**Abstract Form**

**Page set up**: one page abstract (A4)

**Document**: 2.5 cm left/right margins. 3 cm top/bottom margins, 0 gutter.

**Paragraph**: Single space

**Font**: Times New Roman, Point 11.

**Title of Abstract**

Times New Roman, Point 11, bold. Do not exceed 3 lines.

**Authors**

List all authors. Last name first followed by first name (full name, not initials). Underline the

presenting author. Use numerical superscripts to indicate the different affiliations.

**Affiliations**

Use a separate line for each affiliation.

**Email**

Include the email of the presenting author only.

**Main Body**

The required subheadings are Introduction, Methods, Results & Discussion. If you prefer, you

can also have a Conclusions subheading.

**File name**

Name the saved pdf file as Lastname\_firstname.doc. In case of a second submission, use Arabic

numbers after the first name (Lastname\_firstname1.doc, and Lastname\_firstname2.doc).

# Please see a sample of an Abstract in the next page

# Glyphosate chronic exposure impairs vitellogenesis and affects female zebrafish reproduction

Giommi Christian 1,5, Lombό Marta 1,2,5, El Kamouh Marina 3, Habibi Hamid R. 4, Carnevali Oliana 1,5, Maradonna Francesca 1,5

1 Dipartimento Scienze della Vita e dell’Ambiente, Università Politecnica delle Marche, Via Brecce Bianche, 60131 Ancona, Italy;

2 Department of Molecular Biology, Faculty of Biology and Environmental Sciences, Universidad de León, 24071 León, Spain

3 INRAE, Fish Physiology and Genomics, UR 1037, Rennes, France.

4 Department of Biological Sciences, University of Calgary, Calgary, AB T2N 1N4, Canada;

5 INBB—Consorzio Interuniversitario di Biosistemi e Biostrutture, 00136 Roma, Italy. Email: c.giommi@pm.unipm.it

# INTRODUCTION

Glyphosate, the active compound of several herbicide formulations, is commonly used for weed control in crops. Despite it was predicted to possess no action against organisms other than plants and bacteria, some evidence demonstrated its detrimental effects especially on aquatic animal species. Since its application widely increased over the years, its accumulation in the environment represents a concrete and severe risk for both wildlife and human health.

# METHODS

Fish were exposed through the diet to 0.5 mg/kg/body weight/day (G1), defined by the EFSA as acute reference dose, 5 (G2) and 50 mg/Kg/body weight/day (G3), displaying no observable adverse effect (NOAEL), for three weeks, and results were compared to those of an untreated control group (C). During sampling, liver, ovaries and body weight were measured and the hepatosomatic and gonadosomatic indexes were computed. In order to analyze ovary follicle classes number, Hematoxylin and Eosin staining was performed on histological sections of paraffin embedded samples. Class III and IV follicles were also separately collected during sampling to perform expression analysis of master genes involved in reproduction, while in livers the expression of the seven vitellogenin isoforms and the estrogen receptors mRNA levels were evaluated.

# RESULTS & DISCUSSION

Hepatosomatic index (HSI) ad gonadosomatic index (GSI) did not show differences among female exposed to different doses of glyphosate and C. Similarly to HSI and GSI, also the frequency of follicles at different maturation stages was not affected by glyphosate exposure. On the contrary, the molecular analysis evidenced significant changes regarding genes involved in oogenesis. Gene expression analysis of class IIIb follicles revealed that the highest dose of glyphosate led to an increase of the gonadotropin receptor (*fshr* and *lhcgr*) and estrogen receptor transcripts (*esr1* and *esr2a*), suggesting the estrogenic effect of this xenobiotic. Progesterone receptor (*pgrmc1* and *pgrmc2*) levels resulted instead unaffected. No changes were observed in female exposed to G2 and G3 doses. Considering class IV follicles, no alteration of genes expression was observed, even if a similar trend to class III was evident for all genes analyzed. Moving to the hepatic expression of all the seven vitellogenin isoforms, the highest glyphosate dose decreased the expression of *vtg1*, *vtg2*, *vtg3* and *vtg4*, while the lowest dose caused a decrease of *vtg3*, *vtg4* and *vtg7*. Being hepatic vitellogenin levels under the control of estrogen receptors (ERs), the expression of *esr1* was evaluated and significant reduction was observed in all the treated groups compared to C, in agreement with the vitellogenin expression reduction. Additional investigations are in progress to better elucidate the effects of glyphosate on zebrafish female reproduction.

The project received funding from Fondo Ateneo 2022 to OC and FM.

Please select a preferred section:

1. Neuropeptides: new and emerging concepts

2. Endocrinology and chronobiology

3. Endocrine control of ion-and osmoregulation

4. Endocrine and paracrine control of reproduction and development

5. Endocrine responses to environmental challenge and change/Leopoldina Symposium

6. Endocrine control of energy balance and growth

7. Signaling pathways in immunity

8. Function of hormones, their receptors and binding proteins

9. Molecular and Cellular Regulation of stress

10. Invertebrate hormones and behaviors

11. Cell Plasticity, Stemness, Differentiation

Select one option

* I would like to present this work as ORAL presentation
* I would like to present this work as POSTER presentation