When research matches hope
The start of Prof. Yann Herault's great scientific project, financed by the association Ring14 Onlus, aimed at delving into the physiopathology of the Ring14 syndrom

New fuel to the research to fight against the RING14 syndrome.
Encouraging the scientific research is one of the core values of the **Associazione Internazionale Ring14 Onlus of Reggio Emilia**. It is the only way to understand and give a future of hope to those who are hit by rare genetic syndroms.
That's why Ring14 Italy Onlus, in cooperation with its twin association Ring14 USA, has recently funded a research project called **"Creation of a rat model hit by Ring14 aimed at better understanding the physiopathology of the human syndrome"**, which will last 2 years (2012-2014) and will be headed by Prof. Herault, Director of the Institut Clinique de la Souris (ICS) of Strasbourg, specialized in translational research and functional genomics.
This research is the **first international grant** funded by RING14 Onlus. For 10 years Ring14 has been promoting and financing scientific projects on the Italian territory in the clinical, genetic, pharmacological and rehabilitation fields, aimed at understanding the pathogenesis and detecting any potential therapies against rare syndromes caused by aberrations of chromosome 14, like the Ring14, from which our Association has taken its name.
On the other hand, starting from 2012 all the projects funded by RING14 Onlus, as well as Prof. Yann Herault's research, will be evaluated and selected according to the "**peer review"** concept, i.e. by means of an **international board of scientists** that will also be charged to check the progress and assess if the set targets have been attained.

The premises: a murine model in order to understand human complex diseases
Ring14 is a genetic rare disease causing motor and mental impairments, morphological aberrations and epilepsy. It is a specific aberration of chromosome 14, whose consequence is a ring that appears after the two ends of the chromosomes have joined together and caused the partial loss of the genetic material
The research Prof. Herault is running aims at going deep into the Ring14 syndrome and the related syndromes by means of a rat model hit by Ring14.
As of today, the laboratory rat (murine model) is the first model used in the integrated biomedical and pharmaceutical researches, because it shares with the human being quite a lot of similarities in its genes (> 95%), its physiology and anatomy. **The study of murine models** allows to analyse and better understand the physiopathological mechanisms and the genotype-phenotype relations which are the cause of complex diseases.

The targets: towards a thorough clinical diagnose
The target of the research is to answer the questions related to the role played by chromosome 14 in the sequentiation of genes, reaching a **complete clinical diagnose**, **an in-depth examination of the main symptoms like epilepsy and a more accurate evaluation of the behavioural and cognitive impairments in the test animals,** by a comparison with the human characteristics of patients hit by Ring14.
Particularly the rat models will be used for the following purposes:

- Understanding the transmission of the ring-shaped chromosome in the mutant cells and the viability of the same cells
- Producing a complete phenotypic standardized analysis of the models
- Comparing the phenotypic evaluation in the rat and in human patients
- Assessing the gene(s) responsible for the cognitive phenotypes / motor and epileptic and understanding their function
- Further characterizing the cerebral phenotypes, by restricting the altered paths, for a better understanding of the processes that can influence different areas of the brain
- Proposing and possibly try out therapeutic approaches in the murine models

Interview to Professor Yann Herault, Responsible for the Research

1. **Can you explain which are the targets of the research and on which premises is it based ?**
   The rat model is a basic one when you have to study rare diseases and the so called chromosomal diseases like trisomy 21 (Down syndrome). In less than 10 years studies on rat models with trisomy 21 enabled to obtain valuable information for a better understanding the physiopathology of this ailment, assessed by the target genes or by the routes without rules and in order to develop therapeutic approaches in pre-clinical models. These advances can be foreseen for the Ring14.

2. **By when do you expect the first scientific results ?**
   I hope to obtain the rat models within one year. Later on it will be necessary to produce more in bulk and analyse them and assess their results. In order to validate the model, we will need to compare the results with the shortcomings shown by the patients.

3. **Which new ways will this research lead to ? What will this mean for the international scientific community ?**

These stages will certainly need a lot of time though we are eagerly waiting for the results .They will allow us to better understand the genetic origin of the disease and its consequences. I hope to be able to propose new views of treatments.

A few words by Stefania Azzali, Chairwoman of Associazione Internazionale RING14

"RING14 Onlus funds many scientific research projects: the gathering of blood samples at the Bio Banca Telethon Galliera of Genova, the medical data in the clinical database of the Association itself, the study of the language retardation and the scientific workshops with the attendance of international experts. I do not want to deceive myself with the hope to find a treatment for the syndrome, but I think it would be much of a success if efficient therapies could be found for the heaviest symptoms like epilepsy, respiratory infections, mental retardation and autism. Is that too much ?"

Engagement, support, future: l' Associazione Internazionale RING14 Onlus

IMPEGNO, SOSTEGNO, FUTURO.

AIUTO E RICERCA PER I BAMBINI AFFETTI DA MALATTIE GENETICHE RARE - ONLUS

The Association was founded in 2002 in Reggio Emilia, Italy, sponsored by a group of families of children hit by a rare genetic illness, caused by aberrations of the chromosome14. For 10 years it has been working vigorously giving support to those who live in situations of serious disability and promoting projects of international scientific research. Engagement, support and future are the core values that inspire its staff and volunteers. Its mission is to mitigate suffering of kids and their families as well as to describe the story of this ravaging and almost unknown pathology, by favouring the development of early diagnosis at any time and help find out valid therapies strengthening the mutual contracts between physicians and people.

PRESS REVIEW
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