

## Tools and Resources for the SMA Biomarker RFA

A new [SMA Biomarker Study funding opportunity](#) has been announced by the [National Institute of Neurological Disorders and Stroke](#) (NINDS) of the National Institutes of Health (NIH). It solicits studies designed to evaluate potential biomarkers and clinical outcomes across the spectrum of SMA severities for use in clinical trials. A biomarker is any biochemical, molecular or cellular measure that is useful for monitoring or evaluating normal or abnormal biological processes. Several tools and resources are now available that may be useful for potential applicants:

- **Biomarkers for SMA (BforSMA) study**: The SMA Foundation completed the BforSMA study to discover biomarkers in an unbiased manner that correlate with disease severity. Through the participation of 130 children at 18 clinical sites, candidate biomarkers were found that significantly differentiated between disease and control groups and correlated with SMA disease severity. A manuscript describing the results of the study has been submitted for publication. The entire BforSMA dataset is available for download through an [on-line searchable database](#) to be available in July of 2011.
- **SMA Plasma Protein Biomarker Panel**: The SMA Foundation is working with [Rules-Based Medicine](#) to confirm plasma protein biomarker candidates previously identified from the BforSMA study using their unique Multi Analyte Profiling (MAP) technology, and to generate a specific panel of biomarker assays from the new and confirmed candidate markers that can be validated by the SMA community.
- **SMN-ELISA**: The SMN enzyme-linked immunosorbent assay (ELISA) is a complete kit for the quantitative determination of SMN protein levels in human tissues available through [Enzo Life Sciences, Inc.](#) Using the SMN ELISA, the Foundation has conducted experiments aimed at developing an optimized protocol for measuring SMN in peripheral blood mononuclear cells (PBMCs).
- **SMN1/2 transcript quantification kit**: The absolute SMN1/2 transcript quantitative PCR method developed by [Tiziano et al. \(2010\)](#) is available as a kit from [RealGene](#).
- **SMA Tissue Repositories**: The Pediatric Neuromuscular Clinical Research (PNCR) Network has a Molecular Genetics Core at Columbia University that analyzes genetic samples from patients and maintains a database of molecular genetic results. Columbia University has established a [biorepository](#) to store a collection of clinically characterized cell lines and tissue samples from patients with SMA. Human tissue can also be accessed through the [NICHD Brain and Tissue Bank for Developmental Disorders](#) hosted by the University of Maryland School of Medicine. Cell lines derived from SMA patients are available through the [Coriell Institute for Medical Research](#).

- **Animal Models:** Several SMA mouse models are available. In general these models are genetically designed to be deficient in mouse SMN protein and also have varying numbers of human SMN2 genes reintroduced into their genome in an effort to recapitulate a range of disease features and severities. The SMA Foundation has partnered with [The Jackson Laboratory \(JAX\)](#) to support the importation of mouse models of SMA into the JAX mouse repository. To date, ~40 lines have been imported.