

RELAZIONE SULLE ATTIVITÀ SVOLTE NEL CORSO DI DOTTORATO
REPORT ON ACTIVITIES CARRIED OUT DURING THE PHD PROGRAMME

DOTTORANDO / PhD STUDENT	
COGNOME NOME / SURNAME NAME	CODICE DOTTORATO / Ph.D CODE
Mastrogiovanni Fabio	DOT1335834
CORSO DI DOTTORATO / PHD PROGRAMME	CICLO / CYCLE
Scienze delle produzioni vegetali e animali (SPVA)	XXXI
POSIZIONE / POSITION	<input checked="" type="checkbox"/> with scholarship <input type="checkbox"/> without scholarship <input type="checkbox"/> other
TUTOR (COGNOME NOME) / TUTOR (SURNAME NAME)	
Lacetera Nicola Bernini Roberta	

BREVE RELAZIONE SULL'ATTIVITÀ DI RICERCA / SHORT REPORT ON RESEARCH ACTIVITIES (max. 2500 caratteri, spazi esclusi/ maximum 2500 characters excluding spaces)
<p>The nutraceutical can be considered a valid alternative to the use of pharmaceuticals, indeed molecules and/or plant compounds contained in plants (or their products) may have useful effects on cell viability, oxidative stress, immune system stimulation, and against microbial pathogens.</p> <p>In certain periods of their lives, and in particular in the transition period in dairy cattle and in the post-weaning period in piglets, psychological and physical stressors may lead to immunosuppression, higher risk of infections, and inflammation. In addition, periparturient dairy cows are also more prone to undergo oxidative stress.</p> <p>Recently, according to the "circular economy strategy", by-products recovered from food wastes are used as sources of bioactive molecules. Pomegranate peel, the by-product of the juice production, has attracted our attention for its antioxidant, anti-inflammatory, antihyperglycemic, antihepatoprotective and anticancer properties, described in humans and laboratory animals.</p> <p>Based on the literature data, standardized pomegranate peel extracts (PPE) rich in polyphenols were prepared in our laboratories. Furthermore, biological activities of PPE as cytotoxicity, anti-proliferative, antioxidant and anti-inflammatory properties, were evaluated on bovine models (BME-UV1 and PBMC) and on human/porcine models (Caco-2 and colon tissues explants).</p> <p>BME-UV1 treated for 48 hours with sublethal concentrations of PPE (0.1, 1 and 10 µg/mL) and exposed to oxidant agent (H₂O₂), showed decrements of ROS and Malondialdehyde (MDA) productions; 10 µg/mL of treatment on LPS-induced BME-UV1 cells, showed a decrease of the expression of cytokines involved in inflammatory status (<i>TNF</i>, <i>IL1B</i>, <i>IL10</i>). Treatment with 10 µg/mL of extract on PBMC, showed a protective effect against ROS production and evidenced a decrease of the cell proliferation.</p> <p>Caco-2 cells treated for 24 hours with sublethal concentrations of PPE and induced by TNF showed</p>

decrease of CXCL8 in supernatant in dose-dependent manner. Porcine colon tissues co-treated for 3 hours with LPS and PPE showed decrement of expression of inflammatory cytokines (CXCL8, IL1A and IL6). The high percentage of punicalagins contained in PPE, in combination with the literature data, suggested that the antioxidant and anti-inflammatory properties evidenced by the pomegranate extract are related almost exclusively to the punicalagins' biological activities. The results obtained suggest that this by-product could be used on animal species affected to oxidative stress and inflammatory diseases in improving animal health, however *in vivo* studies are needed to evaluate the consequences of the ingestion process on the stability and on the bioactivity of the PPE.

PRINCIPALI ATTIVITÀ FORMATIVE / MAIN TRAINING ACTIVITIES
(elencare tutte le principali attività svolte e, per ognuna, indicare i dati richiesti
list the main activities and specify for each of them the requested data)

TIPO / TYPE [Corso/Seminario/Workshop/ Convegno/Altro (specificare) – Course/Seminar/Workshop/Conference/Other (specificare / specify)]	TITOLO / TITLE	SEDE / LOCATION	ORE – GIORNI / HOURS – DAYS A.A. – A.Y.
Conference	Kick off meeting Progetto SAFE-Med, DAFNE Dipartimento di Eccellenza	University of Tuscia, (Italy)	10/10/2018
Seminar	Costruire un ponte tra ricerca e ambiente: progettare soluzioni innovative per lo sviluppo e la salvaguardia del territorio (Dr. Matteo Carboneschi)	University of Tuscia, (Italy)	24-29/09/2018
Conference	14th International Symposium: Digestive Physiology of Pigs	Brisbane (Australia)	21-24/08/2018
Course	Principi di Scrittura Scientifica (Dr. Daniele Porretta)	University of Tuscia, (Italy)	17-21/07/2017
Conference	22nd congress of the Animal Science and Production Association	Perugia, (Italy)	13-16/06/2017
Course	L'ambiente statistico R: una introduzione all'analisi dei dati ecologici (Dr. Giorgio Mancinelli)	University of Tuscia, (Italy)	05-09/06/2017

Course	English course for PhD students (Prof. Julie Anne Hobson)	University of Tuscia, (Italy)	March-May 2017
Seminar	Digestione anaerobica di reflui e biomasse: sistemi avanzati per la produzione di biogas (Dr. Maria Rosaria Boni, Andreina Rossi, Emilio D'Amato)	University of Tuscia, (Italy)	22/02/2017
Seminar	L'approccio tecnologico alla bonifica di un sito contaminato sulla base del più recente quadro normative (Dr. Maria Rosaria Boni, Angela Antonucci, Fabio Tatti)	University of Tuscia, (Italy)	15/02/2017
Seminar	Biotechnology & Nanotechnology – The future for mankind (Dr. Octaviu Moldovan)	University of Tuscia, (Italy)	04/11/2016
Seminar	Comunicazione della Ricerca Scientifica (Dr. Maria Flora Mangano)	University of Tuscia, (Italy)	10/12/2015

ATTIVITÀ DI DIDATTICA E DI RICERCA / TEACHING AND RESEARCH ACTIVITIES
(elencare numerando tutte le attività svolte e, per ognuna, indicare i dati richiesti
list and enumerate all activities and specify for each of them the requested data)

TIPO / TYPE	TITOLO / TITLE
ATTIVITÀ TUTORIALI E DIDATTICO INTEGRATIVE SVOLTE TUTORSHIP ACTIVITIES (specificare / specify)	
SEMINARI TENUTI DAL DOTTORANDO SEMINARS HELD BY THE PHD STUDENT (specificare / specify)	<ul style="list-style-type: none"> Evaluation of nutraceutical properties of standardized pomegranate peel extracts in bovine and porcine models” for academic course “Biotecnologie animali”, taught by Prof. Basiricò 16/10/2018

<p>LISTA PUBBLICAZIONI SCIENTIFICHE LIST OF SCIENTIFIC PUBLICATIONS indicare le opere che sono state pubblicate lavori sottomessi rapporti di ricerca, etc. - riportando la citazione bibliografica completa / indicate published works – submitted works, research reports - quoting full bibliographic references</p>	<ul style="list-style-type: none"> • Mastrogiovanni F, Bernini R, Basiricò L, Bernabucci U, Campo M, Romani A, Santi L, Lacetera N. 2018. Antioxidant and anti-inflammatory effects of pomegranate peel extracts on bovine mammary epithelial cells BME-UV1. <i>Natural product research</i>, 1-5. doi: 10.1080/14786419.2018.1508149 • Mastrogiovanni F, Mukhopadhy A, Lacetera N, Ryan MT, Romani A, Bernini R, Sweeney T. 2019. Anti-Inflammatory Effects of Pomegranate Peel Extracts on In Vitro Human Intestinal Caco-2 Cells and Ex Vivo Porcine Colonic Tissue Explants. <i>Nutrients</i>, 11: 548. doi: 10.3390/nu11030548 • Mastrogiovanni F, Romani A, Santi L, Lacetera N, Bernini R. 2019. Anti-proliferative effect of pomegranate peel extracts on bovine peripheral blood mononuclear cells (PBMCs). <i>Natural Product Research</i>, 1-6. doi: 10.1080/14786419.2019.1627350 • Ovidi E, Triggiani D, Valeri M, Mastrogiovanni F, Salvini L, Bonechi C, Taddei AR, Masci V, Tiezzi A. 2018. Biological effects of <i>Salvia Officinalis</i> leaf extract on murine myeloma cells. <i>Pharmacognosy Magazine</i>, 14: 208-212. doi: 10.4103/pm.pm_401_17 • Mastrogiovanni F, Danieli PP, Tiezzi A, Barone A, Silveri L, Gallipoli L, Abbruzzese S, Lacetera N. 2017. Preliminary Evaluation on the Bio-Activity of Herb and Spice Extracts Against Bovine Mastitis Causing Bacteria. <i>Approaches in Poultry, Dairy & Veterinary Sciences</i>. 1: 1-4. doi: 10.31031/APDV.2017.01.000520 • Mastrogiovanni F, Ovidi E, Mamadalieva NZ, Tiezzi A. Testings of <i>Myrtus communis</i> leaf extracts on mammalian and bacteria cells. 2017. <i>New aspects in Medicinal Plants and Pharmacognosy</i>, Edition: First, Chapter: 7, Publisher: JBBook, Poznan, Poland, Editors: Antonio Tiezzi, Tomasz M. Karpiński, pp.147-159. doi: 10.5281/zenodo.833147
<p>PRESENTAZIONI A CONGRESSI PRESENTATION AT CONFERENCES (indicare se la presentazione - poster, abstract, etc. - è stata anche pubblicata riportando la citazione bibliografica completa / indicate whether the work – posters, abstract etc - has already been published, quoting full bibliographic references)</p>	<ul style="list-style-type: none"> • (POSTER) Fabio Mastrogiovanni, Roberta Bernini, Nicola Lacetera. Valutazione delle proprietà nutraceutiche di estratti standardizzati di buccia di melograno su modelli bovini e suini. <i>European Researchers' Night</i>, Viterbo, 28/09/2018 • (POSTER) Fabio Mastrogiovanni, Anindya Mukhopadhy A, Nicola Lacetera, Roberta Bernini, Annalisa Romani, Torres Sweeney. Ex-vivo investigation of the anti-inflammatory effects of pomegranate peel extracts on a porcine colonic tissue explant. 14th International Symposium: Digestive Physiology of Pigs, Brisbane (Australia) 21-24/08/2018 (POSTER) and winner of an international travel grant (1500 AUD) provided by the conference. • (POSTER) Fabio Mastrogiovanni, Umberto Bernabucci, Loredana Basiricò, Daniele Dipasquale and Nicola Lacetera. Evaluation of antioxidant effects of pomegranate peel extract on bovine mammary epithelial cells. 2017. <i>ASPA 22nd Congress Book of Abstracts</i>. <i>Italian Journal of Animal Science</i>, 16(Sup1), pp 197. doi: 10.1080/1828051X.2017.1330232
<p>ALTRE PUBBLICAZIONI OTHER PUBLICATIONS (indicare le opere che sono state pubblicate lavori sottomessi rapporti di ricerca, etc. - riportando la citazione</p>	<ul style="list-style-type: none"> • Mastrogiovanni F, Gallipoli L. 2019. Aronia, coltura alternativa dalle rinomate virtù salutari. <i>Terra e Vita</i>, 8: 54-55

