COMMENTARY

Biomarkers in atopic dermatitis and psoriasis—a Delphi-based guide through the jungle?

The field of inflammatory skin diseases, with psoriasis (PSO) and atopic dermatitis (AD) at its forefront, is on the surge of personalized medicine. Over the past decade, the treatment landscape of these diseases has drastically changed, and many new compounds are in the pipeline.[1] Targeted treatments have become actual game changers to achieve disease control in PSO and AD. Along with these developments, the insight has emerged that the efficacy of these medications considerably varies among patients. A complex interplay of genetic, immunological and environmental factors contributes to this heterogeneity.[2–4] In AD, for instance, various endo- and phenotypes have been described and characterized, depending on the affected area (e.g. head and neck type), the presence/absence of comorbidities, the patient's ethnicity or age.[3,5,6] This complexity goes along with the need to stratify patients (1) to optimize the choice of treatment and (2) to predict treatment response. This has resulted in a boom of biomarker research. Biomarkers are, as has stated by the World Health Organization and International Program on Chemical Safety in 2001, 'any substance, structure, or process that can be measured in the body or its products and influence or predict the incidence of outcome or disease'.[7] The number of publications identifying new possible diagnostic or predictive biomarkers in AD and PSO is constantly growing and urges the need to define high-quality criteria to assess their validity and enable their translation and use in clinical practice.

This task is being tackled in a European research initiative called BIOMAP (Biomarkers in AD and PSO), a consortium of researchers, clinicians, industry partners and patient organization representatives.[8] In this context, Ziehfreund *et al.*[9] have performed a two-round Delphi survey to identify the characteristics of high-quality biomarkers for AD and PSO. A Delphi survey is a structured approach to get an expert consensus based on several rounds of open questions/statements whereby the experts do not have to meet in person—an advantage in times with an ongoing pandemic.[10] In the present study, three open questions were asked about the requirements of biomarkers, obstacles concerning their implementation and desired outcomes. Based on the answers, 26 statements were developed and rated in the second round. Reliability and the importance of the positive predictive value were rated as the highest priorities among the assessed statements about biomarkers. This underlines the importance of validation of biomarkers to ensure their utility in a clinical setting.

The work of Ziehfreund *et al.* is an important first step to help identify standardized quality characteristics and to point out gaps in the current research landscape for biomarkers in AD/PSO. Future studies should further dissect the disease-specific needs of biomarkers and solicit experts involved in biomarker discovery, validation and translation to enable the development of recommendations/guidelines in this area. As the experts of this publication agree on, a good biomarker should be relevant, reliable, valid and have a high positive predictive value. And the more personalized medicine gets, the more important meaningful biomarkers become.

Funding sources

No funding was received for this article.

Acknowledgement

Open access funding provided by Universitat Zurich.

Conflicts of interest

There are no conflicts of interest to declare.

Data availability statement

Data sharing not applicable to this article as no datasets were generated or analysed during the current study

D. Fehr,[1,2,3] M.-C. Brüggen[1,2,3,*]

[1]Allergy Unit, Department of Dermatology, University Hospital Zurich, Zurich, Switzerland, [2]Faculty of Medicine, University of Zurich, Zurich, Switzerland, [3]Christine Kühne-Center for Allergy Research and Education, Davos, Switzerland

*Correspondence: M.-C. Brüggen.

E-mail: marie-charlotte.brueggen@usz.ch

Linked article: S. Ziehfreund *et al. J Eur Acad Dermatol Venereol* 2022; **36**: 1467–1476. https://doi.org/10.1111/jdv.18178.

References

1 Bieber T. Atopic dermatitis: an expanding therapeutic pipeline for a complex disease. *Nat Rev Drug Discov* 2022; **21**: 21–40.

2 Renert-Yuval Y, Thyssen JP, Bissonnette R *et al.* Biomarkers in atopic dermatitis-a review on behalf of the international eczema council. *J Allergy Clin Immunol* 2021; **147**: 1174–1190.e1171.

3 Czarnowicki T, He H, Krueger JG, Guttman-Yassky E. Atopic dermatitis endotypes and implications for targeted therapeutics. *J Allergy Clin Immunol* 2019; **143**: 1–11.

4 Fania L, Moretta G, Antonelli F *et al*. Multiple roles for cytokines in atopic dermatitis: from pathogenic mediators to endotype-specific biomarkers to therapeutic targets. *Int J Mol Sci* 2022; **23**: 2684.
5 Guglielmo A, Sechi A, Patrizi A, Gurioli C, Neri I. Head and neck dermatitis, a subtype of atopic dermatitis induced by Malassezia spp: clinical aspects and treatment outcomes in adolescent and adult patients. *Pediatr Dermatol* 2021; **38**: 109–114.
6 Lang CCV, Renert-Yuval Y, Del Duca E *et al*. Immune and barrier characterization of atopic dermatitis skin phenotype in Tanzanian patients. *Ann Allergy Asthma Immunol* 2021; **127**: 334–341.
7 World Health Organization & International Programme on Chemical Safety. Biomarkers in risk assessment: validity and validation; 2001. https://apps.who.int/iris/handle/10665/42363
8 Biomap. About BIOMAP. Towards personalised medicine for Inflamatory skin diseases. https://biomap-imi.eu/about (last accessed on June 30, 2022).
9 Ziehfreund S, Tizek L, Hangel N *et al*. Requirements and expectations of high-quality biomarkers for atopic dermatitis and psoriasis in 2021-a two-round Delphi survey among international experts. *J Eur Acad Dermatol Venereol* 2022; **36**: 1467–1476.
10 McMillan SS, King M, Tully MP. How to use the nominal group and Delphi techniques. *Int J Clin Pharmacol* 2016; **38**: 655–662.

DOI: 10.1111/jdv.18422