Federico Zurita Martínez

I started researching about “Molecular and Evolutionary Mammalian Cytogenetics” (1992- 1999). At that time, we were focusing on the regulation of the expression of ribosomal cistrons.

On the basis of that topic, I obtained my PhD degree in 1998 from the University of Granada with the doctoral thesis entitled “Structural organization and regulation of the expression of Ribosomal Cistrons”.

Then, four articles were published from this doctoral these: two articles in the journal Heredity, one article in the journal Chromosome Research and one article in Journal of Cell Science. In 1999 I was awarded a postdoctoral grant from the MEC, and I carried out one research stay for two-years in two different laboratories in France (Rennes and Montpellier).

In those two laboratories I was working on “Genetic control of gonadal development in mammals”. We used the mole Talpa occidentalis as a model organism. The Iberian mole is a species in which XX individuals possess bilateral ovotestes, that is, gonads containing both testicular and ovarian tissue. The ovarian portion contains oocytes and therefore confers fertility to these females, but in addition testicular tissue is developed and it secretes functional testosterone. This XX testicular tissue from the ovotestes is developed in absence of the SRY gene. So we set out to study and characterize those cells that formed cords and morphologically resembled Sertoli cells. Testicular development in mammals depends on Sertoli cells as these cells secrete factors involved in Leydig cell citodifferentiation which subsequently secrete testosterone.

However, our results yielded the surprising conclusion that testicular tissue XX (which presents testicular-specific cells, such as Leydig cells, and peritubular myoid cells) develops in the absence of functional Sertoli cells. It would be therefore necessary to explain both Leydig cell and peritubular myoid cell cytodifferentiation in the absence of functional Sertoli cells.

From this line, four articles were published (Mechanisms of Development, Sexual Development, International Journal of Developmental Biology, Journal of

Experimental Zoology-B Mol Dev Evol) Finally since 2010 I belong to the research team involved in several projects headed by Dr. González-Reyes.

These projects are focusing on the ovary of Drosophila as a model organism and address the cellular and molecular characterization of stem cells (Germline Stem Cells). Specifically, we have been addressing the role of metalloproteinase inhibitors (timps) in maintaining the integrity of the niche morphology, cellular environment and signaling that supports these GSCs. Several articles have been published in this line of research (see CV). Currently we are researching the probable role of the reck gene in “niche” homeostasis using also the Drosophila ovary as a model organism.