

Show Number: 724

#### Martin D. Chapman, PhD President & CEO, InBio Allergens and IEQ; An Interview with the Dean of Allergens

Good Day and welcome to IAQ Radio+ episode 724 Blog. This week we welcomed Dr. Martin D. Chapman, PhD, President & CEO, InBio discuss Allergens and IEQ; an underappreciated area of IEQ.

Dr. Chapman is a leading scientist/entrepreneur in the field of allergy. Dr. Chapman received his PhD in Immunology in 1981 from the Royal Postgraduate Medical School, University of London, U.K. Following postdoctoral fellowships at the London School of Hygiene and Tropical Medicine and at UCLA School of Medicine, Dr. Chapman was appointed to the Faculty at the University of Virginia in 1985 and became a tenured Professor of Medicine and Microbiology. In 2001, he moved from UVA to become President and CEO of InBio (formerly Indoor Biotechnologies Inc.) the company that he founded in 1997.

#### Nuggets mined from today's episode:

Dr. Chapman made my job blogging today very easy by providing his slide presentation. His slides are attached along with my Takeaway notes at the bottom of the slides.

Below is a link to his prior show: Air Date: 9-12-2008 | Episode: 94

#### https://www.iaqradio.com/martin-d-chapman-phd-indoor-biotechnologiespresident/

Blog from episode 94 There's something special about a British accent.

Today's IAQradio guest Martin Chapman PhD. provided our listeners with valuable information on allergens. Our guest told listeners what makes an allergen an allergen, provided the timeline on how household allergens were discovered and listed the many types of allergens found in the home.

Like many indoor air quality problems, it all comes back to water. Moisture and humidity control was pointed out as being an effective method of reducing allergens in the home. It was enlightening to learn that many rodent and animal allergens reside in animal urine.

When asked what household pets he recommended, our guest opined that having dogs and cats as pets exposes infants to allergens and improves their resistance to allergens.

For our entrepreneurially minded listeners, Dr. Chapman outlined the business opportunities offered by providing allergy sampling services up to and including the training and financial requirements of setting up an allergy testing lab. He pointed out that his firm's products and services would be useful in scientifically validating the efficacy of allergy relief products.

#### Z-Man signing off

*Trivia: What are the 4 different types of common allergens?* 

Answer: Airborne, Skin, Food & Medicine Sorry no one answered the trivia question correctly.



CZ - Allergens in homes cause allergic disease. 1 in 10 children is asthmatic. Early lung hypersensitization in children results in irritation by other triggers. Mouse allergens are found in schools. Allergens retain potency, often causing cleaning to be ineffective. Air cleaners remove

cat/dog allergens.

### **Clinical Efficacy of Interventions**

Selected Studies



CZ - Tailored intervention based on specific allergens reduces flare-ups. Use of mattress covers for children 11 years old or younger reduces asthma by 45%.



CZ - Asthmatics recover in clean environments. Removing carpets is effective on cat and dog allergens.



# Assessment of Allergen Exposure in the Home, Workplace, Schools, Public Buildings

Portnoy et al, AAAAI/ACAAI Practice Parameter, Ann Allergy Asthma Immunol, 2013 Gold et al, NIAID, NIEHS, NHLBI, and MCAN Workshop Report JACI 2017

Collect "reservoir" dust samples from bedding, carpets, furnishings

Collect air samples for animal allergens

Send to lab for analysis by ELISA or MARIA®

· provides most accurate exposure measurement

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CZ - ELISA measures 1 allergen at a time, tests potency of allergen. Multiplex Array for Indoor Allergen (MARIA) is more sensitive to airborne allergens and tests for many allergens simultaneously. Cannabis growing releases high amounts of biomatter including allergens



CZ - This study collected blood, DNA, and markers for heart disease, diabetes and allergies. Eva King was involved. MARIA was developed due to the high number of samples that needed to be analyzed

#### MARIA Case Study: The Schools Inner-City Asthma Studies (SICAS), 2008-13

Wanda Phipatanakul, Children's Hospital, Harvard Medical School, Boston, MA

A study of allergen exposure in 37 inner-city elementary schools in the northeastern US.

 ~1,100 dust/air/table wipe samples were collected from schools and children's homes.

• Samples were by MARIA 9-plex array for Der p 1, Der f 1, MiteGroup 2, Fel d 1, Can f 1, Mus m 1, Rat n 1, Bla g 2, Alt a 1 and for endotoxin.

Over 11,000 data points:

- Mus m 1 was the most common allergen found in schools and homes
- Higher Mus m 1 levels found in settled dust from schools (which was highly correlated with airborne Mus m 1)

· School-wide IPM program or HEPA filter purifiers in the classrooms did not significantly reduce symptom-days with asthma (JAMA 2021).

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#### CZ - Prior to this study, most studies concentrated on homes. Mus m 1, is mouse allergen





CZ - Electrostatic dust collector is static in sits in rooms. Personal sampling device has pump and samples onto disc media. Rat and mouse allergens also stay airborne for long periods too, like cat and dog. It's dust mite and cockroach allergens that are only airborne for

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#### short periods of time, say up to an hour.

# Apollo

Ambient Air Sampling Device

- High volume air sampler (>400L/min)
- Quiet operation (<40 decibels)</li>
- Proprietary allergen capture filter that offers improved efficacy over IOM samplers
- Tested for detection of a wide range of indoor allergens, food allergens and endotoxin
- Long-duration sampling without saturation, suitable for longitudinal exposure studies
- · Currently in clinical trials
- Use anywhere by anyone!
- Long duration sampling without saturation
- Evaluate longitudinal allergen exposure
- Unique allergen capture filter offer improved efficacy over IOMs
- Quiet, under 40 decibels
- Highly reproducible results

#### Apollo vs IOM Sampling

0.3

IOM

0.1

10

	Nanogram of allergen per filter after 12 hours										
	Der p 1	Mite G2	Fel d 1	Arah 3	Ara h 6	Gal d 2	Bos d 5	Shrimp	Cor a 9	Ana o 3	Gly m 5
Apollo	11	5	272	97	98	206	300	1	88	13	1

2.3

6.9

<LOD

<LOD

0.3

· Apollo and IOM samplers were run side-by-side for 12 hours in the same

• ~30 - >100 more allergen was captured on the Apollo sampler filter

0.1

• Shrimp, Cor a 9 and Gly m 5 were detected using Apollo but were undetectable using IOM.

0.8



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<LOD

CZ - Apollo is better for mice. IOM is good for dog and cat



CZ - Allergies at young age often manifest into asthma later. Farming studies found low incidence of asthma in farmers. Allergies are often associated with pets. Dust mites are widespread.



CZ - IAQ people working with allergy community to reduce exposure. Under Obamacare, multiple hospital admissions for asthma may trigger home inspection. Public housing conditions are often bad and are asthma prone. Potential allergy triggers are not always visible.



CZ - Dr John McKeon, iAIR holistically working on developing healthy buildings and encouraging cleaner air indoors. Food allergens found indoors include egg and peanut. Bringing a cat into the home during a child's 2<sup>nd</sup> year of life improves tolerance to allergens.

## **Meetings and Conferences**

InBio 2024



Amsterdam May 14th-17th

Occupational Health 2024

> Belfast June 20nd-21st



Columbus, Ohio May 20th-24th



Honolulu, Hawaii July 7th-11th