

Merepõhja häiringud Soome Lahes: keskkonna- ja terviseriskid kemikaalide remobiliseerumisel

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Eesti elurikkuse andmebaas

HELCOMi eesmärgid: 2020

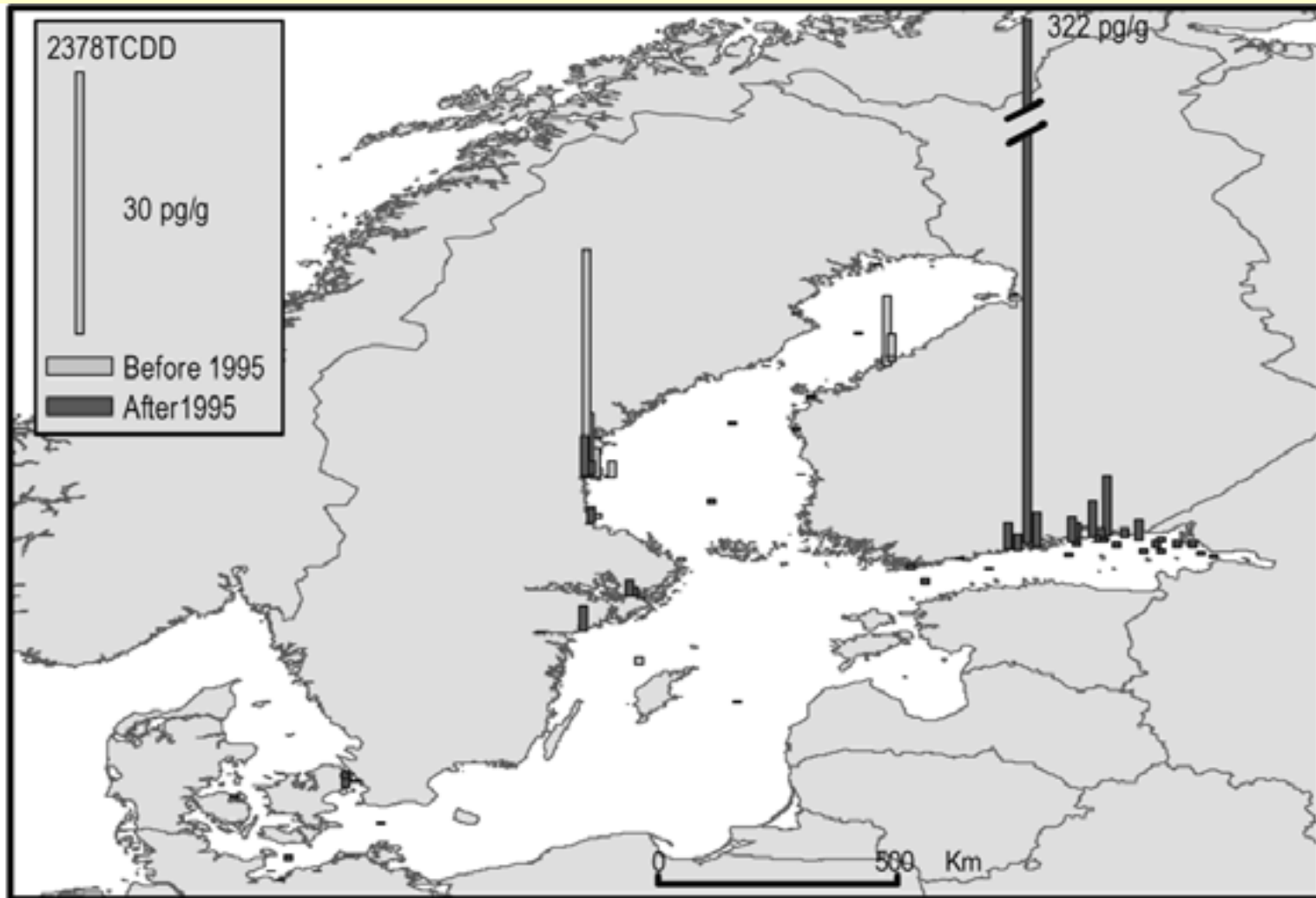
Krakow, 2007

- (1) **concentrations of hazardous substances close to natural levels;**
- (2) all fish safe to eat;
- (3) healthy wildlife;
- (4) radioactivity at pre-Chernobyl level.

Kavandataavad merepõhja häiringud

- Miinide lõhkamine (kraatrid $d=2.5-5$ m, sügavus 0.5-1 m). Espoo EIA: 30 miini; Soome EIA: 600-900 miini. Väide keskkonnamõju kohta: **minimaalne**.
- Ehitustööd - süvendamine ja 1 milj. t graniitkillustikuga katmine. Väide keskkonnamõju kohta: **mõju puudub**.
- Ohtlikke aineid on uuritud osaliselt ning ainult 5 cm paksuses pinnakihis.

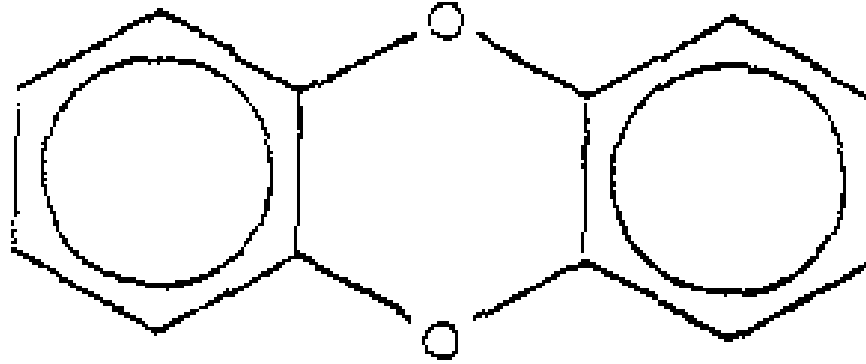
Dioksiin 2378 TCCD anomaalia Kymi jõe suudmes



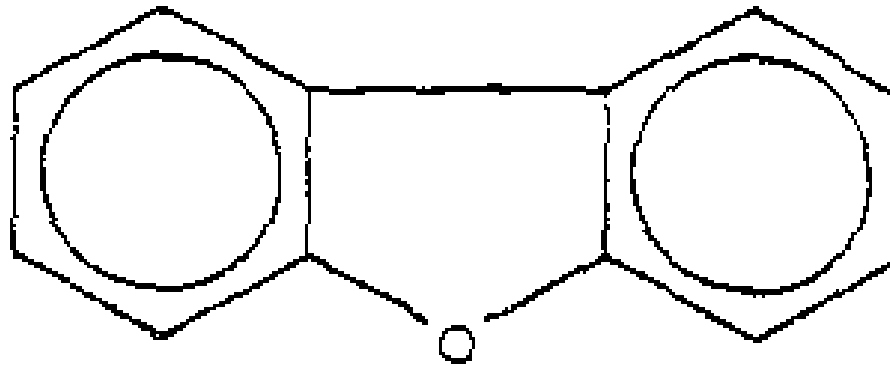
“The post-1986 sediments in the studied sedimentation basins in front of the Kymijoki River estuary are 8-17 cm thick. During the last 30 years, the surface concentration of PCDD/Fs has decreased by about 50%. (Isosaari, 2004, PhD thesis).



FIGURE 5-1. A map of the Gulf of Finland, showing the impact area of the Ky 5 release from the Kymijoki River (I, Table 3) and the main sampling sites (I, II). Sampling sites for sediment cores have been named.



Dibenzo-p-Dioxin



Dibenzofuran

Figure 1. Structure of dibenzo-p-dioxin and dibenzofuran.

Ligands enter cell

Receptor binds ligand

AhR
XAP2
hsp90
hsp90

ARNT

DREs CYP1A1

Other factors?

DREs Other genes

mRNA

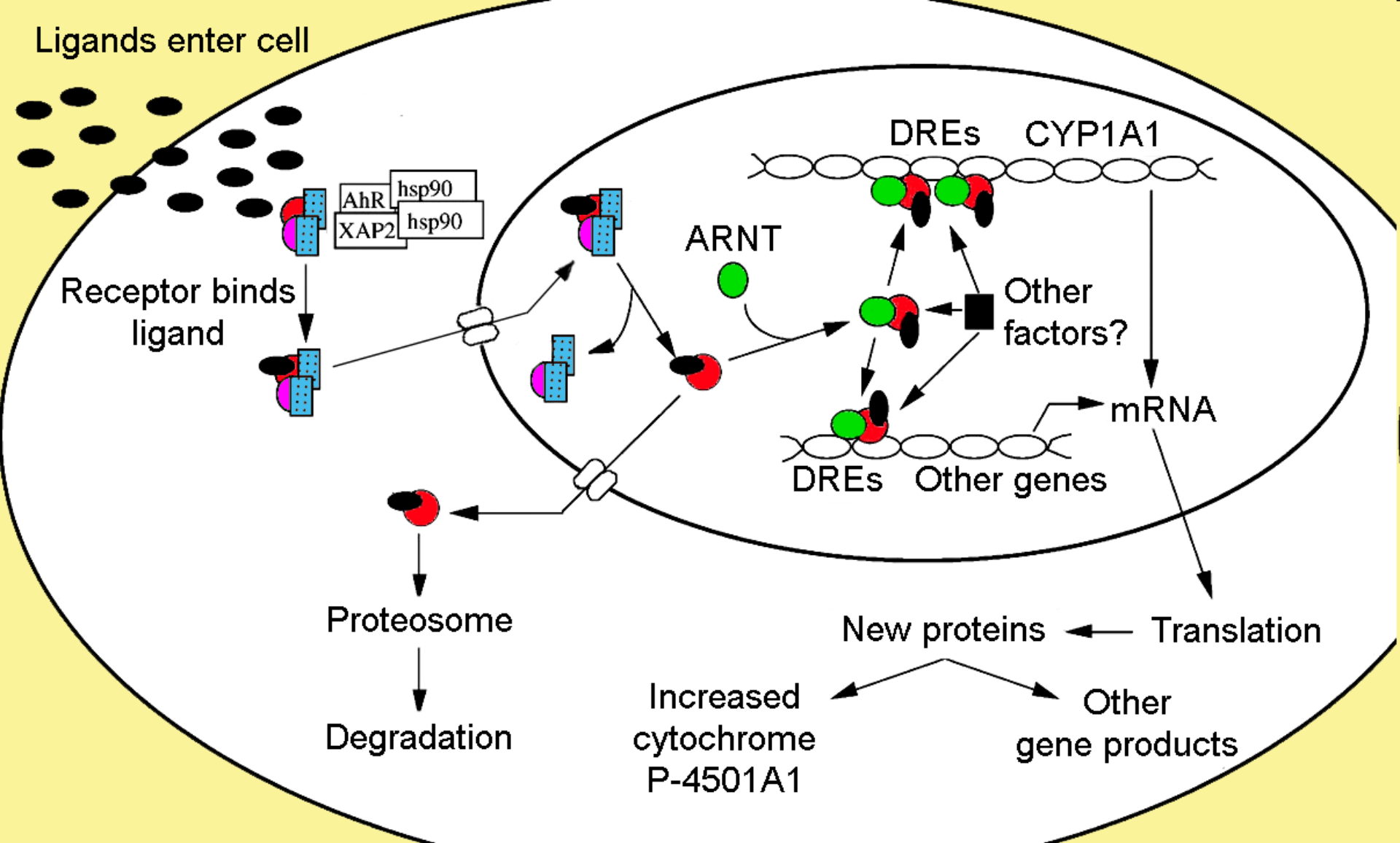
Proteasome

Degradation

New proteins ← Translation

Increased cytochrome P-4501A1

Other gene products



Mehhanismid

- Remobiliseerumisel põhjasetetest satuvad dioksiinid ja metüül-Hg toitumisahelasse.
- Kalad (eriti räim ja lõhe) kontsentreerivad dioksiine. Soomes norm ületatud 2x ja Venemaal lubatud 1,5x suurem norm EU normist.
- Mõned dioksiini erimid tungivad rakkudesse, mõjutades DNA-d.
- Suurimas ohus rasedad ja imetavate emade lapsed (dioksiinide 50x kontsentreerumine).

Toksilisus ja terviseriskid

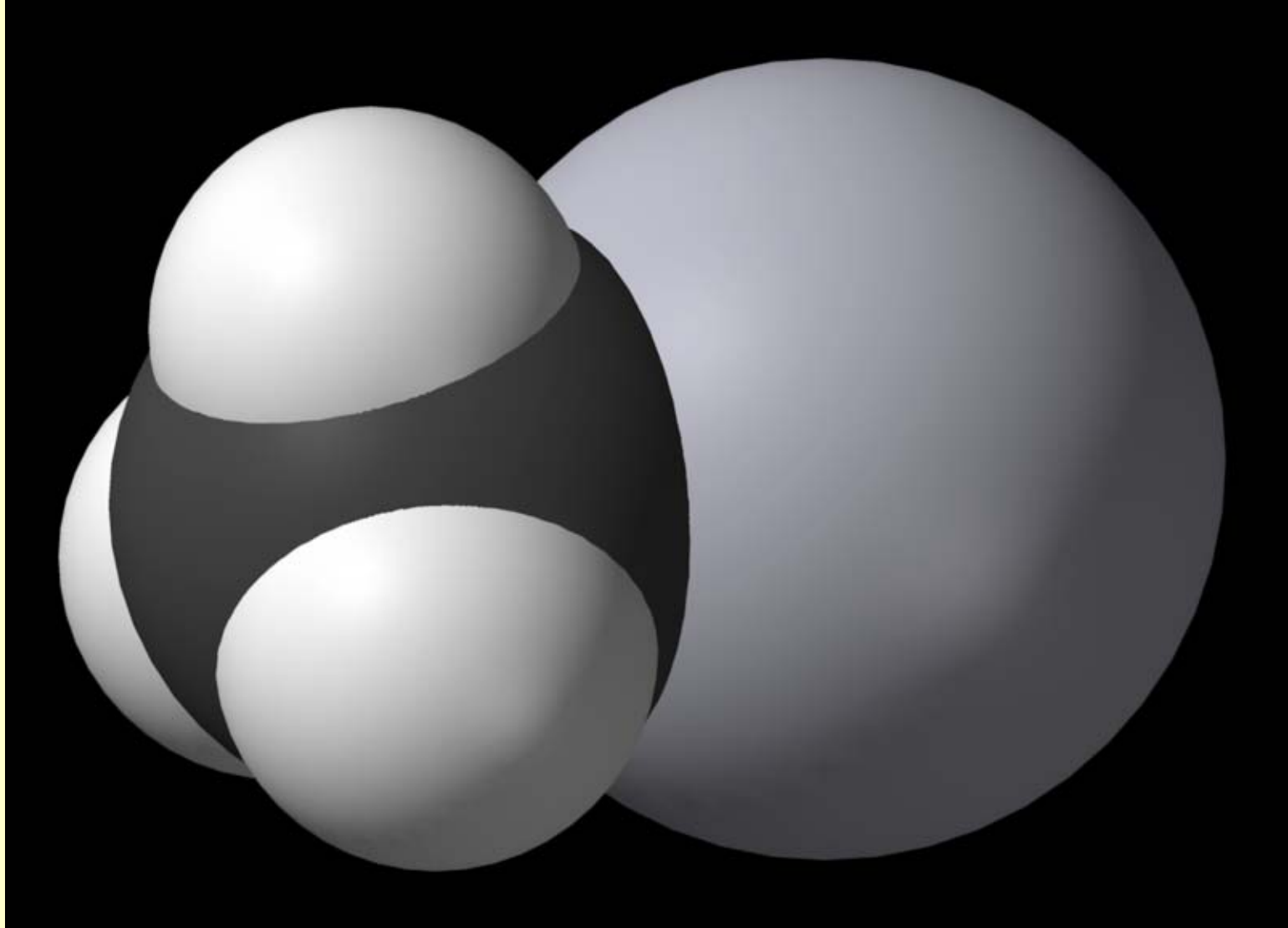


- kloorakne, rinnapiima mõjul hammaste väärarengud, kantserogeensus, loodete ja laste luustiku väärarengud.



- Soomes on dioksiinide kriitilised kontsentratsioonid on juba praegu räimes ja lõhes, Hg haugis. (EVIRA: süüa 2 räime kuus, rasedatele haug keelatud).





Metüülelavhõbe - $\text{H}_3\text{C} - \text{Hg}^+$, seostub tsüsteiini sisaldavate valkudega kovalentse sideme kaudu

Human health effects

Ingested methylmercury is readily and completely absorbed by the gastrointestinal tract. It is mostly found complexed with free cysteine and with proteins and peptides containing that amino acid. The methylmercuric-cysteinyl complex is recognized by amino acid transporting proteins in the body as methionine, another essential amino acid.[10] Because of this mimicry, it is transported freely throughout the body including across the blood-brain barrier and across the placenta, where it is absorbed by the developing fetus. Also for this reason as well as its strong binding to proteins, methylmercury is not readily eliminated. Methylmercury has a half-life in human blood of about 50 days.[11]

Several studies indicate that methylmercury is linked to subtle developmental deficits in children exposed in-utero such as loss of IQ points, and decreased performance in tests of language skills, memory function and attention deficits.[12]