WIAS

Annual Conference

2025

SESSION B. Room: Theatre Cerise 13.20-14.40 hrs

Effective allergen specific immunotherapy for equine insect bite hypersensitivity (IBH)

J.T. Celis Moreno[1*], R.J.J. van Neerven[1], E. Tijhaar[1]

[1] Cell Biology and Immunology, Wageningen University & Research, The Netherlands
* Corresponding author. E-mail: julia.celismoreno@wur.nl

Equine insect bite hypersensitivity (IBH) is a seasonal IgE-mediated skin allergy caused by *Culicoides obsoletus* midge bites. IBH causes severe skin inflammation, pruritus, and intense scratching leading to skin wounding and infections. Available symptomatic treatments are temporary and insufficient. Allergen specific immunotherapy (AIT) is the only allergy-modifying treatment for allergies with curative or long-lasting effects. To date, only a few AIT protocols exist for IBH, with limited efficacy. This study aimed to develop an effective AIT for IBH using recombinant allergens. First, the *C. obsoletus* allergic profile of two female Shetland ponies was established. Then, an AIT mix was prepared with the most relevant recombinant allergens and combined with a Th1-skewing adjuvant. The Shetlanders received a total of six doses of the AIT mix, every three weeks between June and September.
Post AIT, both ponies showed a marked decrease in allergen-specific IgE levels, while protective allergen-specific IgG levels increased. Allergen-specific skin reactivity also decreased, along with skin reactivity towards *C. obsoletus* whole body extract (WBE). Finally, both ponies exhibited clinical improvement from the third AIT dose and had no visible skin lesions by the end of the treatment.
In summary, the developed AIT successfully desensitized the IBH-affected Shetlanders towards the recombinant allergens used, reduced in vivo reactivity towards *C. obsoletus* WBE, and most importantly, demonstrated clinical efficacy in controlling IBH symptoms. Notably, this is the first effective AIT for IBH with proven clinical efficacy within the same season it was administered.