



EU cofin Project Final Report 2018

The EU projects that receive co-finance from the top sectors must submit a technical and financial final report. This format is to be used for reporting the technical results. The report must be submitted before 15 February 2019 to Hans van der Kolk

General information	
TKI Number of the project	AF-EU-15003
Title	Improving Allergy Risk Assessment Strategy for new food proteins (ImpARAS)
project leader WR (e-mail address)	Prof. dr. Harry J. Wichers harry.wichers@wur.nl
Address project website	http://imparas.eu/
Start date	1 Januari 2015
End date	31 December 2018

Short description/aim project (this information can be published on a website of the TKI/Topsectors)

The main objective of the Action is to build an interdisciplinary European network of scientists with a broad range of expertise to discuss with an out-of-the-box view, new ideas and more predictive models and approaches to improve the current allergenicity risk assessment strategy. This allows the transfer of scientific advances to European food companies to develop safe products, advice food safety authorities on better risk assessment strategies and change the public opinion on the safety of novel sustainable food.

Description highlights and results (this information can be published on a website of the TKI/Topsectors)

ImpARAS operated with 4 working groups:

- WG1 identified the gaps in knowledge of the physical/chemical properties of proteins impacting their allergenicity. WG1 studied in more detail selected protein families, comparing strong and weakly allergenic proteins and physiological differences between known allergenic protein families.
- WG2 reviewed existing knowledge concerning protein uptake and bioavailability, allergen exposure and the activation of the innate and adaptive immune mechanisms and processes. The available information was structured according the AOP concept and *in vitro* methods were linked.
- WG3 reviewed animal models and how we can correlate *in vivo* with *in vitro* findings.
- WG4 identified the gaps in the current risk assessment strategy, and defined possible risk management targets for the assessment of IgE-mediated allergenicity proteins and identified their implications on future methods development.

Representatives of WFBR have participated in WGs 2 and 3.

During different WG meetings, scientists were able to participate in their WG of choice, but joint mixed group discussion were also encouraged. Collaborations between different countries and groups was further stimulated by STSM, joint project writings, such as Marie Curie ITN and more than 30 joined publications.

Important impact is: Influence on the allergenicity assessment strategies of EFSA, via the EFSA focus group on allergenicity, the building of an European network of leading institutes on food

allergy, training and education of young European scientists. Attending EU commission meeting on future needs in food safety research.

Deliverables (partly in progress):

1. 4 WG papers on current status of allergenicity assessment, from analytical, in vitro, in vivo point of view and from regulators point of view
2. Opinion paper on improved allergenicity assessment strategy of novel proteins
3. Development of new ideas/protocols for more predictive tools/methods (in vitro/in vivo, in silico) for allergenicity assessment
4. Report/publication on how to define allergenicity of proteins.

Number of delivered products (in an appendix, please provide the titles and/or description of the products or a link to the products on public websites)			
Academic articles*	Reports**	Articles in journals	Introductions/workshops
5	4		12

Appendix: Names of the products or a link to the products on a public website

* With authorship of WFBR-employees

** Progress reports to EU

Academic articles:

- Bøgh KL, van Bilsen J, Glogowski R, López-Expósito I, Bouchaud G, Blanchard C, Bodinier M, Smit J, Pieters R, **Bastiaan-Net S, de Wit N**, Untersmayr E, Adel-Patient K, Knippels L, Epstein MM, Noti M, Nygaard UC, Kimber I, Verhoeckx K, O'Mahony L.
Current challenges facing the assessment of the allergenic capacity of food allergens in animal models.
Clin Transl Allergy. 2016 Jun 16;6:21. doi: 10.1186/s13601-016-0110-2
- Jolanda H M van Bilsen, Edyta Sienkiewicz-Szapka, Daniel Lozano-Ojalvo, Linette E M Willemsen, Celia M Antunes, Elena Molina, Joost J Smit, Barbara Wróblewska, **Harry J Wichers**, Edward F Knol, Gregory S Ladics, Raymond H H Pieters, Sandra Denery-Papini, Yvonne M Vissers, Simona L Bavaro, Colette Larré, Kitty C M Verhoeckx, Erwin L Roggen (2017)
Application of the Adverse Outcome Pathway (AOP) concept to structure the available *in vivo* and *in vitro* mechanistic data for allergic sensitization to food proteins.
Clin. Transl. Allergy 2017;7:13. Published online May 12, 2017. DOI: 10.1186/s13601-017-0152-0
- Daniel Lozano-Ojalvo, Sara Benedé, Celia M. Antunes, Simona L. Bavaro, Grégory Bouchaud, Ana Costa, Sandra Denery-Papini, Araceli Díaz-Perales, María Garrido-Arandia, Marija Gavrovic-Jankulovic, Simone Hayen, Mónica Martínez-Blanco, Elena Molina, Linda Monaci, Raymond H.H. Pieters, Clelia Villemin, **Harry J. Wichers**, Barbara Wróblewska, Linette E.M. Willemsen, Erwin L Roggen, Jolanda H.M. van Bilsen
Applying the adverse outcome pathway (AOP) for food sensitization to support *in vitro* testing strategies
Tr Food Sci Technol, *accepted for publication*
- Laure Castan, Katrine L. Bøgh, Natalia Z. Maryniak, Michelle M. Epstein, Sahar Kazemi, Liam O'Mahony, Marie Bodinier, Joost Smit, Jolanda van Bilsen, Carine Blanchard, Robert Glogowski, Hana Kozáková, Martin Schwarzer, Mario Noti, **Nicole de Wit**, Grégory Bouchaud, **Shanna Bastiaan-Net**
Overview on *in vivo* and *ex vivo* endpoints in murine food allergy models: Suitable for evaluation of sensitizing capacity of novel proteins?
Short title: Relevant Murine-type food allergy endpoints
Allergy, *submitted*
- Erwin Roggen, Barbara Wróblewska, Celia Antunes, Ana Costa, Sara Benedé Pérez, Grégory Bouchaud, Simona Bavaro,....., Jolanda van Bilsen, **Harry Wichers**, Linette E.M. Willemsen
Linking systemic inflammation and allergic diseases: the role of macrophages
In preparation

Conference lecture:

Harry Wichers (2018)
Epitopes in sensitisation and in elicitation: the impact of food processing
4th ImpARAS conference June 19-21, Naples, Italy

Meetings:

2014 December 8, Brussels: kick-off
2015, March 3-4, Utrecht: 1st WG-meeting
2015, September 2-3, Madrid: 2nd WG-meeting

2015, November 24-26: 1st ImpARAS conference
2016, March 8-9, Barcelona: 3rd WG-meeting
2016, September 20-22, Warsaw: 2nd ImpARAS conference
2016, November 29-December 1, Vienna: 4th WG-meeting
2017, June 7, Porto: 5th WG-meeting
2017, October 10-12, Helsingor: 3rd ImpARAS conference
2018, March 22-23 Milan: 6th WG-meeting
2018, June 19-21, Naples: 4th ImpARAS conference
2018, October 2-3, Nantes: 7th WG-meeting

<http://imparas.eu/>

<https://www.wur.nl/nl/Onderzoek-Resultaten/Topsectoren/show/AF-EU-15003-IMPARAS-1.htm>