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Horizontal delivery of microRNAs via food-mother-pup axis.

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Keywords: microRNA, horizontal genetic transfer, milk, diet

Background:

Recent reports have shown that ingested microRNAs may be transferred to blood, accumulate in tissues and exert canonical regulation on endogenous transcripts. In spite of several attempts to replicate these findings, they have not been confirmed and several questions remain.

Objective:

The aim of our studies is to obtain a clearer understanding of the biological activity of diet-derived microRNAs in multiple tissue compartments. We have focused our study on the food-mother-pups axis.

Methods:

By developing mouse experiments, we studied the presence of xenomiRs (diet-derived exogenous microRNAs) by NGS approach, in mammary gland, organ of milk constituent biosynthesis and secretion.

Then we used a pertinent transgenic mouse model over-expressing the microRNA miR-30b in the mammary gland in order to study the horizontal delivery of microRNAs *via* the oral ingestion of miR-30b-enriched milk by the pups. Sensitive, mature microRNA-specific RT-qPCR assays were used to quantify miR-30b variations in the fluid and tissues of pups fed by transgenic or non-transgenic females.

Results:

The analyses of NGS data that will permit to evaluate the horizontal transfer from food to the mammary gland of the mother are in process and will be presented during the meeting.

For the transfer from the milk to the pups, our findings demonstrated that, although very high levels of miR-30b were found in milk and in stomach contents of the pups, we did not detect an increase in miR-30b in tissues of pups fed by transgenic females compared to pups fed by wild-type females.

Conclusion:

Our study will give first information of the horizontal delivery of microRNAs *via* food-mother-pup axis. We will present results about the horizontal transfer from food to the mammary gland of the mother, but also to the mother to their pups *via* milk.

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