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Vitiligo: Mechanistic Insights Lead to Novel Treatments

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8 Abbreviations/Acronyms: Alpha-melanocyte stimulating hormone (a-MSH), damage-9 associated molecular patterns (DAMPs), glycogen synthase kinase- β (GSK- β), Genome wide association studies (GWAS), Herpes Simplex Virus (HSV), Janus Kinase (JAK), narrow band UVB 10 (nbUVB), psoralen plus UVA (PUVA), reactive oxidative species (ROS), single-nucleotide 11 12 polymorphisms (SNPs), Signal Transducer and Activator of Transcription (STAT), T regulatory cell 13 (Treg), resident-memory T cells (Trm), Wingless-related integration site (WNT), vitiligo activity 14 scoring index (VASI), vitiligo extent score (VES), vitiligo European task force measurement 15 (VETF).

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17 **Key words:**

18 vitiligo, treatment, T cell, IFN-g, CXCL9, CXCL10, CXCR3, resident memory, regulation, stress,

- 19 innate immunity, inflammasome, NLRP1, NLRP3, melanocyte, regeneration, clinical trials,
- 20 repigmentation, hair.
- 21

22 Abstract

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24 Vitiligo is an autoimmune disease of the skin characterized by patchy depigmentation. Current 25 treatments are moderately effective at reversing disease by suppressing autoimmune inflammation 26 in the skin and promoting the regeneration of melanocytes. Recent basic and translational 27 research studies have significantly improved our understanding of disease pathogenesis, which is 28 now leading to emerging treatment strategies based on targeted therapy. Here we discuss 29 important clinical characteristics of vitiligo, current therapies, their limitations, advances in 30 understanding disease pathogenesis, emerging targeted treatments, and strategies to optimize 31 clinical trials to efficiently and effectively test these new treatments.

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