

Biologic monitoring



EXPOSURE – DISEASE MODEL

- ◆ 1. substance in medium (Measure levels)



- ◆ 2. Internal Dose (Biologic monitoring of exposures)



- ◆ 3. Biologic Effect (Biologic monitoring of effect)



- ◆ 4. Clinical Disease (Diagnosis & Rx)

Ambient monitoring
in air, soil
water, diet etc.

External exposure

Chemicals

Biological monitoring

in blood, urine

Internal exposure

Toxins,
metabolites

Biochemical effects

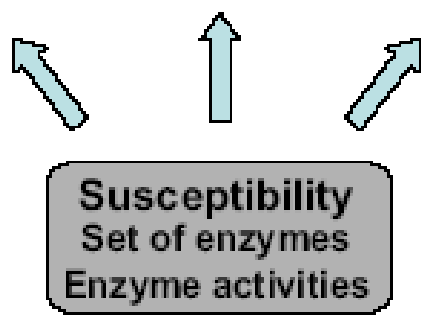
Protein adducts
DNA adducts

Biological effects

Cytogenetic,
immunological
parameters

Diagnosis
of the patient

Health impairment,
illness



1. Scheme of ambient and biological monitoring (modified acc. DFG, 2002; Angerer and Gündel,