

**Chelsea's Hope: Lafora Children Research Fund**  
**A family's effort to find a cure**

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Lafora disease, also called Lafora progressive myoclonus epilepsy, is a rare, progressive, and degenerative form of epilepsy that strikes children usually between the ages of nine and 14. Symptoms, which begin in late childhood or adolescence and become increasingly worse over time, include seizures, muscle spasms, difficulty walking, and dementia, eventually leading to death. It is incurable.

Until recently, there was no therapy that had proven effective against the disease's progression. Yesterday's therapy was palliative – treating symptoms and reducing seizures, some of which can be controlled for long periods of time by using antiepileptic drugs; however, patients rarely survive beyond one or two decades because of the devastating effects to nerve cells and associated neuronal cell death. Today, the UCLA Institutional Review Board (IRB) has approved intravenous (IV) Gentamicin as a “read-through” drug to correct nonsense mutations (changes in a base in the DNA that prematurely stop the translation of messenger RNA) in Lafora disease. The next step will be the approval for replacement gene therapy, which has been shown to successfully treat the disease in mice models.

Since Lafora is extremely rare, it has been classified as an “orphan” disease, meaning that the research receives very limited federal and private foundation funding. The *Chelsea's Hope: Lafora Children Research Fund* was created by the family of a child who was diagnosed with the disease; the family was shocked to find that there was little information and nowhere to get help. With the aid of a friend, they created a Website designed to fill this void and connect the families and friends of children afflicted with this disease. It also resulted in a community effort to raise funds to support the research of Dr. Antonio Delgado-Escueta, a leading expert in Lafora disease. Chelsea's Hope underwrites Dr. Delgado-Escueta's pursuits to find treatments and ultimately a cure.

**Use of Funds to Date**

Dr. Delgado-Escueta is Professor of Neurology at the David Geffen School of Medicine at UCLA, and for more than 20 years, he has devoted his life to Lafora disease research and the clinical care of patients. Since March 2008, Chelsea's Hope has made gifts of

almost \$170,000, which has enabled Dr. Delgado-Escueta and his team of international researchers to make significant progress toward their ultimate goal of finding a cure.

### **Patient Recruitment for Lafora Disease Research**

The success of the Chelsea's Hope Website and its network of families, friends, and advocates have drawn much-needed attention to this disease and to Dr. Delgado-Escueta's work, to the point that there is a wait-list of youngsters who want to be involved in his research efforts. For many of these children, there is now a very real hope that with treatment, they will not only find relief from the symptoms, but also benefit from advances in the studies.

### **Public and Private Grant Funding for Research**

Dr. Delgado-Escueta has acquired an electroencephalography (EEG) machine to study mouse models of Lafora disease. His team has been monitoring the EEGs and examining the reactions to treatment. The results of the EEG and epilepsy monitors are related to the neuropathological hallmark of the disease, namely cell death and Lafora inclusion bodies. A National Institutes of Health (NIH) seed grant has funded the study of IV Gentamicin in the Lafora mice, while an RO1 grant is supporting continuing studies on gene therapy of these mice. Gene replacement has successfully reduced the Lafora inclusion bodies load when administered in pregnant mice, after birth, and at four-12 weeks old – a significant breakthrough. In 2009, as a result of this discovery, Dr. Delgado-Escueta worked with the UCLA IRB for approval to use IV Gentamicin in the treatment of Lafora disease in humans. A clinical research team is now in place and includes a nephrologist, neuro-otologist, and a pharmacokinetics specialist, along with a safety and oversight committee. They will help ensure that the drug protocol is safe and complete.

To date, *Chelsea's Hope: Lafora Children Research Fund* has provided the funds to purchase the EEG, used to detect abnormalities related to electrical activity of the brain and to support the mice colonies used in research. Funds are now needed to cover the cost of Gentamicin antibiotics for treatment in existing patients, as well as to help pay for inpatient and outpatient expenses, as well as clinical research unit, nursing care, technical, and laboratory fees required to administer IV Gentamicin.

As of December 2009, seven children with Lafora disease are waiting to start the IV Gentamicin trials. Approximately \$30,000 is required for each patient to be admitted to UCLA for this potentially lifesaving treatment, which they will receive over a period of 10-12 days. By correcting the nonsense mutations, IV Gentamicin would not only save the lives of these patients, but also would help correct the altered brain structures. In addition to NIH and ROI grant funding, *The PACE Foundation*, a private foundation, has accepted Dr. Delgado-Escueta's proposal for funding IV Gentamicin treatment. He also will request additional NIH funding for the drug trials in 2010.

## **Impact of the Research on Other Genetic Diseases**

Private support is critical for these patients, because the results of the NIH grant applications for 2010 take a long time – and time is something that our patients simply do not have; moreover, NIH funding cannot cover all of the related costs.

Your gift to the Chelsea's Hope: Lafora Children Research Fund enables Dr. Delgado-Escueta and his team of researchers and clinicians at UCLA to jumpstart the IV Gentamicin therapy. It also will enable him to pursue the next crucial step, which is gene replacement for these children. In 2010, your support will do more than improve the quality of life for countless youngsters who are afflicted with this dreadful disease. It could be the year that takes researchers closer to finding a cure and ending the suffering. While Lafora may be an “orphan” disease, the results of Dr. Delgado-Escueta’s protocols might provide significant advances and accelerate research in other degenerative diseases of the brain such as Alzheimer’s, Parkinson’s, and associated genetic epilepsies, which afflict millions of people all over the world.