Comment on Platts-Mills T, Caraballo L, Jacquet A, Zarzuk J. Dust mite allergy. In: Dramburg S, Hilger C, Santos AF, de Las Vecillas L, Aalberse RC, Acevedo N, et al. EAACI Molecular Allergology User's Guide 2.0. Pediatr Allergy Immunol. 2023 Mar;34 Suppl. 28:e13854.

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June 15, 2023

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To the Editor,

We read with great interest your chapter from the EAACI Molecular Allergology User´s Guide 2.0, entitled: Dust mite allergy [1]. The development of Component Resolved Diagnosis (CRD) has efficiently contributed to identify genuine sensitization to a panel of eliciting allergens, thus allowing subsequent clinical decisions to an individualized therapy. Given that two possible decision algorithms have been proposed for mite allergy in both temperate and tropical countries -including 4 and 7 individual molecules, respectively- several complementary considerations could be addressed.

Firstly, since environmental variations, in climate warming and industrialization are becoming a more globalized concern, changes in the human allergen exposome are likely expected. Moreover, it has been speculated that these changes may affect mite metabolism, leading to an increased indoor allergen production worldwide and possibly a shift in their species [2]. This is the case for *Blomia tropicalis* and*Lepidoglyphus destructor* (Glycyphagoidea family), formerly considered as marginal storage mites with a limited allergenic cross-reactivity with Pyroglyphidae mites, but currently showing as relevant markers for atopic disease under specific weather conditions [3]. As atopic pheno-endotypes are steadily evolving under a changing allergen exposome, a decision approach -including an algorithm with a larger number of commercially available individual molecules as Der p 5, Der p 7 and/or Der p 21- is specially warranted in those locations with a preponderant rate (up to 80%) of polysensitized subjects suffering from allergic rhinitis and/or asthma (Figure 1). In addition, as polysensitization has a confirmed impact on the clinical expression and severity of allergic disease [4], the inclusion of Lep d 2 from *Lepidoglyphus destructor* in our proposed algorithm (Figure 2) may be of interest not only under tropical and subtropical climate conditions but also the as a potential emerging allergen source in temperate countries [5].

Secondly, the description of locally serodominant allergens -Der p 7- and the subsequent identification of clinically relevant allergens -i.e., IgE binding molecules as Der p 5 with a defined allergenic activity- is nowadays paving the road to a personalized management of allergic diseases. Despite a perfect molecular matching between patient´s IgE sensitization profile and allergen immunotherapy (AIT) composition is

ideally sought, a wide range of variations in the representation of individual molecules in an extract is currently allowed according to European guidelines [6]. In this regard, CRD has greatly contributed to improve success of AIT only for those house dust mite (HDM)-allergic patients who were exclusively sensitized to specific molecules -i.e. Der p 1 and/or Der p 2- but not for patients with a sensitization to other HDM allergens [7]. Therefore, the use of standardized extracts of good quality with documented clinical evidence -i.e. proven safety and efficacy- comprising those relevant molecules present in the local allergen exposome, highlights the importance of individualized care to AIT success. In fact, despite Der p 1, Der p 2 and/or Der p 23 account for more than 80% of the specific IgE to *Dermatophagoides pteronyssinus* [1], the absence of evidence regarding a concurrent sensitization to the so-called mid-tier allergens -i.e Der p 5, Der p 7 and/or Der p 21- may not be considered a formal contraindication for AIT in selected cases.

Provided that AIT is still used in less than 10% of subjects with allergic respiratory diseases [6], the progressive availability and knowledge of allergenic molecules favors a better understanding of the different sensitization profiles to benefit a broader number of patients from the only potential disease-modifying therapy.

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Figures and legends:

Figure 1: Possible decision algorithm for mite allergic rhinitis/asthma in temperate countries. SPT: Skin Prick Test. CRD: Component Resolved Diagnosis. Dp: *Dermatophagoides pteronyssinus*extract. Df: *Dermatophagoides farinae* extract. AIT: Allergen Immunotherapy. CH: Clinical History. CRD Dp/Df*: Der p 1, Der p 2, Der p 5, Der p 7, Der p 10, Der p 21, and Der p 23. Molecular profile A: Der p 1/Der p 2 and/or Der p 23, and/or Der p 5, and/or Der p 7 and/or Der p 21.

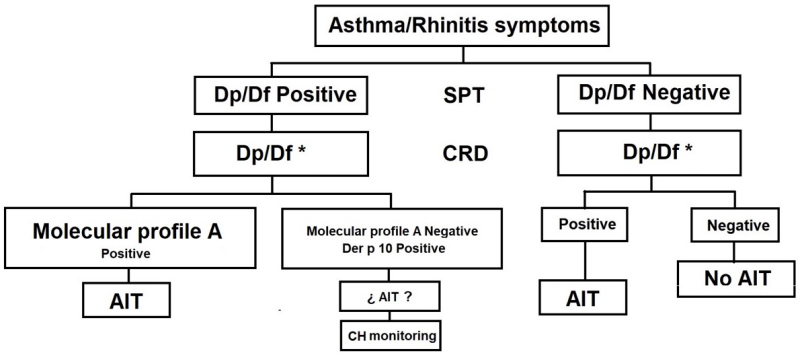

Figure 2: Possible decision algorithm for mite allergic rhinitis/asthma in subtropical and tropical countries. SPT: Skin Prick Test. CRD: Component Resolved Diagnosis. Dp: *Dermatophagoides pteronyssinus* extract. Df: *Dermatophagoides farinae* extract. Bt:*Blomia tropicalis* extract. Ld: *Lepidoglyphus destructor*extract. AIT: Allergen Immunotherapy. CH: Clinical History. CRD Dp/Df*: Der p 1, Der p 2, Der p 5, Der p 7, Der p 10, Der p 21, and Der p 23. CRD Bl**: Blo t 5, Blo t 10, and Blo t 21. CRD Lp$^{\$}$: Lep d 2. Molecular profile A: Der p 1/Der p 2 and/or Der p 23, and/or Der p 5, and/or Der p 7 and/or Der p 21. Molecular profile B: Blo t 5 and/or Blo t 21.