

# MeDALL OBJECTIVES ★

MeDALL (Mechanisms of the Development of Allergy) aims to generate novel knowledge on the mechanisms of initiation of allergy from early childhood to young adulthood, in order to propose early diagnosis, prevention and targets for therapy. A novel definition of phenotypes of allergic diseases and an integrative translational approach are needed to understand how a network of molecular and environmental factors can lead to complex allergic phenotypes.



# MeDALL STRATEGY ★

We propose a novel, stepwise, large-scale and integrative approach led by experts in allergy, epidemiology, allergen biochemistry, immunology, molecular biology, epigenetics and genomics, functional genomics, bioinformatics, computational and systems biology, combining the strengths of previous and ongoing EU projects. A feasible and achievable project links epidemiological and clinical research with experimental and animal models.

- Classical phenotypes (expert-based) and novel phenotypes of allergy (hypothesis-free statistical modelling) will be compared. Asthma and atopic dermatitis will be considered.

- Population-based data will include a large network of existing European birth cohorts which will be followed using a common protocol and a "unique" cross-sectional study in Karelia, Finland-Russia.

- IgE to food and inhalant allergens will be tested using component-resolved diagnosis in populations across Europe.

- The discovery of biomarker profiles ("fingerprints") of the classical and novel allergic phenotypes will be carried out in a multistep process using epigenetics, targeted proteomics and unbiased transcriptomics. Fingerprints will be extensively assessed in a subsample of the study

populations and those associated with the allergic phenotypes validated in the study populations at large. Relevant fingerprints will be combined into network biomarker phenotype "handprints" using a systems biology approach and validated in a sufficiently powered sample. Animal studies and *in vitro* human immunology will reinforce the validation and confirmation processes.

- The role of risk and protective factors will be extensively assessed both for the classical and novel phenotypes by means of modelling their interactions with epigenetic changes and biomarkers. Population groups at high risk of developing allergic diseases will be characterized.

- Results will be fitted into new integrative complex mathematical models to establish suitable biomarkers for the early diagnosis and prevention of allergy-associated diseases such as asthma and atopic dermatitis.

# MeDALL EXPECTED OUTCOMES ★

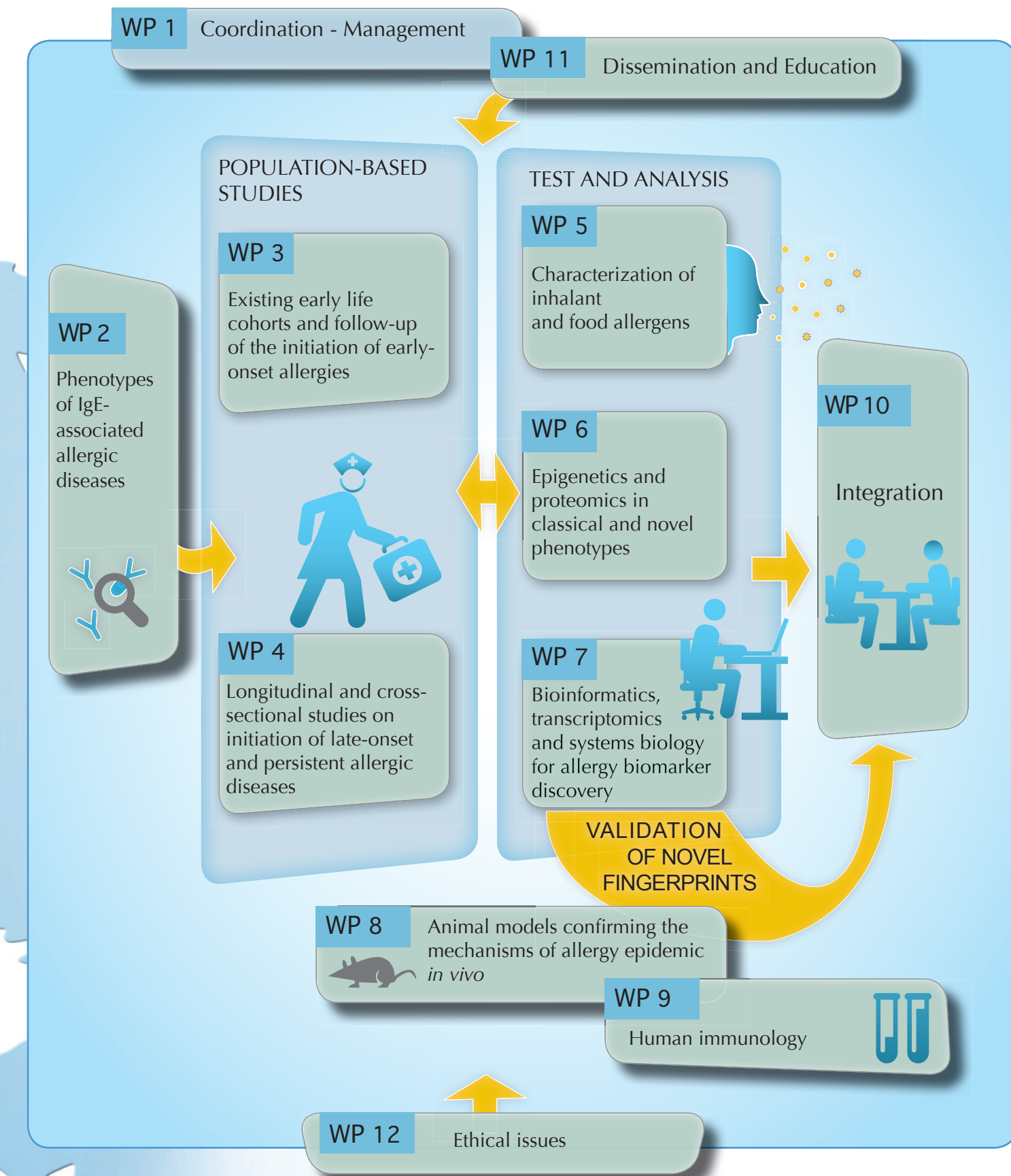
- MeDALL will contribute to a substantial improvement of the understanding of the allergic phenotypes and will expand the current knowledge of the genomic and environmental determinants of allergic diseases during childhood and adolescence, in an integrative way.

- It will lead also to novel diagnostic tools for the early diagnosis of allergy, molecular targets potentially useful for the development of novel treatment modalities, development of methods for the promotion of health and prevention of allergic diseases, particularly in children. It will reduce fragmentation of allergy research in Europe.

- This project ultimately aims at improving the health of European citizens, increasing the competitiveness and boosting the innovative capacity of Europe while addressing global health issues.



# MeDALL ACTIVITIES ★



The MeDALL consortium encompasses 23 public and private institutions, including 3 European SMEs whose specific complementary scientific expertise will highly contribute to MeDALL project objectives. The project was constructed in order to achieve optimal complementarity and is supported by the European Commission under the Health priority of the 7th Framework Programme.



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Investigation of the mechanisms of initiation of allergic response, genetic predisposition, biomarkers and identification of targets for therapy



For further information please visit our website at:  
[www.medall-fp7.eu](http://www.medall-fp7.eu)



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## Mechanisms of the development of ALLergy



Design: Studio Shiny Army 06.66.74.05.52

MeDALL is a collaborative project supported by the European Commission under the Health Cooperation Work Programme of the 7th Framework programme.



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