

### Work Package 4 Laboratory testing under controlled conditions

4.1 Per A. Clausen	Dust particle chemistry and dynamics
4.2 Anne Mette Madsen	Transport mechanisms of microbiological contaminants
4.3.1.1 Torben Sigsgaard	Human exposure to chitin
4.3.1.2 Ingunn Riddervold	Human exposure to [ozone + dust]
4.3.2 Peder Wolkoff	Animal bioassay testing

### Work Package 4.1 Laboratory testing under controlled conditions

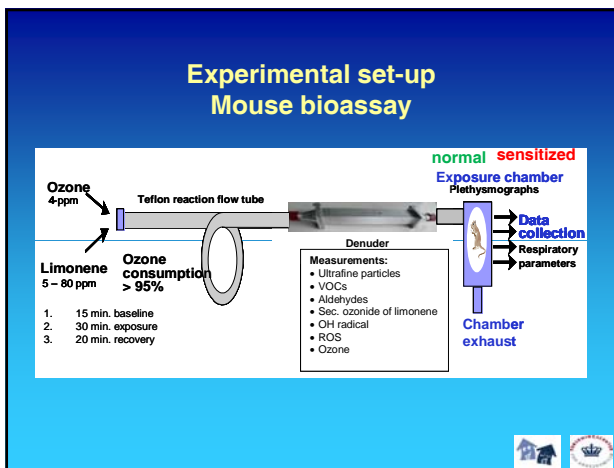
Per A. Clausen      Dust particle chemistry/dynamics

2010-2011:

- Paper about temperature dependent DEHP emission 2nd review process
- DEHP dust emission study needs some additional experiments before writing up

2011-2012:

- Long-term emission from dust particles exposed to ozone (WP4.3.1 support)



### Formaldehyde hypotheses "humidity and sensitization"

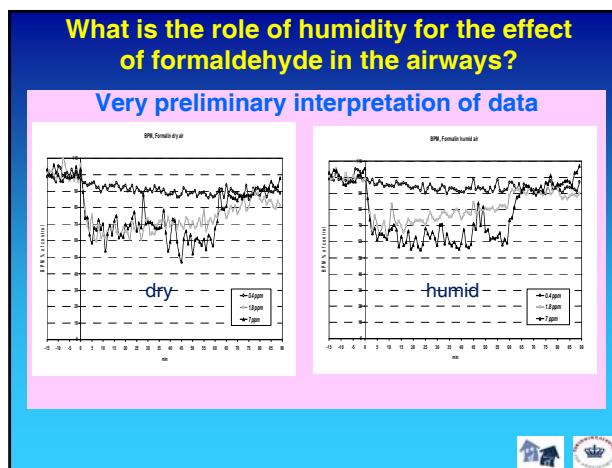
- Dry conditions exacerbate sensory irritation?
- Dry conditions cause effects in lower airways?
- Sensitization cause exacerbation?
- Sensitization and dry conditions amplify the effects?

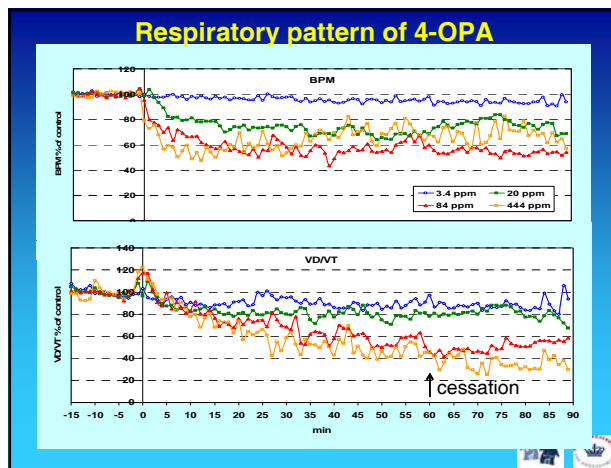
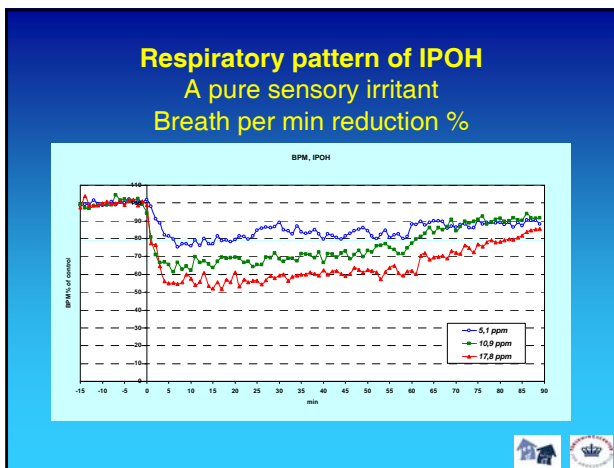
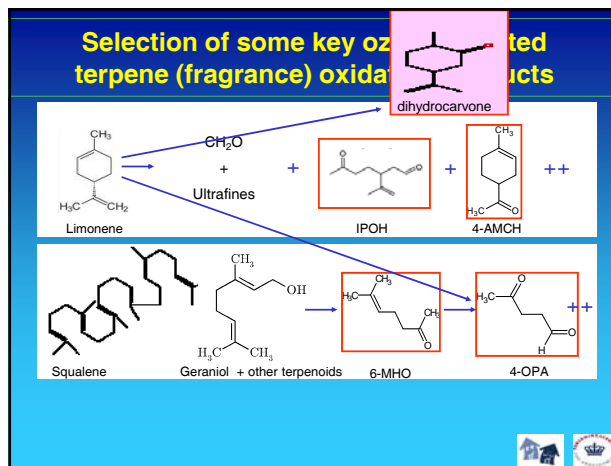
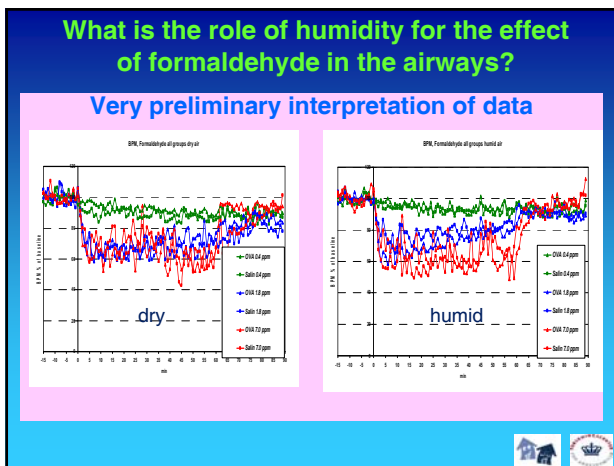
### Formaldehyde 2010-2011 Nitrogen dioxide 2012-2013 Test protocol BALB/ca male mice

Days						
0	14	21	28	29	30	31
+	Boost	Boost	Aerosol Ovalbumin	Aerosol Ovalbumin		Formaldehyde exposure
				Rel. hum.	Rel. hum.	Rel. hum.
-				Rel. hum.	Rel. hum.	Rel. hum. Bronchoalveolar lavage

+ = Immunization  
- = Immunization

Relative humidity (Low, medium, high)  
3 different concentrations around RD<sub>50</sub>





### RD<sub>50</sub>, LOAEL, REL values (mg/m<sup>3</sup>)

Compound	RD <sub>50</sub>	LOAEL*	REL*	Effects	
				Sensory irritation	Lung effects
(+)-Limonene	6000	392	54		-
4-AMCH	3390	240	24	(+)	+
6-MHO	6190	403	56		+ moderate
IPOH	~130	~15	~0.25	+ strong	-
4-OPA	nd			1-10 min strong	10-30 severe
Dihydrocarvone	?	?	?	?	?
CH <sub>2</sub> O	5	0.75	0.003	strong	-

\* Kuwabara et al. EHP 115 (2007) 1609-1616 - for the general population.

### Comparison of sensitization index, in vitro and in vivo data

Compound	In vitro effects		In vivo effects	
	Sensitization potential index	Lung cells inflammatory mediators	Sensory irritation	Lung effects
(+)-Limonene	0.18		-	-
4-AMCH	0.25		(+)	+
Dihydrocarvone				
IPOH	0.81		+ strong	-
6-MHO	0.23		-	+ moderate
4-OPA	0.52	IL-6, TNF-α, GM-CSF	1-10 min strong	10-30 severe
	"Predicted" Forester and Wells, 2009	Andersson et al. 2010 *α-terpineol + O <sub>3</sub>		This work

Additional data for 4-OPA: 31% 6-HHO + \* 0.6% 4-OPA no sign. effect