

## NCS Highlights the Importance of Automation in Biobanking

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To say that a longitudinal study of 100,000 children – from pre-birth to 21 years – is challenging and complex is quite an understatement. But that’s precisely what the [National Children’s Study](#) (NCS) is authorized to do. More precisely, the NCS is studying the effects of environmental factors, including air, water, diet, sound, family dynamics, community and cultural influences, and genetics “on the growth, development and health of children across the U.S.”

Tens of millions of biological samples (e.g., urine, blood, breast milk, hair and nail clippings) must be collected along with environmental samples, such as dust, water, soil from subjects’ homes, so that researchers can identify possible correlations to future disease or disability. Then these samples must be placed in reliable, long-term storage: This is biobanking on a massive scale.

Despite its outsize scale, the NCS offers lessons that are useful across biobanks of all sizes. Foremost among these lessons is – **automate wherever possible**. For the NCS, automation exists at many points across workflows. This includes automated DNA extraction systems, robotic aliquoting systems and automated tube labeling, each implemented ONLY after establishing baselines for yield and purity, using non-automated processes, to prove the efficacy of automated alternatives.

Automation isn’t a new concept in biobanking – in fact, at the end of last year [Frost & Sullivan estimated](#) that the market reached \$818 million in 2011 on its way to \$1.4B in 2018. Products covered in this market assessment include automated liquid handling systems and robotics, automated compound storage and sample management systems, laboratory information management systems (LIMS) and related consumables.

Without oversimplifying the massive and unique requirements of the NCS (a more comprehensive overview can be downloaded [here](#)), automation has clear benefits that speak to single-location facilities as well as geographically dispersed operations. In addition to obvious cost and time savings, automation provides assurances of technical alignment with industry best practices, something that will go a long way as new models, such as virtual and/or shared

biobanks, emerge. Although we're far from standardizing how biobanks operate, automation is at least a step in this direction.

We're interested in progress you've made toward automation. What has worked best? What hasn't worked? Please share what you've learned with others – or your questions – in the comments below.