UNIVERSITÀ DI PARMA

FINAL ANNUAL REPORT

ACADEMIC YEAR 2018 - 2019

Year of Study:1 **Cycle: XXXIV**

Surname and Name: Simon Ancuta Cezara

PhD Course: Food Science

Tutor: Professor Adriana Ianieri

EDUCATION ACTIVITIES

SPECIFIC COURSES AND MULTI-DISCIPLINARY ACTIVITIES

Courses on specific topics offered by PhD Programme or from Master/Laurea degrees, Seminars, Schools, Workshops, Training

Denomination of the Activity	DATE	Scientific Discipline[1]	N. hours	CFU[2]	Vote - Judgment	Professor	Level (PhD, Master, etc.)
1. Seminar "Socio-biology and antimicrobial resistance of *Listeria Monocytogenes* in the food industry"	November 27th, 2019	VET04	2			Dr. Pedro Rodríguez-López	PhD

INTER-DISCIPLINARY ACTIVITIES:

Interdisciplinary courses dedicated to general skills or links among disciplines, e,g, communication, computer skills, research management or networking and intellectual property

Denomination of the Activity	DATE	Scientific Discipline[1]	N. hours	CFU[2]	Vote - Judgment	Professor	Level (PhD, Master, etc.)
1. Training at Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia-Romagna (IZSLER), Brescia, Italy	February-April 2019						

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SCIENTIFIC ACTIVITY:

Doctorate schools, Workshops, internships, attended and publications, study abroad period, etc…

done by the candidate during the current period.

Description	Institution/Venue	DATE/Period	Hours	CFU
1. Summer school "Risk-benefit in food safety and nutrition"	European Food Safety Agency, Parma, Italy	June 11th – 13th, 2019	18	
2. Conference "Ready-to-eat foodstuff: regulation, analytic aspects and risk assessment"	Alma Mater Studiorum, Bologna, Italy	November 15th, 2019	6	

Publications: indicate Authors, Title, Journal, year, volume, pages.	***Impact Factor***
Simon A.C., Baldo V., Losio N., Filipello V., Colagiorgi A., Scali F., Zanardi E., Ghidini S., Ianieri A., Alborali G.L. *Molecular characterization of Methicillin-resistant Staphylococcus aureus isolated from the pig production chain in Northern Italy*, 2020. IJFS, 9:8412. Submitted manuscript	Cite Score 2019: 1.8 (Scopus)

Communications to congresses/workshops	**Presented personally Y/N**	**Type (oral/poster)**
"Staphylococcus aureus Meticillino-Resistenti (MRSA) nella filiera suinicola: prevalenza ed epidemiologia molecolare" at "XXIX National congress of the Italian Association of Hygienist Veterinarians", Università degli Studi di Bari "Aldo Moro", Bari, Italy. September 11th -13th, 2019	Y	Oral

OTHER ACTIVITIES:

Complementary didactic activities carried out by the candidate within courses of the University of Parma (teaching hours: max 40), tutoring, exercises, laboratories assistance, other…

1. Laboratory practices for master's degree students in "Medical, veterinary and pharmaceutical biotechnologies"
2. Tutoring for university student attending the master's degree in "Medical, veterinary and pharmaceutical biotechnologies"

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RESEARCH:

Partecipation in Research Groups

Brief description of the research activity carried out during the current year. Methodology, objectives and results, etc… and name of International or national projects of which the reasearch was part. Please provide a narrative description in seperate sheets.

Activity description (**Title of the Project** and description)	**INSTITUTION** (DEPARTMENT UNIV. PARMA – OTHER UNIVERSITY – OTHER RESEARCH INSTITUTION)	**DATE/Period**	
		FROM	**TO**
Project: CLASSYFARM (Farm risk categorization and evaluation of the level of antibiotic-resistance in the swine production chain) Objective: Antimicrobial resistant microorganisms isolated from the swine chain Methods: Isolation and identification of Staphylococcus aureus Methicillin-resistant (MRSA) isolates from the swine chain, followed by phenotypic and genotypic resistance analyses to 11 antimicrobial agents, study on biofilm forming capacity and molecular characterization Results: Outputs from the analyses performed on 25 MRSA isolates: 1) Genotypic investigation: 96% of the isolates harbour genes encoding resistance towards folate inhibitors, 84% harbour resistance genes towards tetracycline and 80% carry resistance genes towards β-lactams. 2) Phenotypic testing: all MRSA isolates are resistant to β-lactams, followed by 80% of resistance to tetracycline and 50% of resistance towards pleuromutilins. 3) Biofilm forming capacity: among the MRSA isolates, 32% of the isolates were classified as weak producers, followed by 28% of non-producers, 18% moderate producers; lastly, 14% of the isolates were strong producers. 4) Molecular characterization: the prevalent Sequence Type was ST398, related to spa-types t899 and t011. This lineage is frequently isolated from pigs throughout Europe and commonly referred to as Livestock-Associated MRSA (LA-MRSA).	Università di Parma	April 2019	November 2019

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FINAL ANNUAL REPORT

ACADEMIC YEAR 2019 - 2020

Year of Study:2 **Cycle: XXXIV**

Surname and Name: Simon Ancuta Cezara

PhD Course: Food Science

Tutor: Professor Adriana Ianieri

EDUCATION ACTIVITIES

SPECIFIC COURSES AND MULTI-DISCIPLINARY ACTIVITIES

Courses on specific topics offered by PhD Programme or from Master/Laurea degrees, Seminars, Schools, Workshops, Training

Denomination of the Activity	DATE	Scientific Discipline[1]	N. hours	CFU[2]	Vote - Judgment	Professor	Level (PhD, Master, etc.)
1. "Actions Marie Skłodowska-Curie Individual Fellowship"	March 18th, 2010		4			Dr. Silvia Tavernini	PhD
2. "Study of the aromatic fraction of food: methods for its determination and analysis"	April 24th and 27th, 2020		6			Dr. Martina Cirlini	PhD
3. "Research from start to finish"	June 24th – 25th, 2020		6			Dr. Giovanni Sogari	PhD
4. "Application of Differential Scanning Calorimetry (DSC) in Food Research"	July 2nd, 2020		3			Dr. Maria Paciulli	PhD

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INTER-DISCIPLINARY ACTIVITIES:

Interdisciplinary courses dedicated to general skills or links among disciplines, e,g, communication, computer skills, research management or networking and intellectual property

Denomination of the Activity	DATE	Scientific Discipline[1]	N. hours	CFU[2]	Vote - Judgment	Professor	Level (PhD, Master, etc.)
"Official controls in plants authorized for export to the USA"	March 3rd – 4th, 2020		12				
"From Covid-19 to genetic engineering; from genetic engineering to microbiome"	May 11th, 14th, 18th and 21st, 2020		8				
One Health European Joint Program Annual Scientific Meeting	May 27th – 29th, 2020		13				
Summer School "One Health"	June 9th - 10th, 2020		6				

SCIENTIFIC ACTIVITY:

Doctorate schools, Workshops, internships, attended and publications, study abroad period, etc…

done by the candidate during the current period.

Publications: indicate Authors, Title, Journal, year, volume, pages.	***Impact Factor***
Ancuta Cezara Simon, Valentina Baldo, Nadia Losio, Virginia Filipello, Angelo Colagiorgi, Federico Scali, Emanuela Zanardi, Sergio Ghidini, Adriana Ianieri, Giovanni Loris Alborali, 2020. *Molecular characterization of Methicillin-resistant Staphylococcus aureus isolated from the pig production chain in Northern Italy*. Italian Journal of Food Safety, 9:8412. Corresponding author: yes	Cite score: 1.8 (Scopus, 2020)

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Pedro Rodríguez-López, Virginia Filipello, Pierluigi Aldo Di Ciccio, Alessandra Pitozzi, Sergio Ghidini, Federico Scali, Adriana Ianieri, Emanuela Zanardi, Marina Nadia Losio, ***Ancuta Cezara Simon***, Giovanni Loris Alborali, 2020. *Assessment of the Antibiotic Resistance Profile, Genetic Heterogeneity and Biofilm Production of Methicillin-Resistant Staphylococcus aureus (MRSA) Isolated from The Italian Swine Production Chain*. Foods, 9, 1141. Corresponding author: yes	4.092 (2020)

OTHER ACTIVITIES:

Complementary didactic activities carried out by the candidate within courses of the University of Parma (teaching hours: max 40), tutoring, exercises, laboratories assistance, other…

1. Teaching (Seminar): "Methicillin-Resistant Staphylococcus aureus (MRSA) in the pig chain: prevalence and molecular epidemiology", 8th May 2020 (2 hours)
2. Teaching (Seminar): "Antimicrobial resistance and Food safety. Case study: Methicillin resistant - Staphylococcus aureus", 29th May 2020 (2 hours)
3. Exam assistance: overall 20 hours
4. Tutoring (master's degree students in Biology and Food Science)

RESEARCH:

Partecipation in Research Groups

Brief description of the research activity carried out during the current year. Methodology, objectives and results, etc… and name of International or national projects of which the reasearch was part. Please provide a narrative description in seperate sheets.

Activity description (**Title of the Project** and description)	**INSTITUTION** (DEPARTMENT UNIV. PARMA – OTHER UNIVERSITY – OTHER RESEARCH INSTITUTION)	**DATE/Period**	
		FROM	**TO**
Project: CLASSYFARM. Objective: Characterization of antimicrobial-resistant bacteria from pig supply chain Isolation of microorganisms, genotypic and phenotypic identification, biofilm production assessment, antibiotic resistance (qualitative and quantitative analysis) profiling, analysis of genes encoding enterotoxins	Università di Parma and Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia-Romagna "Bruno Ubertini", Brescia (Italy)	2019	2020

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FINAL ANNUAL REPORT

ACADEMIC YEAR 2020 - 2021

Year of Study: 3 **Cycle: XXXIV**

Surname and Name: Simon Ancuta Cezara

PhD Course: Food Science

Tutor: Professor Adriana Ianieri

EDUCATION ACTIVITIES

SPECIFIC COURSES AND MULTI-DISCIPLINARY ACTIVITIES

Courses on specific topics offered by PhD Programme or from Master/Laurea degrees, Seminars, Schools, Workshops, Training

Denomination of the Activity	DATE	Scientific Discipline[1]	N. hours	CFU[2]	Vote - Judgment	Professor	Level (PhD, Master, etc.)
1. Course "Perform 2020: Antimicrobial agents susceptibility testing in 2020	March 9th, 2021		5			Dr. Marco Rizzi, Dr. Chiara Silvia Vismara	PhD
2. Seminar "Viruses of foodborne origin: from the pathogenic agent to laboratory diagnosis" Seminar "Bacteriophages: innovative and potential strategies to fight pathogenic bacteria" "Zoonotic viruses, public health and the role of food: avian influenza and hepatitis E virus as examples"	April 27th, May 11th, and May 13th 2021		6			Professor Giuseppe Aprea Dr. Cornelia Adlhoch	Master, PhD

3. Seminar "Food authenticity with molecular markers"	May 14th, 21st and 28th, 2021		6			Professor Barbara Prandi	PhD

INTER-DISCIPLINARY ACTIVITIES:

Interdisciplinary courses dedicated to general skills or links among disciplines, e,g, communication, computer skills, research management or networking and intellectual property

Denomination of the Activity	DATE	Scientific Discipline[1]	N. hours	CFU[2]	Vote - Judgment	Professor	Level (PhD, Master, etc.)
1. Training on the use of Real-Time PCR (QuantStudio 3, ThermoFisher Scientific)	November 25th and February 2nd, 2021		10			Dr. Letizia Gerace	PhD
2. Training on the use of Vizion™ coupled with Swin software (ThermoFisher Scientific)	May 21st, 2021		4			Dr. Andrea Melani Dr. Martine Theron	PhD
3. EFSA Summer School "Food Safety Aspects of Integrated Food Systems"	September 28th – 30th, 2021		9				PhD

SCIENTIFIC ACTIVITY:

Doctorate schools, Workshops, internships, attended and publications, study abroad period, etc…

done by the candidate during the current period.

Please follow the order indicated

Description	Institution/Venue	DATE/Period	Hours	CFU
Publications: indicate Authors, Title, Journal, year, volume, pages.			***Impact Factor***	
Ghidini S., De Luca S., Rodríguez López P., ***Simon A.C.***, Liuzzo G., Poli L., Ianieri A., Zanardi E. *Microbial contamination and antimicrobial resistance of bacteria isolated from a high-throughput pig abattoir*. 2021. Submitted to Italian Journal of Food Safety.			Cite score: 2.1 (Scopus, 2020)	

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Communications to congresses/workshops	**Presented personally Y/N**	**Type (oral/poster)**
Oral communication "*Antimicrobial resistance of microorganisms isolated from the swine chain*" at "XXV Workshop on the developments in the Italian PhD research on Food Science Technology and Biotechnology"	Y	Oral

OTHER ACTIVITIES: Complementary didactic activities carried out by the candidate within courses of the University of Parma (teaching hours: max 40), tutoring, exercises, laboratories assistance, other…		
2. Teaching (Seminar): "Antimicrobial resistance and Food safety. Case study: Methicillin resistant - *Staphylococcus aureus",* 13th May 2021 (2 hours)		
3. Exam assistance: overall 25 hours		
4. Tutoring (master's degree students in Biology and Food Science)		
5. Laboratory assistance for master students in Biology and Food Science		
RESEARCH: Partecipation in Research Groups Brief description of the research activity carried out during the current year. Methodology, objectives and results, etc… and name of International or national projects of which the reasearch was part. Please provide a narrative description in seperate sheets.		
Activity description (**Title of the Project** and description)	**INSTITUTION** (DEPARTMENT UNIV. PARMA – OTHER UNIVERSITY – OTHER RESEARCH INSTITUTION)	**DATE/Period** **FROM** / **TO**
Project: CLASSYFARM (Farm risk categorization and evaluation of the level of antibiotic-resistance in the swine production chain) 1. Objective: Antimicrobial-resistance profiling of bacteria (*i.e.,* Methicillin-resistant *Staphylococcus aureus*, *Escherichia coli*, *Escherichia coli* EsβL) isolated from heavy pig swine at abattoir level located in Northern Italy. Methods: Sampling of carcasses after stunning but before chilling and sampling of cecal content. Isolation and phenotypic identification of *E. coli* and *E. coli* EsβL isolates.	Università degli Studi di Parma and Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia-Romagna "Bruno	July 2020 – April 2021

Isolation and molecular confirmation of Methicillin-resistant *Staphylococcus aureus* (MRSA), followed by antimicrobial susceptibility testing, antimicrobial resistance genes determination, and molecular typing. Results: Recovery of *E. coli* and *E. coli* EsβL isolates from cecal samples. Identification of the isolates through phenotypic analyses. Molecular confirmation and antimicrobial-resistance testing under development. Seventy-one MRSA isolates were confirmed via molecular confirmation and the isolates displayed high values of Minimum Inhibitory Concentration (MIC, µg/mL) towards cefoxitin, tetracycline and clindamycin. On the other hand, the most frequent genes among isolates were *nor*A, *tet*M and *bla*Z, encoding resistance to quinolones, tetracycline, and β-lactams, respectively. Finally, molecular typing revealed that the prevalent lineage among swine is Sequence Type 398 and spa-type t011.	Ubertini", Brescia (Italy)		
2. Objective: Determination of the level of contamination, antimicrobial-resistance and biofilm production of Gram-negative isolates identified in a high throughput pig abattoir located in Northern Italy. Methods: Isolation of Gram-negative isolates from air, carcass, and surface samples. Identification of the isolates through phenotypic and biochemical assays, followed by antimicrobial susceptibility testing and biofilm assay. Results: Sixty isolates, belonging to 20 species, 15 genera and 10 taxonomic families were representative of the microbiota in a high throughput pig abattoir. Among them, 37 isolates displayed resistance to at least one antimicrobial tested and 17 were classified as multi-resistant. Most of the isolates (n=55) were able to adhere to produce quantifiable biomass levels after 24 hours of incubation. Lastly, the lowest total viable count of bacteria was recorded during pre-operative procedures (i.e., before commencement of slaughter activities), and progressively increased with the commencement of the normal activity of the plant.	Università degli Studi di Parma Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia-Romagna "Bruno Ubertini", Brescia (Italy)	April 2021	October 2021

3. Objective: Identification of *Salmonella* spp. in a high throughput pig abattoir located in Northern Italy. Methods: Sampling of air, surface, and carcasses. Isolation and identification of *Salmonella* spp. isolates, followed by biochemical assays, molecular confirmation, and serotyping; lastly, antimicrobial-resistance profiling and biofilm-forming capacity were assessed. Results: Sixteen isolates belonging to the species *Salmonella* spp. were identified from surfaces and carcasses at slaughter. *Salmonella* spp. isolates were identified thoroughly by means of phenotypic and molecular analyses. Except for one multi-resistant isolate, the remaining ones were susceptible towards critically important antimicrobials for human or veterinary medicine. Biofilm formation assay and serotyping analysis are under development.			