



HAL
open science

HLA and asthma in the Consortium on Asthma among African-ancestry Populations in the Americas (CAAPA)

Nicolas Vince, Sophie Limou, Michelle Daya, Nicholas Rafaels, Jill Hollenbach, Antoine Lizée, Estelle Geffard, Alexandre Walencik, Maria Pino-Yanes, Steven L. Salzberg, et al.

► To cite this version:

Nicolas Vince, Sophie Limou, Michelle Daya, Nicholas Rafaels, Jill Hollenbach, et al.. HLA and asthma in the Consortium on Asthma among African-ancestry Populations in the Americas (CAAPA). Assises de génétique humaine et médicale 2018, Jan 2018, Nantes, France. inserm-02161772

HAL Id: inserm-02161772

<https://inserm.hal.science/inserm-02161772>

Submitted on 21 Jun 2019

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

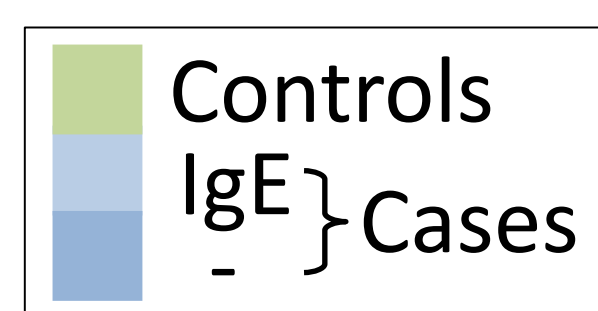
HLA and asthma in the Consortium on Asthma among African-ancestry Populations in the Americas (CAAPA)

Nicolas Vince¹, Sophie Limou¹, Michelle Daya², Nicholas Rafaels², Jill Hollenbach³, Antoine Lizée¹, Estelle Geffard¹, Alexandre Walencik¹, Maria Pino-Yanes⁴, Steven Salzberg⁵, Daehwan Kim⁵, Harold Watson⁶, Leslie Lange², James Wilson⁷, Terri Beaty⁵, Margaret Taub⁵, Ingo Ruczinski⁵, Rasika Mathias⁵, , Consortium on Asthma among African-ancestry Populations in the Americas (CAAPA) 5, Kathleen Barnes², Dara Torgerson³, Pierre-Antoine Gourraud¹

¹ATIP-Avenir, Centre de Recherche en Transplantation et Immunologie UMR 1064, INSERM, Université de Nantes, Nantes, France ; ²Department of Medicine, University of Colorado, Aurora, CO, USA; ³University of California San Francisco, San Francisco, CA, USA; ⁴Research Unit, Hospital Universitario N.S. de Candelaria, Universidad de La Laguna, Santa Cruz de Tenerife, Spain; ⁵Johns Hopkins University, Baltimore, MD, United States of America; ⁶Faculty of Medical Sciences, The University of the West Indies, Queen Elizabeth Hospital, Bridgetown, St. Michael, Barbados; ⁷Department of Physiology and Biophysics, University of Mississippi Medical Center, Jackson, MS, USA

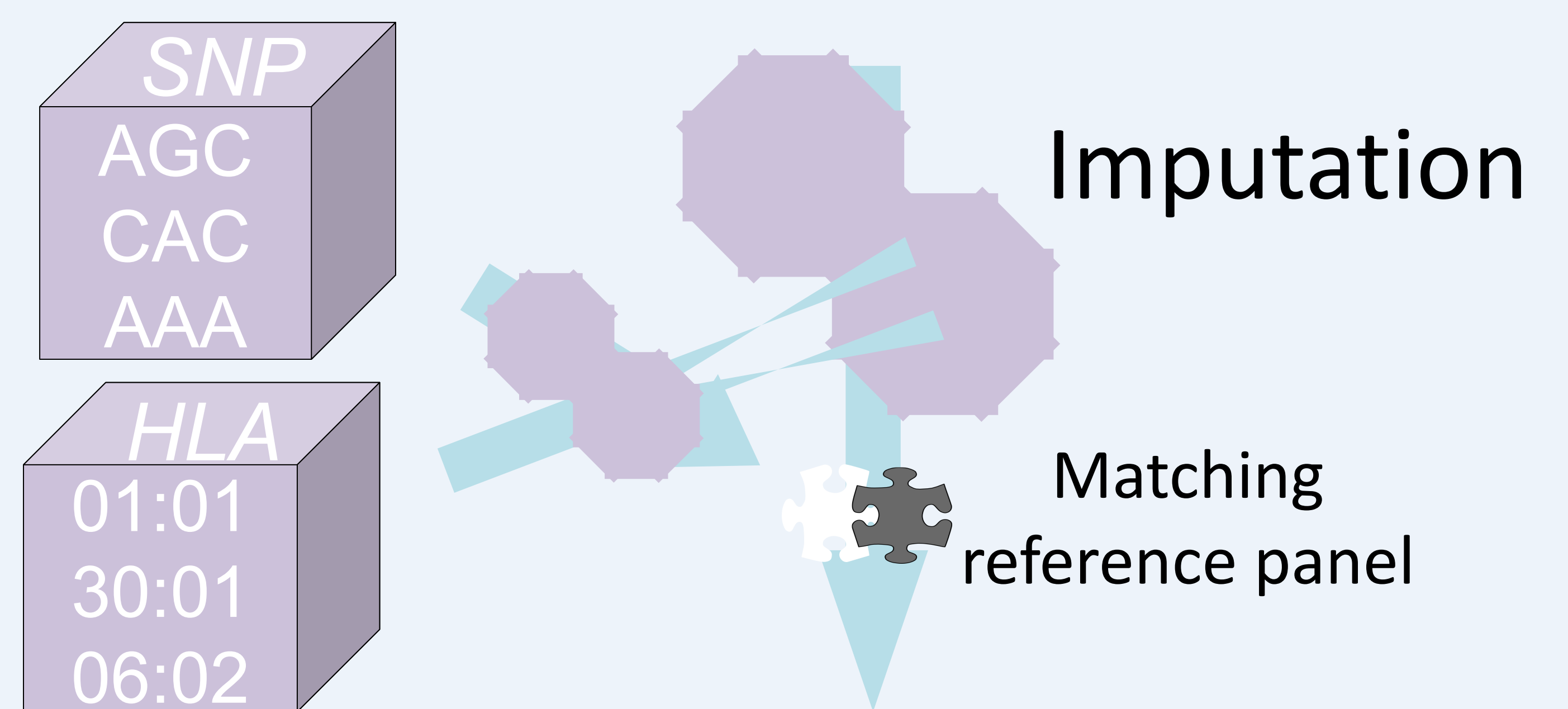
	Previously		Here
Design	Candidate genes	GWAS	CAAPA
cohort type	Small	Big	Big
Advantages	Biological meaning	Power	Both

10 African American asthma cohorts



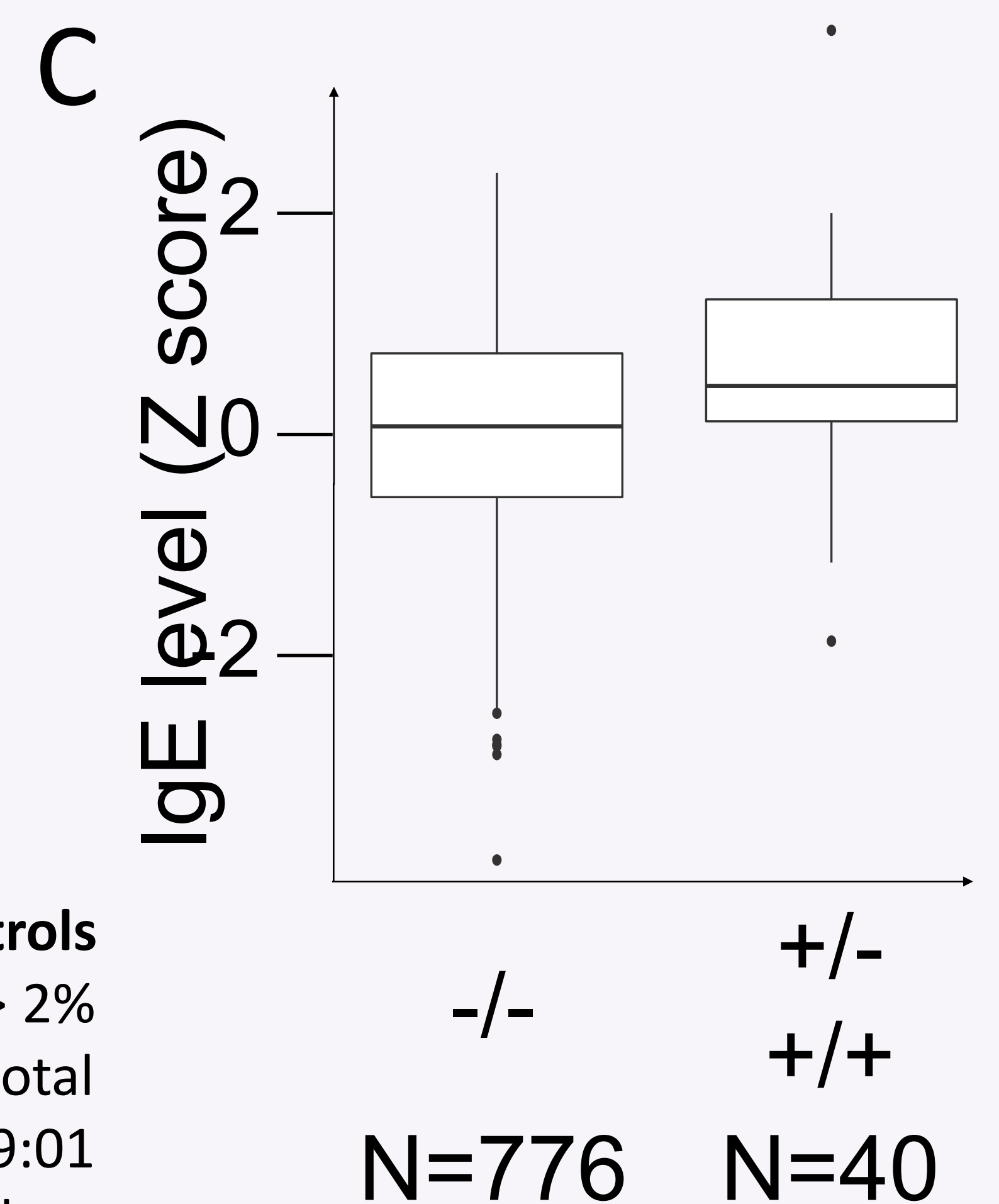
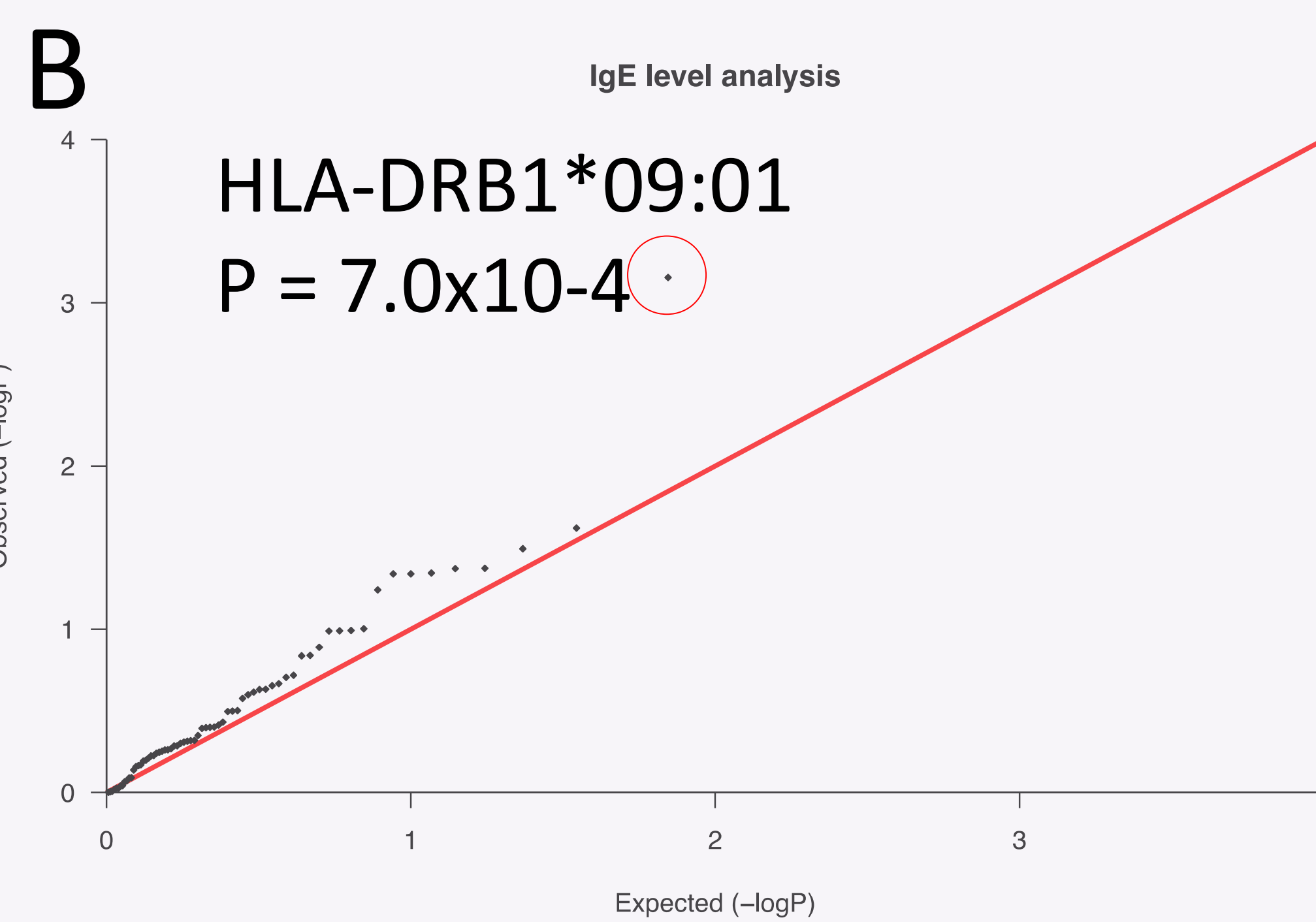
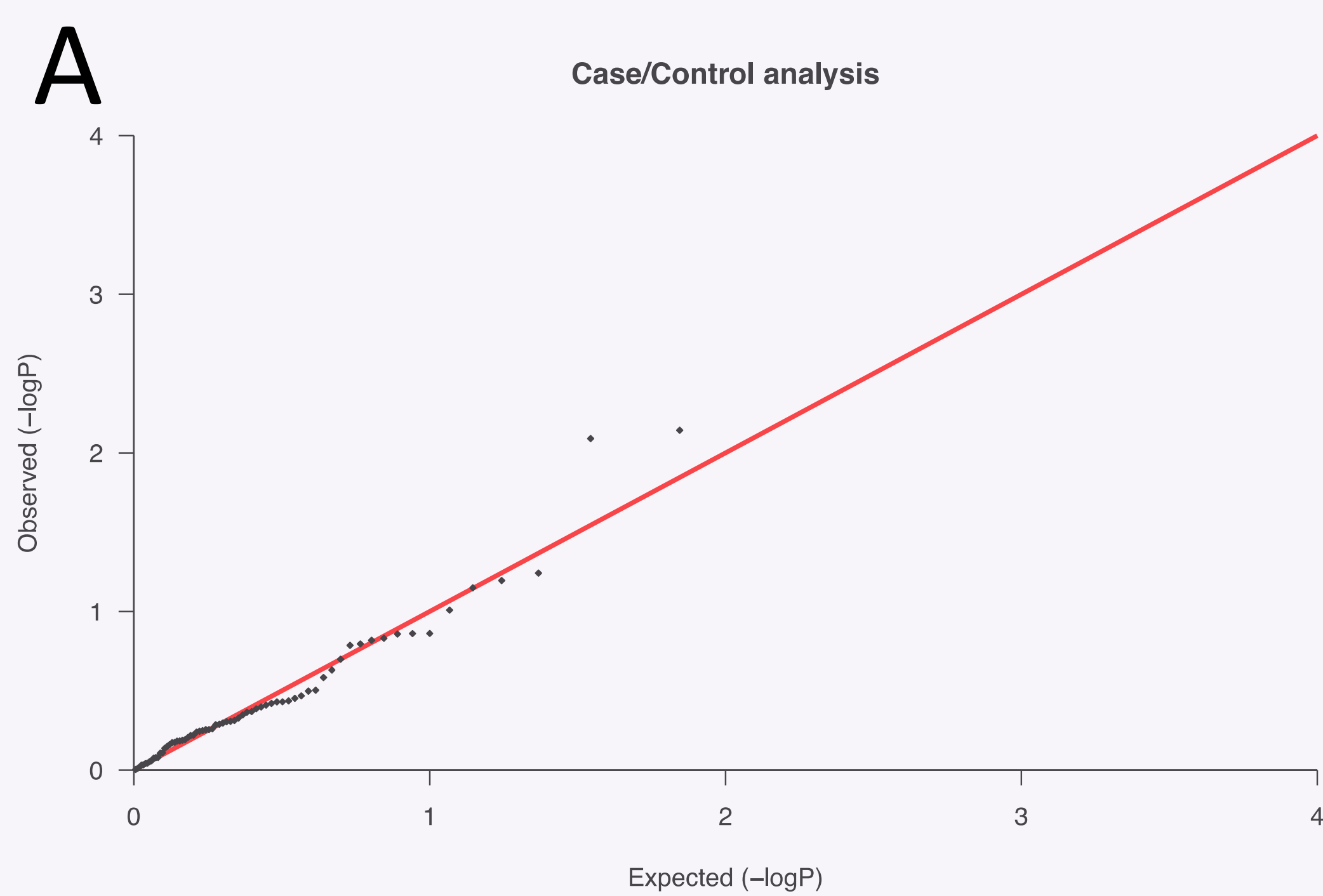
Innovative computational statistical inference

Genotypes			HLA allele
A	G	C	?
C	A	C	?
A	A	A	?



HLA alleles are inferred from the SNPs using a large HLA reference panel

HLA allele
01:01
30:01
06:02



QQplots of P values obtained in a meta-analysis (allelic regression model) comparing HLA alleles in a) **cases and controls** and in b) **IgE level as continuous variable**. Analysis was corrected with local ancestry. HLA alleles with a frequency > 2% are represented. Imputed HLA with a post-probability < 0.5 were excluded from the analysis. c) Box plot comparing total IgE level between Asthmatics with 1 or 2 HLA-DRB1*09:01 allele (+/- and +/+) and Asthmatics without HLA-DRB1*09:01 allele (-/-). IgE level is expressed in Z score. The N representing the number of individuals in each group is depicted on the graph. The P value of the meta-analysis from the dominant regression model is depicted on the graph.



nicolas.vince@univ-nantes.fr

We identified for the first time an *HLA* allele associated with asthma severity amongst African Americans. Our report emphasizes that by leveraging powerful computational methods, specific/extreme phenotypes, and population diversity, we can explore *HLA* gene polymorphisms in depth and reveal the full extent of complex disease associations.