Jerome Lejeune
FOUNDATION USA
Research Care Advocacy

JLF USA NEWSLETTER

■ Fall 2015

Committed to those with Down Syndrome and other genetic intellectual disabilities

"My son Clark who loves life, loves to laugh, and spreads love and hugs everywhere he goes."

-From our "Wall of Heroes"

October is Down Syndrome Awareness Month!

... A month when advocates around the world join together to spread awareness and to encourage inclusion of individuals living with Down syndrome throughout our communities. It is a time to celebrate these special people we know and love by making others aware of their abilities and accomplishments, but also by highlighting their future potential being unlocked by advances in medical research.

Parents and other advocates know that raising awareness about Down syndrome among those outside our community can be a challenge. Some we encounter have a sugar-coated perception of individuals with Down syndrome as "perfectly adorable angels," but that attitude is countered on the other side by those who see Down syndrome as a devastating disability that brings tremendous hardship and suffering to the individual and their family. Both are wrong. These perceptions are ill-informed and removed from reality. They stand in the way of progress toward improving lives, giving appropriate human respect, and securing a meaningful place for children and adults with Down syndrome in communities.

The *truth* that parents intimately know is the fierce love they have for their child with Down syndrome, and that love compensates for anything others might see as "lacking" in a child with a disability. The perception that medical professionals often have - and pass on to their patients - is informed by looking at chromosomes in a prenatal test. That is far removed from the reality of the person to whom those chromosomes belong.

We dedicate this Fall newsletter of the Jerome Lejeune Foundation to Down Syndrome Awareness Month in the hopes of keeping our friends informed about new advances in research, care, and advocacy for people living with Down syndrome.

> **"We need to be clear: The quality of a civilization can be measured by the respect it has for its weakest members. There is no other criterion."**
>
> ***-Jerome Lejeune***

This is our metric for success, and with the gracious assistance of our friends and benefactors, we are able to carry on the legacy of this great man by funding and conducting the highest level of cutting-edge research, by improving medical care, and by speaking out on behalf of those whose lives we strive to improve each day.

Celebrate Down Syndrome Awareness Month with us! Share your hero or story today in honor of someone special. See page 5

News in Brief

Stay up-to-date with the Jerome Lejeune Foundation

- **A Potential New Drug Treatment for a Rare Disorder:** Funding from the Jerome Lejeune Foundation has assisted researchers in identifying a drug to treat MECP2 duplication syndrome. Findings were published in *Molecular Psychiatry* on September 8, 2015. The disorder occurs in boys and displays a wide variety of symptoms, including low muscle tone, developmental delays, recurrent respiratory infections, speech abnormalities, seizures, autistic behaviors, and potentially severe intellectual disability.

- **Shutting Down the Extra 21st Chromosome:** Researchers at Elixergen LLC published remarkable research on August 31, 2015 in a paper called *Correction of Down syndrome and Edwards syndrome aneuploidies in human cell cultures*. Their research showed the possibility of introducing ZSCAN4, a gene responsible for genomic stability, into cell cultures of individuals with Down syndrome and Edward syndrome. When those cells divided, 41% of the cells had no extra chromosome.

- **A Medical and Pedagogical Center in Dubai:** In October 2015, the Jerome Lejeune Foundation opened a medical clinic in Dubai that will provide care and therapy to children under 15 years of age with learning, language, or developmental disorders which require a multidisciplinary approach.

- **JLF USA President Appointed to NORD Bioethics Committee:** Mark Bradford, president of the Jerome Lejeune Foundation USA, has been appointed to the Bioethics Committee of the National Organization for Rare Disorders.

- ***Jerome Lejeune: To The Least of These My Brothers and Sisters:*** The documentary on Dr. Jerome Lejeune will be shown three times in October, including at the JPII Inter-Faith Film Festival in Miami, FL, in Philadelphia, and in Lincoln, NE. Call us for information if you live in those areas and are interested in attending.

The Americans with Disabilities Act: Intention and Outcomes for People Living with Intellectual Disabilities

On July 26, 2015 the Americans with Disabilities Act (ADA) that was signed by President George H. W. Bush in 1990 turned 25. It was the first legislation of its kind focused solely on prohibiting discrimination against persons with disabilities and mandating that all Americans be accorded equality in pursuing jobs, goods, services and other opportunities.

The ADA has radically improved the lives of individuals living with physical, intellectual, and developmental disabilities over the last 25 years, especially in the areas of accessibility, education, and employment. **But 25 years later, one of the reasons we have a Down Syndrome Awareness Month is because we are still seeing forms of discrimination – to a greater or lesser extent – in American societal attitudes, especially toward those with intellectual disabilities like Down syndrome.**

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The Americans with Disabilities Act Cont.

In August of this year, new projections were released for the anticipated global growth of the prenatal testing market through 2019. In 2012 that market was valued at $1.12 billion. **Projections are that by 2019, that market will have grown to $8.37 billion.** The market for noninvasive prenatal tests surpasses testing in general with projected growth of 37.6%! It does not take rocket science to understand the reason for that phenomenal growth – it is a market fueled by fear of disability.

Prenatal tests are the only medical tests that have been developed that can offer no therapeutic benefit. Their primary objective is to allow parents the opportunity to selectively terminate an otherwise wanted child because a trait has been discovered that is considered undesirable.

A prenatal test cannot reveal who a particular child will be, the extent of their disability, or how his or her life will impact the life of the family. The decision to terminate is a form of discrimination that is clearly in conflict with the findings and philosophical underpinnings of the ADA and other legal protections that have been put into place in the U.S. to shield those with disabilities from discrimination.

The ADA called for the federal government to play a central role in enforcing the standards it established on behalf of individuals with disabilities. Unfortunately, this area of disability rights interfaces with a topic that is perhaps the most contentious one in public discourse in the U.S. – abortion rights. But when politics and ideology impede social progress, the ones who usually suffer most are those who cannot speak for themselves. **Disability-selective abortion is fundamentally an issue of social justice that transcends pro-life and pro-choice politics.**

As we remember this 25th anniversary year of the Americans with Disabilities Act, we need to be grateful for the many advances that have been made on behalf of those with all disabilities. But we need to commit ourselves to working toward consistency with regard to the law, and the "inherent right to life" of persons with disabilities as Article 10 of the UN Convention on the Rights of Persons with Disabilities states.

As we look at a projected market growth in noninvasive prenatal testing of over 37% in the next four years, it is past time for a serious evaluation of how our acceptance of prenatal diagnosis damages the disability community by reinforcing attitudes that focus on the disability before the person.

We often quote from Adrienne Asch, the now deceased disability rights activist who said, **"the only thing a prenatal diagnosis can provide is a 'first impression' of who a child will become."** Making radical and exclusionary decisions against a person based upon a first impression is to make a decision that is based upon a preconceived opinion and not one based on reason or actual experience. **That is one of the definitions of prejudice.** The intent of the ADA was to protect those with disabilities from all forms of prejudice. We can say in at least one area, that we still have much work to do.

"The love and pride I have for my sweet boy is overwhelming sometimes. When I take him in public I feel like I am escorting a prince."

-William's mom

Prenatal Testing

An $8 Billion Industry

It is impossible to have a meaningful conversation about Down syndrome during a month committed to Down syndrome advocacy without engaging in the uncomfortable, but critical topic of prenatal testing and how it affects the Down syndrome community.

Dr. Jerome Lejeune was deeply troubled that his discovery of the genetic cause of Down syndrome would lead to the abortion of children with Down syndrome. **He dedicated his life as a researcher, physician, and advocate to fighting against this threat, and the Jerome Lejeune Foundation has continued that work since Dr. Lejeune's death in 1994.**

Recent market projections have indicated that the **prenatal testing industry will grow at about 37% each year over the next four years, and be valued at over $8 billion by 2019.** But what does that phenomenal growth indicate as the future for those conceived with Down syndrome and other genetic anomalies?

That market growth is largely being driven by the introduction in October 2011 of so-called noninvasive prenatal testing, or cell-free DNA testing (cfDNA) – a screening test that can be given as early as 10 weeks, with claims by the manufacturers of near perfect accuracy. It is expected that the use of prenatal testing will increase with these tests, and many fear the frequency of termination following a prenatal test will increase as well.

Research published over the last few months has clarified the effect prenatal diagnosis has had on the Down syndrome population in the U.S. **One study in the American Journal of Medical Genetics by Gert deGraaf, Frank Buckely and Brian Skotko showed that between 1974 and 2010, the Down syndrome population in the U.S. was reduced by 30% because of the availability of prenatal testing and abortion.**

A story published in the Boston Globe in December 2014 by the New England Center for Investigative Reporting exposed the danger the newest type of prenatal screening has caused. The investigators showed that some women consider this new screening test as diagnostic; and therefore, make the decision to abort a pregnancy without having the results of the screen validated by a truly diagnostic test, such as amniocentesis. In one study the authors reference, 22 out of 356 women who were told they were at high risk following a cfDNA test aborted without confirming the result. Stanford University reported that there were at least 3 cases of women who chose to abort and later discovered that the cfDNA test was wrong. They had aborted a typical fetus!

As did Dr. Lejeune, the Jerome Lejeune Foundation strongly believes in the positive potential of research to remove the reasons one would choose to abort a child prenatally diagnosed with Down syndrome. We also believe that if families were told the whole truth of what life is like with a child with Down syndrome, far fewer would ever make the decision to abort.

The Jerome Lejeune Foundation is deeply committed to research, like that being done by Dr. Diana Bianchi and her team at Tufts University, into prenatal therapies. **Perhaps one day soon, early cfDNA testing will provide a window of opportunity to prenatally treat a fetus diagnosed with Down syndrome, allowing these children to be born with far greater potential than is now possible.**

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*"I read somewhere that in **no other circumstance** does someone give you a pamphlet that your baby will have a X% chance of a heart defect, Y% chance of hearing loss, digestive blockage, etc., than when you are given the prenatal diagnosis of Down syndrome. **None of the percentages mean anything** when you hold your baby, and all that matters is what is relevant to you and your baby."*

-Luke's mom

Prenatal Testing Cont.

The Jerome Lejeune Foundation has also worked to pass so-called Down Syndrome Prenatal Education Laws, like "Chloe's Law" in our home state of Pennsylvania, which requires that women who receive a positive prenatal test be provided good, peer-reviewed information about all the potential outcomes of having a child with Down syndrome – including the abundance of good news that is available.

Can you imagine what it would be like to live with a condition that you knew was so feared that people would do all they could to avoid it – even to the point of refusing a child through prenatal diagnosis and abortion?

Karen Gaffney, a young woman living with Down syndrome, who has swum the English Channel and the San Francisco Bay, adamantly said in a recent TEDx talk that "All lives matter," and that the future for people like her is uncertain given what is taking place in prenatal diagnosis. **She said the race is on to discover better and faster ways for prenatal diagnosis, and that doctors continue to counsel patients with old data that reflects the past and ignores the present. At one point, she challenges the audience to "save our lives!"**

Karen's challenge is a challenge that we take up every day. **As Dr. Jerome Lejeune used to say, "the only way to save them is to cure them."** We invite you to join in our determination to save lives prenatally diagnosed, and to improve the lives of people living with Down syndrome by supporting the Jerome Lejeune Foundation's mission of research, care, and advocacy with your financial gift.

Cell-free DNA Prenatal Testing

- **October 2011:** Sequenom, Inc. introduced MaterniT21, the first so-called non-invasive, or cell-free DNA (cfDNA) prenatal test. These noninvasive, molecular genetic tests are able to test fragments of DNA floating in the mother's blood to indicate a risk for Down syndrome, trisomy 18, trisomy 13, and some sex chromosome abnormalities. Three other companies soon introduced prenatal screening tests based on the similar technology.
- **October 2013:** Sequenom announce its "**enhanced sequencing series-** its MaterniT21 PLUS test. The **genetic targets were expanded** to identify "clinically relevant" microdeletions, including 22q11.2 deletion syndrome (DiGeorge), Cri-du-chat syndrome, Prader-Willi/Angelman syndrome, 1p36 deletion syndrome, as well as two additional trisomies (trisomy 16 and trisomy 22).
- **July 2015:** Sequenom announced their latest prenatal genetic test, MatierniT GENOME. The company claims this test is the first noninvasive prenatal test (NIPT) to provide "**karyotype-level insight** into fetal chromosomal status prior to considering an invasive procedure," and claims it screens for very small deletions or gains at the subchromosomal level.
- **July 2015:** The American College of Obstetricians and Gynecologists (ACOG) released a Committee Opinion clarifying the limitations and use of cfDNA testing, and stating that it **should not be used to screen for microdeletions,** nor for women who have had multiple pregnancies
- **2015:** cfDNA testing - originally offered only to women considered at high risk for having a child with Down syndrome - **is now being offered to women at average risk. Some insurers are covering the test for all women.**
- **August 2015:** Market projections are published that anticipate the prenatal testing market to be valued at **$8.37 billion by 2019.** The largest segment of the market is cfDNA testing with 37.6% annual growth through 2019.

Join us in Celebrating Down Syndrome Awareness Month!

Shea Mary B.

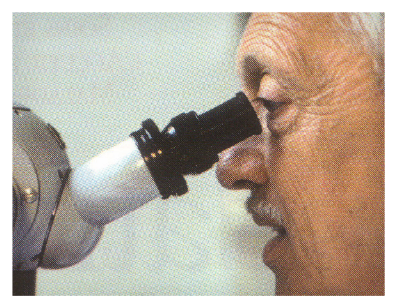
Those of us in the Down syndrome community know how special our family members and friends are who have been blessed with an extra 21st chromosome. This month is a special time to share with the world what it means to have Down syndrome, what they need from us, and how people with Down syndrome play a vital role in our family's lives, and in our communities.

What more encouraging support can we provide than to share the positive experiences families have, and the beautiful and happy faces of those who are so deeply loved by their families and friends. We have two special initiatives for you to participate in:

- **Stories of Love and Hope**: Share your story of receiving a prenatal or postnatal diagnosis of Down syndrome and we will add your story to our online collection so that other families may be comforted and educated about the joy a child with Down syndrome can bring to a family. Visit the website: www.lejeuneusa.org/Stories_of_Love_and_Hope
- **Lejeune's Wall of Heroes**: Send us a picture of your special hero with Down syndrome, along with a phrase of tribute to that person. We will add your hero to our virtual "wall," and will eventually use these images to create a mosaic of the face of Jerome Lejeune. Visit the Wall: www.lejeunesheroes.tumblr.com

We hope that through our "Stories of Love and Hope" and "Lejeune's Wall of Heroes," parents who have received a prenatal or postnatal diagnosis will have the opportunity to meet families - at least virtually - and know that they, too, will fall in love with their child the first time they hold him or her in their arms.

How Much did it Cost to Fly to the Moon?



Jerome Lejeune was once quoted saying that "curing" Down syndrome would take much less intellectual effort than putting a man on the moon.

Many disagreed with him, but he thought it was inconceivable that a treatment would not one day be found to significantly improve the lives of children and adults living with Down syndrome.

21 years after his death, Dr. Lejeune's confidence in medical research is finally being realized. Thanks to the Jerome Lejeune Foundation, and others, children born with Down syndrome today have the hope of a very different future than what was possible not long ago.

Not even five years ago, most would have agreed that efforts to develop treatments to improve lives of individuals with genetic intellectual disabilities was a waste of time and money. **Today; however, clinical trials are being successfully conducted by major pharmaceutical companies on drugs to improve genetic conditions like Down syndrome and Fragile X syndrome (see sidebar).** Very recent research even indicates it may some day be possible to at least partially silence the extra 21st chromosome in people with Down syndrome!

Now, back where this article began… Jerome Lejeune believed that curing Down syndrome would take less intellectual effort than putting a man on the moon. Maybe so, but we have not had NASA's budget to reach that goal.

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Flying to the Moon Cont.

Our trip to the moon back in 1969 cost approximately $25.4 billion, or the equivalent of over $140 billion in today's dollars. **The NIH's current budget for Down syndrome research is only $18 million.**

The U.S. has a brilliant and committed research community, but they have not had sufficient funding to make the kind of progress we know is possible. We need to raise more money to support their work.

Thanks to our benefactors' generosity, the Jerome Lejeune Foundation continues to drive medical research internationally toward treatments that may be available to patients within a decade. **In 2015, the Jerome Lejeune Foundation will spend approximately $4.5 million on our research program, or about 25% of the U.S. federal government's commitment to Down syndrome, but we need much more.**

Please consider supporting, or increasing your support to the Jerome Lejeune Foundation. **With you, we can make an incredible difference in the lives of people all over the world living with Down syndrome and other genetic intellectual disabilities.**

"Ronen is a funny, joyful little boy who loves to play!"

Sidebar

A new initiative has begun at our Paris office to raise $600,000 to support the next phase of a clinical trial we have already been funding in Barcelona on the use of EGCG to improve memory and executive function in Down syndrome. The previous phase enrolled participants 18-30 years old, but indications are that EGCG may be even more effective in younger patients so this next step will invite younger patients into the study. Recruitment will begin as soon as the necessary funding has been secured.

The Jerome Lejeune Foundation is also funding a clinical trial at the Jerome Lejeune Institute in Paris on the use of folinic acid and thyroid hormone to improve the psychomotor development of infants 6-18 months old.

Other Clinical Trials:

Roche: Phase 2 of a clinical trial on their drug RG1662 in individuals 12-30 years old. A drug intended to address cognitive and behavioral deficits in people living with Down syndrome.

Balance Therapeutics: A phase 1b clinical trial in Australia to test the safety and efficacy of a compound to improve cognition in individuals 13-35 years old.

Transition Therapeutics: A completed phase 2a study to evaluate the effectiveness of ELND005 to enhance cognition and executive function in individuals with Down syndrome

ACImmune: A pending clinical trial of ACI-24, an active vaccine intended to stimulate a patients immune system to produce antibodies that prevent beta-amyloid accumulation and clear plaques on the brains of individuals with Down syndrome to prevent Alzheimer's disease.

Alcobra: The FDA has granted "fast track" status to their drug "Metadoxine" to expedite and facilitate the further development and testing of their drug now in phase 2 development for the treatment of Fragile X syndrome.

2015 USA Research Funding

Thanks to the generosity of our benefactors, the Jerome Lejeune Foundation is able to offer two opportunities each year for researchers to apply for funding from the Foundation to support their research.

For the first cycle of 2015 our Scientific Advisory Board recommended three new grants to researchers working to improve the lives of people living with genetic intellectual disabilities. Two of these researchers are conducting research for individuals with Down syndrome, and the third is investigating a rare genetic syndrome called cardio-facio-cutaneous syndrome (CFC).

Alper Bozkurt, PhD, Assistant Professor of Electrical and Computer Engineering and Biomedical Engineering at North Carolina State University in Raleigh, NC. It is estimated that 30% of infants with Down syndrome have moderate to severe sleep apnea, and that percentage increases to 50% - 60% of toddlers. Poor sleep is linked to cognitive impairment in people living with Down syndrome, and traditional sleep studies are difficult to conduct on young patients.

The Foundation's grant to Dr. Bozkurt will assist in the design of a low cost, miniaturized wireless system that can study and predict abnormal sleep performance in young children with Down syndrome.

ANTICIPATED BENEFIT: Easier, more accurate, and less invasive sleep study for young patients suspected of having sleep apnea, making earlier treatment more likely.

Johann Hitzler, MD, researcher at the Hospital for Sick Children, Research Institute in Toronto has been provided with funds to identify children with Down syndrome who are at risk for developing acute myeloid leukemia (AML). The incidence of AML is 150 times more frequent in young children with Down syndrome and is preceded during infancy by a pre-leukemic disorder called Transient Leukemia (TL), which has a 20% risk of transforming into AML.

Currently, all children with AML receive the same course of treatment, but Dr. Hitzler believes that treatment may be excessive, and by identifying the mutations that cooperate in transforming transient leukemia to AML, doctors may be able to provide more personalized treatments, reducing dosage levels of drugs; and therefore, the patient's toxic response to treatment.

ANTICIPATED BENEFIT: Personalized treatment for children with Down syndrome who develop acute myeloid leukemia using lower doses of drugs with better outcomes.

Lauren Weiss, PhD, Assistant Professor, University of California, San Francisco has been awarded a grant to study the morphological and functional consequences of cardio-facio-cutaneous syndrome (CFC) mutations across neuronal (nerve cell) subtypes.

Dr. Weiss and her team at UCSF are studying the most common genetic mutations responsible for CFC. Her preliminary data suggest that the anatomical and functional manifestations of CFC is caused by differences in the timing of the development of neural cells. The purpose of her investigations is to identify or screen for potential targeted treatments to improve the lives of these patients.

ANTICIPATED BENEFIT: Better understanding of the progression of cell development to better identify treatments that may be effective in improving the lives of patients with CFC.

Ways YOU Can Help

Become a Donor

Your gift supports our mission of research, care, and advocacy following the medical and ethical standards of Dr. Jerome Lejeune, the "father of modern genetics." Please make a tax-deductible contribution today.

Become a Volunteer

Contact us at contact@LejeuneUSA.org to join our network of volunteers and advocates.

Invite us to a Meeting

If you are a member of a local Down syndrome support group, we would love to learn more about your work and tell you about the work of the Foundation.

Spread the Word

Pass this newsletter on to families you know who might be interested in joining us in our exciting work.

Want to Learn More?

To learn more about the important research we fund, read stories about the care we provide and explore and join our network, visit our website at **www.LejeuneUSA.org**.

Giving to JLF USA

The Jerome Lejeune Foundation USA is a registered 501(c)(3) charitable organization. All contributions made to the Foundation in the U.S. are fully deductible from federal income tax.

YOU are the Jerome Lejeune Foundation. TOGETHER we can do amazing things!

*Checks are welcomed at the address below, or you may go to the following link to contribute online: **www.LejeuneUSA.org**.*

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Pioneering Innovative Therapies

to improve the lives of those with genetic intellectual disabilities

Created in 1996 in Paris and in 2012 in the United States, the Jerome Lejeune Foundation is registered with the Internal Revenue Service as a 501(c)(3) nonprofit corporation serving individuals with genetic intellectual disabilities and their families...

Research in order to identify targeted treatments for patients affected by genetic intellectual disabilities. The Jerome Lejeune Foundation is the world's largest private funder of research on trisomy 21 (Down syndrome) and other disabilities. The Foundation funds projects in basic science, and also early clinical trials on drugs that offer hope that commercially available products will one day be available to improve the lives of people affected by genetic intellectual disabilities.

Care to provide specialized medical treatment and follow-up throughout the patient's life. The U.S. Foundation is involved in improving medical education and developing guidelines for care of individuals modeled after the work of the Lejeune Institute in Paris, a medical clinic which provides care to over 6,000 patients.

Advocacy for the fundamental human rights of persons with genetic intellectual disabilities. The Jerome Lejeune Foundation is committed to the inherent human dignity of all persons and the protection of life from conception to natural death.

Are You Connected?

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