

info@evokeproject.org  
evokeproject.org

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**Szymon M. Drobniak<sup>1\*</sup>, H  lo  se Dufour<sup>2\*</sup>, Tania Jenkins<sup>3\*</sup>,  
Xana S  -Pinto<sup>4\*</sup>, Johnathan Silvertown<sup>5\*</sup>**

\* All Authors contributed equally

1. Institute of Environmental Sciences, Jagiellonian University, Poland; School of Biological,  
Environmental and Earth Sciences, University of New South Wales, Australia

2. Cercle FSER, Paris, France

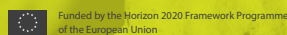
3. Swiss Academy of Sciences (SCNAT), Bern, Switzerland

4. Research Centre on Didactics and Technology in the Education of Trainers, University of Aveiro, Portugal

5. Institute of Evolutionary Biology, University of Edinburgh, Edinburgh, United Kingdom



## **Science communication in Europe relating to health and food safety: answers to Commissioner Vytenis Andriukaitis**





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## Promoting science literacy and evolutionary knowledge in Europe

**Scientific literacy is crucial to achieving the  
objective of smart, sustainable and inclusive  
growth contained in the Europe 2020 strategy**

### What is EvoKE and the EuroScitizen COST Action?

- EvoKE (Evolutionary Knowledge for Everyone) is a transdisciplinary network of 250 people in 31 countries using evolutionary biology as a model to tackle scientific literacy.
- We have expertise in biological research, science education, science communication and policy drawn from universities, the media, science centres, museums and botanical gardens.
- In 2018 we received an EU COST Action (EuroScitizen) to research strategies that promote scientific literacy.
- We work from the principle that evolution is fundamental to human health, food security, biodiversity and adapting to climate change. Understanding evolution can help people develop the skills and scientific knowledge needed to make informed decisions that address these issues.
- Our five working groups focus on: assessment of scientific literacy in evolution, formal education, non-formal education, media and researchers' engagement

## ■ The EvoKE/EuroScitizen strategy

European citizens have a positive attitude towards science<sup>1</sup>, but they do not always use it to make informed decisions.

- Research shows that simply providing access to more information does not affect scientific literacy, as most people interpret evidence based on their social group values, pre-existing conceptual networks and beliefs<sup>2,3,4</sup>.
- Creating a more knowledge-based society therefore requires a multidisciplinary approach<sup>5</sup>, that fosters deeper dialogue and engagement to build empathy with the public<sup>3</sup>.
- We are developing strategies to better know our target public and to build science based approaches to scientific literacy that connects with people's motivations, values and aspirations.
- We would like to explore how we can work with the Commission on promoting scientific literacy to reach a more knowledge-based society.

## ■ Answers to Commissioner's questions



How to communicate that science plays an important role in food production, to a public that prefers to associate food with nature and tradition, tending to ignore that the food we eat today has been crafted by man and is not the result of spontaneous mutations only?

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Identifying values and goals that are shared by researchers and the public and building strategies to promote these interactions is required to promote effective communication<sup>3,4,5</sup>. In relation to food production, we should ask why people value nature and tradition in food. The underlying reasons may be related to personal concerns for the environment, taste or health safety. These motivations give us a clear framework to address the above questions directly.

In order to engage with them it is important to show how research values both tradition and nature. Members of EvoKE are already evaluating (with promising preliminary results<sup>6</sup>) strategies that engage students and the general public, valuing their cultural heritage and individual's biological features, while providing opportunities for them to learn about evolution, develop healthy food habits and appreciation for the value of genetic diversity. It is also important to provide the public with opportunities to meet researchers with diverse profiles<sup>3</sup>. This is an area that several EvoKE members are active in projects such as "scientific speed-meetings events", and dialogue events on gene technology<sup>7,8</sup>. Preliminary evaluation of these activities suggests that they contribute to improving public scientific literacy and be implemented at large scales and low cost<sup>7,8</sup>. Finally, scientists doing research on food could build their projects to address some of the public's concerns and, even more interestingly, co-create their projects with the local community<sup>5</sup>. Co-created research projects are currently being promoted by EvoKE members in distinct countries.



How to convince consumers that science is a sound basis for informed decision about food and not a threat to food safety?

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To use science to make informed decisions, it is not enough simply to know the scientific facts. It is also important that people understand how science operates and why the information it generates is trustworthy. Citizens should be able to generate, evaluate and use evidence (e.g. through citizen-science initiatives and science-informed educational curricula) and participate in public debates<sup>9</sup>. Developing such knowledge and skills requires a continuous effort that should be pursued throughout an individual's life<sup>9</sup>. The EuroScitizen COST Action is currently conducting research on effective strategies to achieve this goal.

In addition, we need to understand who sees science as a threat, what the underlying causes of this are and to find common ground and shared values and interests to start positive and effective dialogue<sup>3,4,5</sup>. The value of this approach is perfectly illustrated by the case of Mark Lynas, an early anti-G.M.O. activist who radically changed his position on GMOs after engaging with science to help fighting climate change<sup>10</sup>.

Following the example and recommendations of successful science communication projects<sup>5</sup>, EvoKE and EuroScitizen encourage multidisciplinary teams to develop and evaluate new approaches in science communication and production, that build on empathy and promote trust between researchers and the public.



How to communicate about risks and an acceptable level of risk? how to explain that zero risks does not exist?

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In quantitative terms, risk is a difficult concept which, when stripped of its mathematical interpretation, often becomes a biased and easily manipulable source of fear and misguided decisions. Conveying in an easy to grasp way the idea that risk is a product of hazard, vulnerability and exposure could not only help people approach risk assessment sensibly but also limit anti-scientific risk narratives. Excellent references, like for example Spiegelhalter (2017)<sup>4</sup> emphasize the need of using intuitive comparisons in communicating risk. A good approach is to compare an unfamiliar risk with a commonly understood one, e.g. "Apart from smoking, obesity is the single biggest preventable cause of cancer."<sup>4</sup> A study using pairwise comparisons of risk showed that people ranked risks reasonably well, through this approach<sup>11</sup>. According to this study, the accuracy of respondents' mortality ranking being better explained by the respondents' capacity to employ scientific evidence in everyday decision making. This highlights the importance of measures for the promotion of public scientific literacy and numeracy, ideally built since the first school years. But research shows that this is not enough. In fact, risk perception is better explained by the social group to which a person belongs to, than by their scientific literacy or numeracy<sup>3</sup>. Furthermore, even when people held reasonable perceptions of risk, their choice of police priorities are better explained by their values than by their risk perception<sup>11</sup>. This again highlights the urgency to develop a sense of citizens belonging to science and the scientific community using approaches that take into account at an early stage citizens' knowledge and values, whilst valuing their own areas of expertise.

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