



Trisomy 21 Research Society

2019 Annual report



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General information

The Trisomy 21 Research Society (T21RS) is the first non-profit scientific organization of researchers studying Down syndrome, founded to promote basic and applied research on Down syndrome, stimulate translational research and apply new scientific knowledge to develop improved treatments and cures.

The society aims to:

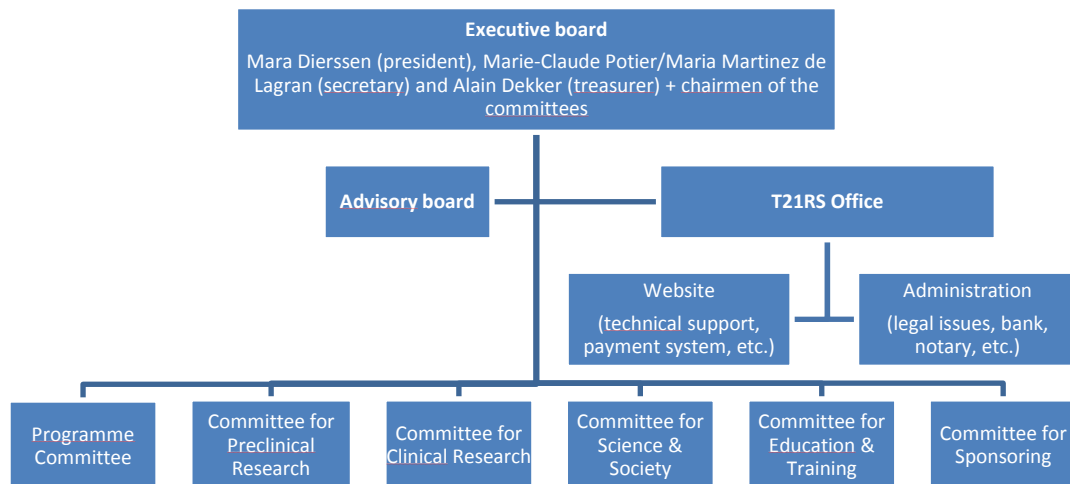
- Facilitate the permanent interaction between researchers studying Down syndrome by means of our website, scientific meetings, publications in journals and the two-yearly T21RS International Conference.
- Establish common protocols both for basic research (mice studies, stem cells studies) and translational research (for clinical trials with biomarkers, cognitive paradigms etc.).
- Support education and training of young researchers in all stages of their careers, including undergraduates, graduates and postdoctoral fellows that are interested in Down syndrome, by providing training programs and grants to young scientists Stimulate research on Down syndrome.
- Explain (recent) findings in Down syndrome studies to the general public and to inform legislators and other policymakers about new scientific knowledge and recent developments and their implications for public policy and society.
- Promote the interaction between scientists and patient associations, foundations and pharmaceutical industries

The society was created in April 2014 and statutes were registered on 17th April 2014 in Groningen, The Netherlands, under the auspices of Mr. Albert Kraster, civil-law notary practicing in Groningen and member of The Royal Dutch Association of Civil-law Notaries. These statutes were revised the 11th July 2017. The Executive Board of T21RS produced a Governance document to facilitate operation. The society is a non-profit organization for the stimulation of scientific research on Down syndrome, operating under Dutch law. The original deed in Dutch and the English translation can be downloaded from the society website, t21rs.org, as well as the Governance document.

The society has organized the 1st International Conference in Paris on June 4-8 2015, the 2nd in Chicago June 7-11 2017 and the 3rd in Barcelona 5-9 2019.

Executive board of T21RS

The executive board is formed by the president, past-president, elected president, secretary and treasurer of T21RS as well as the chairs of the committees



President:

Mara Dierssen (Center for Genomic Regulation, Barcelona, Spain)

Secretary:

Marie Claude Potier (Brain and Spine Institute, Paris, France) (until July)

Maria Martinez de Lagran (Center for Genomic Regulation, Barcelona, Spain) (from July)

Treasurer:

Alain Dekker (University Medical Center Groningen, Groningen, the Netherlands)

Committee chairs:

Program Committee: **Anita Bhattacharyya**

Committee for Science & Society: **Peter Paul De Deyn**

Committee for Sponsoring: **Jean Delabar**

Committee for Education and Training: **Renata Bartesaghi** (until July), **Sandra Guidi** (from July)

Committee for Pre-clinical Research: **Yann Herault** (until July), **Eugene Yu & Elizabeth Fisher** (from July)

Committee for Clinical Research: **André Strydom** (until July), **Alberto Costa** (from July)



An electronic ballot was organized on May for the election of the next President of T21RS (2020-2021). The Executive Board accepted all the nominations. The list of nominees was the following: Yong Dai, Tarik Haydar, Yann Hérault, William Mobley and Andre Strydom. Of the 247 members, 133 (53,8%) voted, and the candidates obtained the following votes: Dr. Yong Dai² (1,5%), Tarik Haydar⁴⁰ (30%), Yann Hérault³¹ (23%), William Mobley¹⁹ (14%) and Andre Strydom⁴¹ (30,8%). Andre Strydom became the President Elect of T21RS.

A nomination period was opened in December for the election of the new chairs of the Program committee and Science & Society committee and President Elect. The list of accepted nominees was the following:

Program committee: **Dr. Yann Hérault** from Institut de Génétique et de Biologie Moléculaire et Cellulaire (France), **Prof. Ann-Charlotte Granholm** from Knobel Institute for Healthy Aging (US) and **Prof. Elizabeth Head** from University of California Irvine (US).

Science & Society committee: **Dr. Renata Bartesaghi** from University of Bologna (Italy), **Dr. María Carmona Iragui** from Sant Pau Hospital (Spain) together with **Dr. Anne-Sophie Carret-Rebillat** from Institut Jérôme Lejeune (France) and **Dr. Jacqueline London** from University of Paris (France).

President Elected (2022-2023): **Dr. William Mobley** from UC San Diego (US) and **Dr. Weihong Song** from University of British Columbia (US)

Elections will take place on January 2020 using an electronic ballot.

T21RS activities

T21RS launched two calls during 2019 for supporting with 500 EUR the organization of scientific or dissemination events to contribute to increase the public visibility of Down syndrome research and of T21RS. Applicants should be T21RS members. Executive committee awarded 2 applications in the call launched on March and 10 in the September call (see below).

In the year 2017, the Committee for Education and Training launched the Annette Karmiloff-Smith Outstanding Thesis Award Program, for outstanding Ph.D. thesis. The name of the award was to honor the memory of this prestigious scientist and member of the T21RS, who highlighted in the field of developmental disorders. In 2019, the executive committee approved the change of the name of this biannual award by **Annette Karmiloff-Smith and Michael Harpold Dissertation Award 2019** in memory of a distinguished scientist passionately involved in Down syndrome research. This award will grant two researchers in the field of Down syndrome who obtained the PhD title during the period January 1, 2018 to December 31, 2019.

In June 2019, T21RS organized the 3rd T21RS international meeting in Barcelona (see below).



Report of the Presidency

During 2019 the T21RS third president activities, have been mainly devoted to the organization of the 3rd International Conference of the T21RS held in Barcelona 6-9th June, 2019, to extend the funding support of our Funding Members, to search for new founder/supporting members and to harmonize their agreements and benefits. The presidency handled more than T21RS 7500 email during 2019.

A. Actions and advances: New activities and initiatives

Since its launch, T21RS has worked to expand the international community of researchers committed to understand the effects of trisomy 21, to recruit new generations of investigators, and provide to researchers in the field opportunities to collaborate and network, learn from experts, explore the newest tools and technologies, and discover great career opportunities. We have launched several new activities to this purpose.

1. Renewal of Founding member Agreements and new supporting members and fundraising. We worked on renewing and homogenizing the agreements with all our founding members. This required the revision of all the agreement conditions and a number of teleconferences (17) and emails (more than 450). We got signed the agreements (5.000 Eur/5 years) with Jerome Lejeune Foundation, Lumind, and the compromise of Mathews Foundation and Trisomie 21 France. We also got a new Supporting Member (Down Spain). Finally, T21RS is part of a H2020 project, which was granted (**20.000 Eur** for the society to contribute to PPI activities)

2. Professionalization of T21RS: Contract of a Technical Secretariat. In 2019, we signed a contract with BCO Congresos, S.L.

We devised the following duties:

- Communicate with the President, committee chairs for the Conference calls, Newsletters, Bulletins, Tables and Documents and manage the creation of the monthly newsletter and sending of emails.
- Maintain calendars for executive committee; arranging meetings, teleconferences, send agendas and minutes.
- Receiving and handling calls and mail
- Member management: new members, withdrawals, receipts, emailing
- Administrative and accounting tasks.
- Prepare reports by collecting information (text and graphics) and transcribing.
- Provide historical reference by utilizing the Google drive.
- Maintain knowledge by searching and collecting information on scientific papers and conferences.
- Manage T21RS website: load documents and images as determined by the President, and committee chairs
- Participate in the organization of the T21RS meetings



- Coordinating the society's face-to-face activities.
- Creating and maintaining websites and social networks.
- Relationships with Sponsors

The Secretariat set up a **Google Drive System for T21RS document repository** to substitute the dropbox initiated by M. Dierssen in 2018, a **Zoom system for the conference calls**, and we are **setting up the new T21RS website**.

3. Attracting new members and ensuring the sustainability of the Society has also been a priority. We worked very hard to strengthen our membership and expand worldwide and very especially with young investigators, as we are faced with a progressive leakage of critical mass in the field. **The number of members in December 2019 was 336 with a steady growth (July 2018: 163).**

We also developed a campaign for members to renew and Asian members to join the Society (more than 600 Emails sent out)

Increasing membership value:

3.1- Our interest to increase membership value has led to the **creation of a Call for t21rs grants for the organization of scientific events for T21RS members**. This program is designed to contribute to the funding of technical and scientific activities such as talks, meetings and events, which will contribute to increase the public visibility of Down syndrome research and of T21RS. The range of activities funded included from local activities on specific topics to multidisciplinary activities with a strong international participation. The maximum amount funded is 500€, depending on the availability of funds and the outcome of the evaluation for speaker travel and housing, venue and or equipment rental, catering etc.

3.2- We devised **new activities in the 3rd International Conference of T21RS** (Families' Day, Industry Session, and Young Investigator Program).

3.3- We launched the **Montserrat Trueta Outstanding Career Award** sponsored by the Fundació Catalana Síndrome de Down, to recognize outstanding scientists in the field of Down syndrome, for their sustained and distinguished career, including groundbreaking scientific contributions, leadership, and mentoring. We signed an agreement that commenced on 1 February 2019 and continue until 30 June 2023.

3.4- **Supporting members' applications and initiatives**. T21RS has supported or participates as partner in different grant applications, has promoted member's visibility, and has improved the publication of events organized and positions offered by T21RS members.

T21RS already launched the Annette Karmiloff-Smith Dissertation Award, and launched the Michael Harpold Dissertation Award in 2019, to honor the memory of these distinguished scientists.

3.5- **T21RS Chapters**: Our interest is to create a strong community and to boost Down syndrome research visibility. We created, together with the Membership Committee, a **Latin American and an Asian Chapters**. Those are created to promoting activities organized by T21RS members to engage local communities.



4. Improving communication: The Communication Workgroup (see report below) has continued preparing regular newsletters, an improved website and new communication strategies with patient associations and stakeholders. The **monthly newsletter has increased the participation of the members in the Society, and has served to foster communication, discussion and debate on research topics amongst the T21RS members** and to meet new members. Members contributed with their perspective, no matter the research interests in the field of Down syndrome, and ideas to the activities of the Society, working with colleagues from around the world to advance the progress of Down syndrome research.

We obtained funding and launched 8 videos from young and senior researchers working on Down syndrome
We started a **YouTube channel for T21RS.**

5. Advocacy: T21RS is committed to lead our field as it confronts the difficult situation of reduced interest in treatment developments for intellectual disability disorders. We have taken specific actions to make the public, policy makers, and relevant stakeholders aware of these research inequities and change that situation. For promoting advocacy and public communication about Down syndrome, **T21RS has contributed to several advocacy actions** at the European parliament, European Commission, NIH. Several meetings were held to this purpose. **Local advocacy:** Our biennial meeting was a unique opportunity to increase public awareness of the progress and benefits of Down syndrome research at the local level. In Spain, the Trisomy 21RS International Conference was a year-long event intended to bring together scientists, families, schools, and communities to promote Down syndrome research. The meeting was recognized and supported by the local authorities as shown by the very important policymakers in our Honorary Committee: <http://t21rs2019.com/honorary-committee/>

6. Young Investigators. Ensuring that young researchers see the excitement and potential of a career in a rapidly advancing area of research.

Thus, we have almost triplicated the amount of money devoted to support young researchers to attend the 3rd T21RS International Conference.

We **funded 36 young investigators** to attend the International Conference of T21RS in Barcelona, from which 10 young researchers were founded through an Agreement with Fundació La Caixa for short stages in Down syndrome research labs. **We had 47 applicants from 18 countries**
We funded **3 Child Care Awards**

We also **funded 6 poster awards** (two per poster session) for the best posters presented to the meeting. 3 awards at 500.00 Euro and 3 awards at 300.00 Euro

We devised a **full Young Investigator Program** for the Third International Conference in Barcelona (see below)

7. T21RS committees have been working to continue promoting international pre-clinical and clinical research on Down syndrome, to stimulating translational research to develop improved treatments and cures, and have designed new actions to improving education of researchers in the field. The Science and Society has working to disseminate research news to families and understand their needs (see below). The plan for next term is to assign a specific budget to concrete actions proposed by the committees.



8. Increasing and improving the relationships with Down syndrome associations. M Dierssen and J Delabar have worked very hard to re-establish the links with EDSA and consolidated relationships with other associations.

9. Institutional relationships. T21RS has contributed to IBRO elections, and meetings. This gives access to T21RS members to all IBRO open calls for funding and to IBRO resources.

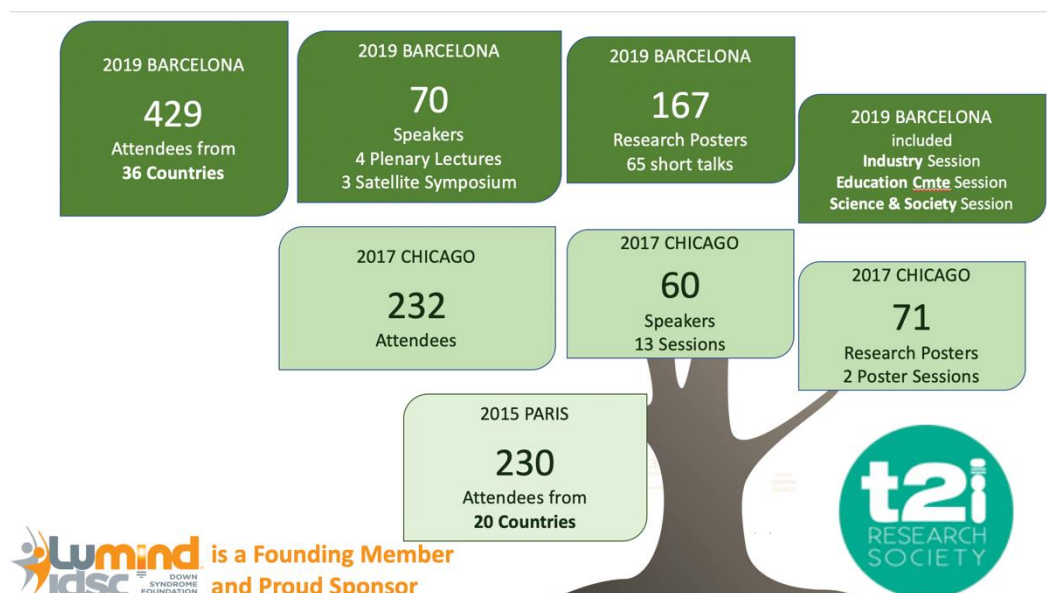
B. The 3rd International Conference of the Trisomy 21 Research Society “Building the future therapies for Down syndrome”

The meeting held on 6-9 June 2019 in Barcelona is an important part of our activities (<http://t21rs2019.com/>). We hired a very strong and professional technical secretariat (BCO; <https://www.bcocongresos.com/>) and created a local organizing committee (<http://t21rs2019.com/organizing-committee/>) consisting of excellent scientists and professionals who make sure that everything runs smoothly all year long for our congress. We created a devoted website and planned carefully the event planning marketing strategy that has boosted delegate numbers this year. We created a Conference Logo in which we capture the essence of Barcelona (the “Trencadis”) with the T21S logo.

In Paris, the 1st meeting of T21RS attracted 230 participants from 20 countries. In Chicago, we had 222 attendees and 10 Science and Society attendees. We had in total 60 speakers in 13 sessions and 71 posters in 2 poster sessions. (See report of the Program Committee)

In Barcelona, we brought together a total of 429 scientists, families, and industry representatives from 36 countries. The most represented countries were Spain, USA, France, Italy, United Kingdom, and Brazil, but we had attendees from many other countries.

167 posters were presented from which 65 had the opportunity to present also a short talk or a Nano symposium, four plenary lectures, **3 satellite symposium, 14 symposia (70 talks)**, an **Industry session, Education Committee Session**, and the full day **Families’ Program** including the Science and Society Symposium.





The meeting was supported by the **11 members of the Organizing Committee, 12 PhD/Postdoc volunteers and 9 volunteers with Down syndrome, 10 members of the Program Committee**, and the support of the 11 members of the executive board. The technical secretariat managed more than 7.300 emails. **We obtained the support of 19 companies/institutions.**

New Sessions

The Third International Conference of T21RS planned a variety of sessions in new formats, making our scientific program even more diverse and interesting. Plenary lectures, parallel sessions, symposia, pre-meeting satellites, a Science and Society symposium, and “Meet the Expert” and “Education Committee” sessions, the new and very successful Nano symposium format in which selected groups of posters will get the opportunity to present their poster during a 30-minute session.

Pre-meeting sessions

INDUSTRY SESSION

CLINICAL COMMITTEE SATELLITES (ADULT & PEDIATRIC)

PRECLINICAL COMMITTEE SATELLITE

Young Investigators Program

In 2019, T21RS kicked off a Young Investigators Program, with many different activities (<http://t21rs2019.com/young-investigator-programme/>). Young investigators are an integral part of the T21RS Conference and T21RS installed a variety of measures to ensure that their participation is made as fruitful as possible. The young investigators had the opportunity to apply for travel grants, join the volunteers program, attend focused interest sessions, participate in the “Meet the Scientist” session or even visit during one month a research lab investigating on Down syndrome in Spain to learn new techniques or simply get to know the lab and discuss about job opportunities. They had plenty of opportunities for their career development.

Families Program at T21RS: connecting with Down syndrome needs

We continued with the Science and Society symposium (<http://t21rs2019.com/science-society/>), that this year reached the highest number of registrations, with 281 attendees. This Program has expanded to a full day program held on Saturday, June 8, 2019. This attracted many families who did not want to travel to only attend a 3-hour session. In addition, we reduced the fee to 20 Eur, in agreement with the S&S committee. The full program was composed by three sessions: a session on Advocacy, Awareness and Fundraising, the Science and Society Symposium, and the Bridging Knowledge Session.



ADVOCACY, AWARENESS & FUNDRAISING SESSION

Through a series of short presentations and Q&A, this session addressed important issues for self-advocates, family members, and Down syndrome organizations regarding three areas that are intricately related – advocacy, awareness & fundraising for Down syndrome research. To facilitate the interaction, English-Spanish and Spanish-English translations was provided. Global Down syndrome organized this symposium.

SCIENCE AND SOCIETY SYMPOSIUM (see report of the S&S Committee)

The Science and Society Committee of the T21RS organized this symposium.

BRIDGING KNOWLEDGE SESSION

This session is organized and supported by Jesús Flórez (University of Cantabria, Fundación Iberoamericana Down21, Spain), Carmen Martínez-Cué (University of Cantabria, Spain)

Doctors and scientists may be brilliant in their fields, but some may not be great at communicating their knowledge to the lay people. A good communication is important when research scientists are presenting their work aiming to reach non-scientific participants. With that goal, a team of experts directed by Profs. Jesús Flórez and Carmen Martínez-Cué offered excerpts and summaries in Spanish of the relevant findings and discoveries reported during the conference. Profs. Flórez and Martínez-Cué simplified the technical language to lay terms so that the main findings can reach families and other professionals of the Down syndrome associations.

DOWN SYNDROME VOLUNTEER PROGRAM In this edition of the T21RS meeting we had individuals with Down syndrome volunteering to help with the practical aspects of the meeting. This was an opportunity to network and share experiences, strengthen their self-advocacy skills, and learn about the importance of building meaningful relationships.

SOCIAL PROGRAM. In the Opening Ceremony we had a theatre representation (Romeo and Juliette) directed by Victor Ignacio Romero Rojas, from the Compañía Nacional de Teatro Manantial de Ilusión (Chile) formed by actors with DS and an Art Exhibition by an artist with Down syndrome.

MEET THE RESEARCHERS. People with Down syndrome, families and caregivers were invited to discuss and ask questions to young researchers that explained their research. For the researchers, especially the young investigators, it was an opportunity to get to know individuals with Down syndrome and their families.



I-Program Committee

Program Committee members, location and area of research

Anita Bhattacharyya, Chair (Wisconsin, USA)
Tom Blumenthal (Colorado, USA)

iPSCs
biomarkers in DS

John Crispino (Northwestern, USA)
Juan Fortea (Spain)
Anna Esbensen (Cincinnati, USA)
Victor Tybulewicz (London, UK)
Pablo Helguera (Argentina)
Yasuji Kitabatake (Japan)
Brad Christian (Wisconsin, USA)
Weihong Song (UBC, China)
Roger Reeves (T21RS Exec Committee, USA)
Mara Dierssen, (T21RS President, Spain)

leukemia in DS
clinician, neurodegeneration
outcome measures in DS, sleep, behavior (junior)
mouse models of DS, neurological phenotypes
mitochondrial function in DS
iPSCs
imaging of dementia in DS
clinician, AD
mouse genetics
mouse models of DS



The Program Committee was formed in April 2018 to help craft the scientific content of the T21RS meeting in Barcelona in June 2019. The duties of this Committee include 1) coordinating submission of symposia proposals, 2) review and selection of symposia sessions, 3) providing feedback and suggestions for schedule and plenary speakers, 4) selection of late breaking abstracts for short talks.

The Third International Meeting of the Trisomy 21 Research Society was held June 6-9, 2019 at Cosmo-Caixa in Barcelona, Spain. The meeting brought together a total of 429 scientists, families, and industry representatives. The most represented countries were Spain, USA, France, Italy, United Kingdom, and Brazil, but attendees came from many other countries. 167 posters were presented and the Program Committee chose 65 of these to present short talks. The meeting included four plenary lectures, 3 satellite symposia, 14 symposia, 1 Industry session, 1 Education Committee Session, six pre-meeting workshops, and one lab tour in the Barcelona Biomedical Research Park. We also had a full day program for families, the Science and Society Symposium and an amazing and inspiring Social Program.

In addition to the 10 members of the Program Committee, the meeting was supported by 11 members of the local Organizing Committee, 12 PhD/Postdoc volunteers and 9 volunteers with Down syndrome, and had support of the 11 members of the Executive Board. The technical secretariat managed more than 7,300 emails and we had the support of 19 companies/institutions. We are very pleased that 40% of attendees were students and post-doctoral fellows – these young investigators represent the next generation of Down syndrome researchers. We were able to select 57 early career investigators for travel grants thanks to the support of generous donors and the NIH. 15 attendees represented seven different Pharma or Biopharma companies and 97 had an MD degree; these are critically important areas for interaction with the basic research community, and fostering these exchanges is a fundamental goal of T21RS.



The vibrant content of the meeting shows that our community continues to thrive. Cutting-edge results in neuroscience, neurology, model systems, psychology, cancer, and molecular and pharmacological approaches – the list includes practically every major research area – demonstrate the compelling interest and continuing advance in all aspects of understanding and ameliorating conditions associated with trisomy 21.

The meeting had several sponsors from Europe and USA: Global Down Syndrome Foundation, Jerome Lejeune Foundation, LuMind Research Down Syndrome Foundation, National Institute on Aging, National Institute of Neurological Disorders and Stroke, EMBO, Down Spain, Fundación IMIM, National Down Syndrome Society, PROUS institute, Grand Fontaine, La Caixa, Down syndrome UK and Alzheimer's association, La fundacion IberoAmericana, CRG, BBVA, AMIPI and Aelis Pharma.

Travel awards were given to 51 young investigators through funding from the National Institutes of Health, LaCaixa, Global DS, Company of Biologists, LuMind Research Down Syndrome Foundation and Jerome Lejeune Foundation. The scientific committee was in charge of evaluating the grant applications.

Proceedings of the meeting will be written in March-April 2020, submitted to *Molecular Syndromology* for publication in 2020.



Full Programme

Wednesday, June 5, 2019

9.00 – 12:00 Pre-Meeting Scientific activities.

12.00 – 14:00 Pre-Meeting Touristic tour. Visit to Gaudí's Crypt in Colonia Güell.

15:30 – 19:00 Registration

16:00-18:00 Industry session. Top Challenges Facing the Pharmaceutical Industry in Down syndrome Drug Development

Registration and Industry sessions

Thursday, June 6, 2019

09:00 08:30– 18:00 Registration

09:00 – 13:00 PRE-MEETING SATELLITE SYMPOSIA (parallel)

CLINICAL SESSIONS

Health co-morbidities in older adults with Down syndrome – assessment and diagnosis

Health co-morbidities in children with Down syndrome

PRECLINICAL SESSION

Mouse master class

14:00 START OF MEETING

14:00- 14:30 Welcome note (*Mara Dierssen, President T21RS and local authorities*). **Presentation of the T21RS Honorary Member**

Prof. Marie-Odile Rethoré

14:30-16:30 SCIENTIFIC SESSION 1

SESSION 1: Three of a perfect pair: stereotyped homeostatic compromises in trisomies

Chair: Pablo Helguera (INIMEC-CONICET, Argentina)

1. Metabolic dependencies of aneuploid cells. *Eduardo Torres* (University of Massachusetts-Worcester, USA)
2. Comparative analysis of autosomal human trisomies. *Jorge Busciglio* (University of California-Irvine, USA)
3. Aneuploidy-associated stress; another therapeutic target for pathophysiology in Down syndrome. *Yasuji Kitabatake* (Osaka University, JP)



Short talks:

PO105. Multi-Omics Data-Driven Systems Biology approach for the identification of molecular targets to rescue Down syndrome-associated cognitive.

PO113. A Comprehensive Proteomics-Based Interaction Screen Links Dyrk1a to RNF169 and to the DNA Damage Response

16:30 – 18:00 Poster SESSION 1 and selected Nanosymposia with coffee

Poster Session 1: PO18-PO19-PO20-PO21-PO22-PO23-PO24-PO25-PO26-PO27-PO28-PO29-PO30-PO31-PO32-PO33-PO34-PO35-PO36-PO37-PO38-PO39-PO40-PO41-PO42-PO43-PO44-PO45-PO46-PO47-PO48-PO49-PO50-PO51-PO52-PO53-PO54-PO55-PO56-PO57-PO58-PO59-PO60-PO61-PO145

17:00 – 17:30 Nanosymposia #8: PO13-PO14-PO15-PO16-PO17 (Room GAMMA)

17:30 – 18:00 Nano-symposia #3: PO01-PO02-PO03-PO04-PO05-PO06 (Room ALPHA)

17:30 – 18:00 Nano-symposia #6: PO07-PO08-PO09-PO10-PO11-PO12 (Room BETA)

18:00 – 18:10 Montserrat Trueta Award *Katy Trias (Fundació Catalana Síndrome Down, Spain)*

18:00 18:10 – 19:10 JEROME LEJEUNE PLENARY LECTURE: Genetics of Human Chromosome 21. Stylianos Antonarakis (University of Geneva, CH)



19:00 19:10 – 22:00 Social Programme – Opening ceremony.

Friday, June 7, 2019

08:00 – 18:00 Registration

08:30 – 09:30 THE EMBO KEYNOTE LECTURE: Human-specific genes, neural stem cell amplification, and neocortex expansion in development and human evolution, Nereo Kalebic (Max Planck Institute, GER)

Chair: Anita Bhattacharyya (University of Wisconsin, USA)



09:30 – 11:30 SCIENTIFIC SESSION 2 (parallel)



SESSION 2A: New disease-relevant behavioral perspective in preclinical intellectual disability studies

Chairs: Maria Martínez de Lagran (Centre for Genomic Regulation, SP) and Anna Vazquez (University Pompeu Fabra, SP)

1. Social Learning in the Ts65Dn Mouse Model of Down Syndrome: New Evidence for Hippocampal Dysfunction, *Nicholas Santiago (University of California-Santa Cruz, USA)*
2. Sleep and EEG abnormalities in DS mouse model, effects of single gene dosage correction. *Charles Hoefler (University of Colorado, USA)*
3. Using mouse genetics to deconstruct Down syndrome phenotypes. *Victor Tybulewicz (Francis Crick Institute, London, UK)*

Short talks:

PO102. Genetic and Epigenetic Analysis of Down Syndrome: New insights from human studies and mouse models

PO163. Treatment with Granulocyte-Macrophage Colony-Stimulating factor improves cognition in aging mice and in a mouse model of Down syndrome

SESSION 2B: Biomarkers for Alzheimer's disease in Down syndrome

Chairs: Bradley Christian (University of Wisconsin, USA) and María Carmona Iraqui (Hospital de la Santa Creu i Sant Pau, SP)

1. Cognitive correlates of amyloid PET in Down syndrome. *Sigan Hartley (University of Wisconsin, USA)*
2. Alzheimer's-related MRI markers of cerebrovascular disease and dementia in Down syndrome. *Adam Brickman (Columbia University, USA)*
3. Cerebrovascular neuropathology, aging and Alzheimer disease in Down syndrome. *Elizabeth Head (University of Kentucky, USA)*
4. Plasma Neurofilament Light and Alzheimer's disease Biomarkers in Down syndrome: Results the Down Syndrome Biomarker Initiative (DSBI). *Michael S. Rafii. University of Southern California. USA*

11:30 – 12:00 Coffee Break

12:00 – 14:00 SCIENTIFIC SESSION 3 (parallel)

SESSION 3A: New directions in human trisomy 21 stem cell research

Chair: Anita Bhattacharyya (University of Wisconsin, USA)

1. (Epi)genetic approaches towards resolving trisomy 21 gene-dosage contributions. *Stefan Pinter (University of Connecticut, USA)*
2. Consequences of trisomy 21 on the epigenome of different iPSC-derived cell types of the brain. *Hiruy Meharena (Massachusetts Institute of Technology, USA)*
3. CRISPR-enabled functional genomics approaches in Down syndrome iPSCs. *Ernst Wolvetang (University of Queensland, AUS)*



Short talks:

PO87. A System to Unravel Effects of APP Dosage in Trisomy 21 Cerebral Organoids

PO98. Human iPSC-Derived Down Syndrome Astrocytes Display Genome-Wide Perturbations in Gene Expression, Alterations in Chromatin Accessibility, and an Altered Adhesion Profile.

SESSION 3B: Alzheimer's disease in the context of the trisomy of Hsa21 – preclinical studies

Chair: Frances Wiseman (University College London, UK), William Mobley (University of California-San Diego, USA)

1. The role of Dyrk1A in tau pathogenesis in Down syndrome and Alzheimer's disease. *Fei Liu (New York State Institute for Basic Research in Developmental Disabilities, USA).*

2. Mechanisms of neurodegeneration in mouse models of Down syndrome. *Carmen Martínez-Cué (University of Cantabria, SP).*

3. The role of genes other than APP in Alzheimer's disease development. *Frances Wiseman (UCL-UK).*

Short talks:

PO85. Maternal DNA-Immunization strategy targeting Amyloid- β related neuropathology and dementia in Down syndrome

PO86. Alzheimer-like pathology in trisomy 21 cerebral organoids reveals BACE2 as a gene-dose-sensitive AD-suppressor in human brain

14:00 – 15:00 Lunch break

15:00 – 16:00 T21RS general assembly

1. Welcome and opening of the General Assembly, *Mara Dierssen, President T21RS*

2. Presentation and Approval of Annual Report 2018 incl. Financial Report 2018, *Marie-Claude Potier, secretary and Alain Dekker, treasurer T21RS.*

3. Society announcements and discussion

4. Closing

16:00 – 18:00 Poster SESSION 2 and selected Nano symposia with coffee

Poster Session 2: PO75-PO76-PO77-PO78-PO79-PO80-PO81-PO82-PO83-PO84-PO85-PO86-PO87-PO88-PO89-PO90-PO91-PO92-PO93-PO94-PO95-PO96-PO97-PO98-PO99-PO100-PO101-PO102-PO103-PO104-PO105-PO106-PO107-PO108-PO109-PO110-PO111-PO112-PO113-PO114-PO115-PO116-PO117-PO146

16:00 – 17.00 Special symposium "Microbiota, nutrition and dietary supplements in Down syndrome"-Room BETA

Diet and Intellectual disabilities. *Dr. Rafael de la Torre. Integrative Pharmacology and Systems Neurosciences. IMIM, Barcelona, Spain*



Citizen-Science maps the oral microbiome in Down syndrome. *Dr. Toni Gabaldon Comparative Genomics. CRG, Barcelona, Spain*

Plant polyphenols as natural drugs for the management of Down syndrome. *Dr. Rosa Anna Vacca. Institute of Biomembranes and Bioenergetics, Italian National Council of Research, Bari, Italy.*

Dietary Supplement Use in Children with Down syndrome. *Dr. Amy Feldman Lewanda.*

Division of Genetics & Metabolism, Children's National Health System, Washington, DC, USA

17:00 – 17:30 Nanosymposia #9: PO71-PO72-PO73-PO74. (Room GAMMA)

17:30 – 18:00 Nanosymposia #4: PO62-PO63-PO64-PO65-PO66. (Room ALPHA)

18:00 – 20:00 SCIENTIFIC SESSION 4 (parallel)

SESSION 4A: Investigating Down syndrome phenotypes and mechanisms through comprehensive mouse modeling

Chair: Elizabeth Fisher (University College London, UK), Veronique Brault (Institut de Génétique et de Biologie Moléculaire et Cellulaire, FR)

1. Route 66, an exhilarating ride. *Yann Héroult (Institut de Génétique et de Biologie Moléculaire et Cellulaire, FR)*
2. Understanding gene-phenotype relationship of skeletal abnormalities in Down syndrome using several mouse models. , *Randall Roper (Indiana University-Purdue University Indianapolis, USA)*
3. A new, humanized mouse model of Down syndrome. *Roger Reeves (Johns Hopkins University School of Medicine, USA)*

Short talks:

PO33. Investigating DYRK1A gene dosage effect in glutamatergic and GABAergic Neurons in a mouse model of Down syndrome

PO71. Altered Hippocampal-Prefrontal Neural Dynamics in the Dp1Tyb model of Down syndrome

SESSION 4B: Cognitive outcomes in children with Down syndrome

Chair: Anna Esbensen (Cincinnati Children's Hospital Medical Center, USA) and Lisa Jacola (St Jude Children's Research Hospital, USA)

1. Neurocognitive outcomes for survivors of childhood leukemia with Down syndrome. *Lisa Jacola (St Jude Children's Research Hospital, USA)*
2. Cognitive profiles in children with Down syndrome. *Silvia Lanfranchi (University of Padova, IT)*
3. Relationship between executive functioning and behavior in children with Down syndrome. *Anna Esbensen (Cincinnati Children's Hospital Medical Center, USA)*

Short talks:



PO90. New-procognitive? Assessing the reliability and utility of the new DSM-5 neurocognitive disorder criteria in a Down syndrome population

PO138. Mortality reduction in institutionalized children with intellectual disability and social vulnerability: results of 2 years improving basic health care

21:00 GALA DINNER

Saturday, June 8, 2019

09:00 8:30– 18:00 Registration

08:30 – 09:30 PLENARY LECTURE 3: Alzheimer’s disease mechanisms and therapeutics. *Li-Huei Tsai (Massachusetts Institute of Technology, USA) Chair: Victor Tybulewicz (Francis Crick Institute, London, UK)*

09:30 – 11:30 SCIENTIFIC SESSION 5 (parallel)

SESSION 5A: Modifications of autophagy-lysosomal-endosomal pathways in Down syndrome and other neurodegenerative diseases

Chair: Marie Claude Potier (ICM, FR) and Eric Hamlett (Medical University of South Carolina, USA)

1. Dysfunction of the Autophagy-Lysosomal Pathway as a common mechanism of neurodegeneration. *Steve Finkbeiner (University of California- San Francisco, USA)*
2. Neuronal lysosomal dysfunction releases exosomes harboring APP C-terminal fragments and unique lipid signatures. *André Miranda (University of Minho, PRT)*
3. Excess synaptojanin 1 contributes to place cell dysfunction and memory deficits in the aging hippocampus in Down syndrome. *Catherine Marquer (Columbia University, USA)*

Short talks:

PO109. Targeted Proteomics of the Endosomal Compartment: Spatio-temporal localization in human fibroblasts

PO119. Mitochondrial fusion and function are elevated in T21 iPSCs

SESSION 5B: Language Outcome Measures for Treatment Studies

Chair: Len Abbeduto (University of California-Davis, USA), Laura Del Hoyo (University of California-Davis, USA)

1. Measuring spoken language to evaluate treatment efficacy for Down syndrome. *Len Abbeduto (University of California-Davis, USA)*
2. Early language and communication indicators of response to treatment. *Angela John Thurman (University of California-Davis, USA)*
3. Semantic verbal fluency as an early diagnostic tool of Alzheimer’s disease in Down syndrome. *Rafael de la Torre (IMIM-Hospital del Mar Medical Research Institute, SP)*

Short talks:

PO134. Lexical Prediction Abilities in People with Down syndrome: An Eye-Tracking task

PO135. Language Skills as a Predictor of Cognitive Decline in Adults with Down syndrome



11:30-12:00 Coffee break

12:00- 15:30 SCIENCE AND SOCIETY SYMPOSIUM – PROGRAMME FOR FAMILIES

This years' symposium primarily intends to have an interactive discussion between the speakers and the audience. To facilitate the interaction, English-Spanish and Spanish-English translations will be provided. This symposium is organized by the Science and Society Committee of the T21RS.

T21RS Committee for Science & Society: *Peter Paul De Deyn (University Medical Center Groningen, The Netherlands) (Chairman), Alain Dekker (University Medical Center Groningen, The Netherlands), Juan Fortea (Fundació Catalana Síndrome de Down, Spain), Sebastian Videla (Fundació Catalana Síndrome de Down, Spain), Lotta Granholm (University of Denver, USA), Cindy Lemere (Brigham and Women's Hospital, Harvard Medical School, USA)*

12:00 Welcome: *Peter De Deyn* (Chairman of the T21RS Committee for Science & Society)

12:15 Parent-reported needs for development of research on Down syndrome (10 minutes presentation + 20 minutes debate)

Hampus Hillerstrom (LumindRDS, USA).

Results from the parents' surveys on knowledge and personal experiences towards Down syndrome studies. Conducted by LumindRDS in the USA and Fondation Lejeune in the European Union.

12:45 Clinical studies (10 minutes presentation + 20 minutes debate)

Juan Fortea (Sant Pau Hospital, Spain).

General overview of clinical studies and what we can expect for the future. Future clinical trials on Alzheimer's disease will be discussed. The voices of families and associations are encouraged.

13:15 How Global is Supporting Science & Possibilities for Collaboration. *Michelle Whitten (Global Down Syndrome, USA)*

13:30 Lunch break and Meet the Scientist

During lunchtime, individuals with Down syndrome, their families and caregivers will have the opportunity to discuss and ask questions to junior researchers about their work and other aspects of research. For young investigators, it will be an opportunity to get to know individuals with Down syndrome and their families.

14:00 Participation in research: pros and cons. How to involve families in research? (30 minutes debate)

Peter De Deyn (University Medical Center Groningen, The Netherlands)

Discussion with the audience about the needs and targets for research on Down syndrome. What is the point of view of family members and caregivers about participating in research?

14:30 Ethics: autonomy of people with Down syndrome (10 minutes presentation + 20 minutes debate)

Jesús Florez (University of Cantabria, Fundación Iberoamericana Down21, Spain)

How can we promote autonomy in people with Down syndrome? What should -and should not- expect from this autonomy?



15.00 Human Rights Assembly. *Katy Trias (Fundació Catalana Síndrome de Down, Spain)*

15:15 Summary and closure. *Peter De Deyn (University Medical Center Groningen, The Netherlands)*

See the full Programme for family associations here: → [English version](#) | [Spanish version](#)

15:45 – 17:45 SCIENTIFIC SESSION 6

SESSION 6: The Role of Inflammation and NGF dysfunction in cognitive decline and Alzheimer's disease pathology in Down syndrome

Chair: Jorge Busciglio (University of California-Irvine, USA), Florencia Iulita (Université de Montreal, CN)

1. Inflammation and NGF deregulation across the life span in Down syndrome. *Florencia Iulita (Université de Montreal, CN)*
2. Molecular and cellular mechanisms of degeneration in Down syndrome neurons: a link between ABeta pathological changes, inflammation and NGF dysmetabolism. *Maria Lioudyno (University of California-Irvine, USA)*
3. Analysis of biomarkers of cognitive decline and neurodegeneration in plasma and CSF in a DS cohort. *Juan Fortea (Fundació Catalana Síndrome de Down and Hospital San Pau, SP)*

Short talks:

PO149. Disturbed Expression of Inflammation-Related Genes Caused by A Triplication of Erg Gene in The Prenatal Developing Brain with Down Syndrome

PO150. SNX27 Deficiency Limits Antigen Dependent Activation and Potentiates CXCR4 Dependent Migration in T Lymphocytes

17:45 – 19:00 Poster SESSION 3 and selected Nano-symposia with hors d'oeuvres

Poster Session 3: PO127-PO128-PO129-PO130-PO131-PO132-PO133-PO134-PO135-PO136-PO137-PO138-PO139-PO140-PO141-PO142-PO143-PO144-PO147-PO148-PO149-PO150-PO151-PO152-PO153-PO154-PO155-PO156-PO157-PO158-PO159-PO160-PO161-PO162-PO163-PO164-PO165

18:00 – 18:30 Nano-symposia #2: PO121-PO122-PO123 (Room BETA)

18:00 – 18:30 Nano-symposia #7: PO124-PO125-PO126 (Room GAMMA)

18:30 - 19:00 Nano-symposia #1: PO118-PO119-PO120. (Room ALPHA)

19:00 – 20:00 Meet the Experts Sessions: **Li-Huei Tsai (Massachusetts Institute of Technology, USA)** Chair: **Renata Bartsaghi (University of Bologna, IT)**

20:00 – 21:00 Education Committee session: "How should we study Down syndrome: pros and cons of mouse models and human iPSCs"



T21RS Committee for Education & Training: *Renata Bartesaghi (University of Bologna, IT) (Chair), Carmen Martinez-Cué (University of Cantabria, SP), Tom Blumenthal (Linda Crnic Institute for Down Syndrome, USA), Tarik Haydar (Boston University, USA)*

Sunday, June 9, 2019

08:30 – 09:30 PLENARY LECTURE 4: Alzheimer's disease in Down syndrome: update from the LonDowns consortium. *Andre Strydom (University College London, UK) Chair: Juan Fortea (Sant Pau Hospital, Spain).*

09:30 – 10:15 Annette Karmiloff-Smith and Michael Harpold Thesis Awards Ceremony *(Renata Bartesaghi, University of Bologna, IT)*

10:15 – 10:30 Montserrat Trueta Award *(Mara Dierssen and Katy Trias)*

10:30 10:15– 11:00 Coffee break

11:00 – 13:00 SCIENTIFIC SESSION 7 (parallel)

SESSION 7A: Leukemia in Children with Down syndrome: why does it happen and what can we do about it?
Chair: John Crispino (Northwestern, USA), Sebastien Malinge (Telethon Kids Institute, AU)

1. Targeting constitutive Ras/Mapk pathway activation in Down syndrome associated B Cell leukemia. *Sebastien Malinge (Telethon Kids Institute, AU)*
2. Trisomy 21 silencing in hematopoietic and neural cells: new insights and prospects. *Jeanne Lawrence (University of Massachusetts-Worcester, USA)*
3. HMGN1 in phenotypes of trisomy 21 hematopoietic stem/progenitor cells and leukemia. *Andrew Lane (Dana Farber Cancer Institute, USA)*

Short talks:

PO106. Using Single-Cell Sequencing to Assess DNA Damage in Trisomy 21 Blood

PO127. Uncovering the Origin(s) Of Down Syndrome-Associated Leukemia

SESSION 7B: Metabolic defects in Down syndrome: from periphery to the brain
Chair: Eugenio Barone (Sapienza University of Rome, IT) and Marzia Perluigi (Sapienza University of Rome, IT)

1. Plasma and urinary metabolomics profiles of children with Down syndrome. *Maria Chiara Pelleri (University of Bologna, IT)*
2. Trisomy 21 activates the kynurenine pathway via increased dosage of interferon receptors. *Kelly Sullivan (University of Colorado, USA)*
3. Alzheimer's disease biomarkers in neuron-derived extracellular vesicles and cognitive decline in Down syndrome. *Aurelie Ledreux (University of Denver, USA)*

Short talks:

PO47. Reduced Insulin Receptor Levels in Neuronal-Derived Exosomes Highlights Early Alterations of Brain Insulin Signaling In Down syndrome



13:00 -14:00 Lunch

14:00-16:00 SCIENTIFIC SESSION 8

SESSION 8: Correction of circuit specific GABAergic over-inhibition and dendritic alterations in Down syndrome

Chair: *Floriana Costanzo (Child Neuropsychiatric Unit, Department of Neuroscience, Bambino Gesù Children's Hospital, IT) and Jean Maurice Delabar (Paris Sorbonne Université, CNRS, FR)*

1. GABA neurotransmission in a mouse model of Down syndrome, *Trevor G. Smart* (University College London, UK)
2. Cortical inhibitory circuits in Down syndrome, *Javier Zorrilla de San Martin* (ICM, INSERM, CNRS, ICM, FR)
3. Modulation of dendritic $\alpha 5$ -GABAA receptors rescues impaired NMDA receptor activation in a mouse model of Down syndrome, *Jan Michael Schulz* (University of Basel, Switzerland)

Short talks:

PO51. In vivo modeling of human neuron dynamics and Down syndrome

PO54. Altered development of interneurons in Down syndrome.

16:00-16:30 Coffee break

16:30-17:00 Melissa Parisi: updates on US NIH funding (ABC-Connect, INCLUDE)

17:00-17:30 Stephane Hogan: long-term Horizon Europe budget in neuroscience and cognition

17:30-19:30 SCIENTIFIC SESSION 9

SESSION 9: Endpoints for clinical trials

Chair: *Diana Bianchi (NIH-NICHD, USA) and Alain Dekker (University Medical Center Groningen, NL)*

1. Clinical trials in children with Down syndrome, the experience of the Jerome Lejeune Institute. *Clothilde Mircher* (Institut Jerome Lejeune, FR)
2. Endpoints for clinical trials from the Horizon 21 Consortium. *Bessy Benejam* (Fundació Catalana Síndrome de Down, SP)
3. Endpoint selection for AD trials in DS. *Mike Rafii* (University of Southern California, USA)
3. Down syndrome Clinical Trials Network (LuMind)

Short talks:

PO10. Diagnosing Cognitive Decline Due to Alzheimer's disease in Down Syndrome Patients with Neuropsychological Testing

PO95. CSF NPTX2 as A Synaptic Biomarker of Alzheimer's disease in The Down Syndrome Population.

19:30 CLOSING CEREMONY. Poster awards presentation with aperitif

20:30 END OF MEETING



II - Committee for Science & Society

The T21RS Committee for Science & Society aims to be in contact with regional and (inter)national Down syndrome associations to disseminate and explain recent scientific findings in understandable language to family members and caregivers.

Address:	T21RS Groningen Office University Medical Center Groningen (UMCG) <i>attn. prof. PP De Deyn (AB51)</i> PO Box 30.001, 9700 RB Groningen, The Netherlands
Chair:	Peter Paul De Deyn (Belgium and The Netherlands)
Committee members (2019):	Alain Dekker (The Netherlands), Juan Fortea (Spain), Lotta Granholm (USA, Sweden), Cindy Lemere (USA) and Sebastián Videla (Spain).
Founding members:	Matthew Foundation: John Blascovich (President); Jerome Lejeune Foundation: Mrs. Sophie DURAND (Operational Director of Research, Global DS: Michelle Sie Whitten (President And CEO) Trisomie 21: Denis Chauve (Administrator); Lumind: Hillerstrom Hampus (President)

Initiatives and achievements 2019

In the fourth year of T21RS, the Committee concentrated its efforts on 3 major initiatives:

- 1) T21RS Science & Society Bulletins
→ Publishing 4 bulletins
- 2) T21RS Science & Society Symposium 2019
→ Preparations for the Symposium during the T21RS International Conference 2019 in Barcelona
- 3) Contributing to The Dementia Table Initiative in The Netherlands

1. T21RS Science & Society Bulletins

The Committee for Science & Society is strongly committed to introducing scientific research and explaining recent findings in an understandable way through their T21RS Science & Society Bulletins. The Bulletins are short communications introducing the broad, non-scientific readership to a specific topic related to Down syndrome (research). The Bulletins do not aim to provide all ins and outs about a specific study with many reservations. Instead, the Bulletin aims at introducing the readers to the current state-of-the-art knowledge about the topic of the article (mini-review) including the highlighting of important findings from recent research.

T21RS members are kindly invited to submit a T21RS Science & Society Bulletin to the Committee for publication on the T21RS website ([author guidelines](#)). Given the fact that only few members, so far, proposed to write a Bulletin, the Committee decided to focus on invited Bulletins as well. In 2018, a new policy started, asking the T21RS Thesis Award Winners and the elected Honorary Members to write a Bulletin.



In 2019, four Bulletins was published (open access) on our website. Below you will find the four titles and abstracts. Direct link for full (and free) downloads for members and non-members: <https://www.t21rs.org/science-society/t21rs-science-society-bulletin>

T21RS Science & Society Bulletin, 2019 (1)

Relationship between Apgar scores and long-term cognitive outcomes in individuals with Down syndrome. *By Laura del Hoyo Soriano (Sacramento, USA)*

Abstract: The Apgar scoring system is a comprehensive screening tool performed on a baby at 1 and 5 minutes after birth, which reflects how well the baby tolerated the birthing process and is adapting to life outside the womb. The long-term significance of Apgar scores has been shown for typical developing children and those with neurodevelopmental disorders. However, the significance of Apgar scores on later cognitive outcomes has not been studied for Down syndrome yet. The purpose of this study is to investigate whether Apgar scores at birth are related to long-term memory outcomes in individuals with DS. We analyzed Apgar scores from medical records of 148 individuals with DS (72 females and 76 males, age range: 6 to 25 years). In addition, we directly assessed spatial memory, auditory memory and object-location episodic memory and learning of participants with DS. After controlling for chronological age and sex, Apgar scores at 1 minute were related to all memory outcomes while Apgar scores at 5 minutes were solely related to semantic memory. Implications of our results, indicating that even transient low Apgar scores at 1 minute are linked with poorer long-term memory skills in individuals with DS, will be discussed.

T21RS Science & Society Bulletin, 2019 (2)

A Quest for the genes: Down syndrome and Alzheimer disease. *By Claudia Cannavo (London, United Kingdom)*

Abstract: Down syndrome is a complex condition characterized by intellectual disability, facial dysmorphology, and a range of other phenotypes that vary across the population. It is caused by the presence of three copies of chromosome 21, which is called trisomy 21. Since people with Down syndrome develop Alzheimer disease more frequently than the general population, it may be suggested that one of more of the genes present on chromosome 21 cause the development of AD. The APP gene is the main candidate; however, our group hypothesized that other genes on chromosome 21 could also contribute to disease development. The authors wanted to test this hypothesis by comparing a mouse model of AD with a mouse model of AD that had an extra partial copy of chromosome 21, with the APP gene missing. Using this model the team showed that an extra copy of chromosome 21 genes other than APP worsens some aspects of AD pathology. This is an important step towards increasing our understanding of the causes and mechanisms of AD in people who have DS.

T21RS Science & Society Bulletin, 2019 (3)

Identifying Alzheimer's disease in Down syndrome with NGF metabolism: hope for better treatment and diagnosis? *Rowan Pentz* 1, M. Florencia (Montreal, Canada)*

Abstract: People with Down syndrome develop Alzheimer's disease. Alzheimer's disease starts in the brain decades before any memory loss occurs, and stopping it will require both understanding this early phase and finding ways to identify it. The disruption of how a molecule



called “proNGF” is processed is an important early event in Alzheimer’s disease. In Down syndrome, measuring levels proNGF in blood can tell us when memory loss (as a part of Alzheimer’s disease) is going to happen. In fact, we can reliably identify people with Alzheimer’s disease from the whole Down syndrome population just by measuring proNGF (and the proteins that process it) in blood and in spinal fluid. This discovery may help diagnose of Alzheimer’s disease in Down syndrome and offer hope of better treatments.

T21RS Science & Society Bulletin, 2019 (4)

Exploring the role of astroglia in Down syndrome by *Álvaro Fernández (Barcelona, Spain)*

Abstract: In Down syndrome (DS), astrocytes are increased in number and size in the hippocampus and exhibit higher levels of activity, which reduces neuronal activity. Although astrocytes were considered to provide just structural and metabolic support to neurons in the brain, compelling evidence suggests that they are able to communicate with neurons and to influence their responses by the release of several neuroactive substances that can depress or potentiate neuronal responses. We propose that astroglial alterations in DS have disruptive effects in the synaptic transmission of the hippocampus, a highly interconnected and specialized structure involved in learning and memory.

2. Preparation for T21RS Science & Society Symposium 2019 in Barcelona

Defined in the articles of association, T21RS aims, among others, to promote the understanding of, and involvement in Down syndrome research among the public, as well as stimulate interactions between scientists and Down syndrome (family) associations. Next to publishing Science & Society Bulletins, the Committee, therefore, organizes a bi-annual T21RS Science & Society Symposium.

After a very successful kick-off symposium in 2015 in Paris (Delabar et al., 2016) and the lively second edition in 2017 in Chicago (Reeves et al., 2018), the Committee is now organizing a third edition during the T21RS International Conference 2019 in Barcelona.

Based on evaluations and feedback on the 2015 and 2017 editions, and suggestions from (founding) members, the Committee drafted a new program. The Science & Society Symposium is embedded within a larger families program. Importantly, the Symposium aims to stimulate interaction between families and scientists, and thus no parallel scientific sessions are scheduled, to facilitate scientists to join. After various rounds of refinement together with the Program Committee, the 2019 program was as follows:

Saturday June 8th 2019

11:45- 14:30

SCIENCE AND SOCIETY SYMPOSIUM

This years’ symposium primarily intends to have an interactive discussion between the speakers and the audience. To facilitate the interaction, English-Spanish and Spanish-English translations will be provided.

11:45 Welcome

Peter De Deyn (Chairman of the T21RS Committee for Science & Society)

12:00 Parent-reported needs for development of research on Down syndrome (10 minutes presentation + 20 minutes debate)

Hampus Hillerstrom (LumindRDS, USA)

Results from the parents’ surveys on knowledge and personal experiences towards Down syndrome studies. Conducted by LumindRDS in the USA and Fondation Lejeune in the European Union.



12:30 Clinical studies (10 minutes presentation + 20 minutes debate)

Juan Fortea (Sant Pau Hospital, Spain)

General overview of clinical studies and what we can expect for the future. Future clinical trials on Alzheimer's disease will be discussed. The voices of families and associations are encouraged

13:00 Lunch break

13:45 Participation in research: pros and cons. How to involve families in research? (30 minutes debate)

Peter De Deyn (University Medical Center Groningen, The Netherlands)

Discussion with the audience about the needs and targets for research on Down syndrome. What is the point of view of family members and caregivers about participating in research?

14:15 Ethics: autonomy of people with Down syndrome (10 minutes presentation + 20 minutes debate)

Jesús Florez (University of Cantabria, Fundación Iberoamericana Down21, Spain)

How can we promote autonomy in people with Down syndrome? What should -and should not- expect from this autonomy?

14:45 Human Rights Assembly

Catalan Down Syndrome Foundation, Spain

15:00 Summary and closure

Peter De Deyn (University Medical Center Groningen, The Netherlands)

3. Dementia Table initiative

In The Netherlands, the committee contributed to organizing three Dementia Table evenings in 2019. During these evenings, a variety of topics in the field of dementia and intellectual disabilities/Down syndrome is discussed in an easy-accessible way and in a pleasant ambiance. In 2019, we focused, among others, on 1) different tools and methods to support/aid people with intellectual disabilities and dementia, and 2) dental care for people with intellectual disabilities and dementia and 3) palliative support. The Dementia Table initiative is very successful in Groningen (120 participants each time) and a perfect example of interaction between science and society. More info: www.sdtg.nl (in Dutch)

Prof. dr. Peter Paul De Deyn

Chairman T21RS Committee for Science & Society

Department of Neurology & Alzheimer Center, University Medical Center Groningen, The Netherlands

p.p.de.deyn@umcg.nl



III - Committee for Sponsoring

Sponsoring Committee Members:

Jean Maurice Delabar (FR) (Chair)

Carmen Martinez-Cue (SP)

Sujay Ghosh (IN)

Marie-Claude Potier (FR)

Michelle Whitten (GDSF, US)

Chengbiao Wu (US)

During 2019, we had the privilege to recruit two members Dr Carmen Martinez-Cue from University of Santander and Dr Sujay Ghosh from University of Calcutta.

An active communication between members was maintained through conference calls and emails

A. Sponsoring activities:

During 2019, research of sponsors had three objectives

1. To maintain functioning of the society to cover basic expenses (web, technical secretariat)
2. To fund travel grants and awards for young researchers
3. To finalize funding of the Barcelona meeting (third biennial meeting of the society)

T21RS sponsors can be classified in four groups:

- The first one is the circle of founding supporters Lumind, Global Down syndrome, Lejeune Foundation, Matthews Foundation, Trisomie 21 France. 2019 was the last year of the 5 years founding agreement. During the second part of 2019, 4 of them renewed their commitment and accepted to sign an agreement for the years 2020-2024. Discussion for renewing this agreement with Trisomie 21 France were initiated.

Another main sponsor was recruited: Down España, which accepted to sign an agreement for 2020-2024.

- The second group concerns foundations that gave a specific support for the Barcelona meeting including founding supporters and other foundations like La Caixa, Down syndrome UK, La fundacion IbroAmerican, Down España, The company of biologists, EMBO, PROUS Institute, National Down syndrome, Down syndrome UK and Alzheimer's association, Fundación IMIM, CRG, FECYT, BBVA, and AMIPI.



- The third group is the institutional granting agencies: an NIH grant was obtained by J Busciglio and R Reeves to fund travels of PhD and Postdoc US members of T21RS.
- The fourth group put together pharmas with interest in developing treatments for Down syndrome: Aelis Pharma, Grand Fontaine.

B. Membership activities

The committee was active proposing **new benefits for members** including grants to support scientific events.

The committee organised also to recruit new members. With this aim, the committee initiated the creation of **local chapters** in India (chaired by Dr Sujay Ghosh, University of Calcutta, India) and in South and Mid America (chaired by Dr P Helguera, INIMEC, University of Cordoba, Argentina).

The committee continued the update of a contact list of more than 1000 names of researchers, clinicians and associations.

sponsoring@T21RS.org



IV - Committee for Education and Training

Education and Training Committee Members

Chair: Renata Bartesaghi (Italy) to July 2019

Sandra Guidi (Italy) from July 2019

Members: Tom Blumenthal (USA)

Carmen Martinez Cué (Spain)

Tarik Haydar (USA)

In the year 2017, the Committee for Education and Training had launched the **Annette Karmiloff-Smith Outstanding Thesis Award Program**, for outstanding Ph.D. thesis. Two prizes of 1,000 euro each. Eligibility. Participation in the 2017 competition open only to candidates who obtained their Ph.D. title during the period January 1, 2016-December 31, 2017.

For the 2017 Competition, the Committee received five applications. For the evaluation, the Committee has taken into account the originality and contribution to the literature, importance of the research, innovation, employed techniques; general presentation of the thesis and academic curriculum of the applicant. The PhD theses were first examined individually by each member of the Committee and then evaluated in a collegial skype meeting that took place on September 2, 2018. At the end of the skype meeting the Committee decided unanimously to assign the awards to the thesis by Nadine Aziz entitled "Histological, cellular, and molecular abnormalities in forebrain and spinal cord of three distinct mouse models of Down syndrome" and to the thesis by Eric Hamlett entitled "Investigations at the crossroads of Down syndrome and Alzheimer's disease".

The winners presented the results of their theses during a dedicated session on the T21RS meeting in Barcelona, June 2019:

In synergy with the Committee for Science and Society, the Committee for Fellowships, Education and Training invited the two winners of the 2017 Competition to write a short outline of their thesis work to be published in the **Bulletin of T21RS**.

The Committee has conducted **an e-mail survey among T21RS young members** in order to organize actions aimed to foster the scientific development of the young scientists of T21RS and to involve them in the T21RS Barcelona meeting, 2019.

In the framework of the T21RS Barcelona meeting, 2019, the Committee has organized an **educational session** entitled "How should we study Down syndrome: pros and cons of mouse models and human iPSCs".



V - Committee for Pre-clinical Research

Preclinical Committee Members:

Chairs: Yann Hérault (France) July 2019,
Eugene Yu (USA) and Elizabeth Fisher (UK) From July 2019

Members:

Antonarakis, Stylianos (Switzerland)
Bhattacharyya, Anita (USA)
Delabar, Jean-Maurice (France)
Dierssen, Mara (Spain)
Fisher, Elizabeth (UK)
Haydar, Tarik (USA)
Hérault, Yann (France)
Mobley, William (USA)
Potier, Marie-Claude (France)
Puig, Vicky (Spain)
Reeves, Roger (USA)
Roper, Randall J (USA)
Yu, Y. Eugene (USA)

The Committee is pursuing its objectives to help standardise high quality preclinical research into Down syndrome, including by facilitating access to important resources, and helping provide essential robust data for those resources including controls.

To help effect our objectives in 2019 we welcomed three new Committee members with expertise in analysing mouse models and human induced pluripotent stem cell resources: Anita Bhattacharyya, Tarik Haydar, and Vicky Puig.

Our four aims are a continuation of those in 2018, with some refocussing on new priorities:

1. to facilitate the access to cellular and animal models: build a simple nomenclature, create a resource sharing plan, harmonization of generation and storage protocols, set up an accessible virtual repository (database).

- i) **Mouse models:** The 2018 spreadsheet is available to all T21RS members and this includes simplified 'lab names' that can be used in papers after stating the full correct name as held by the Mouse Nomenclature Committee.

We will review updates likely in autumn 2020, noting new rodent strains may be published later in 2020/2021.

- ii) **Human cell lines:** Committee member Anita Bhattacharyya has been diligently pursuing different possible repositories for human induced pluripotent stem cells (iPSCs) and for human fibroblast cell lines. Ideally, we would like to have one 'go to' repository for DS resources internationally. Factors to

consider are what each repository is prepared to bank, and cost to researchers. We would like to include unpublished data if possible, and protocols. We aim to have some preliminary recommendations for discussion by the wider T21RS community later in 2020. Also, for discussion are options to help fund such a DS and control cell line bank.

2. To establish common protocols for preclinical research: behavioural analysis, cellular characterisation, breeding schemes and rigorous reporting of genetic and environmental details for Down syndrome models.

The preclinical committee has recommendations for how papers should report mouse experiments on DS research. These include:

- i) T21RS members will have information available about the ARRIVE (Animal Research: Reporting of In Vivo Experiments) guidelines to improve the reporting of research using animals – maximizing information published and minimizing unnecessary studies.
- ii) Defining each mouse strain by its official MGI (Mouse Genome Informatics) name, which is unique and available from the MGI website (www.informatics.jax.org).
- iii) Randall Roper, Mara Dierssen, Yann Herault created the following checklist specifically for reporting DS mouse model research; these are based on the ARRIVE guidelines with extras important specifically for DS research. We will circulate these ‘rules’ to T21RS for discussion in spring 2020.

In addition to the ARRIVE guidelines, we recommend the following information be included when reporting research with Down syndrome model mice:

1. Official strain designation and number (use Jax or Infrafrontier repository code).
2. From where the mouse strain was obtained and when; How and why the model being used can address the scientific objectives and its relevance to human biology; Genetic background of the trisomic strain and all mice used in the study.
3. For how many generations the strain has been bred in the colony.
4. Sex of the parent transmitting the mutation.
5. Numbers of mice and how many males and females used in the analyses.
6. Indicate the number of independent sub-cohorts and the number of individuals per cohort.
7. Separate analysis of male and female cohorts unless no sex differences in phenotype can be shown statistically. Details of Power Analyses in order to justify numbers used.
8. From how many different litters the mice were derived and average size of litters (e.g. mean or median litter size plus litter size range).
9. When several behavioural tests are used, the order of the tests should be specified.
10. Specify whether the tests were performed in batches, and whether mice come from several litters (to account for possible biases due to maternal behavioural differences).

11. In some DS mouse models, the variance can be different for wild type and trisomic/transgenic mice. Explain how this is considered in the data analysis. Report the number of animals in each group/genotype included in each analysis. Report absolute numbers (e.g. 10/20, not 50%).
12. The DS models have some specific characteristics that have to be considered, for example, given the specific sensitivity of DS models to some types of stress, specifying possible stressful elements (number of mice per cage, control of hierarchical aggression, light intensity in the experimental arena, etc.). Also, specify whether pre-experiment handling was administered and how.
13. Another important factor for some learning and memory tests (e.g. those using foot shock) is the different sensitivity to nociceptive stimuli. The use of specific measures for pain sensitivity has to be specified.
14. If using a stressful test, weigh animals after the experiments are finished to ensure that no weight loss is detected. If treatment is chronic and experiments are done after, specify the age at which each experiment is done.
15. If therapeutic interventions are used, rationale for choice of specific anesthetic, route of administration, drug dose should be clearly specified.

- Bill Mobley has suggested a possible reward strategy to encourage more investigators to follow the recommendations, for example, by publicizing good practice on the T21RS site.
- Tarik Haydar suggested possible on-line storage site for editing the Preclinical Committee recommendations, and other committee documents.
- We note that we have created a comprehensive Table with nomenclature for all published mouse and rat models of DS (no single gene mutants).
- Reviewing and revising of the recommendations will continue.

3. To capture and make available data from phenotyping including OMICS data; joining international initiative such as IMPC www.mousephenotype.org

This is an extremely increasingly issue, and OMICS and other data from multiple organisms may be relevant to DS research. Now, we do not have capacity to address this issue and will look at it again in late 2020. We note that all such data collection would have to be curated to be useful.

4. To validate protocols for preclinical and translational medicine: establish and validate new disease-relevant phenotypes and protocols for preclinical pharmacology studies, publish position papers on new tools for manipulating new targets in cellular and mouse models

Again, is an extremely important issue, which we currently do not have capacity to address? However, re: **Treatment outcomes in mouse models (2019)**, an updated Table has been loaded onto the Preclinical section of the T21RS website by Jean Delabar which contains comprehensive information on treatments in DS mouse models with a range of regimes.

Re: detailed protocols for preclinical research, these have been defined for behavioural analysis with the help of Mara Dierssen and Yann Herault. They were disseminated late and are now under review by other members. This work is ongoing.



We would like to create a document for craniofacial and skeleton defects analysis in mouse models of DS, in particular with input from expert Randall Roper. A draft of this document has been completed and will soon be submitted to the committee for review.

Training the next generation of DS researchers

We wish to bring early stage researchers onto the T21RS Preclinical Committee, in order to gain ‘managerial’ experience of working with the T21RS community.

To that end, we have circulated this text to the Membership:

The Preclinical Committee is Looking For New Members!

The goal of the Preclinical Research Committee of the Trisomy 21 Research Society is to facilitate basic, translational and preclinical research on Down syndrome. To enhance the engagement with junior researchers, we would like to invite the applications for two committee membership slots designated specifically for postdocs and junior investigators who have not established their own laboratories. This is an excellent opportunity to become part on a wider preclinical research community and to get involved in a leadership position in T21RS.

The term of the appointment will be one-year. Interested applicants should send an email with:

- a two-page bio sketch
- a cover letter with the description of research interests, experience
- the reason behind the application.

Submit your application to Elizabeth Fisher elizabeth.fisher@ucl.ac.uk; Eugene Yu yuejin.yu@roswellpark.org & info@t21rs.org. We are looking forward to receiving new applications and the application deadline will be 1st May 2020.

We encourage all researchers including Senior PIs to disseminate this invitation to likely interested parties.

International meetings

We are leading the effort to organize an event in the ‘off-year’ of the T21RS at SfN, which is in Washington DC, 24th – 28th October 2020. Possibilities are:

An independent **T21RS Social** - Eugene Yu has costed a venue including catering/hire at \$5,700 (Henley Park Hotel, 3 minutes’ walk from main SfN venue).

Eugene applied to T21RS for funding ‘Organising a Scientific Event Award’ and was awarded €500 towards costs for this event. Thus, we currently have a significant shortfall if we take this option.

Our formal application for SfN Social has been approved: Mara: Chair; Eugene, Vice-Chair

A SfN **Satellite meeting** last ~2.5 hour, will cost us \$2,600, and could be for preclinical and clinical. The deadline for a satellite application is in April 1 and Anita and Mara have kindly taken this on, and it will likely need help from the Committee. The preclinical Committee may apply to possible sources of funding: Company of biologists/IBRO/EMBO/sebiology/Boehringer.

The following comprehensive **new book** has just been published (2020) that describes in detail important aspects of preclinical research into Down syndrome: Progress in Brain Research, Volume 251, Preclinical Research in Down syndrome: insights for pathophysiology and treatments. Mara Dierssen edits the book as part of the activities of the T21RS Pre-Clinical Committee to serve our members. Members will have 30% discount.



VI - Committee for Clinical Research

Clinical Adult Committee Members:

Chair: Andre Strydom (UK) to July 2019
Alberto Costa (USA) from July 2019

Members: Juan Fortea (Spain)
Benjamin Handen (USA)
Elizabeth Head (USA)
Sharon Krinsky (USA)
Andrew Nowalk (USA)
Huntington Potter (USA),
Zaman Sahid (UK)
Wayne Silverman (USA)
Weihong Song (Canada)
Anne-Shopie Revillat (France)
Stephanie Sherman (USA)
Michael Rafii (USA)

During 2019, the leadership of the Committee for Clinical Research transitioned from Dr. Andre Strydom (Kings College London) to Dr. Alberto Costa (Case Western Reserve University School of Medicine). During this transition, the adult clinical committee has continued to support collaborations between research groups globally, and continued with our ongoing efforts to enable harmonization of clinical assessments.

Specific contributions of the clinical committee:

1. Completed a **review of psychometric tools** used to assess general ability (IQ) and adaptive/ functional abilities in Down syndrome, and how this might be used to track ageing-related changes - published in an open access journal (<https://jneurodevdisorders.biomedcentral.com/articles/10.1186/s11689-019-9279-8>)
2. Contributed to an **ISTAART review of the ethnic and racial disparities** in Alzheimer's disease and related dementias, highlighting some of the related concerns within the Down syndrome community (<https://www.sciencedirect.com/science/article/pii/S1552526018335568>)
3. Participated in NIH's planning meetings for the **NIH INCLUDE program** on Alzheimer's disease clinical trials in Down syndrome <https://www.nih.gov/include-project/alzheimers-disease-clinical-trials-down-syndrome-population-planning-meeting-agenda>
4. Contributed to development of **two clinical trial cohort studies**: (i) the Lumind Life-DSR study, <https://www.lumindidsc.org/life-dsr-study/> in the US; and (ii) the Horizon-21 cohort in Europe <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6296162/>
5. Hosted a successful **pre-conference symposium at the T21RS international congress** in Barcelona.
6. The **membership of the committee** was expanded by the addition of four new members: Michael Rafii, University of Southern California (USA), Anne Sophie Rebillat, Lejeune Institute (Paris), Huntington Potter, University of Colorado (USA), and Andrew Nowalk, University of Pittsburg (USA).



7. A new **partnership with the Down Syndrome Medical Interest Group USA** (DSMIG-USA) was developed to establish an annual workshop to educate physicians and other healthcare professionals on emerging translational research information that may eventually inform their clinical practice. For the current year, due to the COVID-19 pandemic, the workshop will take place in an online forum in the fall. In future years, the workshop will occur either at the DSMIG-USA or T21RS meeting. The Committee for Clinical Research plans to establish similar partnerships with other professional organizations in the UK, European Union, and other countries.

8. Michael Rafii contributed an article for the **T21RS Newsletter** titled: “Aducanumab and the Prospect for Alzheimer’s Disease Therapeutics in Down Syndrome”. This is the first of a series of 2-3 articles per year to be written for the Newsletter by different committee members to review the clinical efforts on pharmacological interventions that may be applicable for those with Down syndrome.

9. The Committee for Clinical Research, in collaboration with the Committee for Science & Society, and under the guidance of Past and Current T21RS Presidents, Drs. Mara Dierssen and Andre Strydom, has recently established the **COVID -19 DS Task Group**. This international effort received the endorsement of many Down syndrome support groups across the globe, and was designed to produce information to help understand the risks and outcomes related to COVID-19 for all those with Down syndrome.



VII - Developmental Clinical Research subcommittee

Developmental Clinical Research Committee Members:

Stephanie Sherman (US), chair

Cécile Cieuta-Walti (CA; FR)

Floriana Costanzo (IT)

Sophie Durand (FR)

Jamie Edgin (US)

Jessica Hunter (US)

Julie Korenberg (US)

Silvia Sacco (FR)

Stephanie Santoro (US)

Brian Skotko (US)

Rafael de la Torre (ES)

Stefano Vicari (IT)

With guidance from:

Kate Hughes (UK)

Alfieri Paolo (IT)

André Strydom (UK)

Stefania Veltri (IT)

The goal of this subcommittee of the T21RS Clinical Committee is to increase our knowledge of the cognitive and behavioral trajectory of children and adolescents with Down syndrome (DS) and deepen our understanding of the effect of various comorbid disorders on these trajectories and on the quality of life. In 2019, we accomplished the following:

1. We held our first **in-person meeting of this committee** at the T21RS Barcelona meeting in June 2019. The goal was to define the vision and set the goals for the rest of the year. We prioritized creating a database to catalog the existing DS cohorts in order to facilitate collaborations. Once completed we plan to create a “use case” to show the value and methods to exploit the data from existing cohorts.
2. To achieve our prioritized task of **cataloging existing DS cohorts**, we formed a working group including Dr. Jessica Hunter as Chair and Drs. Stephanie Santoro, Kate Hughes and Stephanie Sherman as members. Dr. Hunter, with input from the committee, developed a REDCap survey. This was disseminated to the T21RS and the DS Medical Interest Group (DSMIG) memberships. Currently, there are 17 described cohorts summarized in the database. The next step is to initiate a collaborative project to examine comorbidities associated with cognitive level of those with DS. This will be accomplished in 2020.



3. For the T21RS Barcelona meeting, we organized a **pre-meeting clinical session** for all stakeholders as part of our mission to disseminate translational research efforts across the research community, families, and clinicians. The session was called “Health co-morbidities in children with Down syndrome” and included four presentations:
- 1) Overview of Medical Research in Down Syndrome (*Stephanie Sherman; Emory University, USA*);
 - 2) Medical comorbidities of childhood and their potential impact on cognition and development
(*George Capone; Kennedy Krieger Institute, USA*);
 - 3) Psychiatric comorbidities of childhood/adolescents and their association with cognitive impairment
(*Floriana Costanzo; Ospedale Pediatrico Bambino Gesù, IT*)
 - 4) Interventions from early childhood to adolescents—how we can help (*Rafael de la Torre Fornell; Universitat Pompeu Fabra, SP*).

It was well attended and generated an excellent platform for questions and updates.



VIII- Communication Workgroup

Communication workgroup members:

María Luz Montesinos (Spain), Chair

Eric Hamlett (USA)

Claudia Cannavo (UK)

1. We are in charge of producing a **monthly Newsletter**, which is distributed to the T21RS members who signed to receive it and among a list of interested persons who subscribed through our web site.
2. We **update the web site** (English version) with news, events and job offers when solicited.
3. We facilitated the **contact with press and other media** during the 3rd International Conference of the T21RS.
4. Finally, we act as **Community Managers of the T21RS Twitter account**. We have presently 367 followers.

Contact Information: Dr. Maria Luz Montesinos Departamento de Fisiología Médica y Biofísica Universidad de Sevilla, SPAIN mlmontesinos@us.es



FINANCIAL REPORT

01-01-2019 – 31-12-2019

1. Treasury

T21RS is the first non-profit scientific society (*Dutch: vereniging*) for Down syndrome research. T21RS is officially established in Groningen (NL), and operates under Dutch law.

Official statutory address: T21RS Groningen Office
University Medical Center Groningen
attn. P.P. DeDeyn & A.D. Dekker (AB51)
PO Box 30.001, 9700 RB Groningen, The Netherlands

RSIN identification number (NL): 853938283

KvK Chamber of Commerce number (NL): 60501162

Current treasurer (2016-present): Dr. A.D. (Alain) Dekker
University Medical Center Groningen, The Netherlands

Past-treasurer (2014-2015): Dr. A.M.W. (Tonnie) Coppus
Radboud University Medical Center Nijmegen, The Netherlands

Operational currency: Euro (€)

Number format: Continental European
Example: 40.000,25 (*forty thousand and twenty-five cents*)

2. Summary of 2019

In 2019, T21RS organized in Barcelona its third T21RS International Conference. Therefore, this year's income and expenses primarily relate to the conference organization. Due to a larger number of attendees (than expected) and the fact that the venue (CosmoCaixa) was generously provided free by the La Caixa Foundation, the conference turned out to be very profitable. Please note that this Financial Report only provides an overview of (conference) income and expenses directly via the society (through the T21RS Bank Account). A large part of the conference organization was taken care of by the professional conference organizer BCO Congressos. BCO Congressos took care of registration fees, part of the conference support and direct expenses relating to the catering, audiovisual support, etc. The net result was transferred by BCO Congressos to T21RS (see below).



3. Revenues

Revenue in 2019 primarily consisted of 1) membership fees, 2) general financial support for the society by Founding members and 3) conference revenues. Moreover, Dr. Yann Hérault (project coordinator) obtained a specific European project grant entitled GO-DS21, in which T21RS participates. For this project, € 7000, - has been transferred to T21RS in 2019 and will be used for predefined goals in 2020.

1) Membership

T21RS distinguishes two types of membership: a) full membership for researchers and clinicians, and (b) associate membership for DS associations/foundations. A 50% reduced membership fee applies to individuals living and working in countries with low-, low-middle and upper-middle income economies (as defined by the World Bank).

1a) Full member (for researchers and clinicians)

- | | |
|--------------------------------------|---------|
| • Master/PhD student | € 40,- |
| • Postdoctoral fellows | € 80,- |
| • Academic staff members/ clinicians | € 100,- |

1b) Associate member

€ 50,-

2) Founding members 2019

T21RS is very grateful to a number of non-profit organizations that financially support the continuation of the society and its aims. These Founding members have committed themselves to support of € 5000,- per year. In 2019, this concerned:

- Lumind Research Down Syndrome Foundation (USA)
- Fondation Jérôme Lejeune (France)
- The Matthews Foundation (USA)
- Global Down Syndrome (USA)

Trisomy 21 France was a Founding member from 2015-2018, but did not continue its support in 2019.

3) Conference revenue

Since the conference was profitable, BCO Congresos transferred a net profit of € 37.436,17 to T21RS (depicted in the profit and loss statement as 'conference revenue'). Next to conference support by Fundación Iberoamericana Down21 and The Company of Biologists in 2018, we gratefully thank Fondation Jérôme Lejeune, Lumind-IDSC, Global Down Syndrome Foundation, Down España, National Down Syndrome Society, Fondation AMIPI-Bernard Vendre and Prous Institute for Biomedical Research for their generous conference support in 2019.

4. Expenses

Expenses primarily related to the conference, in particular international Travel Awards for PhD students and junior staff. Apart from the conference, expenses related to the new T21RS Award for Scientific and Dissemination Events, the T21RSThesis Award and operational/running costs for website maintenance, banking fees etc.

5. Profit and loss statement

This statement only provides an overview of income/expenses directly through the T21RS Bank Account.

31/12/2019

Profit and Loss Statement

For the period from 01/01/2019 to 31/12/2019

Accrual basis

31/12/2019

Income	
Conference revenue	37 436,17
Financial support (conference)	85 878,72
Financial support (founding members; general support T21RS)	19 961,90
Financial support (specific project allocation)	7 000,00
Interest	3,74
Membership fees	17 618,59
Total - Income	167 899,12
Less: Expenses	
Conference organization (via T21RS account)	20 034,00
Operational costs	1 209,58
T21RS Event Awards	4 460,00
T21RS Thesis Awards	2 000,00
Total - Expenses	27 703,58
Net profit (loss)	140 195,54

6. Balance

Balance Sheet

As at 31/12/2019

Accrual basis

	31/12/2019
Assets	
Cash & cash equivalent	301.335,19
Net assets	301.335,19
Equity	
Retained earnings	140.195,54
Starting balance equity 01/01/2019	161.139,65
Total - Equity	301.335,19
Total equity	301.335,19

7. Conclusion

The year 2019 has been closed with a net profit of € 140.195,54 resulting in a positive balance of € 301.335,19.

8. Discussion and outlook

The net profit will be used to strengthen the financial reserve of the society and boost new initiatives in the upcoming years to fulfill the aims of the society, such as the launch of the T21RS Award for Scientific and Dissemination Events. To ensure continuation of the society and organization of the T21RS International Conferences every two year, the society aims for a stable financial buffer of \pm € 200.000. That is, a financial reserve that roughly allows for the organization of one conference as well as full operational costs for two years. The Barcelona conference was particularly profitable (among others due to the free venue), but these net results are not to be expected for every new conference, as also demonstrated by previous editions in Paris (2015) and Chicago (2017). After the fifth anniversary of existence of T21RS (established in 2014), the financial buffer of the society is finally at a level that ensures continuation of the society, accounting for uncertainty of external financial support and potentially upcoming economically bad times.