High Strategy Meeting

COST Action FA1404 – COREMI

Working Group 2: "End users (One Health) - interdisciplinary approach"

Identification of methods on the determination of clinical aspects and prevalence PRM on humans

Programme & Agenda

Amsterdam, The Netherlands, 18-19 April 2016


Abdigoudarzi et al., 2014


Gavrilovic et al., 2015


Cafiero et al., 2009

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ARISTOTLE UNIVERSITY OF THESSALONIKI
LIVESTOCK RESEARCH WAGENINGEN UR
HELLENIC REPUBLIC National and Kapodistrian University of Athens MEDICAL SCHOOL DEPARTMENT OF PHARMACOLOGY
COREMI

WELCOME

On behalf of the Organizing Committee, it is indeed a pleasure to wish you a warm welcome to the High Strategic Meeting of Working Group 2: "End users (One Health) - interdisciplinary approach" from the COST Action FA1404 – COREMI.

After the first inventory of literature on the effects of *Dermanyssus gallinae* (Poultry Red Mite, PRM) in humans and its prevalence, we identified a knowledge gap. With this High Strategic Meeting human and veterinary medicine will work together to find the best way to fill in this knowledge gap by sharing knowledge and discussing the implications and implementation of this knowledge. This to answer the question how to conduct research to identify methods on the determination of clinical aspects and prevalence *Dermanyssus gallinae* on humans.

I wish you a wonderful experience during this One Health High Strategic Meeting and hope we will look back at the Meeting as a "gezellig", pleasant, social though productive meeting.

Monique Mul
Researcher Animal Health of Wageningen UR Livestock Research

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Organizing Committee

Monique Mul (Wageningen UR Livestock Research, NL)
Elias Papadopoulos (Aristotle University of Thessaloniki, EL)
Ekaterini Tiligada (Medical School, National and Kapodistrian University of Athens, EL)

Scientific Committee

Olivier Sparagano, UK	(Chair)
Elias Papadopoulos, EL	(Vice Chair)
Kathryn Bartley, UK	(WG1 Leader)
Monique Mul, NL	(WG2 Leader)
Ekaterini Tiligada, EL	(WG2 co-Leader)
Lise Roy, FR	(WG3 Leader)
Antonio Camarda, IT	(WG4 Leader)
Annunziata Giangaspero, IT	(STSM Leader)

Organizers

COST Action FA1404 - COREMI
Wageningen UR Livestock Research, NL
Mini-Rondeel, Amsterdam, NL (Timon Brandsen)

General Information

Host Institution

Wageningen UR Livestock Research
Wageningen Campus, De Elst 1 (Building 122)
P.O. Box 338, 6700 AH Wageningen
The Netherlands

Venue

MiniRondeel 't Ei-land
Gaasterlandstraat 4
1079 Amsterdam
The Netherlands

Amsterdam - Mini-Rondeel

In the Mini-Rondeel, Amsterdam, 200 laying hens are housed in the smaller version of the Rondeel® where laying hens are housed in a welfare and environmentally friendly way. The requirements of the laying hen were used to design this new type of housing. The Mini Rondeel is a sustainable laying hen farm producing eggs for the city. It is a meeting place for companies, neighbours and other visitors who would like to know more about this sustainable way of keeping laying hens, locally produced food and sustainable energy [http://www.rondeel.org/].

Oral Communications

The introductory talks should last no longer than 10 minutes. They should be in MS Power Point format and be brought on a USB, saved as: Name_of_presenter.ppt

Social Events

Social Dinner at Rosarium Parker's restaurant, Europaboulevard, Amstelpark 1, 1083 HZ Amsterdam

INTRODUCTION

COREMI

At the end of 2014, COST, a long-running European framework supporting trans-national cooperation among researchers, engineers and scholars across Europe, approved the funding of the Action FA 1404 "Improving current understanding and research for sustainable control of the poultry red mite *Dermanyssus gallinae* (COREMI)". In this COST Action, four Working Groups aim to generate a synergic/holistic approach to improve health, welfare and productivity of the EU's 350 million laying hens through more effective prevention and control of poultry red mite (PRM). This will be achieved through cooperation and multidisciplinary networking between scientists and other stakeholders from different member states and from different disciplines, thus increasing competitiveness of the European poultry industry with respect to other leading countries. The overall objective of COREMI is to consolidate this existing expertise and knowledge to gain a better understanding of PRM and the economic and societal impacts of this pest, using this information to implement more efficient and sustainable control methods.

Why to control PRM?

Problems in poultry farms: The PRM *Dermanyssus gallinae* poses a significant threat to egg-laying hens in many parts of the world, being particularly significant in Europe (Chauve, 1998; Sparagano *et al*., 2009). Though all domestic fowl are at risk from PRM, infestation appears most significant in laying hens. Economic costs associated with control and production losses have been estimated at €130 million per year for the EU egg industry (van Emous, 2005). There is a relationship between PRM infestation and hen mortality, with some reports recording a tenfold increase in death rates following severe infestation (Cosoroaba, 2001). Although causal factors may vary, in extreme cases PRM numbers may be so high that hens become severely anaemic, mortality resulting from exsanguinations alone (Wojcik *et al*., 2000; Cosoroaba, 2001; Kilpinen *et al*., 2005). At a sub-lethal level, mite feeding may result in significant stress to hens, increased feed and water intake and decreased bird condition (Chauve, 1998; Kilpinen *et al*., 2005; Mul *et al*., 2009), also impacting upon production by causing declines in egg quality (through shell thinning and spotting) and laying (Chauve, 1998; Cosoroaba, 2001). Increases in aggressive feather-pecking and cannibalistic behaviours have been reported following infestation (Chauve, 1998; Mul *et al*., 2009). Thus, any proposed ban on beak-trimming should be preceded by a concerted effort to improve PRM prevention and control. Even relatively small mite populations may have significant impact. PRM may serve as a disease vector for numerous pathogens, including *Salmonella, Pasteurella, Listeria, E. coli, Staphylococcus, Streptomyces*, Newcastle disease, Fowl poxvirus, St. Louis encephalitis and various other forms of encephalitis (Valiente Moro *et al*., 2005; 2009). In addition to spreading disease, infestation may limit hen immunological responses to pathogens and/or vaccination strategies. Heavy infestations have been reported to reduce antibody titers to some viral vaccines, or to suppress host antibody production (Kowalski and Sokol, 2009; Kaoud, 2010).

Problems in human health: Though PRM has historically been regarded as avian-specific, increased reports of non-avian infestations suggest a possible wider threat to animal and human health (George *et al*., 2013). The full significance of PRM to these sectors has yet to be fully determined and warrants urgent attention. This is especially true given the cosmopolitan distribution of PRM (also occurring in association with feral and synanthropic birds) and its significant potential as a vector of zoonotic disease. Recent review confirms increasing incidence of PRM attacks on humans (George *et al*., 2013), including propensity for persistent infestation when feeding on human blood alone (Pampiglione *et al*., 2001). Transmission through bird mites *per se* of Spirochetes, Rickettsiae, Salmonellae, Bartonellae, Pasteurellae, Sporozoa, hemogregarines, flagellates, and filariae have all been suggested (Litwin, 1961). More recent evidence supports acquisition of *Bartonella* via *Dermanyssus spp* (Melter *et al*., 2012) and links attacks to Lyme disease, *Bartonella* and/or *Babesia* (George *et al*., 2013). In this context, the question of the etiology of Dermanyssus infestation is crucial, and especially of the role of wild birds in poultry and man infestation.

PRM species: To date, in Europe, a single species has been found in laying farms (*D. gallinae*), while several different species including *D. gallinae* have been found in the wild avifauna. However, no exchanges have been shown to occur between wild birds and domestic fowl, with *D. gallinae* farm populations highly differentiated from *D. gallinae* wild populations (Brännström and Oines 2011, Roy and Buronfosse 2011). Besides, wild birds have been shown to be parasitized by some cryptic species, especially pigeons (Roy et al. 2009; 2010, Roy and Buronfosse 2011).

Objectives and initial results of the COREMI "One Health" Working Group

The main objectives of COREMI Working Group 2 "End users (One Health) – interdisciplinary approach" are: 1) to review the economical and societal impact of Poultry Red Mite (*Dermanyssus gallinae*), and 2) foster further study on PRM in non-avian hosts with medical and veterinary practitioners.

In 2015 a literature search was conducted to identify the incidence of human pathologies associated with the PRM and with the measures used to control PRM, primarily in poultry farming. The outcomes are summarized as follows:

- The available (mainly English) literature from 1828 to 2015 is scarce and refers mostly to case reports on skin lesions, rushes and pruritus caused by Dermanyssus gallinae.
- Although there is data on the consequences to human health of the various measures that frequently target the control of D. gallinae, such as silica dust, the literature on the putative link between these measures and human pathologies is virtually lacking.

Out of this literature search, the following conclusions have been reached:

- The clinical signs and symptoms in humans are usually caused by PRMs that have infested poultry, pet birds or birds nesting in or near human environments (e.g. pigeons, canaries).
- The infestation is not limited to rural areas. Recurrent urban cases have been reported and were mainly related to abandoned pigeons nests.
- The common clinical manifestations associated with *D. gallinae* in humans are nocturnal pruritic dermatitis with chronic or recurrent erythematous maculopapular or papulovesicular lesions and perivascular eosinophilic infiltration of the superficial dermis.
- The laboratory values are normal without blood eosinophilia. The treatment is symptomatic and the elimination of the source of infection is vital.

The clinical manifestations caused by *D. gallinae* bites seem to be under- or misdiagnosed for the following reasons:

- They are not well recognized by physicians and/or patients.
- They are sometimes mistaken for scabies or pediculosis.
- PRM infestation is not included in the differential diagnosis of nocturnal (especially recurrent) pruritus.
- The mite is usually not seen and the diagnosis may rely on the history of the patient (contact with birds or nests, birds inside or nearby human inhabited places, patient occupation, etc).
- Many reports concern nosocomial infestation, whereas cases related to poultry farming are scarce. This may indicate the convenience to refer patients to hospitals and to identify the symptoms in the hospital environment, thus overlooking populations that are highly exposed to the risks associated with the PRM.
- The importance of PRM in public health with respect to its role as potential source of allergens and reservoir of pathogens, as well as the possibility of animal to human cross-infection have not been considered.

As a result, cutaneous or other reactions resulting from PRM bites would be more frequent than those reported in the literature. Furthermore, no data are currently available to determine any association between exposure to PRM and control measures and the incidence of clinical symptoms and signs in humans. A reliable and consistent study on the epidemiology of PRM related human pathologies in different groups exposed to *D. gallinae* (e.g. poultry farmers, people living in the vicinity of pigeons) is suggested. The scope is to identify the clinical characteristics and the actual frequency of this underestimated risk.

Meeting objectives

This HSM aims to promote the collaborative cross-sectoral One Health approach to solve health challenges related to PRM. The HSM is comprised of round table sessions, where the animal and human medical communities share ideas, interact and discuss:

- The risks, prevalence and clinical aspects of PRM
- Arthropod-related skin lesions
- Preventive measures and data collection on PRM effects on humans
- Research approaches to identify the PRM effects in the immune system
- Dissemination and exploitation plans and One Health activities related to COST networking

PROGRAMME AND AGENDA

Monday April 18th 2016

09.00 - 09.30 **Registration of participants**

09.30 – 10.10 **Welcome and introduction**
Welcome, Ir. Monique Mul (NL)
Aim of the meeting and round table questions, Prof. Dr. Katerina Tiligada (EL)

10.10 - 10.20 *Coffee Break*

10.20 – 12.20 Round table I: **Identification of the effects of PRM in humans: Genetic & cellular aspects**
Discussion panel: A. Camarda (IT), M. Grosicki (PL), D. Lekkakou (EL), L. Roy (FR)

Genetic differences within the gallinae complex: possible differences in the pathogenicity of man-attacking and hen-attacking mites?
Lise Roy, Université Paul Valery Montpellier, France

Implication of vectors in pathogen transmission to humans
Antonio Camarda, Universita degli Studi di Bari, Italy

Cellular models for the investigation of the immunological response
Marek Grosicki, Jagiellonian University Medical College, Kraków, Poland

Discussion

12.20 – 13.00 *Lunch*

13.00 – 15.00 Round table II: **PRM in humans: Risks, prevalence and clinical aspects**
Discussion panel: MA Cafiero (IT), A. Giangaspero (IT), G. Gkimpas (UK), L. Hondema (NL), Ch. Magnis (EL)

PRM-related occupational and societal hazards
Laurens Hondema, Dutch Public Health Services, The Netherlands

Prevalence of PRM-related cases in humans
Maria Assunta Cafiero, Zooprophylactic Institute, Foggia, Italy

Differential diagnosis of mite allergy: Focusing on PRM
George Gkimpas, University of Manchester, UK

The role of physician in identifying PRM-related cases in humans
Charalabos Magnis, Thessaloniki, Greece

Discussion

15.00 – 15.15 *Coffee Break*

15.15 – 17.15 Round table III: **Arthropod related human skin disorders**
Discussion panel: A. Camarda (IT), P. Delaunay (FR), M. Dramountanis (DE), T. Hekker (NL), A. Kavallari (EL)

Parasitic skin infections: symptoms, diagnosis and treatment
Pascal Delaunay, Centre Hospitalier Universitaire de Nice, France

Skin lesions: Differential diagnosis and laboratory markers
Michael Dramountanis, University of Düsseldorf, Germany

Strengths and limitations of using primary cell cultures for investigating human skin pathologies
Andrianna Kavallari, Medical School, NKUA, Greece

Discussion

19.15 *Social Dinner* at Rosarium Parker's restaurant
Europaboulevard, Amstelpark 1, 1083 HZ Amsterdam

Tuesday April 19th 2016

08.00 – 08.15 **Registration of participants**

08.15 – 12.15 Round table IV: **PRM-related health issues: Preventive measures and data collection**

Discussion panel: A. Camarda (IT), P. van der Laar (NL), M. Mul (NL), C. Viegas (PT)

Chemical measures for PRM control in poultry farms

Peter van der Laar, Van Eck BV Pest control, The Netherlands

Reporting of PRM-related health issues

Antonio Camarda, Universita degli Studi di Bari, Italy

Occupational exposure to fungi in poultry - An example of effective means of data collection

Carla Viegas, Lisbon School of Health Technology, Portugal

Discussion

12.15 – 13.00 *Lunch*

13.00 – 14.30 Round table V: **Coordination of data analysis and evaluation**

Discussion panel: L. Graat (NL), J. van Riel (NL), O. Sparagano (UK)

The value of questionnaires for data collection

Johan van Riel, Wageningen UR Livestock Research, The Netherlands

Analysis and validation of data

Lisette Graat, Wageningen University, The Netherlands

Discussion

14.30 – 14.45 *Coffee Break*

14.45 – 16.00 Round table VI: **Dissemination of knowledge on PRM-related health issues**

Discussion panel: K. Bartley (UK), E. Papadopoulos (EL), K. Tiligada (EL)

Dissemination and outreach activities targeting scientific audiences, veterinary and health professionals and the public

Elias Papadopoulos, Aristotle University of Thessaloniki, Greece

Future one-health activities related to COST networking: Visibility & sustainability

Katerina Tiligada, Medical School, NKUA, Greece

Discussion

16.00 – 16.30 **Conclusions and evaluation of the meeting**

M. Mul (NL), E. Papadopoulos (EL), K. Tiligada (EL)

General discussion

PRACTICAL INFORMATION

SOCIAL EVENT

Social Dinner Monday 18th of April (19.30) at Rosarium Parker's restaurant, Europaboulevard, Amstelpark 1, 1083 HZ Amsterdam

TRANSPORTATION

Getting from the airport to Hotel Motel One and Mini Rondeel

PUBLIC TRANSPORT

If coming from Schiphol airport you can take a sprinter stopping train (direction Hilversum or Almere Oostvaarders) directly to Amsterdam RAI station. The train comes frequently and the trip takes just over 10 minutes - RAI is the second stop from Schiphol just after Amsterdam Zuid station. Check the overhead boards at Schiphol station to ensure your train stops at Amsterdam RAI. You should not take a train to Amsterdam Central which goes via another route.

The cost of a one-way train ticket in 2016 from Schiphol to Amsterdam RAI is €3 2nd class or €5.10 in first class. Note, there is a €1 surcharge for purchasing a disposable train ticket. See how to buy train tickets in Netherlands for more detailed info. (https://www.ns.nl/producten/en/losse-kaartjes/p/retour)

Alternatively, a taxi from the airport will cost €30-35.

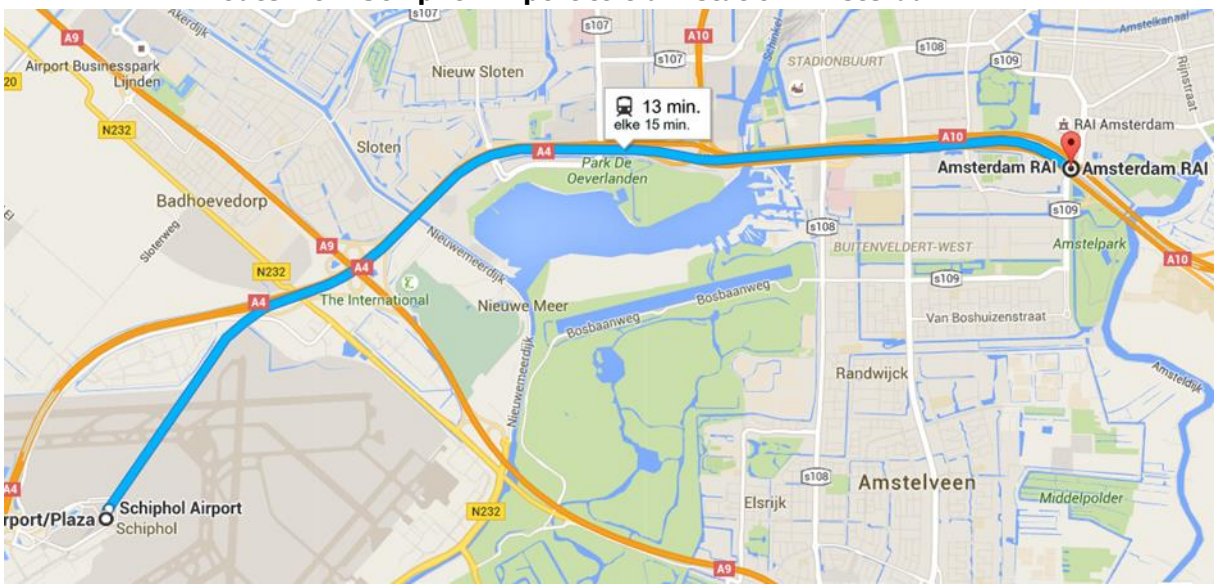
To travel between Amsterdam RAI and Amsterdam centre you have a few choices. By public transport there is Amsterdam metro line 51 or tram line 4 both of which go to central station. A taxi to the centre of the city should cost €15-20.

Check out Amsterdam Metro Map

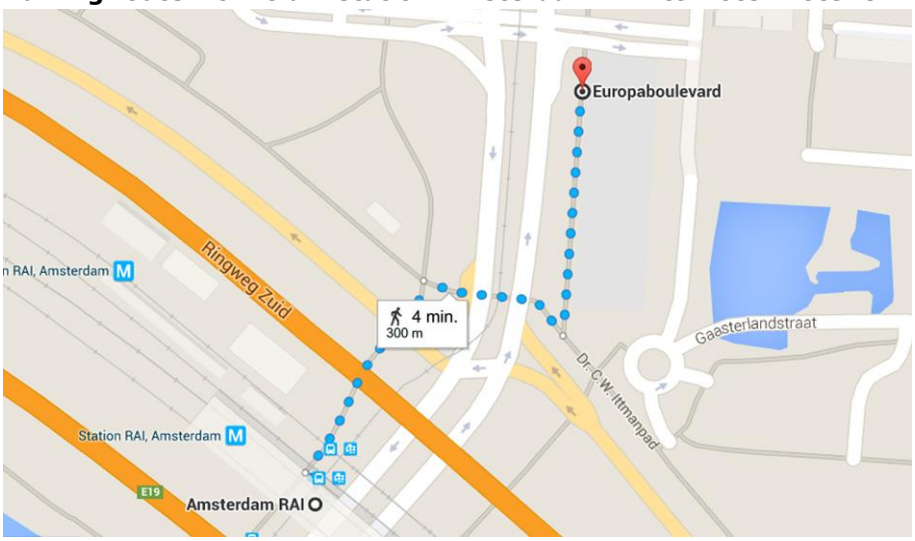
PARKING

Private parking is possible on site (subject to availability) and costs EUR 15 per day.

Route from Schiphol Airport to train station Amsterdam RAI

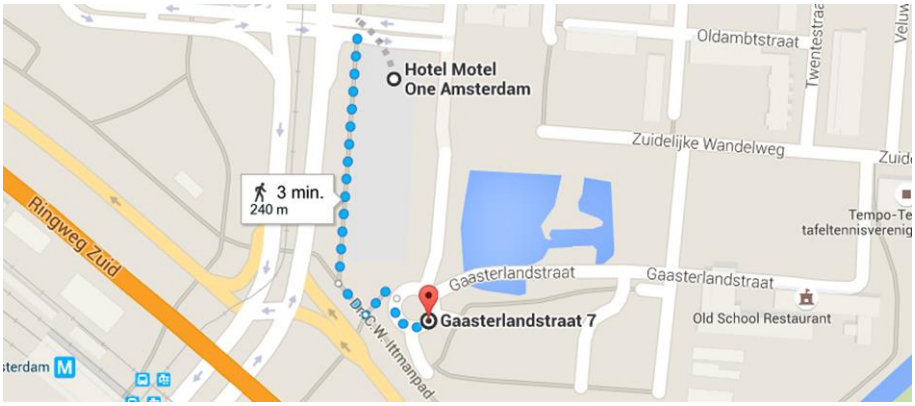


Walking route from train station Amsterdam RAI to Hotel Motel ONE



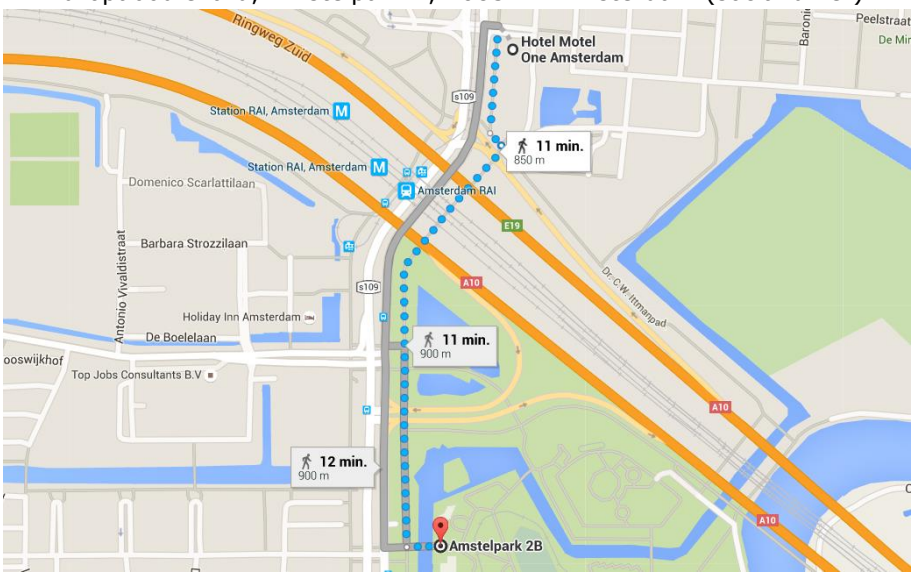
Walking route from Hotel Motel ONE to Mini Rondeel (meeting place)

The meeting is at Mini Rondeel at Gaasterlandstraat 4, Amsterdam.



Walking route from Hotel Motel ONE to Rosarium Parker's restaurant

Europaboulevard, Amstelpark 1, 1083 HZ Amsterdam (social diner)



LOCAL ORGANIZERS CONTACT DETAILS

If you have any queries, please contact Monique Mul at monique.mul@wur.nl, T: +31 (0)317 48 03 87

LIST OF PARTICIPANTS

1.	Kathryn Bartley, UK	Kathryn.Bartley@moredun.ac.uk	MC & CG member, WG1 leader
2.	Maria Assunta Cafiero, IT	ma.cafiero@izsfg.it	MC member
3.	Antonio Camarda, IT	antonio.camarda@uniba.it	MC & CG member, WG4 Leader
4.	Pascal Delaunay, FR	delaunay.p@chu-nice.fr	Human entomologist-parasitologist
5.	Michael Dramountanis, DE	Michael.Dramountanis@med.uni-duesseldorf.de	MD, Trainee in Dermatology
6.	Domenico Galante, IT	domenico.galante@izspb.it	Veterinarian (viruses, molecular biology)
7.	Annunziata Giangaspero, IT	annunziata.giangaspero@unifg.it	MC & CG member, STSM Leader
8.	Lisette Graat, NL	Lisette.graat@wur.nl	Veterinary epidemiologist
9.	Marek Grosicki, PL	grosickim@gmail.com	Biotechnologist, PhD candidate
10.	George Guibas, UK	georgios.gkimpas@manchester.ac.uk	MD, Allergist
11.	Thecla Hekker, NL	tam.hekker@vumc.nl	MD, Microbiologist, Parasitologist, Education coordinator
12.	Laurens Hondema, NL	L.hondema@ggdgmv.nl	Medical environmental specialist in training
13.	Andrianna Kavallari, EL	andrikava@hotmail.com	MD, Trainee in Dermatology, PhD candidate
14.	Peter van der Laar, NL	Peter@vaneckbv.nl	MC substitute, Expert in pest control
15.	Dimitra Lekkakou, EL	DimitraLekkakou@gmail.com	MD, Biopathologist – Microbiologist, PhD candidate
16.	Charalampos Magnis, EL	babis.magnis@gmail.com	MD, Physician
17.	Monique Mul, NL	monique.mul@wur.nl	MC & CG member, WG2 Leader, PhD candidate
18.	Elias Papadopoulos, EL	eliaspap@vet.auth.gr	COST FA1404 Vice-chair
19.	Johan van Riel, NL	Johan.vanriel@wur.nl	Models and statistics expert
20.	Lise Roy, FR	lise.roy@univ-montp3.fr	MC & CG member, WG3 Leader
21.	Olivier Sparagano, UK	ab8677@coventry.ac.uk	COST FA1404 Chair
22.	Ekaterini Tiligada, EL	aityliga@med.uoa.gr	Pharmacologist, MC member, WG2 co-Leader
23.	Carla Viegas, PT	carla.viegas@estesl.ipl.pt	Occupational health expert

RESUMÉ OF PARTICIPANTS (in alphabetical order)

Kathryn BARTLEY
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Kathryn graduated *Aberystwyth University* (Wales) with a degree in Microbiology/Zoology and was awarded her PhD from the *University of Edinburgh* in 2003 for the molecular characterisation of a pox virus (SQPV) associated with the decline of red squirrels in the UK. Kathryn's post-doctoral career has focussed on the development of novel vaccines, routes of vaccine delivery systems and identification diagnostic antigens for the control of livestock diseases. She previously worked with Dr John March on the engineering of lamda phage viruses for use as DNA vaccine delivery system and later with Dr George Russell on the evaluation of malignant catarrhal fever virus capsid antigens for diagnostic and vaccine potential. As a senior post-doctoral researcher in the red mite group lead by Dr Alasdair Nisbet at the *Moredun Research Institute*, her current focus has been on identifying effective poultry red mite vaccine antigen candidates for controlling red mite infestation in commercial layers. Her current research focuses on the identification and testing of red mite vaccine candidate antigens as part of a BBSRC/Zoetis/AKITA funded program of work; small scale evaluation and large scale field trial testing of selected vaccine candidate antigens and evaluation of immune responses; understanding the detoxification pathways in red mite and how they can be exploited in the development of novel controls; transcriptomic and genomic analyses of red mite. Kathryn is a UK MC member for the COST Action FA1404 - COREMI, a member of the organising core group and the lead for WG 1 – novel control methods.

Maria Assunta CAFIERO
Director

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Maria Assunta was born in Foggia, Italy. She obtained her high school diploma from the *Ginnasio - Liceo Matteo Tondi* (San Severo, Foggia, Italy) in 1981, her degree in Veterinary Medicine with honours (1989) and her PhD in Parasitology of the Domestic Animals (1994) from the Faculty of Veterinary Medicine, *University of Bari* (Italy). Since 1993, she is Director of the Units of Virological Diagnostic and Medical and Veterinary Entomology (Department of Virology) at *Istituto Zooprofilattico Sperimentale della Puglia e della Basilicata, Foggia*. She was scientific coordinator of n°12 research projects (Ricerca corrente e finalizzata) funded by the Italian Minister of Health, mainly on arguments of Medical Entomology and Virology treated with an One-Health approach. She has authored and co-authored >100 scientific articles (2 book chapters, 22 peer-reviewed scientific articles in international journals, 75 abstract presentations in national and international congresses) and has presented 10 oral communications as invited speaker. Her expertise, research topics and interests include zoonosis and zoonotic abortion pathogens, mainly *Q Fever*, Chlamidiosis, Parapoxvirus, Enteric Viruses; vector-borne diseases, mainly SPG rickettsiosis and mosquitoes borne diseases; medical and veterinary entomology; arthropods of dermatological interest, mainly mesostigmatic mites, ticks, phlebotominae (taxonomy, vectorial and zoonotic role); molecular analyses for the detection of pathogens in arthropods. She is currently MC member of COST Action FA1404 – COREMI.

Antonio CAMARDA
Associate Professor of Avian Diseases
European College of Veterinary Poultry Science (ECVPS) Diplomate

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Antonio was born in Cursi (Lecce), Italy. He obtained the Degree in Veterinary Medicine, *University of Bari* (1988) and the Specialisation Degree in Avian Diseases and Poultry Sciences, *Naples University "Federico II* (1990). From 1992 to 2001, he worked as Research Scientist of Avian Pathology, Faculty of Veterinary Medicine, *University of Bari*. During that period, he also attended the Microbiology Department of the *Spelderholt Center for Poultry Research and Information Services* (COVP-DLO), NL (1992) and the CLV – *Central Veterinary Laboratory*, Addlestone, UK (1995). From 1996 to2000, he was appointed Professor of Avian Diseases in the Faculty of Veterinary Medicine, *University of Teramo* (Italy). Since 2001, he works as Associate Professor of Avian Diseases at the *University of Bari* and since 2003, he coordinates the Unit of Avian Diseases. Antonio is member of the Apulian Crisis Unit on Avian flu and of the Apulian Epidemiological Observatory of Veterinary Diseases. He is the former President of the Italian branch of the World Rabbit Science Association (2010-2015) and delegate of the Italian Branch of the World Veterinary Poultry Association committee (1998-2000). He worked on epidemiology and prevention of thermophilic *Campylobacters* and *Salmonella* infections in poultry and on bacterial and viral enteric disorders (*Escherichia coli*, *Rotavirus*) in rabbit and poultry. More recently, he is involved in research projects on *D. gallinae* infestation in poultry facilities, also describing the consequences for humans. His research work also focuses on the vectorial role of the PRM. The scientific output consists of more than 100 scientific papers in international and national journals (44 published in peer-reviewed journals with IF), over 100 abstract presentations (within national and international congresses), and 4 book

chapters. Currently, he is MC Member and WG4 leader of the Cost Action FA1404 – COREMI, where he coordinates the section of epidemiology, pathology and surveillance tools.

Pascal DELAUNAY (ECI)
Entomologie-Parasitologie

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Pascal is a parasitologist and mycologist at the *University Hospital of Nice*, France. He studied medical entomology at *Pasteur Institute* and for 20 years, he is developing this specialty in the hospital for patients and physicians. Following dermatology consultations, Pascal sees patients with arthropod bites. After "entomological" and epidemiological questions, he identifies the insect and suggests the methods of eradication, mainly without the use of insecticides. Pascal also teaches medical entomology to dermatologists, physicians and nursing home. His research interests focus on three areas: Bed bug (*Cimex lectularius*) which has a world expansion since 1990's; tiger mosquito *Aedes albopictus* vector of dengue, chikungunya and zika virus, which is present in southern France since 2004; sandfly (*Phlebotomus perniciosus*) vector of leishmaniasis, which is endemic in east-south of France. He cooperates with the French Health Ministty for the control of tiger mosquito expansion and risk of arbovirosis. He identifies 1-3 *Dermanyssus* cases yearly, during the summer. These cases are mainly due to birds close to windows.

Michael DRAMOUNTANIS
Resident in Dermatology

Department of Dermatology
Unikliniken Düsseldorf
Email: Michael.Dramountanis@med.uni-duesseldorf.de

Michael was born in Düsseldorf, Germany. He obtained his high school diploma from the *Hellénique Lyzeum Heerdter Sandberg*, Düsseldorf (2004), his degree in Medicine from the *University of Crete*, Greece (2012) and he is in the 3rd year working as Resident of Dermatology in the *University of Düsseldorf*. He has until now successfully obtained GCP-course and has a big interest to be part in common studies on human aspects.

Domenico GALANTE
Researcher

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Domenico was born in San Marco in Lamis, Foggia, Italy. He obtained his high school diploma from *Liceo Scientifico "Alessandro Volta"*, Foggia (1998), his degree in Veterinary Medicine (2007) from the *University of Parma* and his post degree specialistic diploma in "Physiopathology of the reproduction of domestic animals" (2010) from the *University of Naples*. Since 2008, he works at the *Istituto Zooprofilattico Sperimentale della Puglia e della Basilicata* (Foggia) as researcher in different projects funded by Italian Ministry of Health, mainly focused on topics of Medical Entomology and Virology. From 2008 to 2010, he worked at the *Italian Anthrax Reference Centre* located in the same Institute. He is author and co-author of 45 scientific articles/reports (1 book chapter, 11 peer-reviewed scientific articles in international journals, 33 contributions in national and international congresses). His research experience and skills include: viruses, in particular enteric viruses and vector borne viruses; medical and veterinary entomology, arthropods of dermatological interest, mainly Mesostigmata mites (in particular *Dermanyssus gallinae*); zoonosis and zoonotic abortion pathogens (mainly *Chlamydia, Coxiella burnetii, Parapoxvirus* and enteric viruses); electron microscopy (TEM and SEM) acquired in national and international stages (e.g. Robert Koch Institut), in particular in the detection and identification of viral particles in biological samples and in the identification of arthropods of medical interest; molecular biology (PCR, real time PCR, sequencing, MLST, MLVA), mainly in the detection of pathogens.

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Annunziata graduated in Veterinary Medicine from the *University of Bologna*, Italy and is Full Professor of Parasitology and Parasitic Diseases since 1999 at the *Faculty of Veterinary Medicine of Teramo* (until 2003) and currently at the Faculty of Agriculture, *University of Foggia*. She is Diplomate de facto of the *European Veterinary Parasitology College* (EVPC) and member of the Executive Committee of the *Italian Society of Parasitology* (SoIPa). She spent stages of studies in several European and American Institutions (up to 1 year). During her scientific work, she has made several internships for training and research in different European countries and in the US. Member and Coordinator of several

European projects, she held several positions (Vice-Dean of the Faculty of Veterinary Medicine of Teramo; Coordinator of the Section of Infectious and Parasitic Diseases, Department of Structures, Functions, Animal Diseases and Biotechnology; President of the Commission for student tutoring; Member of the Academic Senate of the University of Foggia). She is currently a PhD Coordinator. She is referee of international journals and of applications of national and international institutions; she has been appointed as consultant to the *World Health Organisation* (WHO) on the 'Assessment and review of vector control capacity for emerging and re-emerging Infections in Albania'. She is author/co-author of 120 articles in peer-review scientific journals and in books. She was involved in European projects and as National Coordinator of the European Management Committee INCO project n.ICA4 2000-30036 (CEE). She is currently Management Committee member and STSM Leader of the COST Action FA1404 – COREMI.

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Lisette (birth name; Elisabeth Anna Maria) was born in Wanroij, The Netherlands. She obtained her high school diploma from *Mgr. Zwijssen College*, Veghel (1983) and her MSc degree in Animal Sciences from *Wageningen University*, The Netherlands (1989). She worked a few years at the *Dutch Pig Herd book* in the Research and Development section. After that, she was asked to develop a new course on quantitative methods in veterinary epidemiology, and also started with a PhD (1992). She obtained her PhD degree in 1996 on the epidemiology of coccidiosis in broilers, which was an integrated approach consisting of modelling work, performing experiments and conducting observational field studies. From 1996 up till now she is (part-time) assistant professor mainly involved in teaching of undergraduate and graduate students of *Wageningen University*, and supervising PhD students. She is also coordinator of the BSc thesis of Animal Science. Her research interests are very diverse, and include mainly research on poultry, pigs, cattle and fish, both of farm-related health problems (coccidiosis, Infectious Bovine Rhinotracheitis, Bovine Virus Diarrhea) and also zoonotic diseases (Q-fever, *Salmonella*, *Campylobacter*, Leptospirosis, with the past years being active in research on antimicrobial resistant bacteria in pigs (livestock associated MRSA in pig production, and ESBL-producing bacteria in poultry and risk for humans). For the latter research she works closely with the *Institute for Public Health and the Environment* (RIVM Bilthoven, The Netherlands). She was author/editor of *Application of quantitative methods in veterinary epidemiology* (eds. J.P.T.M. Noordhuizen, M.V. Thrusfield, K. Frankena, E.A.M. Graat) 2001-2015 (revised ed), 429 pages, ISBN 978-90-74134-89-7), board member of the *Dutch Society for Veterinary Epidemiology and Economics* (1999-2006), and board member of *the British Society of Veterinary Epidemiology and Preventive Medicine* (2000-2001) and senior member of the Graduate *School of Wageningen Institute of Animal Sciences*. In 2008 she was in the top 5 of nominated teachers of the year award of Wageningen University. She (co-)authored >50 peer-reviewed scientific publications.

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Marek was born in Krakow, Poland. He obtained his high school diploma from the *V Liceum Ogólnokształcące im. Augusta Witkowskiego in Krakow* (2004) and his master degree in Biotechnology from the *Agricultural University in Krakow* (2009). Between 2009 and 2012 he was employed as specialist in molecular biology in the genetic diagnostic laboratory *Biote21* and *Mabion Ltd*. He started his PhD studies in 2012 in the Department of Technology and Biotechnology of Drugs, *Jagiellonian University, Medical College*, Krakow. Currently, he is also employee of the *Jagiellonian Centre for Experimental Therapeutics* (JCET). In his PhD studies he is interested in the evaluation of the immunomodulatory role of histamine. In the Department of Technology and Biotechnology of Drugs, Marek is involved in a large project entitled: "Histamine H_3/H_4 receptors as an attractive target for the search of biologically active compounds". Since 2015, he is also leader of the project entitled: "Research on human eosinophils as a potential therapeutic target". His PhD studies focus on eosinophils and histamine receptors, eosinophil interactions with other particles and tissues and their role in inflammatory and immunological disorders. He is author or co-author of 6 scientific publications. He has attended several national and international conferences and he has co-organized an international conference in Krakow. Marek has actively participated in two COST Actions: BM0806 'Recent advances in histamine receptor H4R research' and BM1007 'Mast Cells and Basophils - targets for innovative therapies'. He has attended several COST training schools and has performed a one-month STSM.

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George is a Medical Doctor, specialist in Allergy and Clinical Immunology. He graduated from the Medical School of the *Aristotle University of Thessaloniki* (AUTH, 2004) and received his specialist training in *'ATTIKON' General University Hospital* in Athens. He is currently a Clinical Research Fellow in the Institute of Human Development, *University of Manchester*, where he works with Professor N. Papadopoulos, and an Honorary Clinical Fellow of the Paediatric Allergy and Immunology Department of the *Royal Manchester Children's Hospital*, UK. He holds a PhD (2009) on experimental mechanisms of allergy, specifically in rodent models of respiratory allergy and pertinent pharmacologic interventions. He was a scientific associate of the Laboratory of Experimental Physiology of AUTH, working on the design of models of allergic sensitization, and on the effect of environmental/host factors on experimental development of allergy. He was also a research associate of the Allergy Department, 2nd Pediatric Clinic of the *University of Athens*, conducting epidemiological research on early-life risk factors for future allergy development. His research interests revolve around all facets of allergy, including laboratory and clinical allergy, as well as epidemiology of allergic disease. He has published 15 articles in peer-reviewed journals, presented several abstracts in conferences and delivered talks in national and international congresses and workshops. He is an associate member of the *Royal College of Paediatrics and Child Health*, UK; an expert member of the NHS research *Ethics Committee of Greater Manchester Central*, UK; and the representative of the Jounior Member working group of the *European Academy of Allergy and Clinical Immunology* (EAACI) in the board of the Occupational Allergy Interest Group.

Thecla A.M. HEKKER
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Thecla works as a clinical consultant in a small academic teaching hospital in Amsterdam. *Medical Microbiology and Infection prevention* (MMI) in *VUmc* means bacteriology, virology, mycology, parasitology and infection prevention. She is head of the parasitology lab and interested in fecal parasitology (helminths and protozoa), especially *Dientamoeba fragilis* and *Blastocystis*. She specializes in arthropods (epizoonoses/ectoparasitology) handling a large collection of microscopic samples of mites, ticks, lice, fleas, mosquitos that are used in practical classes for students, dermatologists and other medical specialties. She is coordinator of education in the medical curriculum for the department MMI. She is course coordinator of a 4-week second bachelor year of medicine course Infectious diseases, Dermatology, and Rheumatology. As a lecturer and organizer of practical classes, she works with first, second and third year Bachelor and first year Master students.

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Laurens is Dutch and currently lives in Amsterdam. He obtained his high school diploma from the *Murmellius Gymnasium*, Alkmaar (2004), his BSc degrees Beta-gamma sciences (focusing on interdisciplinarity) and Medicine at the *Vrije Universiteit* (VU), Amsterdam and the *Universiteit van Amsterdam* (UvA) in 2011. He became a medical doctor in 2014. During his studies in Medicine, he volunteered to pursue research on pulmonary arterial hypertension. He co-authored a paper on the role of growth factors in pulmonary vasculature. He maintained a special interest for scientific research but favored to implement science on a practical way in his profession. Currently, Laurens is specializing as an environmental medical doctor during a 4 year training at the *Netherlands School of Public and Occupational Health* (NSPOH) and *GGD Hart voor Brabant*. He likes spending time surfing the North Sea and socializing with friends and family.

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Andriana was born in Agrinio, Aitoloakarnania, Western Greece. She graduated with second class upper honours Degree in Medicine from the Med*ical School of the National and Kapodistrian University of Athens* (2009). In 2010, she joined the Department of Pharmacology as a full-time pre-doctoral fellow under Professor Sitaras' supervision. In 2011, she was granted a two-year intermission on her PhD studies in order to obtain her specialty in Internal Medicine. She completed her residency program in the *General Hospital of Argos* and applied for residency in Dermatology. She attended a two-year full time program leading to the Master's Degree in Health Care Management, *National School of Public Health in Athens* and graduated with upper second class honours in 2015. Currently, she has dedicated herself in completing her PhD studies in Professor Sitaras' Laboratory. Her research interests focus on the alternations of extracellular matrix, especially glycosaminoglycans (GAGs), during skin aging *in vitro* and the potential effects of natural products on dermal fibroblast cell proliferation, metabolic activity and apoptosis.

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Peter was born on a poultry farm and after an education in poultry farming, speciality laying hens, he started as a farm assistant for laying and rearing hens, and worked his way up to general farm manager for 2 poultry farms. After a short period as a manager of an egg trading company, combined with the import – export of table eggs, he started at *Van Eck Bedrijfshygiëne BV*, a company specialised in disinfection and pest control. One of its core businesses is the poultry sector and especially the control of the PRM *Dermanyssus gallinae* Degeer. Within the Van Eck organisation innovation is a key department and Peter worked successfully in the last 15 years together with Paul van Eck on several new techniques. The strength of their approach is based on their knowledge and experience of the practice combined with a real involvement with the problems of the poultry sector and a multi-disciplinary approach. Born on a farm with experience in the field with RPM it's easy for them to understand the problems and they speak the same "language" as their customers, the poultry farmers. Even still today new products are tested daily in Van Eck's own laboratory or in the field, always looking for innovation and improvement. With their wide network in the European poultry business they are able to achieve quick results. The vision of Van Eck 15 years ago was already based on a non-chemical treatment and as an innovative company the developed treatment techniques based on heat-treatment (Thermokill), Silicium and Ozon. Nowadays they conduct treatments on PRM not only in the Netherlands, Belgium and Germany, but also in the UK, Ireland, France, Austria, Poland etc. Peter did on several subjects, in the field of disinfection or pest control, lectures for poultry farmers, poultry organisations, schools and university and has been quoted in several scientific studies. On personal title he is a member of the workgroup for the use of biocides in the agricultural sector for the Netherlands called "Kennisnetwerk Biociden" (knowledge network on biocides). This is an organisation with representatives of the Dutch Government, the biocidal production companies and consumers/appliers. He is also a member of Food Tech Indonesia, a project from the Dutch Government to improve food safety in an upcoming country like Indonesia. Peter has been auditing several poultry farms and put up an educational program for farm managers.

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Dimitra was born in Athens, Greece. She obtained her high school diploma from *Ionidios High School*, Piraeus (1986), her Degree in Medicine from the *National and Kapodistrian University of Athens* (1994) and the specialty of Medical Biopathology from the Prefecture of Athens (2002). She is currently a PhD candidate in the *Medical School of the NKUA* studying *Klebsiella*'s resistance to colimicine. She started her professional career in 1995 as a Medical Biopathologist, working in several laboratories in national and private hospitals. She is currently employed in the clinical laboratories of the prestigious private hospital *Hygeia* in Athens. She has established and now manages the clinical laboratory of the private clinic *Panagia Odigitria* in Piraeus. She has attended and participated in numerous seminars on microbial resistance and infectious diseases. Her clinical diagnostic and research interests focus on multidrug resistant microbes and on the immunological mechanisms underlying infections. Her expertise in clinical microbiology spans from the diagnosis of common infections in patients' samples to the molecular characterization of complex clinical entities, including tickborne infections, viral syndromes and blood and tissue parasite infections.

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Babis obtained his Medical Degree from the *Aristotle University of Thessaloniki* (2002) and the specialty of Internal Medicine in the *General Prefectural Hospital of Thessaloniki 'Agios Pavlos'* (2012). During his professional career, he has served the Greek healthcare system working in voluntary medical services, in primary healthcare centres, in hospitals, in the Greek army force and in rural medical service and managing a wide spectrum of medical, surgical and emergency cases. In 2004, he was granted an honorary clinical attachment in gastroenterology and medicine in the *Chelsea & Westminster Healthcare NHS Trust*, London UK and gained experience of the British National Health Service (NHS) as a visiting doctor from overseas. He has attended various courses, including the *Advanced Life Support (ALS) Provider* course of the *European Resuscitation Council* and the *Acute Life-threatening Events-Recognition and Treatment (ALERT)* course, UK. Since 2013, he runs a private clinic of internal medicine in Thessaloniki focusing on a wide range of human pathologies, including hypertension, diabetes, obesity and allergies.

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Monique was born in Wieringerwaard in the North West of The Netherlands. After high school she obtained her BSc degree in Animal Husbandry at the *CAH in Dronten* (NL, 1993) with her thesis on *Chlamydia psittaci* in sheep. After her degree and before her study in Veterinary Medicine in *Ghent*, Belgium (1993), she voluntary worked on a dairy project in the Western part of Romania. After one year in Veterinary Medicine, Monique started her MSc in Animal Husbandry at *Wageningen University*, NL (1994) enabling her to become a researcher in Animal Health and Epidemiology. In 1997, she graduated on an epidemiological cohort study on *Neospora caninum* in dairy cows and obtained a minor in Educational skills. In 1997, Monique started her research career in pig health for a pig breeding company and continued her research in 1998 at the *Applied Pig Research Station in Rosmalen*, where she worked on a broad number of themes, mostly on disease prevention and effective management measures. The pig research station later merged into *Wageningen UR Livestock Research*. Monique started working in a project on *D. gallinae* in 2005. In 2011, she officially started her PhD focusing on preventive measures and monitoring in layer farms to prevent introduction and spread of *D. gallinae* enabling to minimize the economic losses due to a *D. gallinae* infestation. She works on her thesis aside her work in projects on the development of a *D. gallinae* automated monitoring tool, fly prevention in animal husbandry, *Toxoplasma* in pigs and projects facilitating farmers towards improvement in animal health, welfare and economics. Monique is currently MC member and WG2 leader of COST Action FA1404 – COREMI, coordinating the One Health Working Group.

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Elias graduated in 1988 with the Degree of Veterinary Medicine (DVM) from the *Aristotle University of Thessaloniki*, Greece, MSc from the *University of Liverpool*, UK (1992) and PhD from the *Aristotle University of Thessaloniki* (1997) in the field of Veterinary Parasitology. He is Diplomate of the European Veterinary Parasitology College. He works in the Laboratory of Parasitology and Parasitic Diseases of the School of Veterinary Medicine, Faculty of Health Sciences of the Aristotle University of Thessaloniki. His research interests include several topics within the field of parasitology and parasitic diseases, as arthropods and vector-borne diseases, resistance to antiparasitic drugs, honeybee diseases etc. He has participated in several national and international scientific conferences (in some of them as invited speaker) and he has published alone or with co-authors over 150 scientific papers. He is a management committee member representing Greece and the Vice-Chair of the COST Action FA1404 – COREMI.

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Johan was born in Slagharen, the Netherlands. He obtained his high school diploma from the *Rijksscholengemeenschap* , Coevorden (1987), his MSc degree in Animal Genetics from the *Wageningen University* (1994) and his MSc degree in Statistics from the *VU University* , Amsterdam (2003). Johan started his career in 1994 and is currently working as Researcher at *Wageningen UR*. In the period between 2001 and 2012 he worked as senior statistician at Wageningen UR, working with a team of >200 researchers in animal sciences and animal health, responsible for the quality of design of experimental research and surveys. His research interests focus on sampling problems and development of data-driven decision support systems. He has co-authored >25 articles on this topic in several research fields in animal science and animal health. He combines his knowledge about design of surveys within the implementation of repeated sampling techniques in the research field of precision livestock farming. He is currently involved in the research on control strategies and automated counting of *Dermanyssus* in poultry housing facilities, the research of Monique Mul in COST Action FA1404.

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Lise was born in Avignon, France. She started a career in Classics, obtaining an MSc from the *Université Paris-IV Sorbonne*, Paris in 1996, and taught Ancient Greek, Latin and French language and literature (1997-2000). She then

decided to return to her initial vocation, studying the biology and evolution of arthropods. Resuming her studies, she obtained an MSc in Earth and Life Sciences from the *École Pratique des Hautes Études* (*EPHE*), Paris (2004) and her PhD in Evolutionary Biology and Ecology from the *Institut des Sciences et Industries du Vivant et de l'Environnement, Agro Paris Tech* (2009). She was an engineer at the *École Nationale Vétérinaire de Lyon* from (2004-2010). She is currently Assistant Professor of Population Biology and Ecology at the *Université Paul-Valéry Montpellier 3* and member of the research center *Centre d'Ecologie Fonctionnelle et Evolutive* (CEFE), Montpellier. She teaches ecology to students in both agriculture and human sciences at the BSc and MSc levels. Her research interests focus on the effect of human activities on arthropod populations and communities in agroecosystems in terms of spatio-temporal dynamics and selection. Her main biological models are mites in avian systems and aphids in crop systems. Her PhD was focused on host specificity and dissemination routes within the genus *Dermanyssus* in both wild and domestic birds. She has recently begun studies on mite communities dwelling in poultry litter/manure. She has carried out and supervised several research projects, has authored or co-authored 21 articles in peer-reviewed scientific journals, has communicated her work in 20 national and international conferences and has co-organized one international workshop in the framework of COREMI. She is a member of the managing editorial board of the journal *Acarologia*. She is currently MC and CG member and Leader of WG3 'Genetic structure' of COST Action FA1404 – COREMI.

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Olivier was born in Paris, France. He obtained his first degree in Agronomy, then did a MSc in Environmental Sciences, a MRes in Microbiology and a PhD at the *Institut Pasteur/University Lyon I* in 1994 on monoclonal antibodies and molecular diagnostic of *Naegleria fowleri*, responsible for Primary Amebic Meningo Encephalitis (PAME). He started his academic career in UK in 1995 at *Reading University*, then *Edinburgh University*. He got a *Marie Curie Fellowship* in 1998 to work at the *University of Utrecht* in The Netherlands and returned in UK at *Heriot-Watt University* in 2000 before taking a lectureship at *Newcastle University* in 2001. He became a Senior Lecturer and a Reader there before moving to *Northumbria University* to take a Chair in Health and Biotechnology and becoming the Director of one of the Research Centres there. He became Associate Dean for Research in 2012 and became the Associate Pro-Vice Chancellor for Research at *Coventry University* in 2014. He is currently the Acting Deputy Vice-Chancellor for Research there. Olivier has supervised over 15 PGR students and published over 140 refereed papers and over 250 conference abstracts related to animal health. He is a Fellow of the Royal Society for Biology, the Royal Entomological Society, the Higher Education Academy and the Society for Tropical Veterinary Medicine for which he is currently the President for a third term. He is also currently the Chair of the COREMI COST Action involving 28 countries.

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Katerina was born in Athens, Greece. She obtained her high school diploma from the *École Franco-Hellénique Saint Joseph de l'Apparition*, Athens (1981), her BSc degree in Biochemistry from the *University College Cardiff*, UK (1986) and her PhD in Pharmacology and Therapeutics from the *University of Wales College of Medicine*, UK (1989). She was a research fellow at the *Laboratoire d'Endocrinologie Moléculaire Université de Rouen*, France and she worked as a Demonstrator in the *Department of Pharmacology, UWCM*, UK. She started her academic career in 1990 and she is currently Associate Professor of Pharmacology at the *NKUA Medical School* and coordinator of the 'Research Laboratory of Drug Allergy & Pharmacological Modification of Hypersensitivity Reactions' at the *Allergy Unit, Department of Dermatology, 'ATTIKON' General University Hospital* in Athens. Her research interests focus on the investigation of the functional role of inflammatory mediators in human (patho)physiology and on the preclinical evaluation of new therapeutic immunomodulatory approaches, aimed primarily at the histamine receptors. She has carried out and supervised numerous research projects; authored or co-authored >100 articles in peer-review scientific journals and in books; organized several national and international scientific meetings; communicated her work in >120 national and international conferences; delivered >60 invited lectures; and participated in EU discussion panels and training schools as instructor. She is member of various scientific societies and of the editorial board of the *British Journal of Pharmacology*; expert evaluator or rapporteur of national and European programs, including FP7 and EU Horizon 2020; observer of the Rheumatology/Immunology Working Party of the *European Medicines Agency* (EMA); council officer of the *European Histamine Research Society* (EHRS); and treasurer of the *International Union of Pharmacology* (IUPHAR) – *Immunopharmacology Section*. She was the Chair of the COST Action BM0806 (2009-2013) and is currently MC member and WG2 co-Leader of COST Action FA1404 – COREMI, coordinating the One Health section.

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Carla graduated in Environmental Health from *Lisbon School of Health Technology – Polytechnic Institute of Lisbon*, Portugal (2000). She has a Master degree in Safety and Ergonomics from the *Lisbon University* (2003) and a PhD in Occupational and Environmental Health from the *New University of Lisbon* (2010). Her academic career started in 2000 and she is currently Professor at the *Lisbon School of Health Technology*, Director of the Occupational Health Master's course and researcher at the *Environment and Health Research Group*. Her major field of study is occupational and environmental mycology, leading and participating in several projects on both areas of expertise. Her interests focus on occupational exposure to fungi in highly contaminated settings, complementarity of conventional methods and molecular tools to assess fungi occupational exposure and fungal contamination in food commodities. She has authored or co-authored more than 50 articles in peer-review scientific journals and in books and presented more than 40 communications in national and international conferences.