

### PERSONAL INFORMATION **Lorenzo Jose Fraile Sauce**

#### WORK EXPERIENCE

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November 1996-April 1997 **Responsible of Preventive Pig Medicine programs at the company**  
Cargill S.A (Spain)

May 1997-September 2004 **Production director for the company**  
Picber S.A (Spain)  
Responsible of Preventive Pig Medicine programs at the company.  
Organization of the production.

October 2004-October 2010 **Senior research scientist**  
CReSA (IRTA researcher) (Spain)

October 2010- Present **Full professor**  
University of LLeida (Spain)  
Teaching and research activities

#### EDUCATION AND TRAINING

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September 1987-September 1992 **Doctor in Veterinary Medicine (DVM)**  
University of Zaragoza (Spain)

September 1992-May 1996 **Doctor in Veterinary Pharmacology (PhD).**  
University of Zaragoza (Spain)  
Pharmacology  
Pharmacokinetics

#### ADDITIONAL INFORMATION

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**Expertise** Pharmacokinetics, pharmacodynamics and PK-PD models of antibiotics and non-steroidal anti-inflammatory drugs for livestock species.  
Clinical Pharmacology in livestock species mainly focus on pig and cattle medicine.  
Design of clinical trials to demonstrate the efficacy of drugs and vaccines for livestock.  
Design of epidemiological studies to determine the prevalence and risk factors of livestock diseases.  
Immunology and vaccinology of livestock.

**Publications** 1.- Fraile L; Sibila M; Nofrarías M; López-Jimenez R; Huerta E; Llorens A; López-Soria S; Pérez D; Segalés J.  
Effect of sow and piglet porcine circovirus type 2 (PCV2) vaccination on piglet mortality, viraemia, antibody titre and production parameters.  
Veterinary Microbiology. 161 (1-2) - 1/2 , pp. 229 - 234. (Holland): 2013.

2.- Sibila M; Fraile L; Tico G; López-Soria S; Nofrarías M; Huerta E; Llorens A; López-Jiménez R; Pérez D; Segalés J.

Humoral response and colostral antibody transfer following 'one-dose' pre-mating vaccination of sows against porcine circovirus type-2.

Veterinary Journal. (United Kingdom): 2013.

3.- Crisci, E; Mussá T; Fraile L; Montoya M.

Review on influenza virus in pigs.

Molecular Immunology. 55(3-4) , pp. 200 - 211. (United Kingdom): 2013.

4.- Mussá T; Ballester, M; Silva-Campa E; Baratelli M; Busquets N; Lecours MP; Dominguez J;

Amadori M; Fraile L.; Hernández J; Montoya, M.

Infection by swine, human or avian influenza viruses differentially activates porcine dendritic cells cytokine profile.

Veterinary Immunology and Immunopathology. 145(1-2) , pp. 25 - 35. (Holland): 2012.

5.- Fraile L. Antimicrobial therapy in swine. A practical approach. pp. 1 - 188. (Spain): SERVET, 2013.

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6.- Vilalta,C.; Alcalá, T.; López-Jimenez, R.; Nofrarías M.; López-Soria S.; Espín S.; Varela, T.; Fraile,L.

Clinical efficacy of acetyl salicylic acid as an adjunct to the antibacterial treatment of porcine respiratory disease complex.

Journal of Swine Health and Production. 20(1), pp. 10 - 16. (United States of America): 2012.

7.- Nieto D; Aramouni M; Sibila M; Fraile L; Kekarainen T; Segalés J.

Lack of effect of piglet vaccination against Porcine circovirus type 2 (PCV2) on serum viral loads of Torque teno sus virus 2 (TTSuV2).

Veterinary Microbiology. 157 - 1-2 , pp. 8 - 12. (Holland): 2012.

8.- Fraile L; Grau-Roma LL; Sarasola P; Sinovas N; Nofrarías M; López R, López-Soria S; Sibila M; Segalés J.

Inactivated PCV2 one shot vaccine applied in 3-week-old piglets: improvement of production parameters and interaction with maternally derived immunity.

Vaccine. 30 - 11, pp. 1986 - 1992. (United Kingdom): 2012.

9.- Grau-Roma L; Baekbo P; Rose N; Wallgren P; Fraile L; Larsen LE; Segalés J.

Clinical and laboratorial studies on postweaning multisystemic wasting syndrome (PMWS) affected herds in Denmark, France, Spain and Sweden:

Disease progression and a proposal of herd case definition.

Journal of Swine Health and Production. 20(3), pp. 129: 2012.

10.- Crisci E; Fraile L; Moreno N; Blanco E; Cabezón R; Costa C; Mussá T; Baratelli M;

Martínez-Orellana P; Ganges L; Martínez J; Bárcena J; Montoya M. Chimeric calicivirus-like particles elicit specific immune responses in pigs.

Vaccine. 30 - 14, pp. 2427 - 2439. (United Kingdom): 2012.

11.- Fraile L.

Control or eradication? Costs and benefits in the case of PRRSV.

Veterinary Record. 170 - 9, pp. 223 -224. (United Kingdom): 2012.

12.- Vilalta C; Galofré N; Aragón V; Pérez de Rozas AM; Fraile L.

Effect of marbofloxacin on Haemophilus parasuis nasal carriage.

Veterinary Microbiology. 159 - 1-2 , pp. 123 - 129. (Holland): 2012.

13.- Fraile L; Crisci E; Córdoba L; Navarro MA; Osada J; Montoya M. Immunomodulatory properties of Beta-sitosterol in pig immune responses.

- International Immunopharmacology. 13, pp. 316 - 321. (Holland): 2012.
- 14.- LI Grau-Roma; C S. Kristensen; A Stockmarr; C Enøe; S López-Soria; M Nofrarias; V Bille-Hansen; C K. Hjulsager; M Sibila; S E. Jorsal; L Fraile; P Baekbo; L E. Larsen; J Segalés; H Vigre.  
Infectious risk factors for postweaning multisystemic wasting syndrome (PMWS) development in pigs from affected farms in Spain and Denmark.  
Research in Veterinary Science. 93 - 3, pp. 1231 - 1240. (United Kingdom): 2012.
- 15.- Tarradas J; Monso M; Fraile L; De la Torre BG; Muñoz M; Rosell R; Riquelme C; Josue Perez L; Nofrarias M; Domingo M; Sobrino F; Andreu D; Ganges L.  
A T-cell epitope on NS3 non-structural protein enhances the B and T cell responses elicited by dendrimeric constructions against CSFV in domestic pigs.  
Veterinary Immunology and Immunopathology. 150 - 1-2 , pp. 36 - 46. (Holland): 2012.
- 16.- Mussa T; Rodriguez-Carino C; Sanchez-Chardi A; Baratelli M; Costa-Hurtado M; Fraile L; Dominguez J; Aragon V; Montoya M.  
Differential interactions of virulent and non-virulent H. parasuis strains with naïve or swine influenza virus preinfected dendritic cells.  
Veterinary Research. 43 - 80, (France): 2012.
- 17.- Saco Y; Fraile L; Giménez M, Alegre A; López-Jimenez R; Cortey M; Segalés J; Bassols A.  
Serum acute phase proteins as biomarkers of pleuritis and cranio-ventral pulmonary consolidation in slaughter-aged pigs.  
Research in Veterinary Science. 91, pp. 52 - 57. (United Kingdom): 2011.
- 18.- Grau-Roma L, Fraile L; Segalés J.  
Recent advances in the epidemiology, diagnosis and control of diseases caused by porcine circovirus type 2.  
Veterinary Journal. 187 - 1, pp. 23 - 32. (United Kingdom): 2011.
- 19.- Vilalta, C.; Schneider, M; López-Jimenez, R.; Caballero, JM.; Gottschalk, M.; Fraile, L.  
Marbofloxacin reaches high concentration in pig tonsils in a dose dependent fashion. Journal of Veterinary Pharmacology and Therapeutics. 34- 1, pp. 95 - 97. (United Kingdom): 2011.
- 20.- Tarradas J; Monsó M; Muñoz M; Rosell R; Fraile L; Domingo M; Andreu, D; Sobrino F; Ganges L.  
Partial protection against classical swine fever virus elicited by dendrimeric peptide in domestic pigs.  
Vaccine. 29(26), pp. 4442 - 4449. (United Kingdom): 2011.
- 21.- Tarradas J; Álvarez B; Fraile L; Rosell R; Muñoz M; Galindo-Cardiel I; Domingo M; Dominguez J; Ezquerro A; Andreu, D; Sobrino F; Ganges L.  
Immunomodulatory effect of swine CCL20 chemokine in DNA vaccination against CSFV.  
Veterinary Immunology and Immunopathology. 142 - 3-4 , pp. 243 - 251. (Holland): 2011.
- 22.- Mussa T; Rodriguez-Cariño C; Pujol M; Córdoba L; Busquets N; Crisci E; Dominguez J; Fraile L; Montoya M.  
Interaction of porcine conventional dendritic cells with swine influenza virus.  
Virology. 420 - 2, pp. 125 - 134. (United States of America): 2011.
- 23.- Fraile L; Alegre A; López-Jiménez R; Nofrarias M; Segalés J.  
Risk factors associated with pleuritis and cranio-ventral pulmonary consolidation in slaughter-aged pigs.  
Veterinary Journal. 184 - 3, pp. 326 - 333. (United Kingdom): 2010.
- 24.- Saco Y; Fraile L; Giménez M; Canalias F; Bassols A.  
Validation of an immunoturbidimetric method for determination of porcine serum C-reactive protein.

- Research in Veterinary Science. 89 - 2, pp. 159 - 162. (United Kingdom): 2010.
- 25.- Busquets N; Segalés J; Córdoba L; Mussá T; Crisci E; Martín-Valls GE; Simon-Grifé M; Pérez-Simó M; Pérez-Maíllo M; Núñez JI; Abad FX; Fraile L; Pina S; Majó N; Bensaid A; Domingo M; Montoya M.  
Experimental infection with H1N1 European swine influenza virus protects pigs from an infection with the 2009 pandemic H1N1 human influenza virus.  
Veterinary Research. 41 - 5, pp. 74 - 84. (France): 2010.
- 26.- Aragon V; Cerdà-Cuellar M; Fraile L; Mombarg M; Nofrarías M; Olvera A; Sibila M; Solanes D; Segalés J.  
Correlation between clinico-pathological outcome and typing of Haemophilus parasuis field strains.  
Veterinary Microbiology. 142 - 3-4 , pp. 387 - 393. (Holland): 2010. ISSN 0378-1135
- 27.- Saco, Y.; Fraile, L.; Giménez M.; Pato R.; Montoya, M.; Bassols, A.  
Haptoglobin serum concentration is a suitable biomarker to assess the efficacy of a feed additive in pigs.  
Animal. 4, pp. 1561 - 1567. (United Kingdom): 2010.
- 28.- Fraile L; Calsamiglia M; Mateu E; Espinal A; Cuxart A; Seminati C; Martín M; Domingo M Segalés J.  
Prevalence of infection with porcine circovirus-2 (PCV-2) and porcine reproductive and respiratory syndrome virus (PRRSV) in an integrated swine production system experiencing postweaning multisystemic wasting syndrome.  
Canadian Journal of Veterinary Research-Revue Canadienne de Recherche Veterinaire. 73 - 4, pp. 308 - 312. (Canada): 2009.
- 29.- Grau-Roma L; Heegaard PM; Hjulsager CK; Sibila M; Kristensen CS; Allepuz A; Piñeiro M; Larsen LE; Segalés J; Fraile L.  
Pig-major acute phase protein and haptoglobin serum concentrations correlate with PCV2 viremia and the clinical course of postweaning multisystemic wasting syndrome.  
Veterinary Microbiology. 138 - 1-2 , pp. 53 - 61. (Holland): 2009.
- 30.- Silva-Campa E; Cordoba L; Fraile L; Flores-Mendoza L; Montoya M; Hernández J. European genotype of porcine reproductive and respiratory syndrome (PRRSV) infects monocyte-derived dendritic cells but does not induce Treg cells.  
Virology. 396 - 2, pp. 264 - 271. (United States of America): 2009.
- 31.- Segalés J; Urniza A; Alegre A; Bru T; Crisci E; Nofrarías M; López-Soria S; Balasch M; Sibila M; Xu Z; Chu HJ; Fraile L; Plana-Duran J.  
A genetically engineered chimeric vaccine against porcine circovirus type 2 (PCV2) improves clinical, pathological and virological outcomes in postweaning multisystemic wasting syndrome affected farms.  
Vaccine. 27 - 52, pp. 7313 - 7321. (United Kingdom): 2009.
- 32.-Crisci E; Almanza H; Mena I; Córdoba L; Gómez-Casado E; Castón JR; Fraile L; Bárcena J; Montoya M.  
Chimeric calicivirus-like particles elicit protective anti-viral cytotoxic responses without adjuvant.  
Virology. 387 - 2, pp. 303 -312. (United States of America): 2009.
- 33.- Grau-Roma L; Hjulsager CK; Sibila M; Kristensen CS; López-Soria S; Enøe C, Casal J; Bøtner A; Nofrarías M; Bille-Hansen V; Fraile L; Bækbo P; Segalés J; Larsen LE.  
Infection, excretion and seroconversion dynamics of porcine circovirus type 2 (PCV2) in pigs from post-weaning multisystemic wasting syndrome (PMWS) affected farms in Spain and Denmark.  
Veterinary Microbiology. 135 - 3-4 , pp. 272 - 282. (Holland): 2009.

- 34.- Fraile L; Crisci E; Weenberg J; Armadans M; Mendoza L; Ruiz L; Bernaus S; Montoya M. Effect of treatment with phytosterols in three herds with porcine respiratory disease complex. *Journal of Swine Health and Production*. 17 -1, pp. 32 - 41. (United States of America): 2009.
- 35.- Grau-Roma L; Crisci E; Sibila M; López-Soria S; Nofrarias M; Cortey M; Fraile L; Olvera A; Segalés J.  
A proposal on porcine circovirus type 2 (PCV2) genotype definition and their relation with postweaning multisystemic wasting syndrome (PMWS) occurrence. *Veterinary Microbiology*. 128 - 1-2 , pp. 23 - 35. (Holland): 2008.
- 36.- Calsamiglia M; Fraile L; Espinal A; Cuxart A; Seminati C; Martín M; Mateu E; Domingo M; Segalés J.  
Sow effect on litter mortality in a swine integration system experiencing Postweaning Multisystemic Wasting Syndrome (PMWS). *Research in Veterinary Science*. 82 - 3, pp. 299 - 304. (United Kingdom): 2007.
- 37.- Fraile L. Antibioterapia. De la teoría a la práctica. pp. 1 - 135. (Spain): SERVET, 2007.  
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- 38.- Rueda S; Fraile LJ; Bregante MA; Garcia MA; Solans C.  
Penetration of diltiazem into breast milk and its pharmacokinetics in the lactating rabbit. *Xenobiotica*. 32 - 2, pp. 119 - 130. (United Kingdom): 2002.
- 39.- Fraile LJ; Bregante MA; Garcia MA; Solans C.  
Development of diltiazem deacetylase and demethylase activities during ontogeny in rabbit. *Xenobiotica*. 31 - 7, pp. 409 - 422. (United Kingdom): 2001.
- 40.- Fraile LJ; Bregante MA; Garcia MA; Solans C.  
Altered diltiazem metabolism in the neonatal rabbit following intra-uterine chronic exposure to diltiazem. *Xenobiotica*. 31 - 4, pp. 177 - 185. (United Kingdom): 2001.
- 41.- Solans C; Aramayona JJ; Bregante MA; Fraile LJ; Rueda S; Garcia MA.  
Pharmacokinetics of verapamil in lactating rabbits. Prediction of verapamil distribution into rabbit milk. *General Pharmacology*. 34 - 4, pp. 237 - 243. (United Kingdom): 2000.
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Diltiazem blood pharmacokinetics in the pregnant and non-pregnant rabbit: maternal and foetal tissue levels. *Xenobiotica*. 30 - 8, pp. 831 - 841. (United Kingdom): 2000.
- 43.- Solans C; Bregante MA; Aramayona JJ; Fraile LJ; Garcia MA.  
Comparison of the pharmacokinetics of verapamil in the pregnant and non-pregnant rabbit: study of maternal and foetal tissue levels. *Xenobiotica*. 30 - 1, pp. 93 - 102. (United Kingdom): 2000.
- 44.- Solans C; Bregante MA; Aramayona JJ; Fraile LJ; Garcia MA.  
Pharmacokinetics of verapamil in New Zealand white rabbits during ontogeny. *Biology of the Neonate*. 78 - 4, pp. 321 - 326. (Switzerland): 2000.
- 45.- Bregante MA; Saez P; Aramayona JJ; Fraile L; Garcia MA; Solans C.  
Comparative pharmacokinetics of enrofloxacin in mice, rats, rabbits, sheep, and cows. *American Journal of Veterinary Research*. 60 - 9, pp. 1111 -1116. (United States of America): 1999.
- 46.- Garcia MA; Soláns C; Aramayona JJ; Fraile LJ; Bregante MA; Castillo JR.  
A common method for the determination of several calcium channel blockers using an HPLC system with ultraviolet detection. *Talanta*. 47 - 5, pp. 1245 - 1254. (Holland): 1998.

- 47.- Aramayona JJ; Bregante MA; Solans C; Rueda S; Fraile LJ; Garcia MA.  
Pharmacokinetics of fosfomycin in chickens after a single intravenous dose and tissue levels following chronic oral administration.  
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- 48.- Fraile LJ; Aramayona JJ; Bregante MA; García MA; Solans C.  
Enhanced diltiazem deacetylase activity in pre-term and full-term rabbits compared with adult rabbits.  
Biology of the Neonate. 72 - 1, pp. 51 - 61. (Switzerland): 1997.
- 49.- Fraile LJ; Martinez C, Aramayona JJ; Abadía AR; Bregante MA; García MA.  
Limited capacity of neonatal rabbits to eliminate enrofloxacin and ciprofloxacin.  
Veterinary Quarterly. 19 - 1, pp. 1 - 6. (Holland): 1997.
- 50.- Garcia MA; Aramayona JJ; Bregante MA; Fraile LJ; Solans C. Simultaneous determination of verapamil and norverapamil in biological samples by high-performance liquid chromatography using ultraviolet detection.  
Journal of Chromatography-Biomedical Applications. 693, pp. 387 - 392. 1997.
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Penetration of enrofloxacin and ciprofloxacin into breast milk, and pharmacokinetics of the drugs in lactating rabbits and neonatal offspring.  
American Journal of Veterinary Research. 57 - 4, pp. 533 - 547. (United States of America): 1996.
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Deacetylation of diltiazem by several rabbit tissues.  
Pharmaceutical Research. 13 - 12, pp. 1874 - 1879. (Germany): 1996.
- 53.- Aramayona JJ; Garcia MA; Fraile LJ; Abadía AR; Bregante MA.  
Placental transfer of enrofloxacin and ciprofloxacin in rabbits.  
American Journal of Veterinary Research. 55 - 9, pp. 1313 - 1315. (United States of America): 1994.
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Serum-derived exosomes from non-viremic animals previously exposed to the porcine respiratory and reproductive virus contain antigenic viral proteins. Vet Res. 2016 May 31;47(1):59. doi: 10.1186/s13567-016-0345-x. PubMed.
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## Projects

1.- Name of the project: Caracterización de la respuesta inmune inducida por cepas del virus de la gripe

porcina circulantes en España. Desarrollo de vacunas basadas en VLPs quiméricas.

Body where project took place: Centre de Recerca en Sanitat Animal (CRESA)

Head(s) researcher(s): María Montoya González

Funding body or bodies: Ministerio de Ciencia e Innovación

Code according to the funding body: AGL2010-22200-C02-01

Start date: 2011

2.- Name of the project: Vacunas basadas en cápsidas vacías (VLPs) quiméricas frente al virus de la gripe

porcina: Estudios inmunológicos.

Body where project took place: Centre de Recerca en Sanitat Animal (CRESA)

Head(s) researcher(s): María Montoya González

Funding body or bodies: Ministerio de Ciencia e Innovación

Code according to the funding body: AGL2009-12945-C02-01

Start date: 2010

3.- Name of the project: Nuevas estrategias vacunales frente al virus de la peste porcina clásica. Estudio de

mecanismos implicados en la inmunopatogenicidad viral

Body where project took place: Centre de Recerca en Sanitat Animal (CRESA)

Head(s) researcher(s): Francisco Sobrino

Funding body or bodies: Ministerio de Ciencia e Innovación

Code according to the funding body: BIO2008-04487-C03-03.

Start date: 2009

4.- Name of the project: Nuevas estrategias vacunales e inmunomoduladoras basadas en la estimulación de

las células dendríticas porcinas empleando como modelo el virus de la gripe porcina

Body where project took place: Centre de Recerca en Sanitat Animal (CRESA)

Head(s) researcher(s): María Montoya González

Funding body or bodies: Ministerio de Ciencia e Innovación

Code according to the funding body: AGL2006-13809-C03-01/GAN

Start date: 2007

- 5.- Name of the project: Patogenia de enfermedades víricas porcinas.  
Body where project took place: Centre de Recerca en Sanitat Animal (CReSA)  
Head(s) researcher(s): Mariano DOMingo Álvarez  
Funding body or bodies: Ministerio de Ciencia e Innovación  
Code according to the funding body: CSD2006-0007  
Start date: 2006
- 6.- Name of the project: Nuevas estrategias de inmunización frente al virus del Síndrome Reproductivo y Respiratorio Porcino (PRRS): Estudios inmunológicos y eficacia de antígenos fusionados con quimioquinas.  
Body where project took place: Centre de Recerca en Sanitat Animal (CReSA)  
Head(s) researcher(s): Mariano Domingo Álvarez  
Funding body or bodies: Ministerio de Ciencia e Innovación  
Code according to the funding body: AGL2005-07073-C02-02/GAN.  
Start date: 2006
- 7.- Name of the project: Paso transplacentario y modificaciones cinéticas de los bloqueantes de los canales de calcio durante la gestación y la ontogénesis  
Body where project took place: Universidad de Zaragoza  
Head(s) researcher(s): Jose Javier Aramayona ALonso  
Funding body or bodies: Ministerio de Ciencia e Innovación  
Code according to the funding body: PB92-0350  
Start date: 1993
- 8.- Name of the project: Paso transplacentario de la ciprofloxacina y enrofloxacina en el conejo.  
Body where project took place: Universidad de Zaragoza  
Head(s) researcher(s): Jose Javier Aramayona ALonso  
Funding body or bodies: Diputación General de Aragón  
Code according to the funding body: PCB-13/9  
Start date: 1991
- 9.- Name of the project: Regulación nutrigenética del contenido y la composición de la grasa en el cerdo (GENAVIT)  
Body where project took place: Universidad de Lleida  
Head(s) researcher(s): Ramona Natacha Pena and Joan Estany  
Funding body or bodies: Ministerio de Ciencia e Innovación  
Code according to the funding body: AGL2015-65846-R  
Start date: 2016
- 10.- Name of the project: Relacion entre marcadores moleculares para resiliencia a infecciones y los caracteres de producción y calidad de carne en cerdos.  
Body where project took place: Universidad de Lleida  
Head(s) researcher(s): Ramona Natacha Pena and Lorenzo Fraile  
Funding body or bodies: Ministerio de Ciencia e Innovación  
Code according to the funding body: RTI2018-097700-B-I00  
Start date: 2019
- 11.- Name of the project: REGEVA. Noves estratègies per controlar el virus de la síndrome respiratori i reproductiu porcí  
Body where project took place: Universidad de Lleida  
Head(s) researcher(s): Lorenzo José Fraile Sauce  
Funding body or bodies: Riscat3- Fondos Feder  
Code according to the funding body: COMRDI16-1-0035

Start date: 2017

**Memberships**

I have belonged to the Committee for Veterinary and Medicinal Products (CVMP) for three years (2005-2007) as co-opted member with expertise in swine and poultry medicine. This Committee is involved in the evaluation of drugs and vaccines to be used in veterinary species at European level and it is inside the European Medicine Agency organization (EMA).

I have also belonged to the Scientific Advice Group on Antimicrobials (SAGAM) for two years (2006-2007) that is also inside the EMA organization.

I belong to the Vetcast committee since 2018.

**Other Relevant Information**

I am working also as a coordinator of a Master in pig production and health.