

NTP Projects Utilizing the NIEHS Clinical Research Unit

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The National Toxicology Program (NTP) is recognized for its research involving experimental animals and *in vitro* models, but increasingly has interest in collaborating with the NIEHS Clinical Research Unit (CRU) to pursue research involving human subjects. In brief, NTP staff outline the scientific rationale for a study and basic design elements and CRU staff take the lead in moving the project forward, including review by the Clinical Advisory Committee (CAC) and the Institutional Review Boards (IRBs). Following IRB approval, the CRU implements the protocol. CRU staff contributions are both scientific and administrative.

The NTP Office of Health Assessment and Translation (OHAT) has collaborated with the CRU on four projects, two of which are completed and have been published.

Two projects relate to better understanding of the [pharmacokinetics of bisphenol A](#) following oral or dermal exposure. The oral portion has been completed and published and the dermal arm is in progress (preliminary results available in attachment A).

Thayer, K. A., D. R. Doerge, D. Hunt, S. H. Schurman, N. C. Twaddle, M. I. Churchwell, S. Garantziotis, G. E. Kissling, M. R. Easterling, J. R. Bucher and L. S. Birnbaum (2015). "[Pharmacokinetics of bisphenol A in humans following a single oral administration.](#)" *Env Int* **83**: 107-115.

One project was designed to determine if handling receipt paper by cashiers results in measurable absorption of BPA or the BPA alternatives, bisphenol S (BPS) and 4-hydroxyphenyl 4-isopropoxyphenylsulfone (BPSIP).

Thayer, K. A., K. W. Taylor, S. Garantziotis, S. Schurman, G. E. Kissling, D. Hunt, B. Herbert, R. Church, R. Jankowich, M. I. Churchwell, R. C. Scheri, L. S. Birnbaum and J. R. Bucher (2016). "[Bisphenol A, bisphenol S and 4-hydroxyphenyl 4-Isopropoxyphenylsulfone \(BPSIP\) in urine and blood of cashiers.](#)" *Environ Health Perspect* **124**: 437-444.

The fourth project is a collaboration between NIEHS and EPA to improve characterization of personal care product and home exposures. This project was presented to the NTP BSC as a concept during its June 17-18, 2014 meeting (see <http://ntp.niehs.nih.gov/go/9741>) and has received NIEHS IRB approval and is expected to begin recruitment soon.

The NTP Biomolecular Screening Branch (BSB) is collaborating with the CRU on one project designed to determine if women who are regular users of black cohosh herbal supplements show any of the same biological effects (genetic damage and macrocytic anemia) noted in NTP studies with black cohosh extract in female rats and mice. A variety of standard hematological endpoints are being assessed in study participants including complete blood counts, hematocrit, folate and B12 levels, and frequency of micronucleated erythrocytes.

Mercado-Feliciano M., Cora M.C., Witt K.L., Granville C.A., Hejtmancik M.R., Fomby L., Knostman K.A., Ryan M.J., Newbold R., Smith C., Foster P.M., Vallant M.K., Stout M.D..(2012) An ethanolic extract of black cohosh causes hematological changes but not estrogenic effects in female rodents. *Toxicol Appl Pharmacol* **263**:138-147.