



Potentials of molecular differentiation between psoriasis and eczema in occupational dermatology

P. Bentz¹, K. Eyerich², E. Weisshaar¹

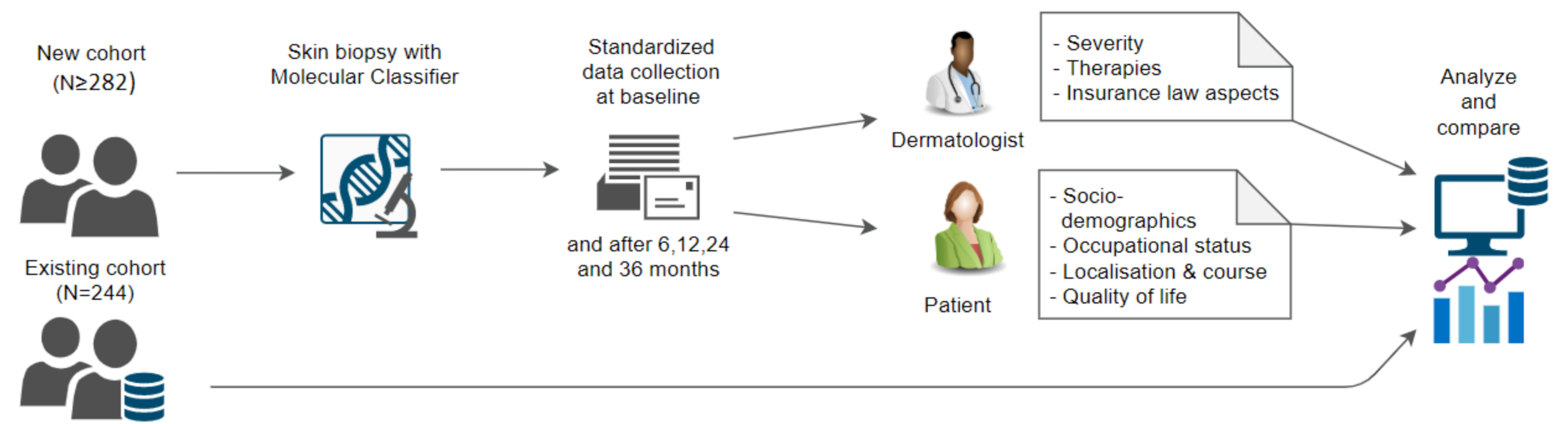
¹Division of Occupational Dermatology, Department for Dermatology, Heidelberg University Hospital, Germany

² Department of Dermatology and Venereology, University Hospital Freiburg, Germany

1 Background

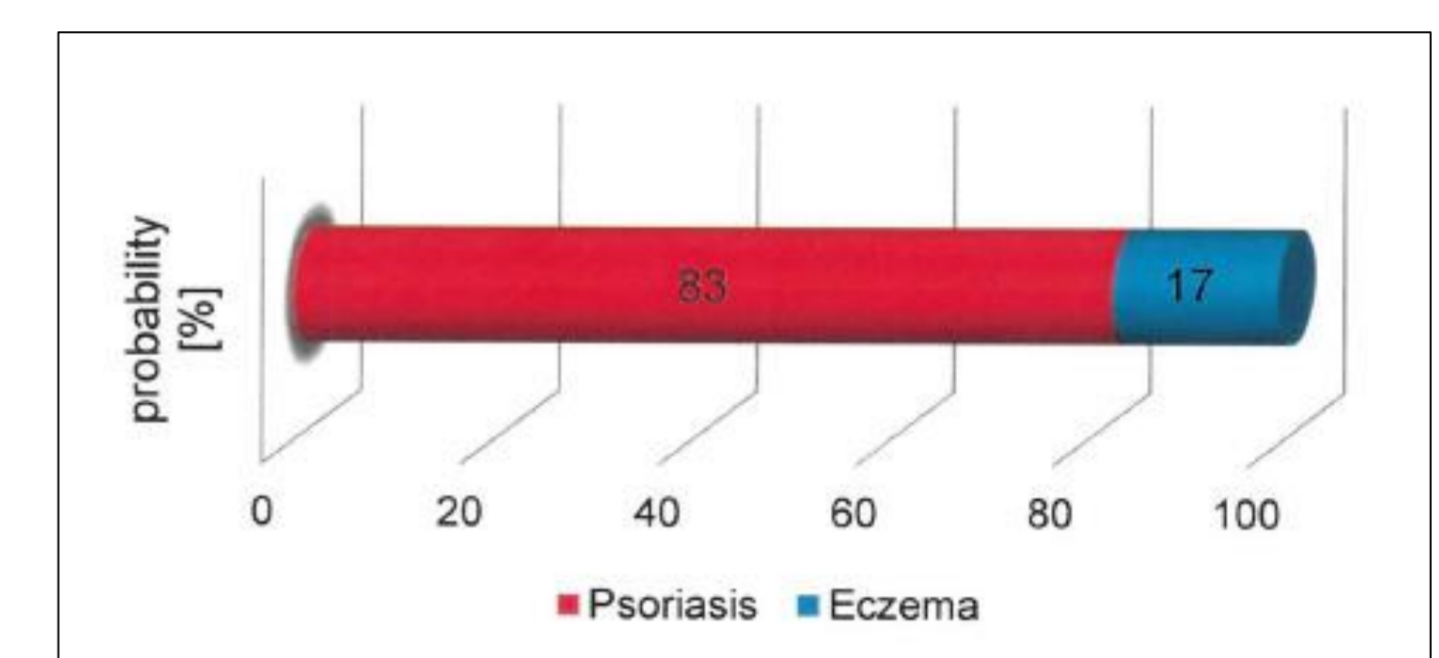
The differentiation of psoriasis and eczema is a major diagnostic challenge in daily clinical practice. Even dermatohistopathological analysis does not always contribute to the reliable differentiation. The Molecular Classifier is used in an occupational dermatological cohort to investigate its effect on diagnostics.

2 Design



3 The Molecular Classifier

The **Molecular Classifier (MC)** uses the disease-specific regulations of the genes NOS2 and CCL27 in psoriasis resp. eczema to train a model that can predict the disease class with an accuracy of 97% [1,2]. Since RNA from a regular skin biopsy is extracted, the classifier can be performed as an “add-on” to standard diagnostic procedures. A graphical, easy-to-interpret result shows the probability of one disease over the other.



4 Results

Patient characteristics (N=286)

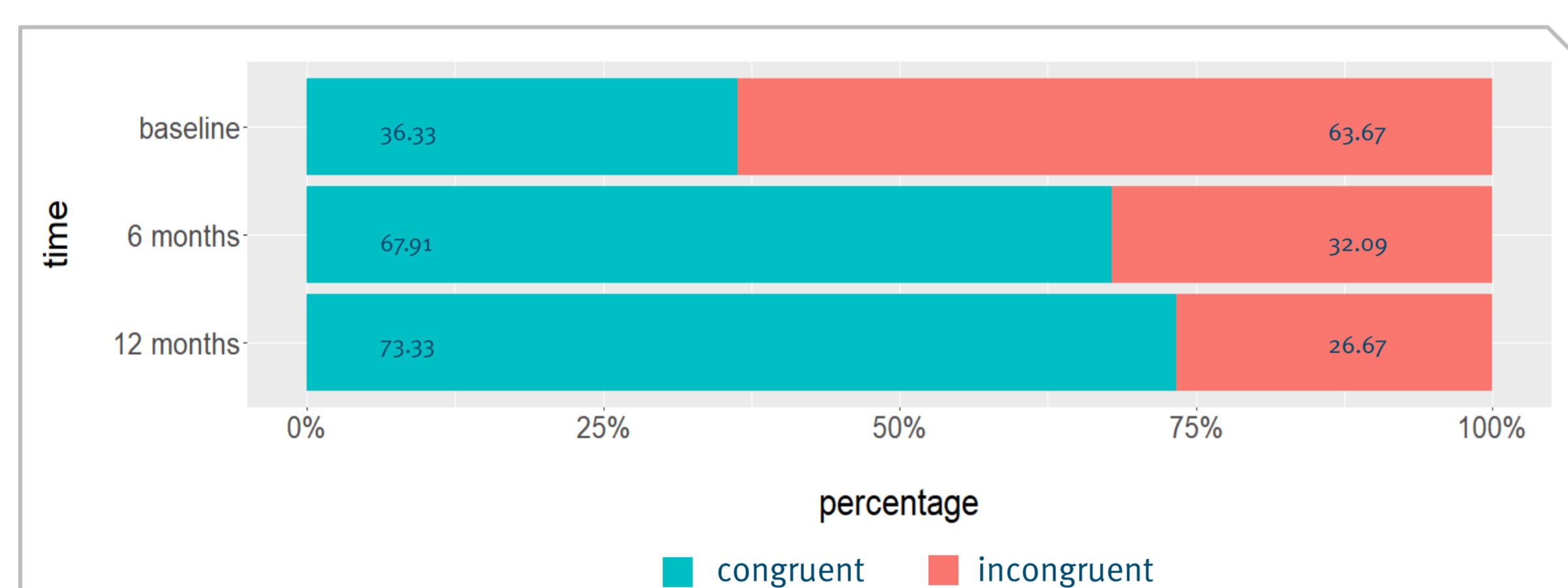
	Male	Female	Total
count	53.5%	46.5%	100%
(%, n)	153	133	286
age	50.5	50.3	50.4
(mean ± SD)	± 12.1 years	± 12.3 years	± 12.1 years
Years since onset of skin disease (mean ± SD)	6.44	6.66	6.54
	± 6.75 years	± 9.07 years	± 7.88 years

Comparison with classifier results

		Clinical diagnosis			
		Eczema	Psoriasis	Unclear	Total
Classifier result	Eczema	28.10% (75)	16.10% (43)	23.59% (63)	67.79% (181)
	Psoriasis	5.24% (14)	6.37% (17)	13.48% (36)	25.09% (67)
	Unclear	3.37% (9)	1.87% (5)	1.87% (5)	7.12% (19)
	Total	36.70% (98)	24.34% (65)	38.952% (104)	100% (267)

Cross table of clinical diagnosis and classifier results in % (n)
Complete congruence: **36.34% (n=97)**.

Congruence of clinical diagnosis and classifier over time



Change in congruence of clinical diagnosis and classifier results in % at baseline, after 6 months and 12 months

12 months after obtaining the MC, dermatologists' clinical diagnoses are increasingly congruent with the classifiers results. The corresponding Cohen's Kappa values for agreement increased by over 10 times ($\kappa_{\text{baseline}} = .039$, $\kappa_{12\text{months}} = .42$)

		Dermatopathological analysis			
		Eczema	Psoriasis	Unclear	Total
Classifier result	Eczema	34.75% (49)	13.48% (19)	17.02% (24)	65.25% (92)
	Psoriasis	13.48% (19)	13.48% (19)	5.67% (8)	32.62% (46)
	Unclear	0.71% (1)	1.42% (2)	0.00% (0)	2.13% (3)
	Total	48.92% (69)	28.37% (40)	22.69% (32)	100% (141)

Cross table of results of histological analysis and classifier results in % (n)
Complete congruence: **48.23% (n=68)**

The complete congruence between all 3 raters (clinical diagnosis – histological analysis – Molecular Classifier) was **19.11% (n=26): Eczema (15.44%, 21), psoriasis (3.68%, 5), unclear (0%, 0)**

5 Conclusions

- High amounts of clinically unclear cases point out the need for a new diagnostic tool to differentiate psoriasis from eczema.
- The Molecular Classifier supports diagnosing clinically or dermatopathologically unclear cases and reduces the amount unclear cases by over 98%.
- After 12 months the diagnosis becomes clearer and dermatologists increasingly support the Molecular Classifier's results.

Contact

Dr. rer. cur. Philipp Bentz, MScN
Division of Occupational Dermatology
Department for dermatology (Center)
University Hospital Heidelberg
Philipp.bentz@med.uni-heidelberg.de
+496221/56-8755 or +496221/56-8761