



# Health Protection – chemical substances

## Ambient Monitoring

external exposure

chemicals:

in air,  
soil,  
water

## Biological monitoring

internal exposure

hazardous substances,  
Metabolites

in blood, urine

biochemical effects

protein adducts  
DNA adducts

biological effects

cytogenetic parameters

enzymes,  
enzyme levels

disease

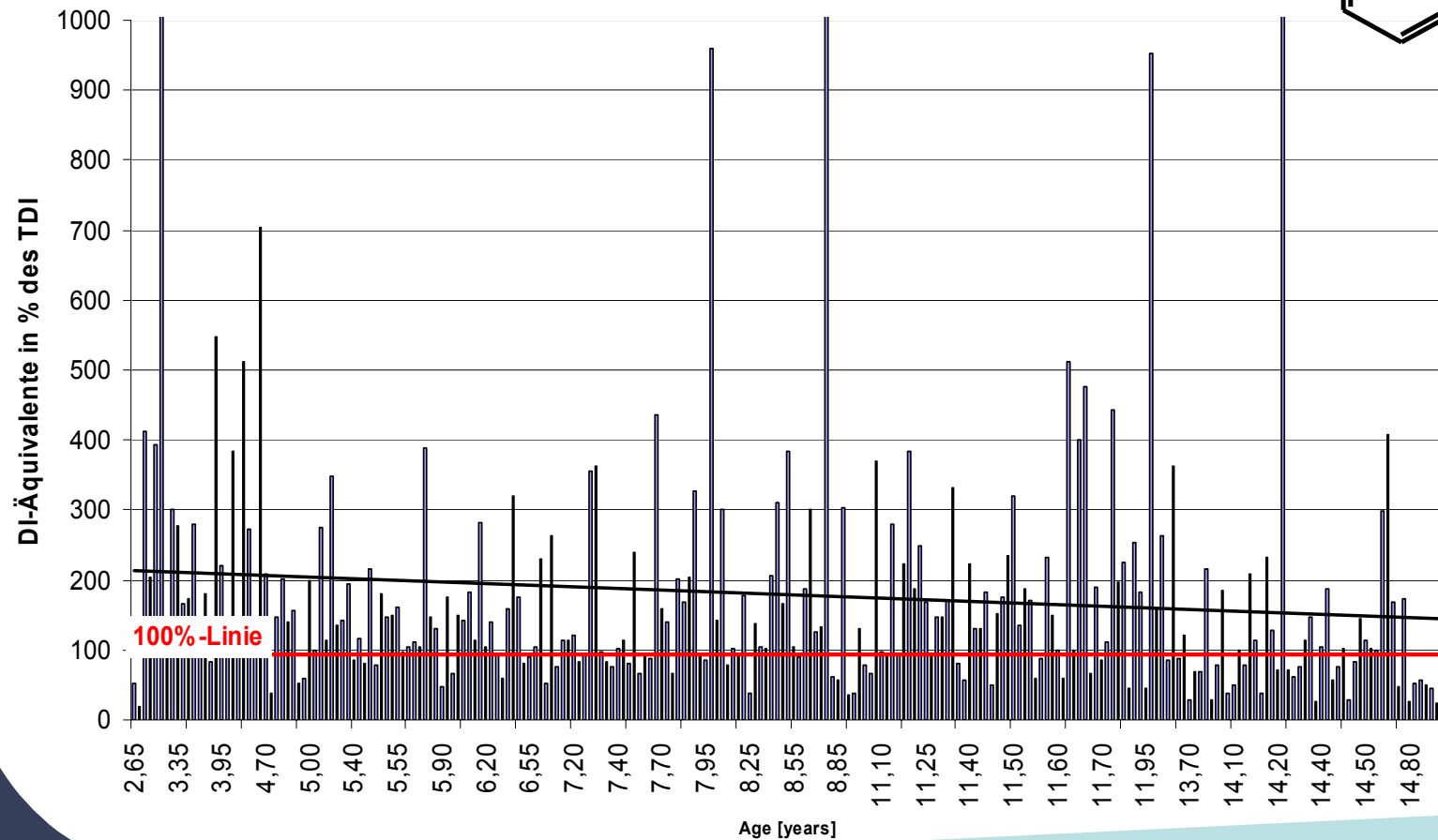
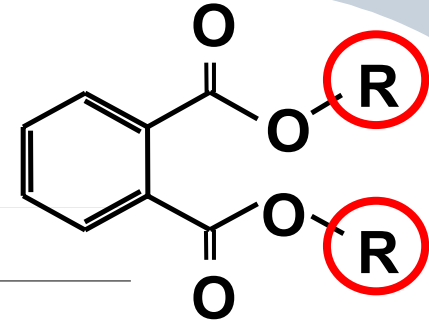
importance for estimating the risk



Uni Erlangen,  
Germany

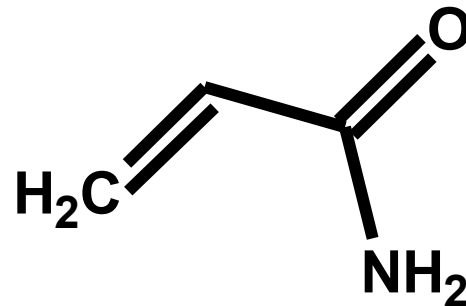
# Phthalates – Exposure – Children Survey / Germany

$\Sigma$  daily intake in % of TDI for DBP, BBzP, DEHP





## Acrylamide - Exposure and Risk Calculation



carcinogen  
diet

**population study Bavaria 2005: Hb-adducts**

n=825; age: 4-84 years; nonsmokers

**uptake (Median):**

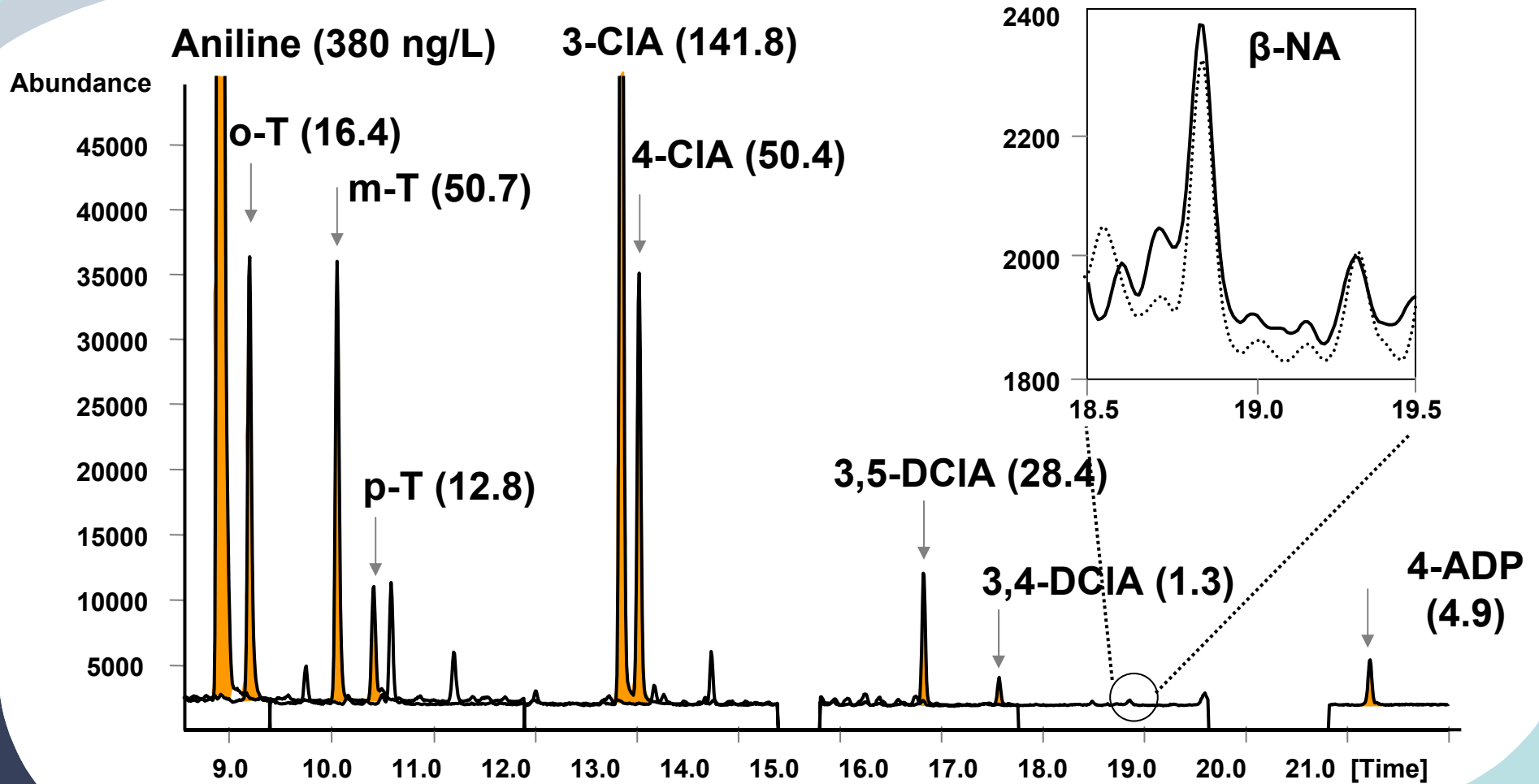
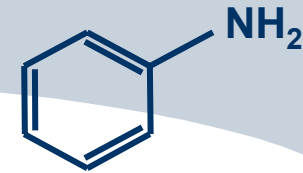
**0.4 µg/kg bw**

**Risk calculation:**

**30/180 cancer cases x 10<sup>-5</sup>**  
(WHO, US EPA, bfr)



# Aromatic Amines – Hb adducts [ng/l] Blood of a nonsmoker





# PAH – German Environmental Survey / Children (n=667)



Benzo[a]pyren

## 1-OH-PYRENE IN URINE

