - 20:00 Dinner Break
20:00 - 21:30 Paper Discussion - Admixture

Thursday 4th of October

9:00 - 20:00 Group Excursion: visit to the Pag Island sheep breeding and hard cheese production

Friday 5th of October

9:00 - 10:30 Signatures of Selection
Presenter: Carl Rubin
10:30 - 11:00 Tea / Coffee Break
11:00 - 12:30 Structural Variations of DNA
Presenter: Carl Rubin
12:30 - 14:00 Lunch Break
14:00 - 15:30 Detecting Structural Variants from Sequence Data - Practical Workshop
Presenter: Carl Rubin / Johann Sölkner / Ana María Pérez O'Brien
15:30 - 16:00 Tea / Coffee Break
16:00 - 18:00 Applying Signatures of Selection approaches to sequence data vs. SNP chip data - Practical Workshop
Presenter: Johann Sölkner / Carl Rubin / Ana María Pérez O'Brien
18:00 - 20:00 Dinner Break
20:00 - 21:30 Paper Discussion - Signatures of selection

Saturday 6th of October

9:00 - 10:30 Genome-wide Association Studies (GWAS)
Presenter: Patrik Waldmann
10:30 - 11:00 Tea / Coffee Break
11:00 - 12:30 Autozygosity Mapping
Presenter: Ino Curik / Johann Sölkner
12:30 - 14:00 Lunch Break
14:00 - 15:30 GWAS - Practical Workshop
Presenter: Patrik Waldmann
15:30 - 16:00 Tea / Coffee Break
16:00 - 18:00 Autozygosity Mapping - Practical Workshop
Presenter: Maja Ferencakovic
18:00 - 20:00 Dinner Break

20:00 - 24:00 Closing Party

Sunday 7th of October

10:00 - 11:30 Trends and Future perspectives
Presenter: Michelle Tixier-Boichard (tentative)

11:30 - 12:00 Tea / Coffee Break

12:00 - 13:00 Final Discussion
Presenter: Invited Guests

13:00 - 14:00 Closing Remarks
Presenter: Johann Sölkner

LIST OF LECTURERS / PRESENTERS

- **Prof. Paolo Ajmone-Marsan (Lecturer):** Internal Department of Zootechnology, Faculty of Agriculture of the Università Cattolica del S. Cuore, Piacenza, Italy.
- **Prof. Henner Simianer (Lecturer):** Department of Animal Sciences, Georg-August-University Göttingen, Göttingen, Germany.
- **Prof. Johann Sölkner (Lecturer):** Division of Livestock Sciences, Department of Sustainable Agricultural Systems, University of Natural Resources and Life Sciences Vienna, Vienna, Austria.
- **Prof. Johannes Lenstra (Lecturer):** Department of Infectious Diseases and Immunology, Faculty of Veterinary Medicine, Utrecht, The Netherlands.
- **Prof. Michelle Tixier-Boichard (Lecturer):** Institut National de la Recherche Agronomique INRA, France.
- **Prof. Ino Curik (Lecturer):** Department of Animal Science, Faculty of Agriculture, University of Zagreb, Zagreb, Croatia.
- **Ass. Prof. Gregor Gorjanc (Lecturer):** Department of Animal Science, Biotechnical Faculty, University of Ljubljana, Slovenia.
- **Dr. Carl Rubin (Lecturer):** Department of Medical Biochemistry and Microbiology, Uppsala University, Uppsala, Sweden.
- **Dr. Patrik Waldmann (Lecturer):** Division of Livestock Sciences, Department of Sustainable Agricultural Systems, University of Natural Resources and Life Sciences Vienna, Vienna, Austria.
- **Dr. Gabor Mezsaros (Lecturer):** Division of Livestock Sciences, Department of Sustainable Agricultural Systems, University of Natural Resources and Life Sciences Vienna, Vienna, Austria.
- **PhD student Ana María Pérez O'Brien (Demonstrator):** Division of Livestock Sciences, Department of Sustainable Agricultural Systems, University of Natural Resources and Life Sciences Vienna, Vienna, Austria.
- **PhD student Maja Ferencakovic (Demonstrator):** Department of Animal Science, Faculty of Agriculture, University of Zagreb, Zagreb, Croatia.

- **PhD student Anamarija Frkonja (Demonstrator):** Division of Livestock Sciences, Department of Sustainable Agricultural Systems, University of Natural Resources and Life Sciences Vienna, Vienna, Austria.

REGISTRATION PROCEDURE

Registration requires two actions:

1. Transfer of (at least) EURO 600,- by wire to:

Bank: BAWAG
Bank identification code (SWIFT): BAWAATWW
Account No.: 05716001131
Account holder: Dr. Johann Soelkner
Purpose: Summer School fees

IBAN: AT431400005716001131

When making the international money transfer, please take care that the cost for the transfer will be paid by you, i.e. we expect € 600.-- to arrive at our account! Do not forget to include your personal details on the transfer form.

Please indicate clearly your name, institute, and the purpose on the bank transfer form.

2. Registration by e-mail to livcongen2012@gmail.com,

Please provide the following details:

First Name
Surname
Organisation
Department/Unit
Street or P.O. Box
Zip code and city
Country
Phone number
e-mail

PhD-student YES NO
Topic PhD-Thesis

We will confirm your participation as soon as the registration fee is received.

For further information, please contact livcongen2012@gmail.com or the secretary of the school mrs Ivana Kovac (e-mail. ikovac@agr.hr, tel. +385 1 239 3797).

GRANT APPLICATION PROCEDURE

1. Registration by e-mail to livcongen2012@gmail.com,

Please provide the following details:

First Name

Surname

Organisation

Department/Unit

Street or P.O. Box

Zip code and city

Country

Phone number

e-mail

PhD-student YES NO

Topic PhD-Thesis

2. Additional requirements (attached to the registration),

2a. Curriculum Vitae,

2b. PhD or recent work summary up to 300 words,

2c. Motivation letter for participation.

For all other details see above.

Grants will be given according to the ranking provided by “grant panel” with decision made on September 3rd, 2012. Note that grant applications are expected until August 20th, 2012, by e-mail to livcongen2012@gmail.com.

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