ISAG
INTERNATIONAL SOCIETY FOR ANIMAL GENETICS

Applied Genetics in Companion Animals

Organized by a Standing Committee: YES

Meeting information

Date: 22 July 2025
Time: 13:30
Number of participants: ~75

Chair

Name: Peter Dovč
Affiliation: University of Ljubljana, Slovenia
Contact email: Peter.Dovc@bf.uni-lj.si

Co-Chair (optional)

Name: Jiansheng Qiu
Affiliation: Neogen Genomics
Contact email: jqiu@neogen.com

Agenda

1:30 PM		**Introduction** Peter Dovc, *University of Ljubljana, Slovenia*
2:10 PM	OP154	**Development of a high-density feline microarray for breed and trait identification.** Ali Pirani, Paola Corrales, and Mikyung Park*, *Thermo Fisher Scientific Inc*, *Seoul, South Korea*.
2:30 PM	OP155	**Transcriptomic profiling of canine gastrointestinal cancer and chronic inflammatory enteropathy: Molecular insights for diagnosis and treatment.** Maria G. Luigi-Sierra*[1], Janne Graarup-Hansen Lyngby[2], Jennifer M. Jacobsen[1], Ann-Sofie Ingerslev[1], Charlotte Bjørnvad[2], Merete Fredholm[1], Annemarie T. Kristensen[2], Lise Nikolic Nielsen[2], and Susanna Cirera[1], [1]*Department of Veterinary and Animal Sciences, University of Copenhagen, Copenhagen, Denmark*, [2]*Department of Veterinary Clinical Sciences, Copenhagen, Denmark*.
2:50 PM	OP157	**A wolf is not a dog—Man's best friends interactome.** D. Schwochow*[1], C. Kálmán[2], R. Carlsson Norlin[1], S. Dasgupta[1], A.

		Karadagi[3], E. Ellis[3], K. Enikö[2], P. Savolainen[1], and P. Sahlén[1], [1]*KTH Royal Institute of Technology, Science for Life Laboratory, School of Engineering Sciences in Chemistry, Biotechnology and Health, Division of Gene Technology*, *Solna, Sweden*, [2]*Eötvös Loránd University, 2 Department of Ethology*, *Budapest, Hungary*, [3]*Karolinska Institutet/ ME Transplantation, Karolinska University Hospital, 3Department of Clinical Science, Intervention and Technology, (CLINTEC), Division of Transplantation surgery*, *Huddinge, Sweden*.
3:10 PM	OP158	**Chromosome-scale assembly with improved annotation of an American Shorthair cat.** Y. Matsumoto[1,2], C. Y. L. Chung[3], S. Isobe[4], M. Sakamoto[5], X. Lin[3], T. F. Chan[3], H. Hirakawa[4], G. Ishikawa[1], H. M. Lam[3], Y. Tanizawa[5], K. Watanabe[1], M. Yagura[5], Y. Niimura[6], and Y. Nakamura*[5], [1]*Research and Development Section, Anicom Specialty Medical Institute Inc*, *Yokohama, Kanagawa, Japan*, [2]*Data Science Center, Azabu University*, *Sagamihara, Kanagawa, Japan*, [3]*School of Life Sciences and the Center for Soybean Research of the State Key Laboratory of Agrobiotechnology, The Chinese University of Hong Kong*, *Shatin, Hong Kong Special Administrative Region*, [4]*Kazusa DNA Research Institute*, *Kisarazu, Chiba, Japan*, [5]*National Institute of Genetics, Research Organization of Information and Systems*, *Mishima, Shizuoka, Japan*, [6]*Department of Veterinary Sciences, Faculty of Agriculture, University of Miyazaki*, *Miyazaki, Miyazaki, Japan*.
3:30 PM		**Coffee Break.**
4:00 PM	OP159	**Epigenetic signatures associated with myxomatous mitral valve disease in dogs.** S. Jang*[1,2], C.-O. Yun[3], T.-S. Hwang[3], J. Kim[1,2], and J. Lee[4], [1]*Division of Applied Life Science (BK21), Gyeongsang National University*, *Jinju, Republic of Korea*, [2]*Institute of Agriculture and Life Sciences, Gyeongsang National University*, *Jinju, Republic of Korea*, [3]*Institute of Animal Medicine, College of Veterinary Medicine, Gyeongsang National University*, *Jinju, Republic of Korea*, [4]*Animal Genetics & Breeding Division, National Institute of Animal Science, RDA*, *Cheonan-si 31000, Chungcheongnam-do, Republic of Korea*.
4:15 PM	OP160	**Integration of hematological parameters and DNA methylome to identify aging biomarkers in dogs.** S. J. Kim*[1,2], C.-Y. Hong[3], S.-L. Lee[3], J. Kim[1,2], and E.-Y. Bok[4], [1]*Division of Applied Life Science (BK21), Gyeongsang National University*, *Jinju, Republic of Korea*, [2]*Institute of Agriculture and Life Sciences, Gyeongsang National University*, *Jinju, Republic of Korea*, [3]*College of Veterinary Medicine, Gyeongsang National University*, *Jinju, 52828 Republic of Korea*, [4]*Division of Animal Diseases & Health, National Institute of Animal Science, RDA*, *Wanju 55365, Republic of Korea*.

4:30 PM	**Proposal of data format for SNP data exchange.** Leanne van de Goor, VHLGenetics, Wageningen, The Netherlands.
4:45 PM	**A new cat SNP panel proposal.** Leanne van de Goor, VHLGenetics, Wageningen, The Netherlands.
5:00 PM	**Dog 2025 CT report.** Robert A. Grahn, University of California-Veterinary Genetics Laboratory, Davis, CA, USA.
5:15 PM	**Cat 2025 CT report.** Hubert Bauer, LABOKLIN, Bad Kissingen, Germany.
5:30 PM	**General Discussion.**
5:45 PM	**Elections.**

Summary of the meeting

1. The introduction was given by the Chair of the Committee, Peter Dovc, University of Ljubljana, Slovenia. He presented the program of the workshop and provisional time schedule for the ISAG 2027 Comparison Test with the emphasis on earlier deadlines as in previous Comparison Tests to avoid shipping problems in the Christmas time. Then he presented the content of the 1st EAAP Companion Animals Workshop in Milano, May 14-16, 2025. The European Federation of Animal Science (EAAP), started the initiative to assess the research and professional activities in the field of companion animals to explore the possibility to include companion animals in the program of EAAP conferences. The first workshop in Milano showed wide spectrum of activities in this field in Europe and revealed the need to better connect the researchers, kennel clubs and pet owners. The EAAP realized the need to establish communication between companion animal community and farm animal working groups within the EAAP. The first step was proposed to start with the organisation of biannual workshops to connect research and professional organisations in EU, and also with interested individuals and groups from other countries.

2. The scientific program contained four oral presentations in the first part and two in the second part, after the coffee break. Leanne van de Goor gave a presentation of proposal for the new standard format for SNP data exchange between laboratories. Laboratories from Europe proposed a unique format, which would make routine exchange of SNP chip data between laboratories relatively simple. The proposed file format is CSV UTF-8, only one species should be reported per file and the content of the file should include:

   Information dog/cat in file (fill in what is available)
   - Chip number*

- Studbook number*
- Name
- Sex [F/M]
- Species [Canine / Feline]**
- Breed
- Date of birth [jjjj-mm-dd]
- Sample ID number (laboratories might receive >1 sample from an animal)**

*   *At least one is required*
** *Required*

Information Laboratory

- Name
- Contact email address

Information ISAG SNP Profile

- ISAG SNP Name
- Genotype (in ISAG nomenclature, Illumina “Top” strand format)
    - In case a marker failed: leave empty

Example file Dog:

```
Chip number;1234567890123;2345678901234;3456789012345;4567890123456
Studbook number;KC1234567;KC2345678;KC3456789;KC4567890
Name;Charlie;Luna;Milo;Cooper
Sex;M;F;M;M
Species;Canine;Canine;Canine;Canine
Breed;Lagotto Romagnolo;Lagotto Romagnolo;Border Collie;Labrador Retriever
Date of birth;2025-02-25;2024-06-02;2024-12-11;2023-04-18
Sample ID;H123456;H123457;H123458;H123459
Laboratory;VHL;VHL;VHL;VHL
Contact email;info@vhlgenetics.com;info@vhlgenetics.com;info@vhlgenetics.com;info@vhlgenetics.com
AH0JFQR;G;G;G;A/G
AH0JFQS;A;A/G;A/G;A
AH1SDW1;A/G;A/G;A;A
AH1SDWZ;A/G;A;A;A/G
AH3999C;C;C;;C
AH704R2;A/G;A;A/G;A/G
AH892YB;A/C;A;A/C;A
AHBKGAB;A/G;A/G;G;A/G
AHBKGAE;A/G;G;G;G
AHCTEGK;G;G;G;A/G
AHD2CMU;A;A;G;A/G
AHFBAS1;A/G;A/G;A;A
AHGJ8ZA;A;A;A;A/G
AHHS65F;A/G;A;G;A/G
AHKA3HT;X;X/Y;X/Y;X/Y
AHKA3HV;A/G;A/G;A/G;A
AHMSZUB;A/G;A/G;A/G;A
AHPAV6S;G;A/G;G;G
AHPAV6U;A;A/G;G;A/G
AHRSSI9;G;A/G;A;A/G
AHUAOVN;A;A;G;A/G
AHVJM1W;A/G;A;G;A/G
AMELOGENIN;X;X/Y;X/Y;X/Y
BICF2G630102146;A/G;A;A/G;A/G
BICF2G630111735;A/G;A/G;G;A/G
BICF2G630122583;A;A/G;G;A/G
BICF2G630133028;A/G;A/G;A/G;A
BICF2G630149030;A/G;A;G;A
BICF2G630159183;G;A/G;A/G;A
BICF2G630200354;A;A;A/G;G
```

Example file Cat:

```
Chip number;5678900000000;6789010000000;7890120000000;8901230000000
Studbook number;KC5678901;KC6789012;KC7890123;KC8901234
Name;Lucy;Jack;Daisy;Max
Sex;F;M;F;M
Species;Feline;Feline;Feline;Feline
Breed;Maine Coon;Maine Coon;Ragdoll;Ragdoll
Date of birth;8-5-2024;22-4-2023;16-2-2025;6-11-2024
Sample ID;K123456;K123457;K123458;K123459
Laboratory;VHL;VHL;VHL;VHL
Contact email;info@vhlgenetics.com;info@vhlgenetics.com;info@vhlgenetics.com;info@vhlgenetics.com
CHRA113728185;G;G;G;G
CHRA1147652232;G;G;G;G
CHRA1161489899;A;A;;A
CHRA1182274661;A/G;A/G;A/G;A/G
CHRA1203180122;A;A;A;A
CHRA1225272697;A/G;A/G;A/G;A/G
CHRA1254445788;;A;A;A
CHRA1277751565;G;A/G;G;A/G
CHRA135096216;A/G;A/G;A;A
CHRA18645803;G;G;G;G
CHRA2105639377;A/C;A/C;A/C;A/C
CHRA2127940273;G;G;G;G
CHRA214510517;A/G;A/G;A/G;A/G
CHRA2171182940;C;C;C;C
CHRA2177549293;A;A;A;A
CHRA221472877;A;A;A;A
CHRA2217930062;G;G;G;G
CHRA233979426;G;G;G;G
CHRA265750322;A;A;A;A
CHRA296523276;A;A;A;A
CHRA3117471748;G;G;G;G
CHRA3139708979;A;A;A;A
CHRA315528070;A/G;A/G;A;A/G
CHRA328113236;A;A;A;A
CHRA32835846;A;A;A;A
CHRA335789415;G;G;G;G
CHRA398497082;A/G;A/G;G;A
CHRB1100153958;A/G;G;G;A/G
CHRB113362;G;G;G;G
CHRB1137984657;G;A/G;A/G;G
```

From 13 institutional members present at the workshop, 11 supported the proposal and laboratories will use the proposed file format to make exchange of SNP data between laboratories easier.

A new set of SNP markers for cat was proposed as additional set for cases where the existing set is not sufficient. Data from 400 SNPs were available, the participants decided to select a smaller number of additional markers (around 100). The participants agreed that the committee can select a panel of approximately 100 SNPs from the available data and publish the additional panel on the ISAG website. The goal is to have this finished before the end of 2026. In the next ISAG SNP comparison test this panel can be tested.

ISAG Comparison test 2025 for dogs was presented by **Robert Grahn** from the Duty lab 2025, Veterinary Genetic Laboratory, UC Davis.

3. **ISAG Comparison test 2025 for dogs was presented by Robert Grahn from the Duty lab 2025, Veterinary Genetic Laboratory, UC Davis**
   One sample was shipped for STR and SNP analysis. STR loci were reported with the accuracy between 100 and 97.42%. The relative SNP genotyping accuracy was 98,47%. Parentage question was correctly answered by all participants for both types of markers. Additional diagnostic markers were reported by 7 laboratories.

4. **Feline ISAG Comparison test 2025** was presented by **Hubert Bauer from LABOKLIN GmbH, Bad Kissingen, Germany.**
   In the feline Comparison test 39 sample sets (22 animals) were shipped to 21 countries. DNA was isolated by GenEluteTM Blood Genomic DNA Kit, concentration was measured photometrically (30 ng/*µl). One sample was shipped for STR and SNP analysis. STR loci were reported with the accuracy between 100 and 96.22%. The relative SNP genotyping accuracy was 99,27%. Additional diagnostic markers were reported by 12 laboratories.*

Table: Rating of the Cat and Dog 2025 CT results

Absolute genotyping Accuracy Dog				***Absolute genotyping Accuracy Cat***			
STR		***SNP***		***STR***		***SNP***	
100 – 98%	*67*	*100 – 98%*	*28*	*100 – 98%*	*16*	*100 – 98%*	*14*
98 – 95%	*3*	*98 – 95%*	*5*	*98 – 95%*	*1*	*98 – 95%*	*2*
95 – 90%	*1*	*95 – 90%*	*1*	*95 – 90%*	*1*	*95 – 90%*	*0*
90 – 80%	*3*	*90 – 80%*	*1*	*90 – 80%*	*0*	*90 – 80%*	*1*
Below 80%	*3*	*Below 80%*	*0*	*Below 80%*	*1*	*Below 80%*	*0*

Business Meeting

The committee has proposed LABOKLIN lab from Germany and Veterinary Genetics Laboratory, UC Davis as duty labs for the 2026-2027 Dog/Cat CTs, respectively. The approval from ISAG Executive Committee is pending.

The committee discussed the technical part of CT execution for the next CT and there was a proposal to ask duty labs to prepare biological material and to extract DNA. The shipping will be organized separately.
The discussion was also about the form of DNA for the next CT, liquid or dry and the decision was to stick with the liquid form for the next CT.

The attention of committee members was pointed to the problem of exclusion rules: should it be defined as the number of mismatches or as the percentage of mismatches. The members were in favour of defining the percentage of mismatches required for rejection of proposed parentage. The number of informative markers for specific trio should be considered. The proposal is to consider less than 1% of mismatches correct, between 1 and 2.5% as doubtful and more than 2.5% as false parentage (exclusion).

New Committee chair

Chair: Hubert Bauer
Term of service: 2nd, 2023-2027
Affiliation: Laboklin GmbH, Bad Kissingen, Germany
E-mail address: bauer@laboklin.com
Co-Chair: Minja Zorc
Term of service: 1st, 2025-2029
Affiliation: University of Ljubljana, Biotechnical Faculty, Ljubljana, Slovenia
E-mail address: minja.zorc@bf.uni-lj.si

New Committee members

Other committee members	First term of service	Second term of service	Email address
Ryan Ferretti	2025-2029		rferretti@neogen.com
Minja Zorc	2025-2029		minja.zorc@bf.uni-lj.si
Kai Poggeman	2025-2029		kai.poggemann@certagen.de
Allyson Stokes	2025-2029		allyson.stokes@biopetlabs.com
Hubert Bauer	2019-2023	2023-2027	bauer@laboklin.com
Robert Grahn	2019-2023	2023-2027	ragrahn@ucdavis.edu
Leslie Lyons		Ex Officio	lyonsla@missouri.edu

SIGNATURES

Chair	Duty laboratory	Duty laboratory
Peter Dovč Digitalno podpisal Peter Dovč Datum: 2025.08.21 11:41:42 +02'00'	Hubert Bauer	Digitally signed by Dr. Robert A. Grahn, PhD Date: 2025.08.21 21:10:48 -07'00'