PLOTINA

Promoting gender balance and inclusion
in research, innovation and training

Promoting gender balance and inclusion in research, innovation and training
PLOTINA
(Horizon 2020 – GA: 666008)

Project Coordinator:
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Horizon 2020
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Gender Summits®
Quality Research and Innovation through Equality

The topic: Specific Challenge

TOPIC: GERI.4.2014-2015 - Support To Research Organisations To Implement Gender Equality Plans

- Gender equality is a key priority of the ERA (European Research Area) Communication. "A Reinforced European Research Area: Partnership for Excellence and Growth", which invites Member States, research performing organisations (RPOs), including Higher Education Institutions, as well as research funding organisations (RFOs) to take action to **promote gender equality** in R&I with the following objectives:
  - ➢ Removing barriers to the **recruitment, retention and career progression** of female researchers
  - ➢ Addressing **gender imbalances in decision making** processes
  - ➢ Strengthening the **gender dimension in research** programmes

What is needed to develop a gender equality plan in my Institution (RPO)?

-Role of the proponent
-Achievement of a competitive result (reputation within the Institution)
-Budget

-Involvement of key actors
-Method (coaching association, now GEAR)
-An international process (other RPOs carring on the same path, with the same timing)
-At least one Institution with our numbers (Students, Ressearchers, Disciplines)

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The topic: Scope (1)

- The action provides support to RPOs and RFOs in order to **support systemic institutional changes**, in particular through the implementation of Gender Equality Plans (GEPs). GEPs shall:

INCLUDED IN THE PROPOSAL

WE ARE HERE NOW. CONCLUDING AND ELABORTING THE AUDIT

  - Conduct **impact assessment / audit of procedures and practices**, including relevant data on HR management, teaching and research activities, in order to identify gender bias at organisation level;
  - **Implement innovative strategies** to address gender bias (family-friendly policies, gender planning and budgeting, training on gender equality in HR management, develop the gender dimension in research content and programmes; integrating gender studies in Higher Education Institution curricula);
  - **Set targets and monitor progress** via indicators at organisation level.

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The topic: Scope (2)

✓The RPOs, including Higher Education Institutions, and RFOs involved in the consortium shall be at a **starting stage in the setting-up of GEPs** and shall ensure the **support from their highest management level**. Participation **of professional associations** in the consortium is recommended.

✓ The proposals shall include a **first assessment of gender issues in each partner organisation**. They shall also situate the planned GEPs in relation with existing national provisions relating to gender equality in research (…).

✓ The proposals shall include a **methodology for impartially monitoring and assessing the progress made throughout the duration of the project.** This activity could be dedicated to a specific partner organisation or subcontracted. This action will be further promoted through the EURAXESS initiative SEAC.3.2014.

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The topic: Expected Impacts

- The activities will **increase the number of RPOs and RFOs implementing GEPs** pursuing the three objectives mentioned in the challenge. In the medium / to long term, activities will contribute to the achievement of ERA in particular by **increasing the number of female researchers, improving their careers** and mobility, thus contributing to research intensity. The integration of the gender dimension in research programmes and content will improve the **social value of innovations** and the fitness for purpose of innovative products

TYPE OF ACTION: Coordination and Support Action

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PLOTINA: overall objective

- To enable the **development, implementation and assessment of self-tailored Gender Equality Plans (GEPs)** with innovative and sustainable strategies for the Research Performing Organizations (RPOs) involved.
- This objective is based on the vision to **foster excellence and the social value of innovations**, by:
  - stimulating a **gender-aware cultural change**;
  - promoting **career-development of both female and male researchers** to **prevent the waste of talent**, particularly for women;
  - ensuring **diversification of views and methodologies** (in this case by taking into account the **gender/sex dimension** and analysis) **in research and teaching**.

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SIMPLE, ADAPTABLE AND VIRAL

Specific objectives

- Designing and implementing **self-tailored GEPs, Libraries of Actions and Good Practices** for six European RPOs (same mission, different dimension) to be used also as role models for other institutions;
- Creating new **Case studies of gendered research** and teaching;
- Wide **disseminating the results and tools** developed to foster other RPOs to follow.

PLOTINA - CASE STUDY UNIBO – GENDERED INNOVATIONS 2.0

TOPIC	Food and Nutrition
TITLE	Analyzing beef sexing and sex-related substances in meat: a problem of authentication:
THE CHALLENGE	**Beef sexing** is a timely issue dealing with food **authentication** (15 papers reported by Scopus from 2007 to 2014), because male beef is designated to be of higher quality than cow or heifer meat. This might produce different prices and a temptation to mislabel beef or to offer non-male beef meat, perpetrating a fraud and damaging the consumers. For this reason, it is important to have various reliable, robust and simple methods, to be applied routinely for determining the gender of beef meat (Zalacy et al., 2002). **Sexual hormones** are substances that are naturally occurring in animals, related with their sex, but they can be also synthetically produced and administrated to the animals, even if banned in the European Union, to increase the animals' growth rate, the lean mass and to reduce their fat content (Lone et al., 1997). Moreover, hormones may have an impact on the nutritional and healthiness properties of beef and their sensory attributes (tenderness, juiciness and overall quality), e.g. due to a reduced marbling and advanced skeletal or lean maturity. For all these reasons, and considering that the daily intake of sexual hormones can be very relevant for the human health (impacting differently based on gender), it is important firstly to survey and then to develop new reliable, fast and highly sensitive analytical methods for beef sexing, alternative to the polymerase chain reaction PCR-based techniques (Herrero et al., 2013), useful also to verify the administration of sex-related substances. A detailed study of the sensory differences on beef would clear the differences produced by animal sexing and sexual hormones administration.
METHOD	• – Analyzing sex, sexual hormones and related sensory attributes in meat PCR is by far the most widely used methodology for meat sexing due to its moderate cost and short analysis time (Herrero et al., 2013).However, to have a complementary vision and in order to avoid possible false negatives, tandem mass spectrometry methods combined with gas chromatography or liquid chromatography could be also used to measure hormones present at low levels and to define their metabolic pathways. Fast and highly sensitive

ADVERSTISING EFFECTIVNESS AND BENEFITS OF PLOTINA IN TERMS OF VISIBILITY AND PARTNERS REPUTATION

4 ALREADY PROPOSED
NO FINANCIAL SUPPORT
WE HOPE OTHERS WILL FOLLOW

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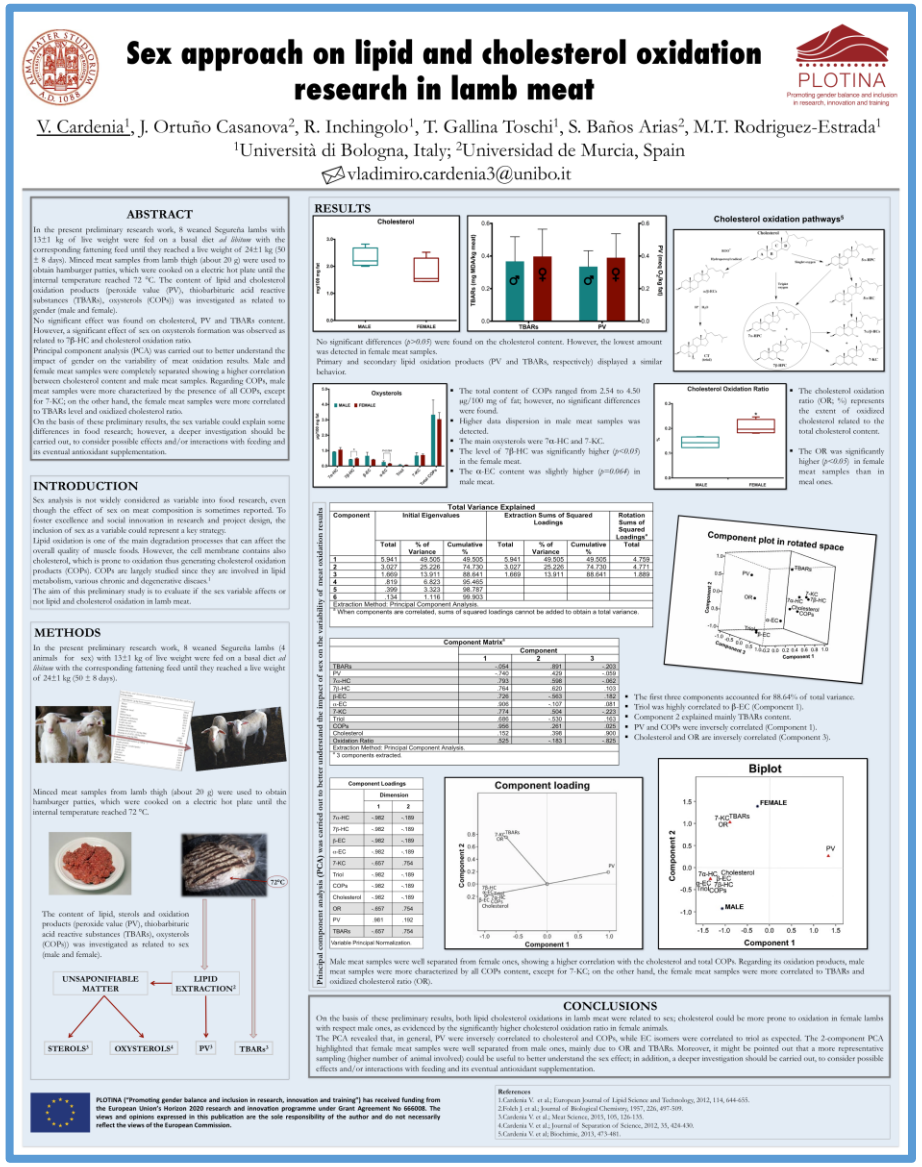
First case study (*in course*) of gendered research on food



Sex approach on lipid and cholesterol oxidation research in lamb meat

PLOTINA
Promoting gender balance and inclusion in research, innovation and training

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ABSTRACT
In the present preliminary research work, 8 weaned Segureña lambs with 13±1 kg of live weight were fed on a basal diet *ad libitum* with the corresponding fattening feed until they reached a live weight of 24±1 kg (50 ± 8 days). Minced meat samples from lamb thigh (about 20 g) were used to obtain hamburger patties, which were cooked on a electric hot plate until the internal temperature reached 72 °C. The content of lipid and cholesterol oxidation products (peroxide value (PV), thiobarbituric acid reactive substances (TBARs), oxysterols (COPs)) was investigated as related to gender (male and female).
No significant effect was found on cholesterol, PV and TBARs content. However, a significant effect of sex on oxysterols formation was observed as related to 7β-HC and cholesterol oxidation ratio.
Principal component analysis (PCA) was carried out to better understand the impact of gender on the variability of meat oxidation results. Male and female meat samples were completely separated showing a higher correlation between cholesterol content and male meat samples. Regarding COPs, male meat samples were more characterized by the presence of all COPs, except for 7-KC; on the other hand, the female meat samples were more correlated to TBARs level and oxidized cholesterol ratio.
On the basis of these preliminary results, the sex variable could explain some differences in food research; however, a deeper investigation should be carried out, to consider possible effects and/or interactions with feeding and its eventual antioxidant supplementation.

INTRODUCTION
Sex analysis is not widely considered as variable into food research, even though the effect of sex on meat composition is sometimes reported. To foster excellence and social innovation in research and project design, the inclusion of sex as a variable could represent a key strategy.
Lipid oxidation is one of the main degradation processes that can affect the overall quality of muscle foods. However, the cell membrane contains also cholesterol, which is prone to oxidation thus generating cholesterol oxidation products (COPs). COPs are largely studied since they are involved in lipid metabolism, various chronic and degenerative diseases.[1]
The aim of this preliminary study is to evaluate if the sex variable affects or not lipid and cholesterol oxidation in lamb meat.

METHODS
In the present preliminary research work, 8 weaned Segureña lambs (4 animals for sex) with 13±1 kg of live weight were fed on a basal diet *ad libitum* with the corresponding fattening feed until they reached a live weight of 24±1 kg (50 ± 8 days).

Minced meat samples from lamb thigh (about 20 g) were used to obtain hamburger patties, which were cooked on a electric hot plate until the internal temperature reached 72 °C.

The content of lipid, sterols and oxidation products (peroxide value (PV), thiobarbituric acid reactive substances (TBARs), oxysterols (COPs)) was investigated as related to sex (male and female).

UNSAPONIFIABLE MATTER · LIPID EXTRACTION[2] · STEROLS[3] · OXYSTEROLS[4] · PV[5] · TBARs[5]

RESULTS
Cholesterol · TBARs (mg MDA/kg meat) · PV (meq O2/kg fat) · Cholesterol oxidation pathways[5]

No significant differences ($p>0.05$) were found on the cholesterol content. However, the lowest amount was detected in female meat samples.
Primary and secondary lipid oxidation products (PV and TBARs, respectively) displayed a similar behavior.

Oxysterols

- The total content of COPs ranged from 2.54 to 4.50 µg/100 mg of fat; however, no significant differences were found.
- Higher data dispersion in male meat samples was detected.
- The main oxysterols were 7α-HC and 7-KC.
- The level of 7β-HC was significantly higher ($p<0.05$) in the female meat.
- The α-EC content was slightly higher ($p=0.064$) in male meat.

Cholesterol Oxidation Ratio

- The cholesterol oxidation ratio (OR; %) represents the extent of oxidized cholesterol related to the total cholesterol content.
- The OR was significantly higher ($p<0.05$) in female meat samples than in meal ones.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings*
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5.941	49.505	49.505	5.941	49.505	49.505	4.759
2	3.027	25.226	74.730	3.027	25.226	74.730	4.771
3	1.669	13.911	88.641	1.669	13.911	88.641	1.889
4	.819	6.823	95.465				
5	.399	3.323	98.787				
6	.134	1.116	99.903				

Extraction Method: Principal Component Analysis.
* When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Component plot in rotated space

Component Matrix*

	Component 1	Component 2	Component 3
TBARs	-.594	.691	.203
PV	-.745	.429	-.059
7α-HC	.793	.596	-.062
7β-HC	.764	.620	.103
β-EC	.726	-.583	.182
α-EC	.906	-.107	.081
7-KC	.774	.604	-.223
Troi	.686	-.530	.163
COPs	.966	.261	.025
Cholesterol	.152	.398	.900
Oxidation Ratio	.525	-.183	-.825

Extraction Method: Principal Component Analysis.
* 3 components extracted.

- The first three components accounted for 88.64% of total variance.
- Troi was highly correlated to β-EC (Component 1).
- Component 2 explained mainly TBARs content.
- PV and COPs were inversely correlated (Component 1).
- Cholesterol and OR are inversely correlated (Component 3).

Component Loadings

	Dimension 1	Dimension 2
7α-HC	.982	-.169
7β-HC	.982	-.169
β-EC	.982	-.169
α-EC	.982	-.169
7-KC	.657	.754
Troi	.982	-.169
COPs	.982	-.169
Cholesterol	.982	-.169
OR	.657	.754
PV	.981	.192
TBARs	.657	.754

Variable Principal Normalization.

Component loading · Biplot

Principal component analysis (PCA) was carried out to better understand the impact of sex on the variability of meat oxidation results

Male meat samples were well separated from female ones, showing a higher correlation with the cholesterol and total COPs. Regarding its oxidation products, male meat samples were more characterized by all COPs content, except for 7-KC; on the other hand, the female meat samples were more correlated to TBARs and oxidized cholesterol ratio (OR).

CONCLUSIONS
On the basis of these preliminary results, both lipid cholesterol oxidations in lamb meat were related to sex; cholesterol could be more prone to oxidation in female lambs with respect male ones, as evidenced by the significantly higher cholesterol oxidation ratio in female animals.
The PCA revealed that, in general, PV were inversely correlated to cholesterol and COPs, while EC isomers were correlated to triol as expected. The 2-component PCA highlighted that female meat samples were well separated from male ones, mainly due to OR and TBARs. Moreover, it might be pointed out that a more representative sampling (higher number of animal involved) could be useful to better understand the sex effect; in addition, a deeper investigation should be carried out, to consider possible effects and/or interactions with feeding and its eventual antioxidant supplementation.

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References
1.Cardenia V. et al.; European Journal of Lipid Science and Technology, 2012, 114, 644-655.
2.Fritsch J. et al.; Journal of Biological Chemistry, 1957, 226, 497-509.
3.Cardenia V. et al.; Meat Science, 2013, 105, 126-133.
4.Cardenia V. et al.; Journal of Separation of Science, 2012, 35, 424-430.
5.Cardenia V. et al; Biochimie, 2013, 473-481.

Poster presented at the GS9

Sex analysis is **not widely considered** as variable into **food research**. For a **most targeted results** and **to avoid approximation in research and project design**, the inclusion of sex as a variable could represent a key strategy.

On the basis of these preliminary results, **the sex variable could explain some differences in food science research**.

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Overall strategy

1. *Focus on Women*: increasing the participation of women in science and engineering by supporting them with training and career development.
2. *Focus on Institutions:* structural and cultural change in institutions.
3. *Focus on Knowledge:* integrating sex and gender analysis into research, fostering excellence and social innovation.

- ✓ PLOTINA proposes an **holistic strategy to increase the representation of women in academia and foster a supportive environment where men and women can thrive** and conduct excellent research, which may itself have a gender/sex dimension.
- ✓ PLOTINA will contribute to make research activity in Europe more competitive on the world scene, by **creating cultures that value and benefit from the diversity in the workplace**.

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Consortium & roles

RPOs

Participant N.	Participant organisation name	Country
1 (Coordinator)	Alma Mater Studiorum – Università di Bologna (UNIBO)	ITALY
2	University of Warwick (WARWICK)	UNITED KINGDOM
3	National Institute of Chemistry (NIC)	SLOVENIA
4	School of Economics and Management (ISEG)	PORTUGAL
5	Mondragon University (MU)	SPAIN
6	Ozyegin University (OZU)	TURKEY
7	Center for Social Innovation (ZSI)	AUSTRIA
8	Jump Forum SPRL (JUMP)	BELGIUM
9	Progetto Donna (PD)	ITALY
10	Elhuyar Foundation (ELHUYAR)	SPAIN

EVALUATION & MONITORING

DISSEMINATION

PROFESSIONAL ASSOCIATIONS

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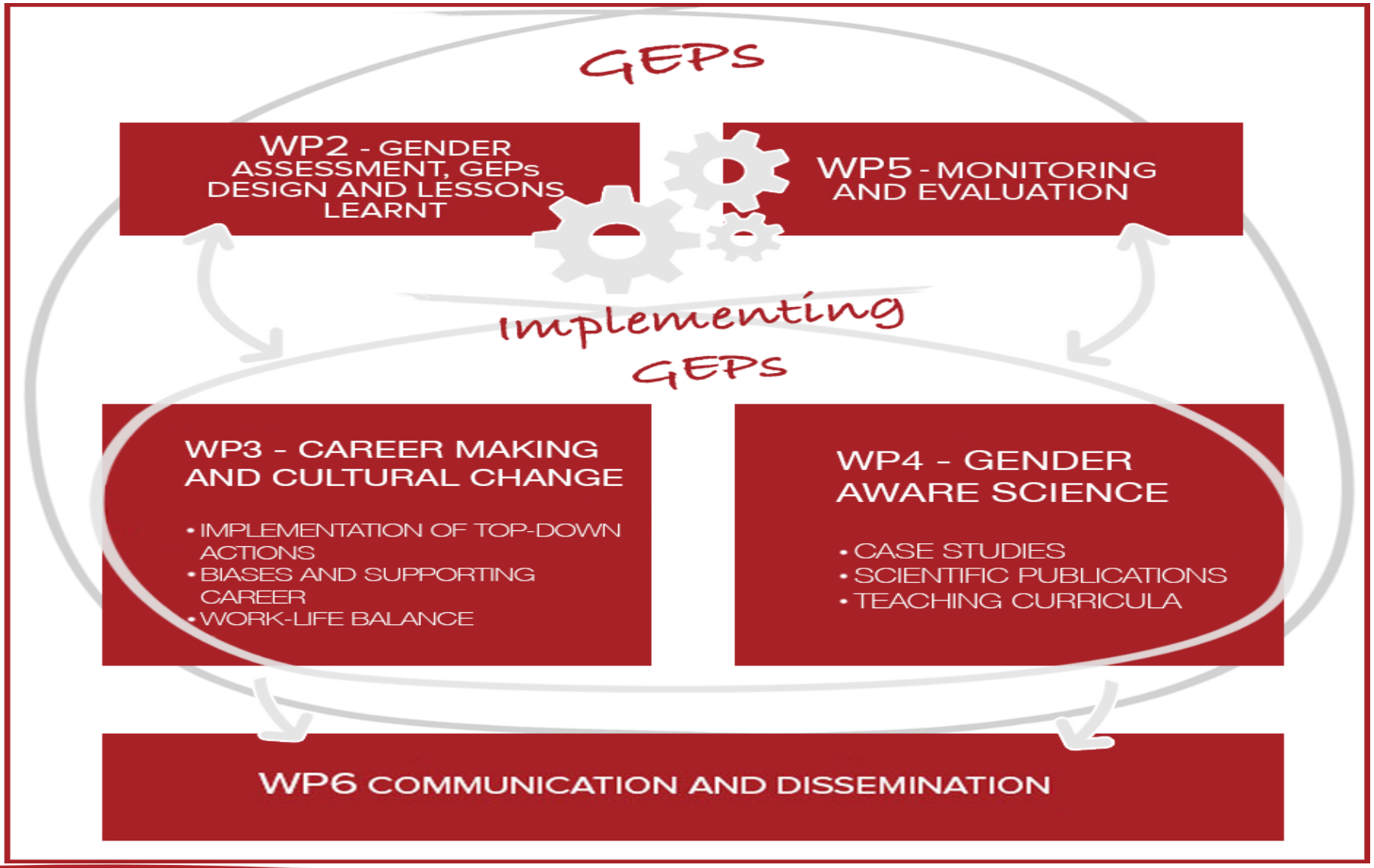
PLOTINA workpackages: PERT diagram



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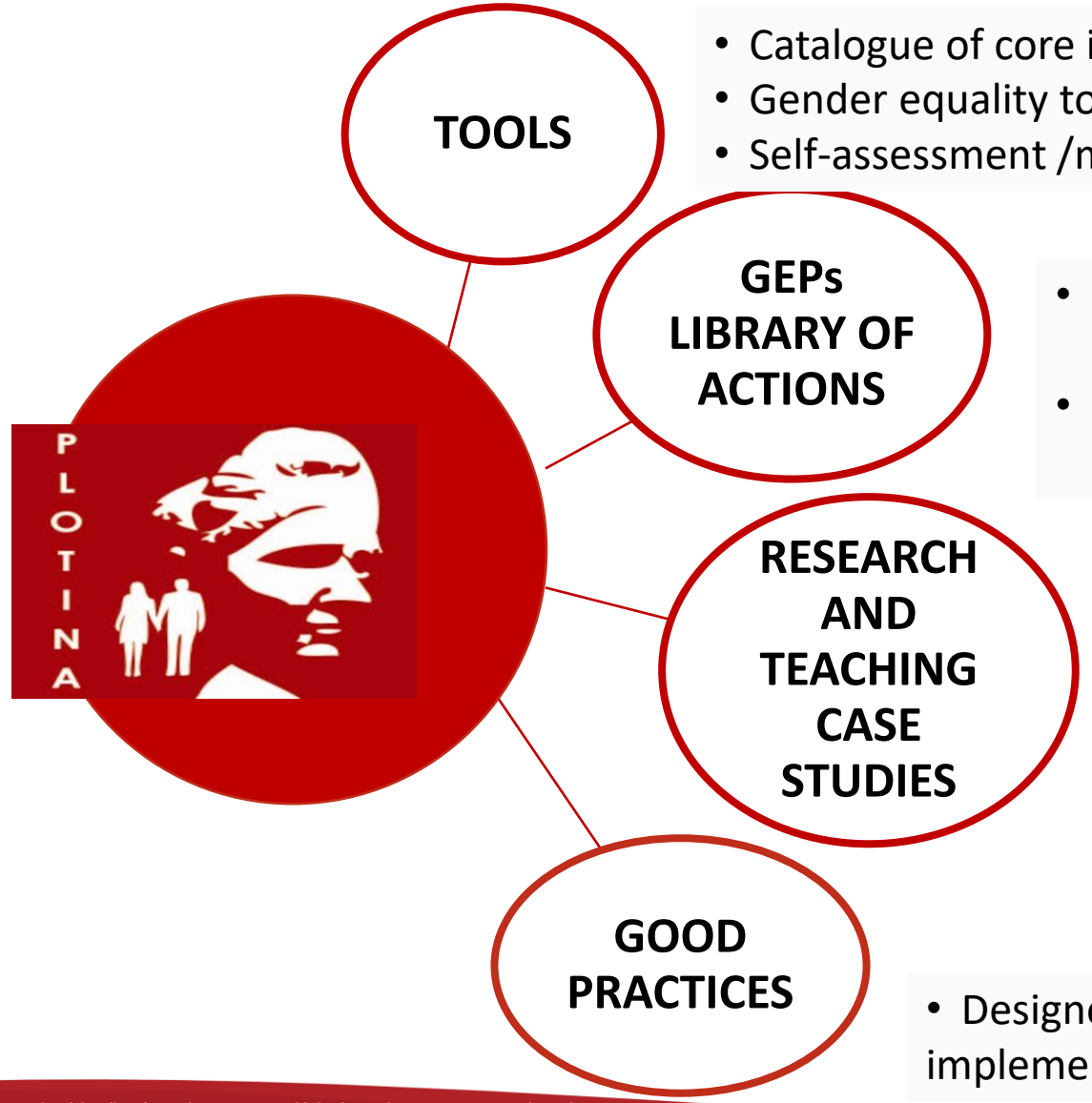
Expected outputs



- Catalogue of core indicators
- Gender equality tools
- Self-assessment /monitoring software

- Existing practices/actions that have been evidenced as effective
- New actions that RPOs of PLOTINA will test

- Examples of integrating gender in research projects to increase their validity
- Gendering teaching curricula

- Designed and implemented GEPs and successfully implemented Action

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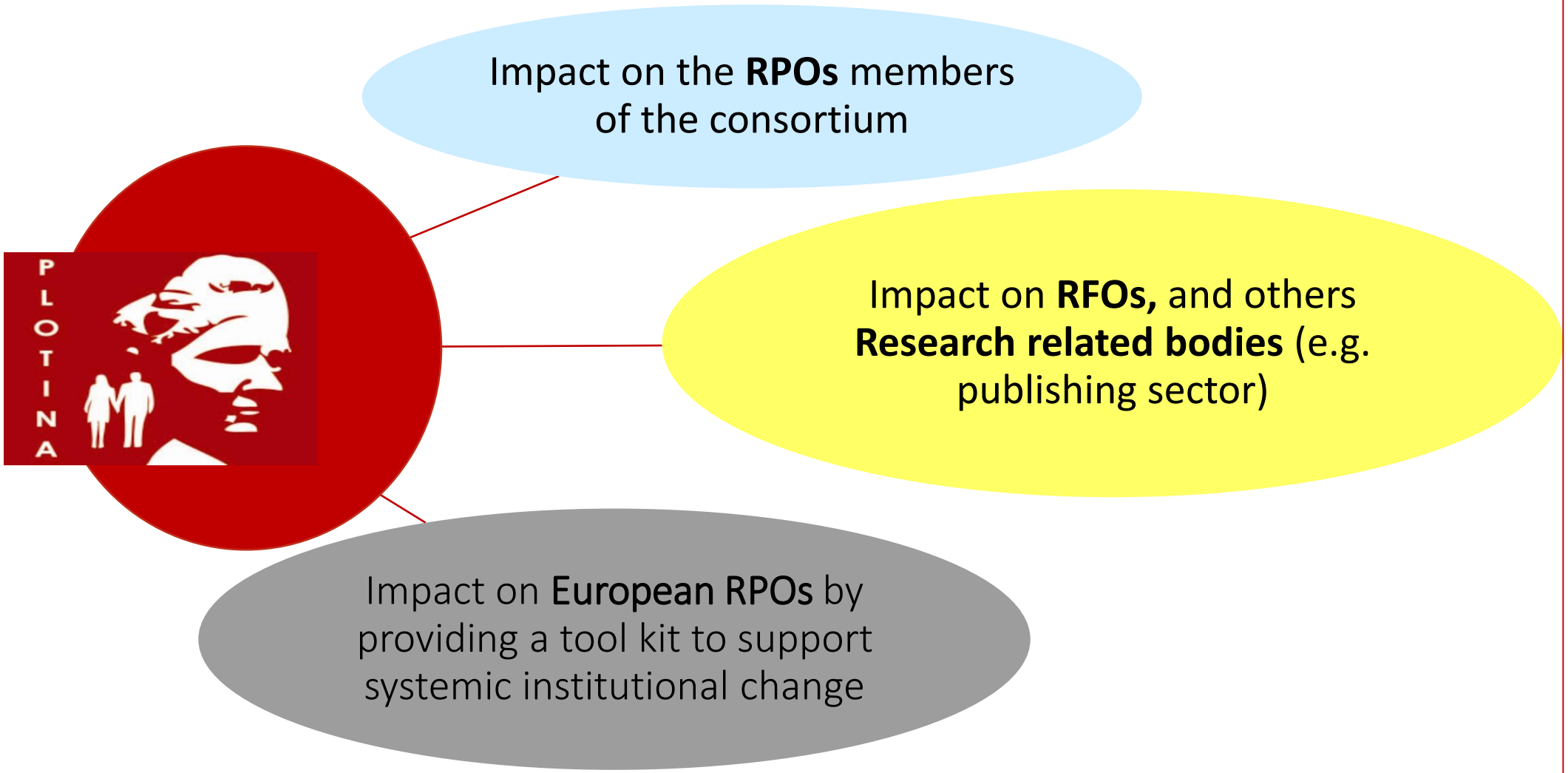
Expected impacts



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Thank you

for your attention

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ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

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