

Inneklimat och hälsa



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Dagsprogram

Vad vet vi om inneklimat och hälsa-egentligen?
Hur hanterar vi inneklimatproblem?
Är mögel så farligt som folk tror?

Praktiska fall / frågor /diskussion
www.orebroll.se/amm

Fjällglimten stängs - drabbat av mögel

Myrviken (SP) De "sjuka gnällkärningarna" hade rätt. Fjällglimten är ett mögelhus. I går kom svaret på de prover som tagits. Facket beslutat att omedelbart stänga väderstent. Boende och personal ska så fort det går flyttas över till Asarna.

Så det vi tidigare fick veta. Vi hade inte ordet lågare, säger Anna Lindgren, en av de sju kärningarna som arbetar på Fjällglimten i Myrviken. Anna har varit sjuk länge och hälsoproblem, som även meddelat tvärs på fötterna och på händerna.

Känner sig kränkta När det handlar om sju kärningar som inte kan arbeta på sjukhuset har blivit menade och kränkta av brandbolaget och kommunen som inte vill ha "sjuka gnällkärningar".



Sjuk-huset



Avdelning på Astrid Lindgrens barnsjukhus stängs efter allergiarm

En avdelning på Astrid Lindgrens barnsjukhus stängs efter allergiarm. Detta beror på att det inte är möjligt att sanera huset. Detta beror på att det inte är möjligt att sanera huset. Detta beror på att det inte är möjligt att sanera huset.





Indoor Climate and Health – What do we **really** know?



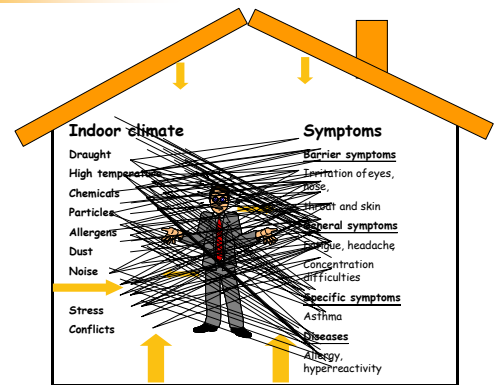
Kjell Andersson MD, MSc

The International Academy of Indoor Air Sciences. Deadly Household Pollution: A call for Action



Nature 447, 236-237 (17 May 2007) | doi:10.1038/447236a; Published online 16 May 2007

- Premature deaths
- Respiratory diseases
- TB
- Cancer
- Poisoning
- etc.



A lot of statistical associations have been published !!!

- Moisture/mould damaged environments – health effects ...
- Insufficient ventilation – symptoms ...
- Women report more symptoms than men do ...
- Those with allergic diseases report more symptoms from the mucous membrane and skin ...

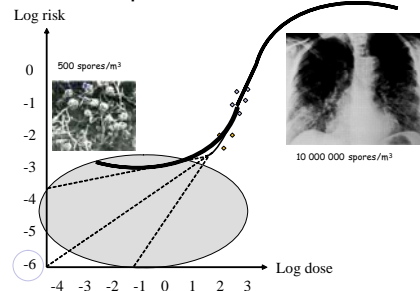
BUT

We do not usually

- know the agents of cause ...
- know the mechanisms ...
- understand why some people react the way they do




Low dose extrapolation



Sigsgaard T. 2007

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Case I



Floor with casein-containing self-levelling screed

Restoring cost 100 million US\$

www.orebroll.se/amm

protein $\xrightarrow[\text{high pH}]{\text{moisture}}$ amino acids \rightarrow products

ammonia

plasticizers \leftarrow \rightarrow discoloured oak

alcohols

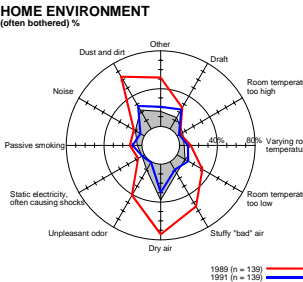
TVOC_{mean} 127 µg/m³

NH₃ < 1 ppm in the indoor air

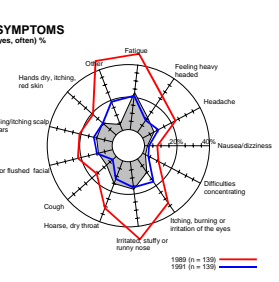
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HOME ENVIRONMENT (often bothered) %



SYMPTOMS (yes, often) %




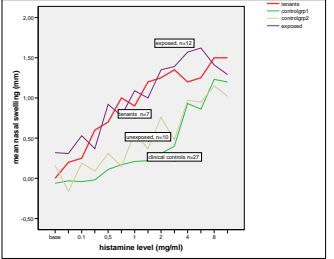
1989 (n = 139) 1991 (n = 139)

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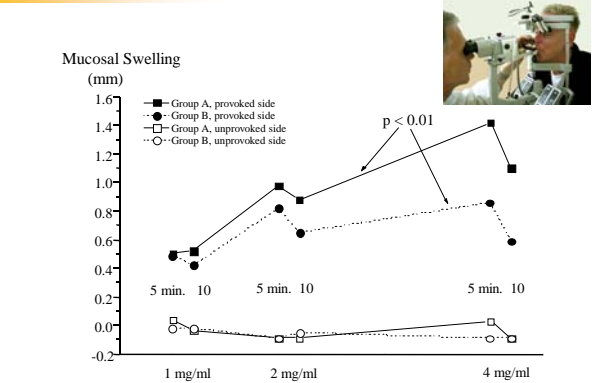
Factor/symptom	1989 (%)	1992 (%)
Stuffy "bad" air	65	6
Dry air	81	6
Unpleasant smell	28	4
Noise	18	11
Dust	79	18
Fatigue	50	10
Eye irritation	28	10
Nasal irritation	54	10
Dry facial skin	24	3

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Mucosal Swelling (mm)

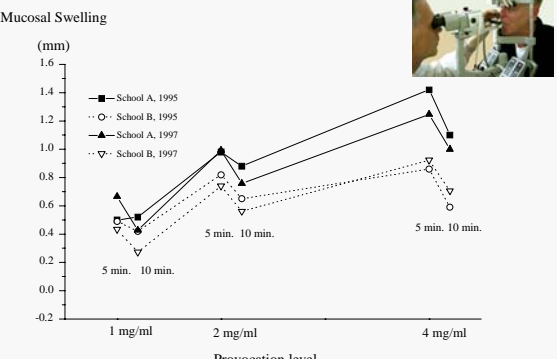


p < 0.01

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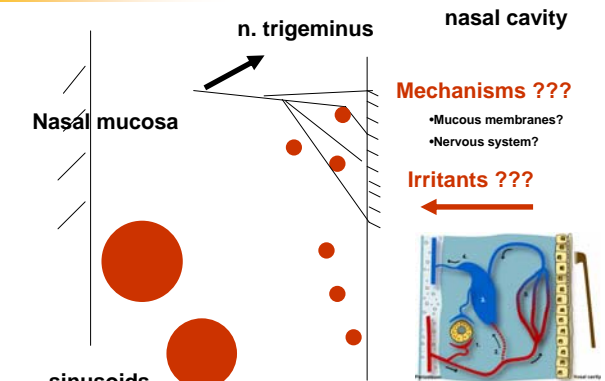
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Mucosal Swelling (mm)



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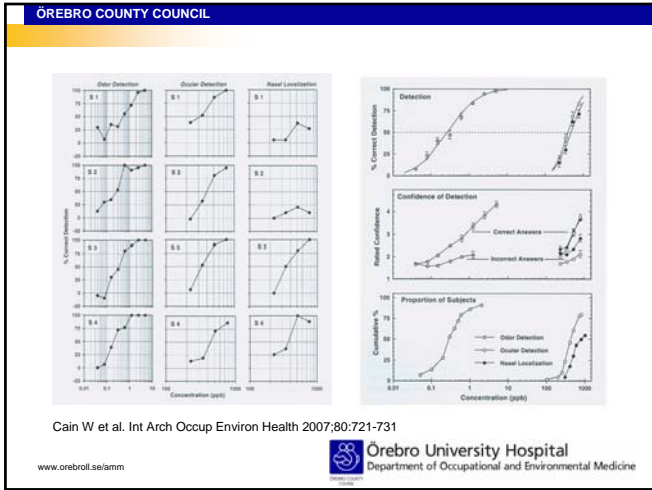
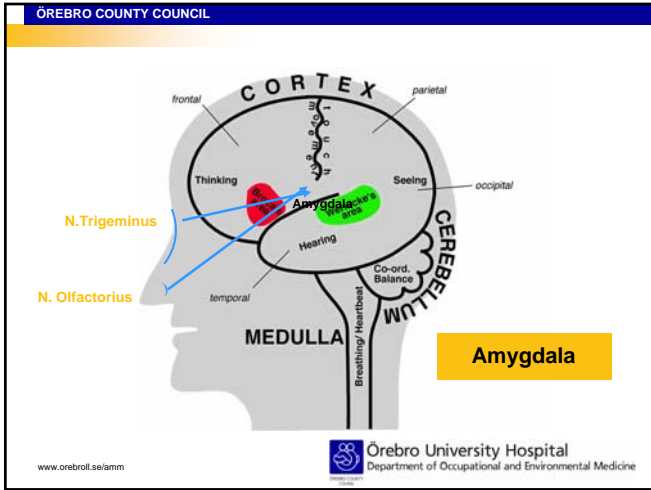
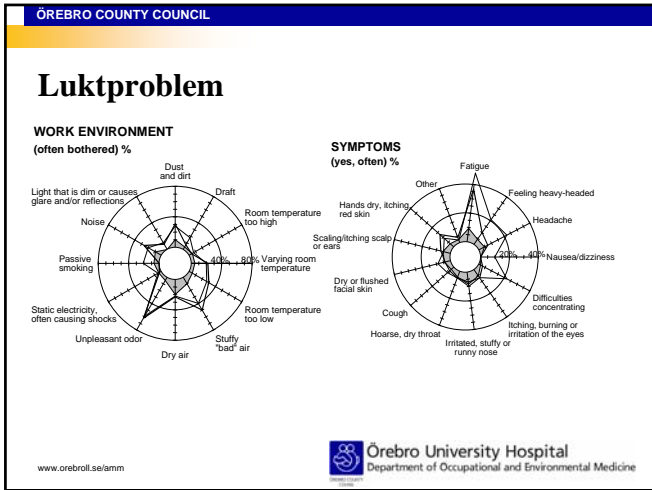
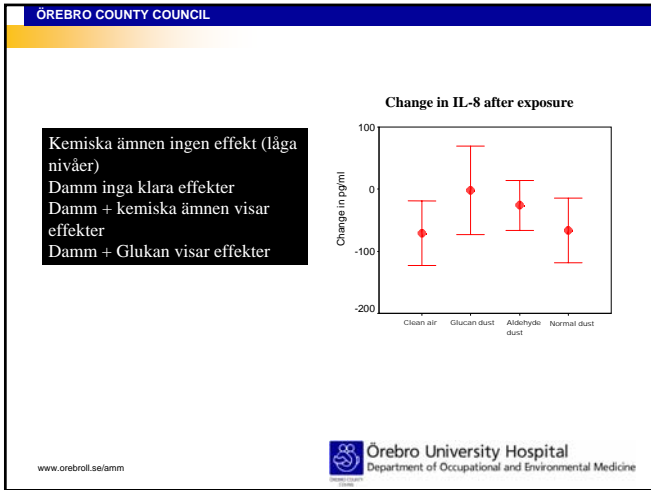
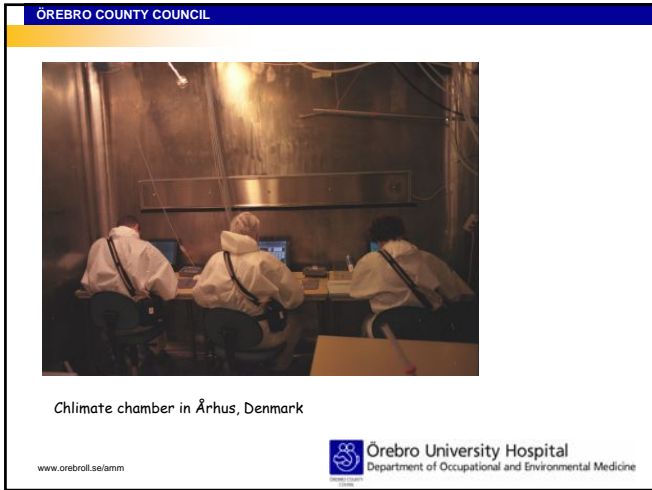
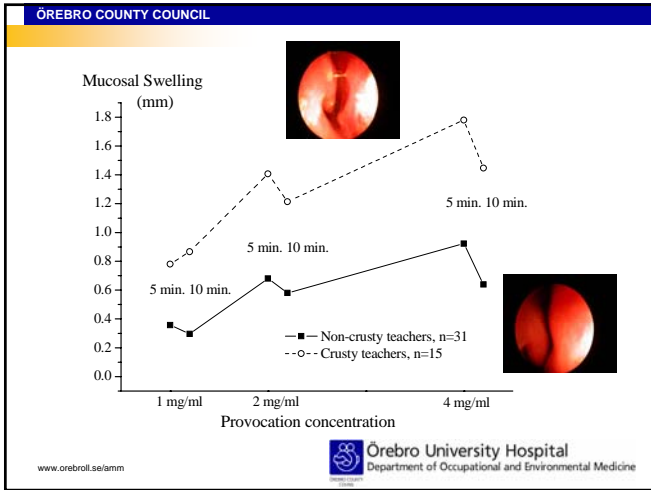


Mechanisms ???

- Mucous membranes?
- Nervous system?

Irritants ???

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Flytten tillbaka till Presidenten oroar



Experiences:

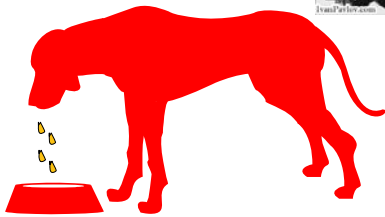
"As soon as I enter the building, my nose starts running"

Some people cannot go back to work despite successful restoration

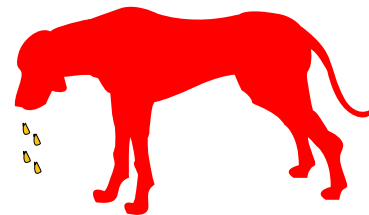
WHY?



EDDA in front of the food



Conditioning



Ur: van den Bergh et al., Scan J of Psych, 2002

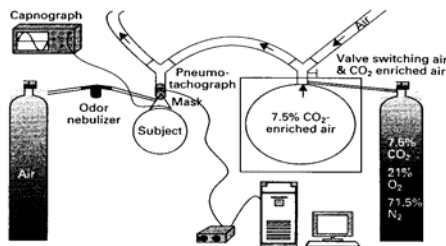


Fig 1. Schema of the experimental set-up for an odor-CO₂ inhalation paradigm.

Factors

Symptoms

smells	negative	↗
	positive	→
mental pictures	negative	↗
	positive, neutral	→
	status	↗
	worry, anxiety	↗



The Museum of Modern Art in Stockholm

Case II
Mould at the Museum of Modern Art in Stockholm (2001)

"sniffer dog findings"

Scared, stressed people
Strange allergy tests (75 % pos SPT)
The personnel had not noticed this "allergy"



Pricktest

"Mold misery"

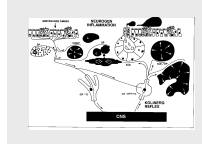
Costs: 65 million US\$

Result:

- Symptom reduction (within months)
- Normalised allergy tests (SPT and RAST)
- Frozen samples showed normal RAST-test, no positive mould test (2004)

Why this outcome in allergy tests?

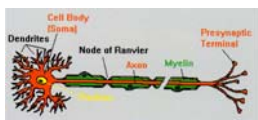
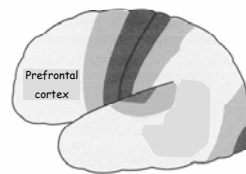
- Exposures???
- Stress??
- Mood?? (Zacharei B, Aarhus University)
- Nervous system? Histamine sensitivity?



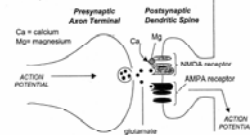
Body and brain are interacting !!!

The main characteristics of the human brain

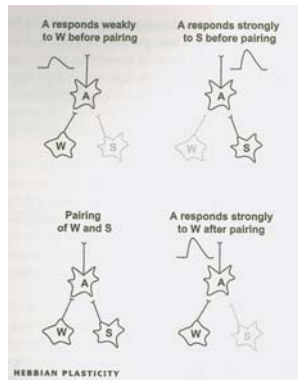
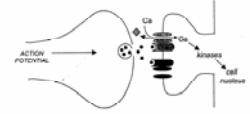
- extreme work distribution
- integrating associative cortex areas



Step 1: Glutamate binds to AMPA receptors and initiates action potential

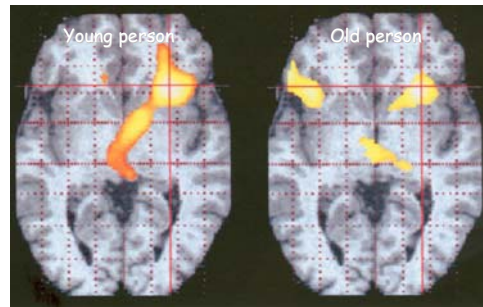
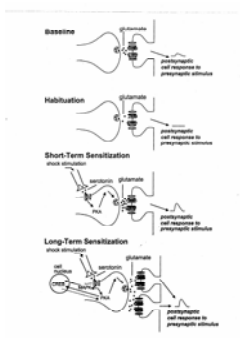
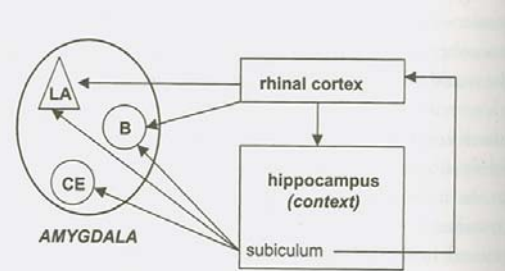
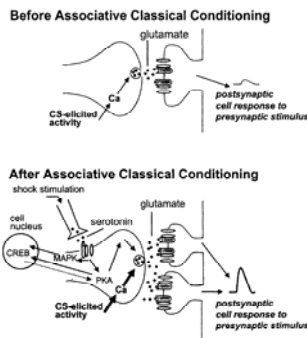
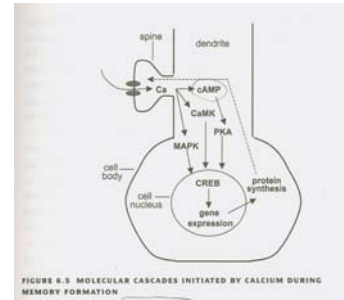
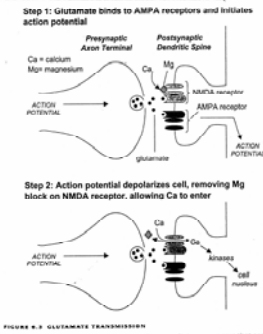


Step 2: Action potential depolarizes cell, removing Mg block on NMDA receptor, allowing Ca to enter



Terje Lømo
Tim Bliss

LTP



Source: R Cabeza & L. Nyberg, 2000

Life has changed – but we still have the "same" body and brain



Basic criteria for survival

Homeostasis
Protection against enemies

Regulatory systems – hypothalamus etc.

Immunological system

macrophages – first line defence

innate system

adaptive system – IgE, IgG etc.

Psychoneurological mechanisms

"Stress" systems

HPA-axis (Hypothalamic-Pituitary-Adrenal)

sympathetic nervous system (adrenalin etc.)

PSYCHONEUROIMMUNOENDOCRINOLOGY

Symptom perception

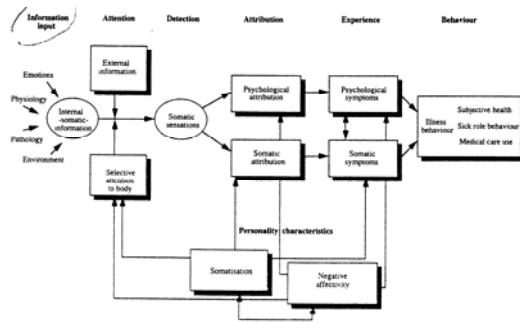


Fig. 1. Symptom perception model.

Final conclusions I

We know many associations between indoor exposures and health effects but a few causal relations between specific exposures and specific health effects, mainly because we do not know the mechanisms

It is necessary to have a holistic view and to realise that the body and brain interact

We need a more "real" multidisciplinary approach

WE NEED MORE ...

Experimental studies



Objective measures

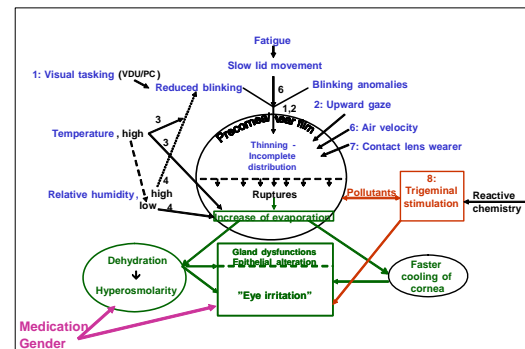


Clinical studies (ind. susceptibility)



Causing agents

Reactive agents???



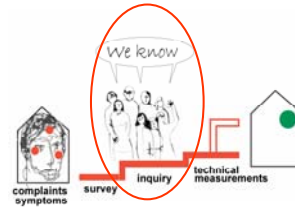
Wolkoff P. Et al. Occ. Envir. Med. 2005;6:4-12

Who will do the research ?



Final conclusions II

Despite our lack of "real" knowledge, most practical situations can be handled, using basic strategies and efficient risk communication and - by putting in financial resources



- Risk communication
- Information
- Involvement
- Respect

Inomhusklimat Örebro 2009

24-25 mars 2009

Välkomna !



Foto Björn Fransson

