OECD BIOPESTICIDES SEMINAR SESSION ON PEPTIDE CONSIDERATIONS

BETTER POLICIES FOR BETTER LIVES

The OECD

- Established: **1961**
- Headquarters: **Paris**
- Structure: **Council (Ambassadors)**
  Committees
  Working Parties
  Secretariat

Better policies for better lives | OECD

The Organisation for Economic Co-operation and Development is a forum and knowledge hub for data, analysis and best practices in public policy. We work with over 100 countries across the world to build stronger, fairer and cleaner societies - helping to shape better policies for better lives.

OECD Expert Group Biopesticides

Focuses on harmonizing methods for assessing biological pesticides and facilitating international cooperation among member countries

Annual seminar series exchanging information and best practice at the OECD Working Party Pesticides Meeting.

Develops reports, guidance, guidelines, tools

Publications on Pesticides | OECD

Health Considerations

- Information on mode of action and potential for allergenicity, toxicity or immunotoxicity
- Stability of proteins - for example degradation in gastric and intestinal fluid
- Development of new functional peptides using target-oriented approaches as in the pharma area with improved selectivity and stability and low toxicity
- Important to learn from experience with peptides used in human health

Environmental Considerations

Peptides

- Contribute to the adaptability and resilience of plants to different environmental conditions
- Regulate various plant processes, facilitating adaptation to the environment and enhancing defence responses to pests
- Low concentrations required for these peptides to be effective and rapid degradation in the environment
- This presents challenges in use of standard ecotoxicological tests - would be wiser to test the formulated product?

Problem formulation

- Problem formulation is a scoping assessment to determine the areas of the assessment which need the most attention.
- In doing so, certain areas of the risk assessment can be either waived or identified for deeper assessment on the basis of available information for example the natural occurrence, and the mode of action.
- With this approach, data requirements can be simplified, animal testing can be saved, the work of risk assessors can become lighter, and regulatory costs for placing biopesticides on the market can be cut
- Report of the 12th Expert Group on Biopesticides Seminar on Problem Formulation for the risk assessment of biopesticides | OECD

Postulated pathway leading to increased allergic/toxic responses in humans from - dietary exposure, corresponding risk hypotheses, and relevant information elements

Pathway steps	Risk Hypotheses	Examples of information elements
The biopesticide is a novel protein		
Humans are exposed to the novel protein via dietary means	Humans are not exposed to the protein by dietary means	Routes of dietary exposure
The novel protein has human allergenicity potential	The novel protein does not have allergenicity potential	Data on allergenicity to humans
The novel protein has human toxicity potential	The novel protein does not have toxicity potential	Data on toxicity to humans

Adapted from OECD Consensus Document on Environmental Considerations for the Release of Transgenic Plants, Harmonisation of Regulatory Oversight in Biotechnology, OECD Publishing, Paris, https://doi.org/10.1787/62ed0e04-en.

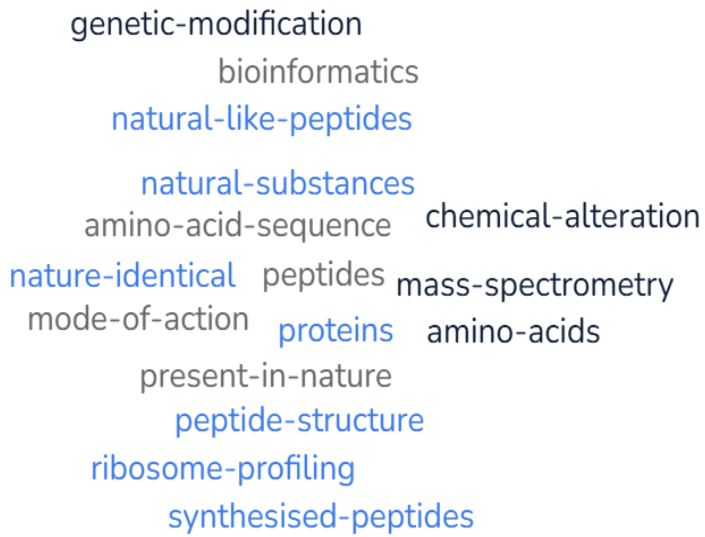
Diversity of definitions

Terminology

- Peptides and proteins for which the amino-acid sequence is demonstrated to be present in nature fall within the scope of “nature-identical”
- Natural substances sourced from nature or nature-identical if synthesized
- Natural and natural-like peptides

Based on properties

- Peptide structure and/or mode of action
- Bioinformatic tests e.g ribosome profiling and mass spectrometry
- Methods of production e.g genetic modification, chemical alteration
- Often arbitrarily restricted to short proteins of 2 to 100 or 50-60 amino acids
- Synthesised peptides



Would be easier to look at the polymorphism of the genes encoding peptides rather than looking into the variations in peptides?