Research Project
Funding Opportunity

Cerebral Palsy ALLIANCE RESEARCH FOUNDATION

METABOLEMIC FINGERPRINTS OF NEWBORN BABIES

A New Method for Identifying Risk for Cerebral Palsy

Neonatal brain injury is an important cause of cerebral palsy and other developmental disabilities. Therapies have typically targeted individual pathways during early phases of injury, but targeting pathways later in the injury response may be more effective. New and advanced brain imaging techniques will allow for early identification of babies at risk for cerebral palsy and, in turn, pave the way for translational studies to prevent cerebral palsy.

PROJECT BACKGROUND

Therapeutic hypothermia (TH), while being standard of care for hypoxic-ischemic encephalopathy (HIE), provides protection for only 60% of babies. Our overarching hypothesis is that the metabolic state of the brain immediately after TH differs markedly between hypothermia responders and non-responders. Changes in intracellular "metabolic fingerprints", or metabolomics, can identify tissues at risk for continued energy failure and resultant permanent injury to the brain. The newly developed hyperpolarized carbon-13 (HP-13C) MRI offers the ability to detect metabolic changes in near real-time. Pre-clinical animal studies are still needed to determine and evaluate the physiological differences between adults and pediatric patients as well as varying disease conditions.

Our aim is to determine the metabolic profiles that correspond to improved functional and structural outcomes. We will accomplish this by measuring the metabolic fingerprints in the brains of newborn babies with HIE and correlating them with outcomes in early adulthood.

RESEARCHER

Dr Donna M Ferriero, MD MS
Distinguished Professor
Departments of Pediatrics and Neurology
675 Nelson Rising Lane
Box 0663
San Francisco CA 94158

FUNDING REQUIRED

$180,000 over 2 years