Rett Syndrome Research, Towards the Future
Rome, 27-29 September 2018
Attended by Tony Cagliuso as representative of Australian Rett Syndrome Association.

Introduction

This conference brought together the world's best researchers and scientists on Rett Syndrome. Many of the researchers presenting are at the absolute top of their respective fields and lead teams of international scientists and research laboratories doing ground-breaking research all over the world.

Amongst the speakers was Dr Adrian Bird (University of Edinburgh, UK), pictured here to the right presenting.

Other speakers included, Dr Alan Percy (University of Alabama at Birmingham, USA), Nicoletta Landsberger (University of Milan, Italy) as well as speakers from the Netherlands, Canada, France and the Democratic People's Republic of South Korea.

Day 1

There was a lot of discussion on research being done in laboratories on mouse models with MeCP2 inactivation. Consensus amongst many researchers is that there is no doubt that Rett Syndrome can be reversed in mice in the laboratory, and that the mouse models are good to work with as results are readily evident and data easily collected. Over the past few years, the life span of the mice with the MeCP2 reversal has been increasing steadily as research advances.

Rett Syndrome is a nervous system disorder where MeCP2 is lacking. There is now evidence in the mouse models with X chromosome (MeCP2) inactivation that the nervous system is ***"not"*** compromised, and that remains intact.

Laboratory research with mouse models is a very costly and time-consuming exercise. For example, it takes a laboratory approximately 6 weeks to produce 20 x MeCP2 mutated mice. Any testing and changes in protocols or dosages, for example, can usually only be done in 6-weekly cycles because of this. Several researchers reported that the supply and availability of mutated mice was a "bottle-neck" in their research.

Findings were presented on a study that involved 30 boys, up to the ages of 43, around the world with Rett Syndrome. In general, the symptoms, behaviours and characteristics of the boys is the same as that for the girls. One stark difference was the variation in the gene mutation for the males was spread a lot further throughout the gene. As a result of this study, a further 60 boys have been identified with Rett Syndrome.

Several of the speakers stressed the importance and value in regularly meeting the families and the girls with Rett Syndrome. They find it highly motivating and further drives their determination to work in this area. One researcher said to me *"I met a young lady and her family with Rett Syndrome about 10 years ago at a conference on another topic, and that was it, I was hooked. I felt like I had to do something for these girls and have been doing research in this area since then."*

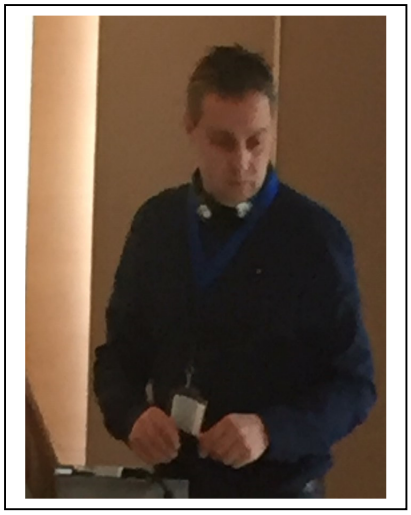
Day 2

There was much discussion around X chromosome inactivation as many geneticists are currently working in this area. Work in this area is taking place on many fronts, current research is happening in

a) preventing the X chromosome in-activation from occurring at all,
b) attempting to repair the X chromosome damage once it has been found to be in-activated, and
c) Attempting to trigger the X chromosome activation to function as needed.

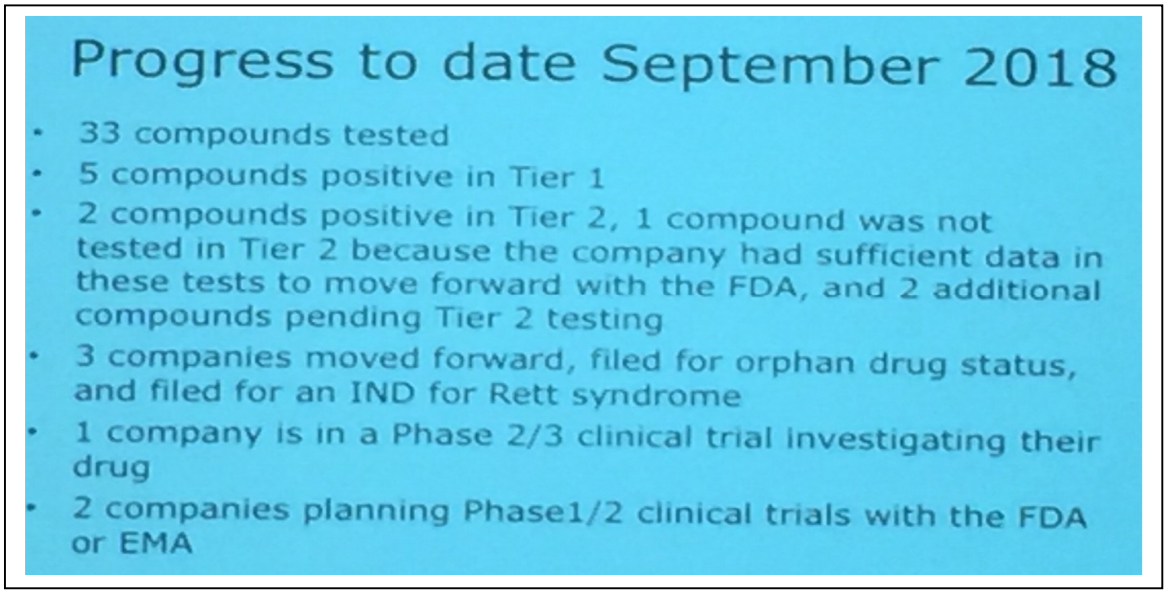
Work is also happening in the fields of gene therapy and stem cell therapy. In gene therapy replacement of a gene/s that are not working well using a harmless virus that helps deliver healthy genes to the nerve cells. The harmless virus plays a role purely as a delivery vehicle to the nerve cells. This type of therapy is a one-shot delivery, i.e. It delivers a gene which stays in the nervous system – the implanted gene can still be found in primates many years after this procedure. Researchers have to be very careful at the time of doing this as there is no going back once the gene has been delivered, therefore they have to be very certain and specific when to use this type of therapy.

Prof Stuart Cobb (University of Edinburgh, UK), pictured here to the right is doing this ground breaking research.



An international trial using Sarizotan for breathing irregularities and hyper ventilating has been ongoing and early indictors are showing some positive results. It is expected that this trial will be completed by July/August 2019. There is currently one family with a Rett daughter in Australia taking part in this international trial.

The drug company undertaking the Sarizotan trials also presented the following data as a summary of drug trials to date involving Rett Syndrome.



Family Day

A number of families brought their girls to the congress, including the President of the Pro Rett committee, he has twin 7 year old girls, one of which has Rett Syndrome. Other Rett girls attending ranged in age from 3-4 year olds to a young lady in her early 20's who was quite ambulatory and had a good understanding in taking directives from her parents.

Many of the speakers gave a shorter re-run of their previous days presentations giving the parents who attended an opportunity to interact and ask questions.

In Summary

This congress presented some very technical and high level scientific discussions.

I found it very interesting that on many occasions a presenter was challenged and questioned on the material they presented to their peers. This encouraged healthy debate amongst researchers with several of them agreeing to meet beyond the congress to continue comparing their findings.

It is obvious there is extensive research and drug trials taking place all over the world on Rett Syndrome. There is a lot of hope and optimism that positive breakthroughs can be achieved.

Rett syndrome is a very diverse and multi symptom disease that needs to be researched in many different areas. Any advancement in drug therapies that improve one aspect of Rett Syndrome symptom, may not necessarily improve all the symptoms in Rett Syndrome.

Advances in technology are helping to speed up processes and progress is steadily being made in many areas.

Mutated mouse models in the lab are now living up to 300 days.

This congress brought together a group of very dedicated and committed, researchers, scientists, geneticists, neurologists, clinicians, behavioural experts, pharmaceutical companies and parents, all with one common goal, to improve the quality of life of our loved ones living with Rett Syndrome, and to eventually find a cure for this debilitating disease.
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We were given a 5 minute time slot to announce Australia's intention to hold the 9th World Congress on Rett Syndrome in Australia in Sept – Oct 2020. This was very well received and a lot of interest was shown from the attendees seeking to be kept informed on progress of this. Pictured below is the Italian Pro Rett Committee who did a wonderful job to stage the Congress in Rome.