

COST
Domain Committee "Food and Agriculture"

COST Action 861

European network for pig genomics

**MONITORING
PROGRESS REPORT**

Period: from 01/01/2008 to 31/12/2008

This Report is presented to the relevant Domain Committee and contains two parts:

- I. Management Report*** prepared by the COST Office/Grant Holder
- II. Scientific Report*** prepared by the Chair of the Management Committee of the Action

The report is a "cumulative" report, i.e. it is updated annually and covers the entire period of the Action.

Confidentiality: the documents will be made available to the public via the COST Action web page except for chapter *II.C. Self evaluation*.

Based on the monitoring results, the COST Office will decide on the following year's budget allocation.

I. Management Report

I.A. COST Action Fact Sheet

Action 861 Fact Sheet

Title

European network for pig genomics

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Details

Draft Mou:

Mou: 306/04

Start of Action: 09/11/2004

Entry into force: 13/09/2004

End of Action: 08/11/2009

CSO approval date: 27/05/2004

Objectives

This Action aims to increase the knowledge of the organisation, expression and regulation of the genes involved in pig development, health, reproduction, and product quality.

Parties

Country	Date
Belgium	23/09/2004
Germany	08/08/2004
Netherlands	08/09/2004
Slovenia	10/02/2005

Country	Date
Czech Republic	23/09/2004
Greece	01/10/2004
Norway	08/04/2005
Spain	20/09/2004

Country	Date
Denmark	08/09/2004
Hungary	18/10/2004
Poland	16/09/2004
Switzerland	09/09/2004

Country	Date
France	04/10/2004
Italy	13/09/2004
Portugal	28/06/2005
United Kingdom	16/09/2004

Total: 16

Intentions to accept the MoU

Country	Date	Country	Date	Country	Date	Country	Date
Ireland	N/A						

Total: 1

Working Groups

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Website

<http://www.toulouse.inra.fr/pignet>

I.B. Management Committee member list

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Grant Holder		
Executive	Finance Officer	Legal Representative

I.C. Overview activities and expenditure

Meetings

Meeting Type	Date	Place	Paid part	Cost	Total
In conjunction with Workshop	03/06/2008	Ljubljana (SI)	40	36196.62	
					36,197

STSM

Beneficiary	Date	From	To	Cost	Total
Dr Mariani Valentina	13/01/2008	Lodi (IT)	FR	1560.00	
Ms Andreia de Jesus Amara	16/06/2008	Wageningen (NL)	UK	2500.00	
Mr Florian Rambow	01/03/2008	Mannheim (DE)	FR	2500.00	
Ms Stephanie Ulrike Buhtz	07/07/2008	Goettingen (DE)	AT	2500.00	
Dr Alessandro Croveti	29/09/2008	Firenze (IT)	ES	2100.00	
Dr LISA NARDI	30/06/2008	FIRENZE (IT)	ES	2300.00	
Dr Szilvia Kusza	28/01/2008	Debrecen (HU)	FR	2500.00	
Mr AHMED ALDARMAHI	18/05/2008	SHEFFIELD (uk)	ES	1110.00	
Mr Davide De Petris	16/06/2008	Firenze (IT)	ES	2200.00	
Ms Erzsébet Emília Gajdócsi	20/09/2008	Mosonmagyaróvár (HU)	IT	2500.00	
					21,770

Workshops

Title	Date	Place		Cost	Total

General Support Grants

Title	Date			Cost	Total

Schools

Title	Date	Place		Cost	Total

57,967

ANNUAL REPORT 2008
COST ACTION 861 "European Network for pig genomics"

1 Activities 2008

In 2008 two major conferences took place. The first conference was the Pig Genome II Conference from June 4-5 in Ljubljana. This conference was hosted and organized by Peter Dovc and colleagues. The programme was organized in four sessions with invited lectures and selected presentations of outstanding posters. The conference was a great success. The proceedings were published with an ISBN number.

The second important conference in 2008 was the International Conference of the ISAG from July 20-24 in Amsterdam. Most of the Action members were also present in Amsterdam and presented their results.

STSM:

The following table summarizes the supported STSM in 2008. A total of 11 STSM were supported with a budget of 22,230 €.

Name	Contry	Destination	Periode
1. Mariani Valentina	Italy	INRA, France	13/01-26/01
2. Szilvia Krusza	Hungary	INRA, France	28/01-23/02
3. Ahmed Aldarmahi	UK	University of Murcia, Spain	18/05-26/05
4. Florian Rambow	Germany	INRA, France	01/03-01/06
5. Andreia de Jesus	Holland	Roslin, UK	01/05-01/07
8. Davide de Petris	Italy	SERIDA, Spain	16/06-17/07
6. Alessandro Crovetto	Italy	I.N.I.A., Spain	29/09-31/10
7. Erzsebet E. Gajdocsi	Hungary	University Diproval, Italy	20/09-20/12
9. Lisa Nardi	Italy	Faculty Veterinaria, Spain	20/06-20/07
10. Stephanie Ulrike Buhtz	Germany	University of Vienna	07/07-07/10
11. Andreia de Jesus Amaral	Holland	Roslin Institute	01/05-01/07

Main achievements 2008:

- Release of a first BAC-based assembly of the porcine genome (Sscrofa5) in Feb. 2008
- Compilation of 316 different pig traits consisting of 1,831 QTLs
- Assembly of the porcine transcriptome including 1,021,891 expressed sequence tags (ESTs) based on the analysis of 97 non-normalized cDNA libraries (PigEST v1.0)
- Publication of the Proceedings of the Pig Genome II Conference in Ljubljana (ISBN 978-961-6379-12-0)

2 Planned Activities 2009

During the MC meeting in June 2008 at the Pig Genome II Conference in Ljubljana it was decided to use the remaining funds of the Action for one final MC meeting in spring 2009. The planning of the meeting will be started at the end of January. The remaining funds will be used for the support of STSM which have been very successful in the years before.

Continuing collaborations (sharing biological resources, technology and equipment):

The contacts with EADGENE Network of excellence was continued. Specific activities were the exchange of SNP informations from different partners of the Action to generate different porcine SNP-chips, e.g. NRSP8-immune chip. In addition, at PTP (E. Giuffra) a specific project called

“MISAGEN” was developed over the last years. The aim of the project is to collect and provide samples of commercial pig breeds with the specific focus on pathogen and host genetic responses. The project includes the creation and maintenance of an epidemiological web-based database containing pedigrees, phenotypes, and environmental data. It will contain informations on improved diagnostics for present and future commercial applications, e.g. GWS (genome wide selection).

3 List of publications of members of the Action 861 (2008)

The following publication list of 2008 of members of the Action demonstrates the close scientific interactions between the different member countries and groups.

1. Ait-Ali T., Wilson A.D., Westcott D.G., Frossard J.P., Mellencamp M.A., Drew T.W., Bishop S.C. & Archibald A.L. (2008) Dynamic differential regulation of innate immune transcripts during the infection of alveolar macrophages by the porcine reproductive and respiratory syndrome virus. *Dev Biol (Basel)* **132**, 239-45.
2. Amaral A.J., Megens H.J., Crooijmans R.P., Heuven H.C. & Groenen M.A. (2008) Linkage disequilibrium decay and haplotype block structure in the pig. *Genetics* **179**, 569-79.
3. Amills M., Ramirez O., Tomas A., Obexer-Ruff G. & Vidal O. (2008) Positive selection on mammalian MHC-DQ genes revisited from a multispecies perspective. *Genes Immun* **9**, 651-8.
4. Amills M., Villalba D., Tor M., Mercade A., Gallardo D., Cabrera B., Jimenez N., Noguera J.L., Sanchez A. & Estany J. (2008) Plasma leptin levels in pigs with different leptin and leptin receptor genotypes. *J Anim Breed Genet* **125**, 228-33.
5. Ando A., Uenishi H., Kawata H., Tanaka-Matsuda M., Shigenari A., Flori L., Chardon P., Lunney J.K., Kulski J.K. & Inoko H. (2008) Microsatellite diversity and crossover regions within homozygous and heterozygous SLA haplotypes of different pig breeds. *Immunogenetics* **60**, 399-407.
6. Bertschinger H., Bürgi E. & Vögeli P. (2008) Molecular genetics instead of antibiotics: application of genetic disease resistance in the pig. *Vierteljahrsschrift der Naturforschenden Gesellschaft Zürich* **153**, 1-6.
7. Beuermann C., Germerodt M., Beck J., Brenig B. & Knorr C. (2008) Chromosomal assignment of eight porcine genes involved in apoptosis. *Anim Genet* **39**, 330-1.
8. Bjerre D., Thorup F., Jorgensen C.B., Vejlsted M. & Fredholm M. (2008) A study of the occurrence of monochorionic and monozygotic twinning in the pig. *Anim Genet*.
9. Bonnet A., Dalbies-Tran R. & Sirard M.A. (2008) Opportunities and challenges in applying genomics to the study of oogenesis and folliculogenesis in farm animals. *Reproduction* **135**, 119-28.
10. Bonnet A., Iannuccelli E., Hugot K., Benne F., Bonaldo M.F., Soares M.B., Hatey F. & Tosser-Klopp G. (2008) A pig multi-tissue normalised cDNA library: large-scale sequencing, cluster analysis and 9K micro-array resource generation. *BMC Genomics* **9**, 17.
11. Bonnet A., Le Cao K.A., Sancristobal M., Benne F., Robert-Granie C., Law-So G., Fabre S., Besse P., De Billy E., Quesnel H., Hatey F. & Tosser-Klopp G. (2008) In vivo gene expression in granulosa cells during pig terminal follicular development. *Reproduction* **136**, 211-24.
12. Bruun C.S., Jorgensen C.B., Bay L., Cirera S., Jensen H.E., Leifsson P.S., Nielsen J., Christensen K. & Fredholm M. (2008) Phenotypic and genetic characterization of a novel phenotype in pigs characterized by juvenile hairlessness and age dependent emphysema. *BMC Genomics* **9**, 283.
13. Casellas J. & Varona L. (2008) Between-groups within-gene heterogeneity of residual

- variances in microarray gene expression data. *BMC Genomics* **9**, 319.
14. Casellas J., Ibanez-Escriche N., Garcia-Cortes L.A. & Varona L. (2008) Bayes factor between Student t and Gaussian mixed models within an animal breeding context. *Genet Sel Evol* **40**, 395-413.
 15. Casellas J., Tomas A., Sanchez A., Alves E., Noguera J.L. & Piedrafita J. (2008) Using haplotype probabilities in categorical survival analysis: a case study with three candidate genes in an Iberian x Meishan F2 population of newborn piglets. *J Anim Breed Genet* **125**, 5-12.
 16. Charlier C., Coppieters W., Rollin F., Desmecht D., Agerholm J.S., Cambisano N., Carta E., Dardano S., Dive M., Fasquelle C., Frennet J.C., Hanset R., Hubin X., Jorgensen C., Karim L., Kent M., Harvey K., Pearce B.R., Simon P., Tama N., Nie H., Vandeputte S., Lien S., Longeri M., Fredholm M., Harvey R.J. & Georges M. (2008) Highly effective SNP-based association mapping and management of recessive defects in livestock. *Nat Genet* **40**, 449-54.
 17. Cirera S. & Fredholm M. (2008) Porcine lung surfactant protein B gene (SFTPB): cDNA sequencing, chromosomal location, and expression studies. *Anim Biotechnol* **19**, 127-37.
 18. D'Andrea M., Pilla F., Giuffra E., Waddington D. & Archibald A.L. (2008) Structural analysis and haplotype diversity in swine LEP and MC4R genes. *J Anim Breed Genet* **125**, 130-6.
 19. Davies G., Genini S., Bishop S. & Giuffra E. (2009) An assessment of opportunities to dissect host genetic variation in resistance to infectious diseases in livestock. *Animal*, in press.
 20. de Sevilla X.F., Fabrega E., Tibau J. & Casellas J. (2008) Effect of leg conformation on survivability of Duroc, Landrace, and Large White sows. *J Anim Sci* **86**, 2392-400.
 21. Estelle J., Gil F., Vazquez J.M., Latorre R., Ramirez G., Barragan M.C., Folch J.M., Noguera J.L., Toro M.A. & Perez-Enciso M. (2008) A quantitative trait locus genome scan for porcine muscle fiber traits reveals overdominance and epistasis. *J Anim Sci* **86**, 3290-9.
 22. Estellé J., Mercadé A., Pérez-Enciso M., Pena R., Silió L., Sánchez A. & Folch J. (2009) Evaluation of FABP2 as candidate gene for fatty acid composition QTL in porcine chromosome 8. *J Anim Breed Genet*, in press.
 23. Ferraz A.L., Ojeda A., Lopez-Bejar M., Fernandes L.T., Castello A., Folch J.M. & Perez-Enciso M. (2008) Transcriptome architecture across tissues in the pig. *BMC Genomics* **9**, 173.
 24. Flori L., Rogel-Gaillard C., Cochet M., Lemonnier G., Hugot K., Chardon P., Robin S. & Lefevre F. (2008) Transcriptomic analysis of the dialogue between Pseudorabies virus and porcine epithelial cells during infection. *BMC Genomics* **9**, 123.
 25. Flori L., Rogel-Gaillard C., Mariani V., Lemonnier G., Cochet M., Hugot K., Chardon P., Robin S. & Lefevre F. (2008) A combined transcriptomic approach to analyse the dialogue between pseudorabies virus and porcine cells. *Dev Biol (Basel)* **132**, 99-104.
 26. Fontanesi L., Scotti E., Buttazzoni L., Davoli R. & Russo V. (2008) The porcine fat mass and obesity associated (FTO) gene is associated with fat deposition in Italian Duroc pigs. *Anim Genet*.
 27. Frandsen P.M., Madsen L.B., Bendixen C. & Larsen K. (2008) Porcine gamma-synuclein: molecular cloning, expression analysis, chromosomal localization and functional expression. *Mol Biol Rep*.
 28. Gallardo D., Canovas E., Lopez-Bejar M., Ramirez O., Pena R., Quintanilla R. & Amills M. (2008) Alternative splicing at exon 28 of the acetyl-coenzyme A carboxylase alpha gene in adult pigs and embryos. *Anim Genet* **39**, 205-6.
 29. Gallardo D., Pena R.N., Amills M., Varona L., Ramirez O., Reixach J., Diaz I., Tibau J., Soler J., Prat-Cuffi J.M., Noguera J.L. & Quintanilla R. (2008) Mapping of quantitative trait loci for cholesterol, LDL, HDL and triglyceride serum concentrations in pigs. *Physiol Genomics*.
 30. Gallardo D., Quintanilla R., Varona L., Diaz I., Ramirez O., Pena R. & Amills M. (2008)

- Polymorphism of the acetyl coenzyme A carboxylase alpha (ACACA) gene associated with fatty acid composition in a Duroc commercial line. *Anim Genet*, in press.
31. Gardan D., Gondret F., Van den Maagdenberg K., Buys N., De Smet S. & Louveau I. (2008) Lipid metabolism and cellular features of skeletal muscle and subcutaneous adipose tissue in pigs differing in IGF-II genotype. *Domest Anim Endocrinol* **34**, 45-53.
 32. Genini S., Cantu M., Botti S., Malinverni R., Costa A., Marras D. & Giuffra E. (2008) Diagnostic markers for diseases: SELDI-TOF profiling of pig sera for PRRS. *Dev Biol (Basel)* **132**, 399-403.
 33. Genini S., Delputte P.L., Malinverni R., Cecere M., Stella A., Nauwynck H.J. & Giuffra E. (2008) Genome-wide transcriptional response of primary alveolar macrophages following infection with porcine reproductive and respiratory syndrome virus. *J Gen Virol* **89**, 2550-64.
 34. Genini S., Malinverni R., Delputte P.L., Fiorentini S., Stella A., Botti S., Nauwynck H.J. & Giuffra E. (2008) Gene expression profiling of porcine alveolar macrophages after antibody-mediated cross-linking of Sialoadhesin (Sn, Siglec-1). *J Recept Signal Transduct Res* **28**, 185-243.
 35. Genini S., Nguyen T., Stranzinger G., Vögeli P. & Giuffra E. (2008) Characterization and RH-mapping of porcine INPP4A and SLC5A7, candidate genes for congenital progressive ataxia and spastic paresis. *Anim Genet*, submitted.
 36. Germerodt M., Beuermann C., Rohrer G.A., Snelling W.M., Brenig B. & Knorr C. (2008) Characterization and linkage mapping of 15 porcine STS markers to fine-map chromosomal regions associated with hernia inguinalis/scrotalis. *Anim Genet*.
 37. Guo Y.M., Lee G.J., Archibald A.L. & Haley C.S. (2008) Quantitative trait loci for production traits in pigs: a combined analysis of two Meishan x Large White populations. *Anim Genet* **39**, 486-95.
 38. Hadjiconstantouras C., Sargent C.A., Skinner T.M., Archibald A.L., Haley C.S. & Plastow G.S. (2008) Characterization of the porcine KIT ligand gene: expression analysis, genomic structure, polymorphism detection and association with coat colour traits. *Anim Genet* **39**, 217-24.
 39. Haubitz M. & Vögeli P. (2008) Arthrogryposis multiplex congenita (AMC) in Large White pigs. *Suisseporcs-Information* **3**, 24-5.
 40. Hoegh S.V., Lindegaard H.M., Sorensen G.L., Hoj A., Bendixen C., Junker P. & Holmskov U. (2008) Circulating surfactant protein D is decreased in early rheumatoid arthritis: a 1-year prospective study. *Scand J Immunol* **67**, 71-6.
 41. Houston R.D., Rance K.A., Sutcliffe E., Archibald A.L. & Haley C.S. (2008) The cholecystokinin type A receptor g.179A>G polymorphism affects feeding rate. *Anim Genet* **39**, 187-8.
 42. Joller D., Jorgensen C., Bertschinger H., Edfors I., Cirera S., Archibald A., Bürgi E., Andersson L., Fredholm M. & Vögeli P. (2008) Refined localisation of the Escherichia coli F4ab/F4ac receptor locus on pig chromosome 13. *Anim Genet*, submitted.
 43. Jonas E., Schreinemachers H.J., Kleinwachter T., Un C., Oltmanns I., Tetzlaff S., Jennen D., Tesfaye D., Ponsuksili S., Murani E., Juengst H., Tholen E., Schellander K. & Wimmers K. (2008) QTL for the heritable inverted teat defect in pigs. *Mamm Genome* **19**, 127-38.
 44. Karlskov-Mortensen P., Hu Z.L., Reecy J.M. & Fredholm M. (2008) A data resource of 838 porcine microsatellite sequences with repeat motifs of three to six bases. *Anim Genet* **39**, 85-6.
 45. Liu G., Kim J.J., Jonas E., Wimmers K., Ponsuksili S., Murani E., Phatsara C., Tholen E., Juengst H., Tesfaye D., Chen J.L. & Schellander K. (2008) Combined line-cross and half-sib QTL analysis in Duroc-Pietrain population. *Mamm Genome* **19**, 429-38.

46. Mao H., Guo Y., Yang G., Yang B., Ren J., Liu S., Ai H., Ma J., Brenig B. & Huang L. (2008) A genome-wide scan for quantitative trait loci affecting limb bone lengths and areal bone mineral density of the distal femur in a White Duroc x Erhualian F2 population. *BMC Genet* **9**, 63.
47. Mariani V., Palermo S., Lanubile A., Fiorentini S., Cecere M. & Giuffra E. (2009) Gene expression study of the two widely used pig intestinal epithelial cell lines: IPI-2I and IPEC-J2., submitted.
48. Markljung E., Braunschweig M.H., Karlskov-Mortensen P., Bruun C.S., Sawera M., Cho I.C., Hedebro-Velander I., Josell A., Lundstrom K., von Seth G., Jorgensen C.B., Fredholm M. & Andersson L. (2008) Genome-wide identification of quantitative trait loci in a cross between Hampshire and Landrace II: meat quality traits. *BMC Genet* **9**, 22.
49. Markussen M.D., Heiberg A.C., Fredholm M. & Kristensen M. (2008) Differential expression of cytochrome P450 genes between bromadiolone-resistant and anticoagulant-susceptible Norway rats: a possible role for pharmacokinetics in bromadiolone resistance. *Pest Manag Sci* **64**, 239-48.
50. Matal J., Jancova P., Siller M., Masek V., Anzenbacherova E. & Anzenbacher P. (2008) Interspecies comparison of the glucuronidation processes in the man, monkey, pig, dog and rat. *Neuro Endocrinol Lett* **29**, 738-43.
51. Megens H.J., Crooijmans R.P., San Cristobal M., Hui X., Li N. & Groenen M.A. (2008) Biodiversity of pig breeds from China and Europe estimated from pooled DNA samples: differences in microsatellite variation between two areas of domestication. *Genet Sel Evol* **40**, 103-28.
52. Moe M., Lien S., Bendixen C., Hedegaard J., Hornshoj H., Berget I., Meuwissen T.H. & Grindflek E. (2008) Gene expression profiles in liver of pigs with extreme high and low levels of androstenone. *BMC Vet Res* **4**, 29.
53. Mortensen K.E., Conley L.N., Hedegaard J., Kalstad T., Sorensen P., Bendixen C. & Revhaug A. (2008) Regenerative response in the pig liver remnant varies with the degree of resection and rise in portal pressure. *Am J Physiol Gastrointest Liver Physiol* **294**, G819-30.
54. Murani E., Ponsuksili S., Srikanchai T., Maak S. & Wimmers K. (2008) Expression of the porcine adrenergic receptor beta 2 gene in longissimus dorsi muscle is affected by cis-regulatory DNA variation. *Anim Genet*.
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