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Risiken erkennen – Gesundheit schützen

Searching for Literature and Information on Alternative Methods

Barbara Grune

Federal Institute for Risk Assessment

ZEBET-Database and Information Services

Animal Welfare Regulations

Council Directive 86/609/EEC (24 November 1986) … regarding the protection of animals used for experimental and other scientific purposes,

Replacement Alternatives - Article 7(2)

"Animal experiments shall not be performed if scientifically satisfactory methods of obtaining the result sought, not entailing the use of an animal, are reasonable and practicably available."

Reduction and Refinement Alternatives - Article 7(3)

"The choice of species shall be carefully considered. Methods shall be selected that use the minimum number of animals, involve animals with the lowest degree of neurophysiological sensitivity, cause the least pain, suffering, distress or lasting harm."

Refinement Alternatives - Article 7(4)

"All experiments shall be designed to avoid distress and unnecessary pain and suffering to the experimental animals."

Proposal for a Directive of the European Parliament and of the Council on the Protection of Animals used for Scientific Purposes, 5 November 2008

The aim of a search

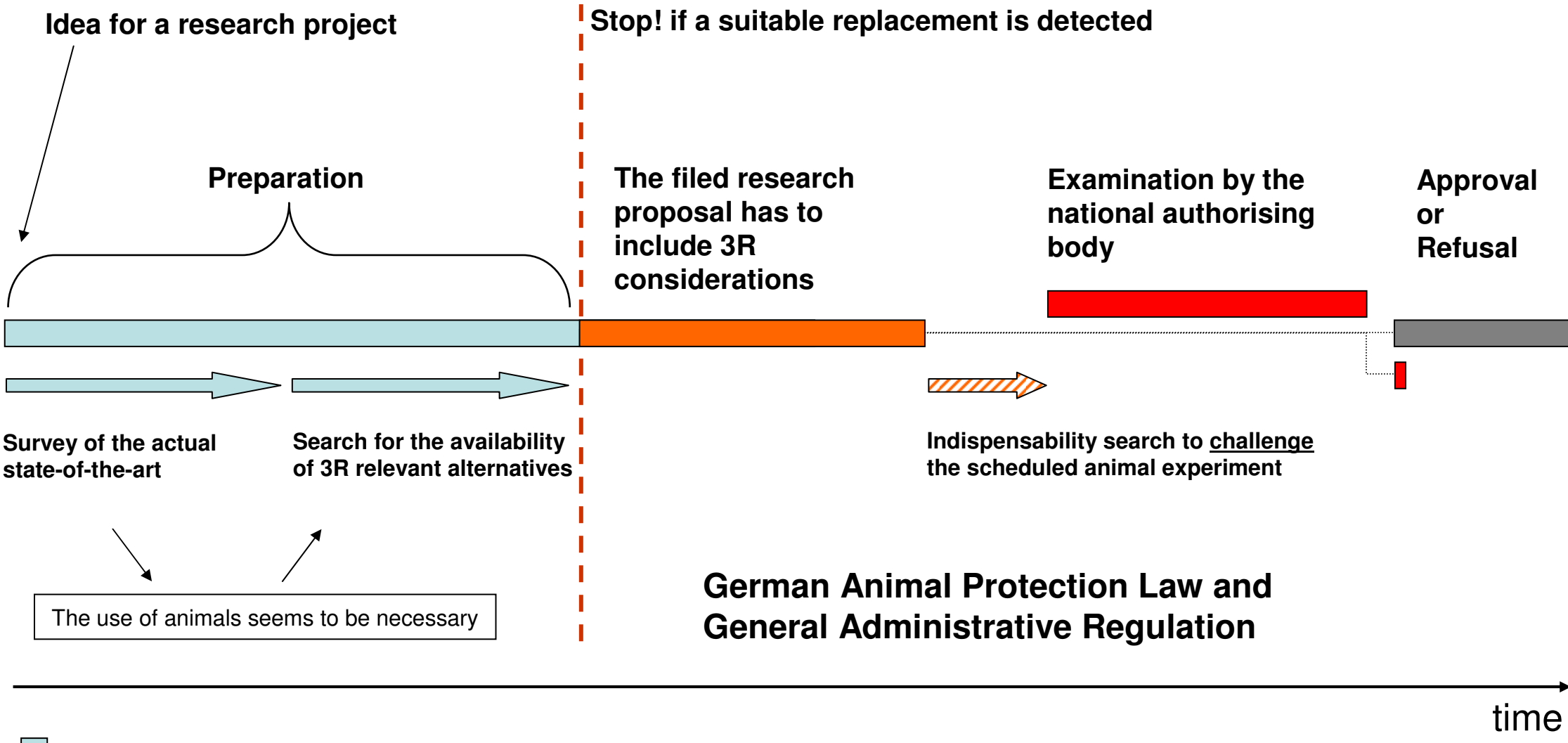
1. Survey
(to get an idea of a topic, find suggestions etc.)

The aim of a search

2. Targeted Search (structured)
(to target specific information or to exclude the presence of a particular piece of information; indespensability search)

German animal protection law § 7 (2)
„…. **examine**, **whether** the pursued purpose **cannot be achieved** by other methods or procedures “

Search-stages during the planing of an animal experiment



The Challenge: Searching Information on Alternative Methods

Where to find information? - Chose the appropriate information resources

Millions of potentially relevant documents are scattered across the Internet

databases (literature, factual, patent, added value) / database hosts
open access resources / organizations and their services / intranet

How to find information? - Compile relevant und necessary search terms

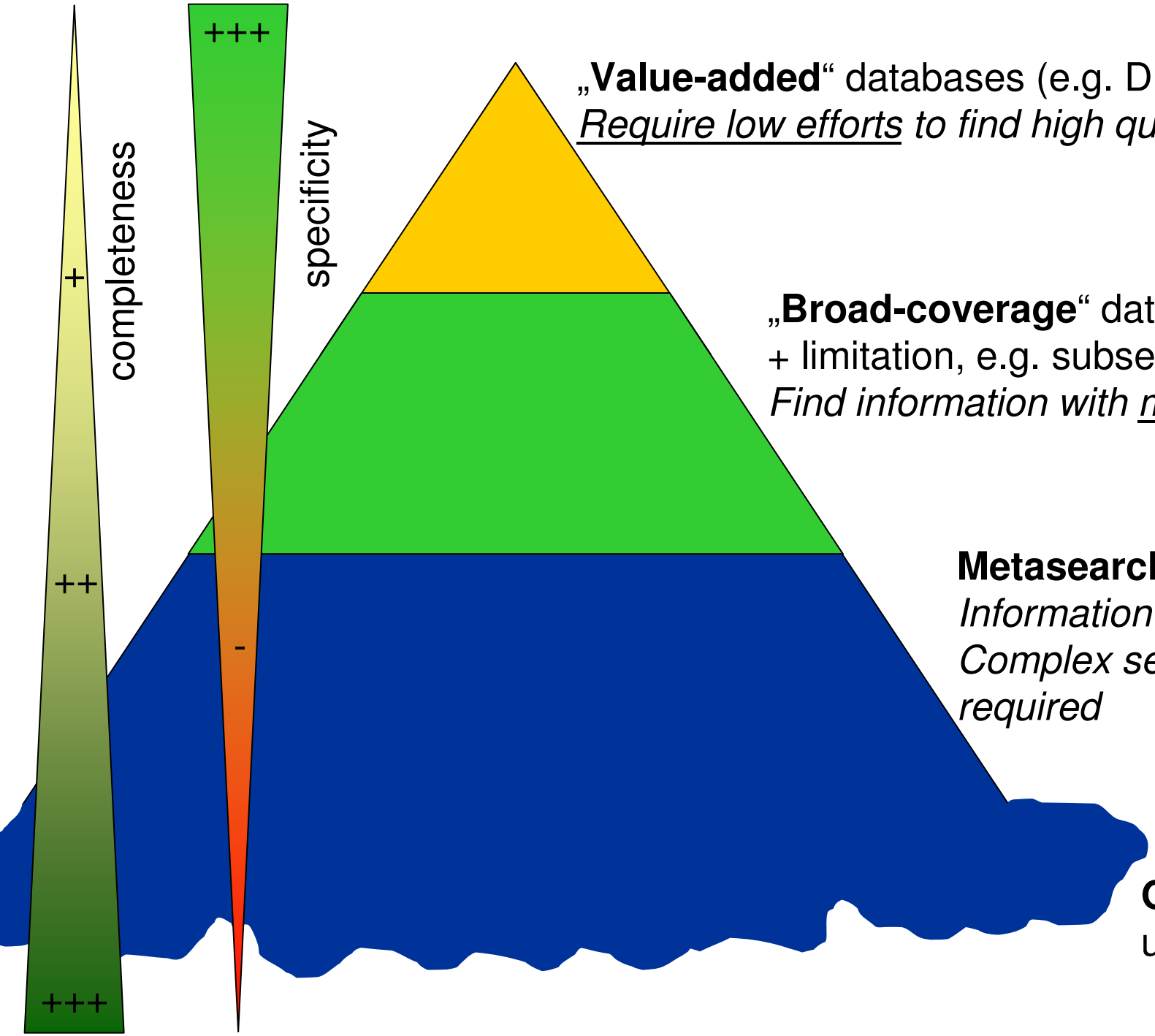
search terms (linguistic variations, synonyms)
search operators

Quality of a search result

Completeness (recall) / Relevance (precision) /
Currentness / Reliability (peer reviewed)

Information can be a basis for decision-making

Proposal for a 3R-specific search routine



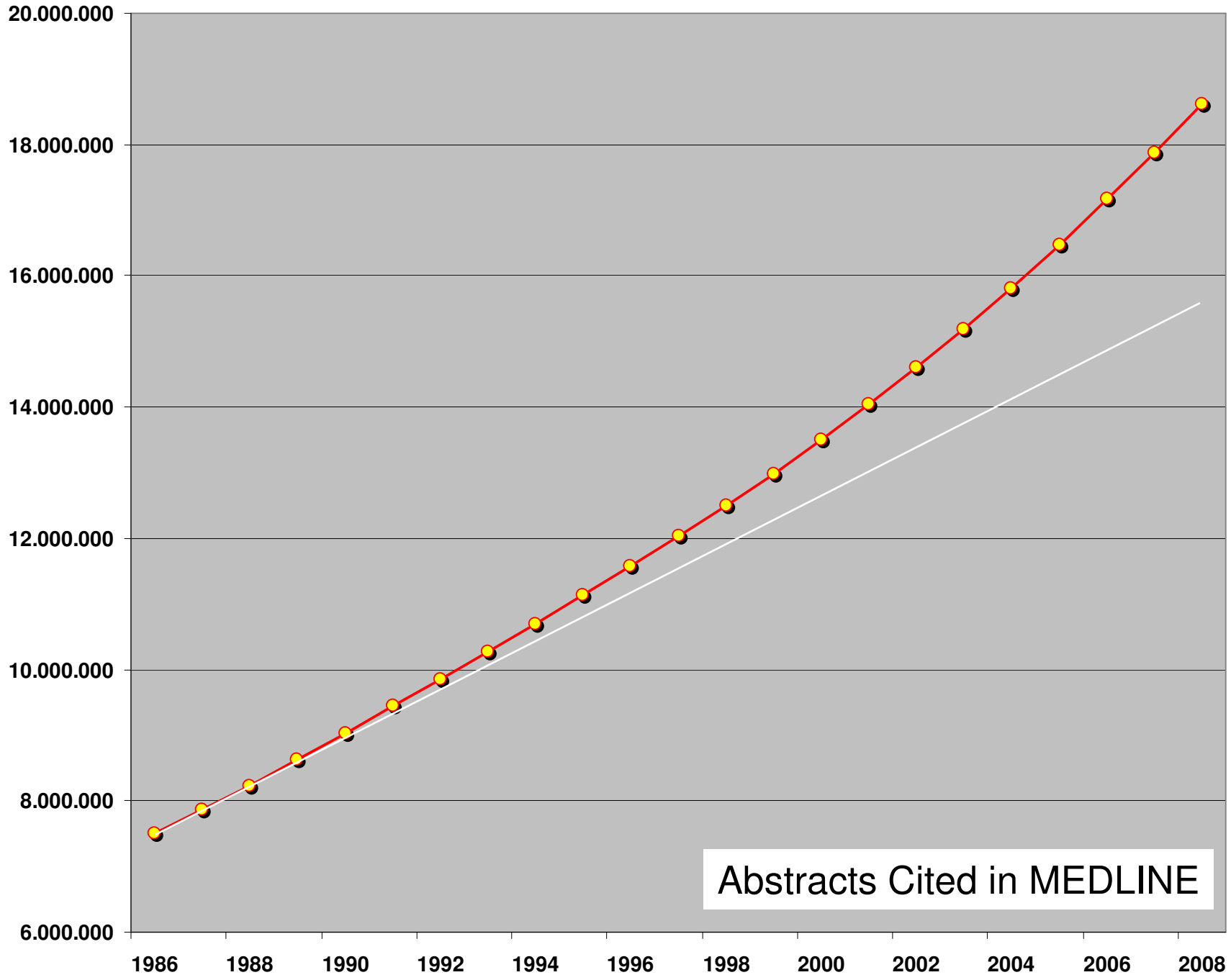
„**Value-added**“ databases (e.g. DB-ALM, AnimAlt-ZEBET):
Require low efforts to find high quality information

„**Broad-coverage**“ databases (e.g. PubMED)
+ limitation, e.g. subset of „animal use alternatives“
Find information with median amount of efforts

Metasearch (various structured sources
Information comes with high effort;
Complex search strategies may be required

Ocean of
unstructured raw information

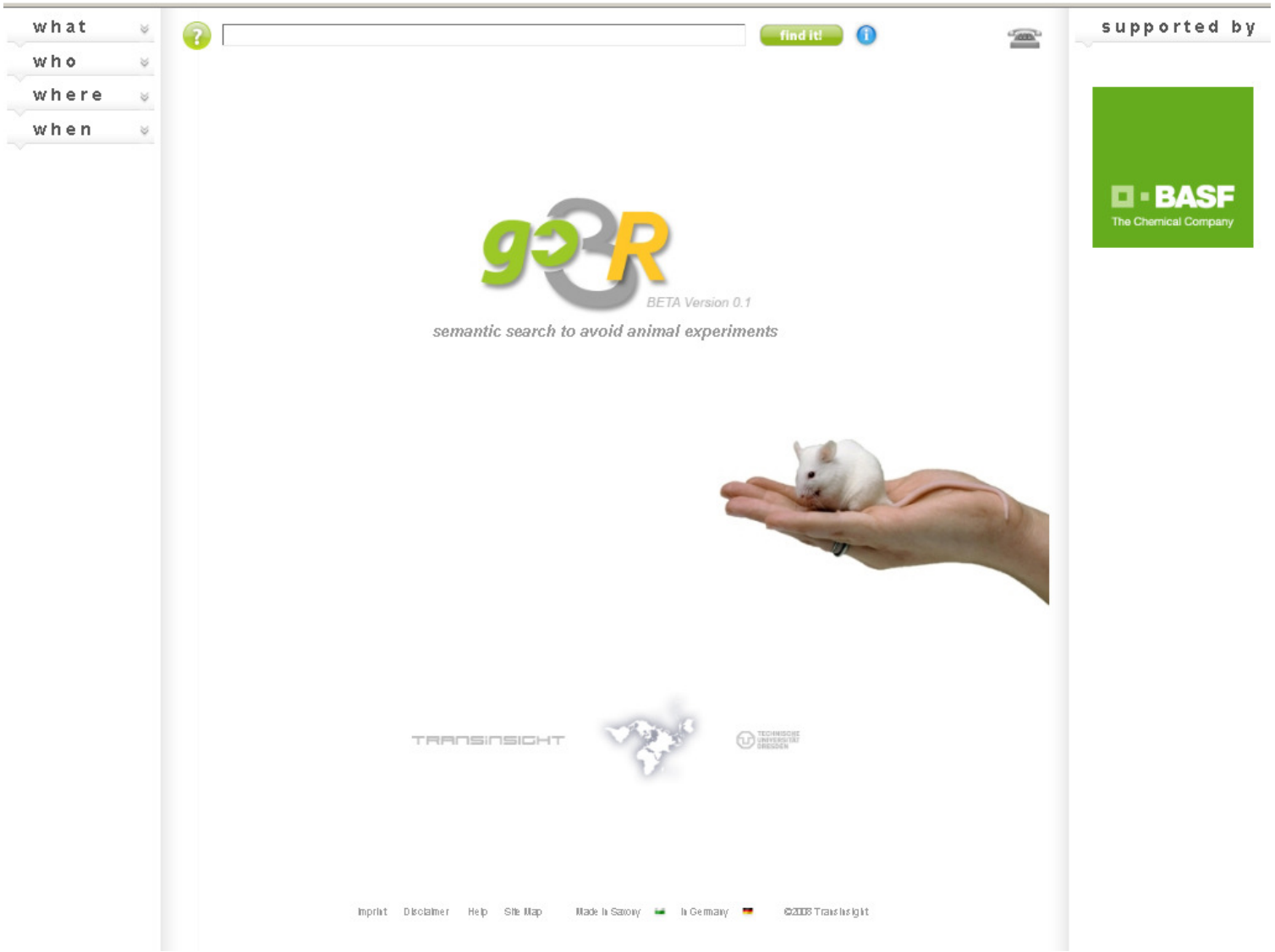
State of the scientific knowledge



Quantity vs. Quality: How to get both?

The main problem is not quantity, it is quality!
Our Answer: Semantic Technologies

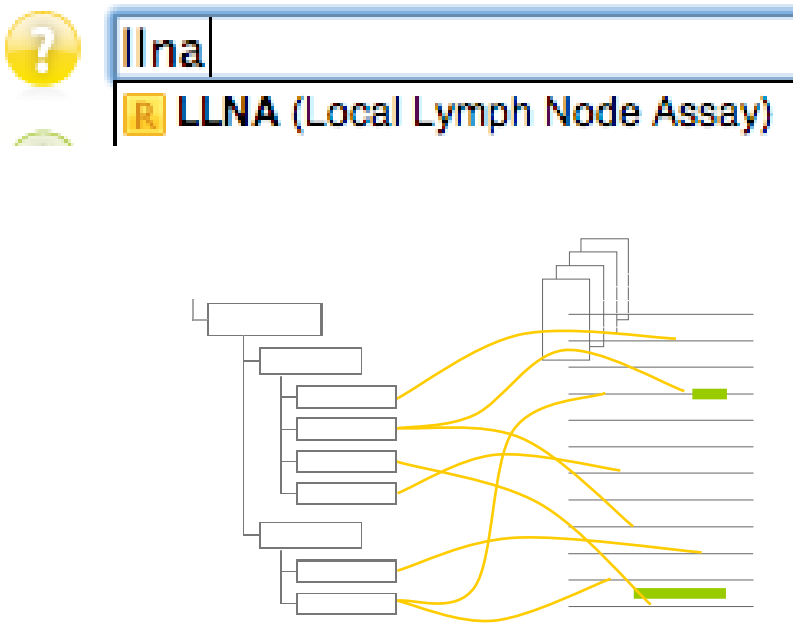
http://www.Go3R.org

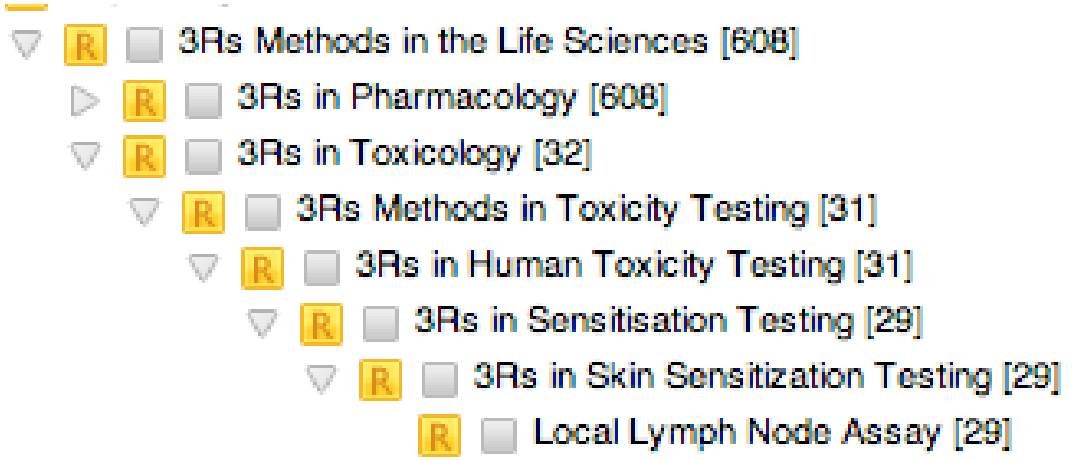


How does it work? Handling ambiguities

- **BCOP** is a Charitable organisation dedicated to improving the quality of life
- Scale-invariant feature transform (or **SIFT**) is an algorithm in computer vision
- **AMES** successfully educates and services over 40000 people every year
- **LLNA** Lucca Leadership North America

Go3R tries to understand your query:





Next Steps
Expansion of the Go3R ontology

Beta Version 0.1

Go3R ontology (October 2009)

26 branches comprise 16.998 concepts
e.g. 3Rs Institutions
3Rs Methods in the Life Sciences
Animal Care and Handling

TECHNISCHE UNIVERSITÄT DRESDEN

TRANSINSIGHT

BASF The Chemical Company

BfR

Scientific Consultancy – Animal Welfare Neubiberg/Munich

„Nano-branch“ of Go3R (October 2009)

8 nanobranches comprise 1.361 concepts enriched with 2.628 synonyms
e.g. Endpoints for Nanomaterial Characterisation & Testing
Methods for Nanomaterial Characterisation & Testing
Nanosubstances, Nanoproducts, etc.

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The AnimAlt-ZEBET Database,

A Unique Resource for Comprehensive and Added-Value Information on 3R Alternatives

Daniel Butzke

Federal Institute for Risk Assessment

ZEBET-Database and Information Services

AnimAlt-ZEBET database is …

… a **reliable resource** for information on **alternatives to all kind of animal experiments**, that presents the information in an **user oriented** and **easy-to-follow** fashion and **supports scientists**, **authorising bodies** and others who have to consider the indispensability of a planned animal experiment **with all the available expertise**.

- online since 2000
- free of charge
- currently hosted by DIMDI (www.dimdi.de)

AnimAlt-ZEBET, stand-alone version online available soon

ZEBET - Alternatives to Animal Experiments
Methods und Literature

Overview... | Change User | Logout

Methods | Help

User signed on: Dr. Butzke, Daniel

AnimAlt-ZEBET

Database for Alternative Methods to Animal Experiments of the Centre for Documentation and Evaluation of Alternatives to Animal Experiments (ZEBET)

In the ZEBET database only those methods are documented which fulfil at least one of the three following criteria:

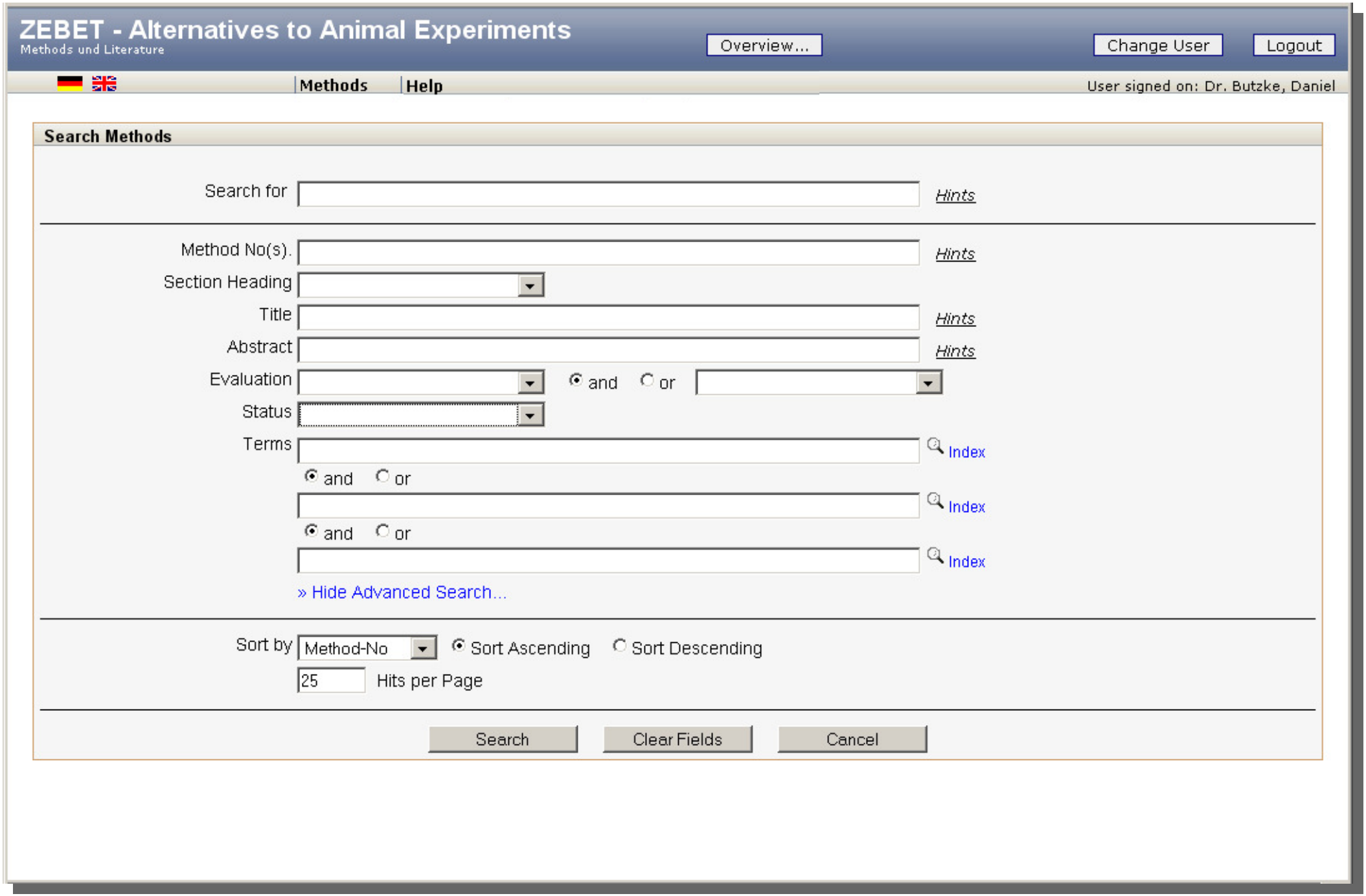
- the method can be used to replace animal experiments (Replacement)
- the number of experimental animals is reduced (Reduction)
- the pain and suffering of the experimental animals are minimised (Refinement)

These criteria correspond to the scientific principle of the 3Rs for alternative methods to animal experiments which was published by W.M.S. Russel and R.L. Burch in their book "The Principles of Humane Experimental Techniques" in 1959.

AnimAlt-ZEBET provides reports containing a scientifically evaluation of the alternative methods by ZEBET's experts with regard to their contribution to the 3Rs principle.

Welcome to the ZEBET-Database for Alternatives to Animal Experiments!

Browse through currently ~140 method summaries



Browse through currently ~140 method summaries

Toxicology	*59*
Physiology	*2*
Pharmacy	*26*
Pharmacology	*21*
Parasitology	*4*
Molecular Biology	*3*
Microbiology	*6*
Immunology	*6*
Food Hygiene	*5*
Cell Biology	*1*
Animal Production	*2*

Place more emphasis on alternatives in basic research

„Humanised“ mice:

- for the generation of therapeutic „human“ antibodies
- suitable **alternative**:

„**Phage Display**“ - technique

e.g. Adalimumab (Humira) for treatment of arthritis

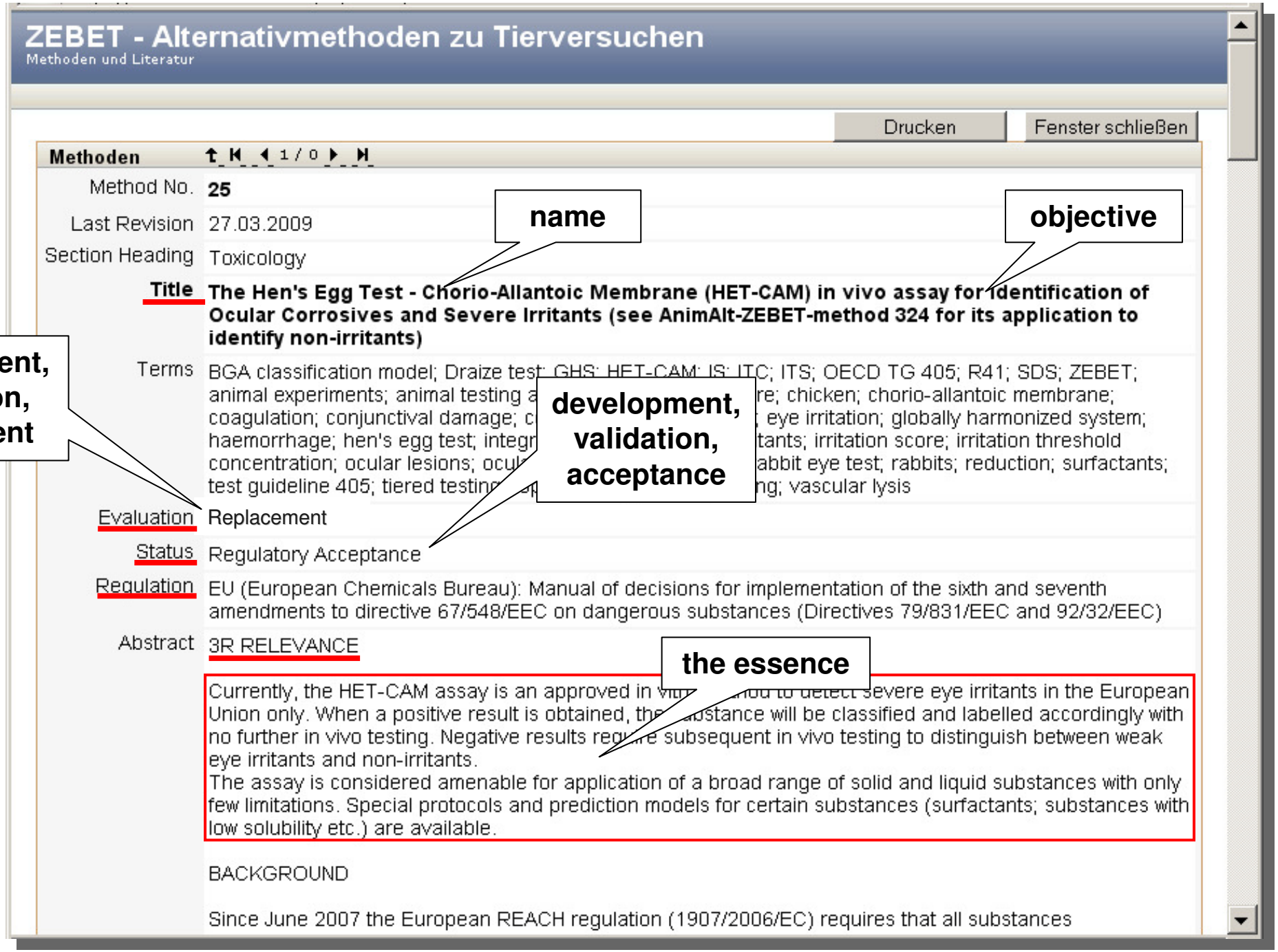
GFP-transgenic pigs

taxodros.unizh.ch

Transgenic flies as model of Alzheimer‘s disease

Aasen et al Nat Biotech 2008

Key information at a glance



New structure of the Abstract

***3R* Relevance**: *the essential facts*

Background

- **Scope**: *in what context is the experiment required*
- **Animal experiment**: *description of the substituted animal experiment*
- **Alternative approaches**: *comparison of existing alternatives*

Method

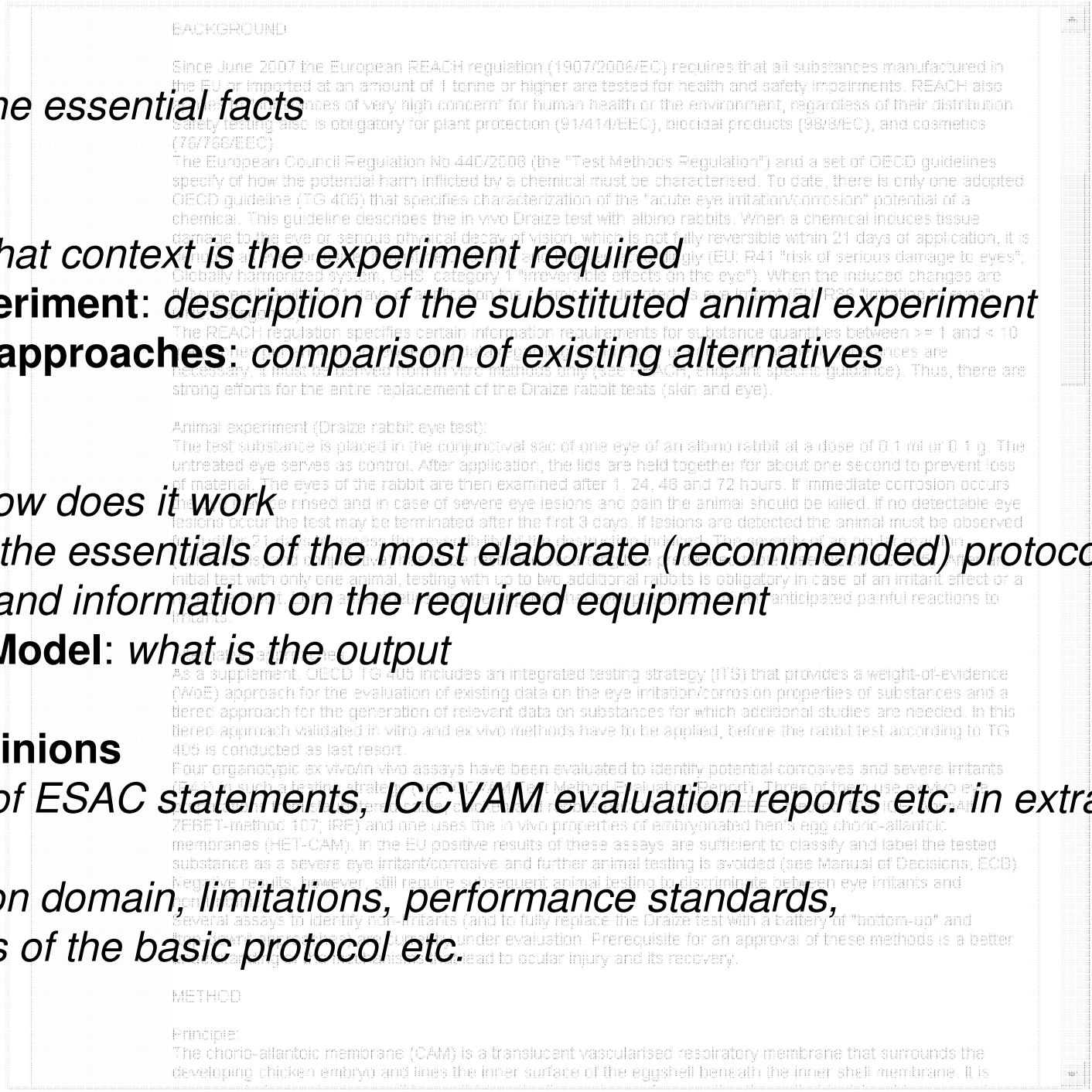
- **Principle**: *how does it work*
- **Procedure**: *the essentials of the most elaborate (recommended) protocol, and information on the required equipment*
- **Prediction Model**: *what is the output*

Expert Panel Opinions

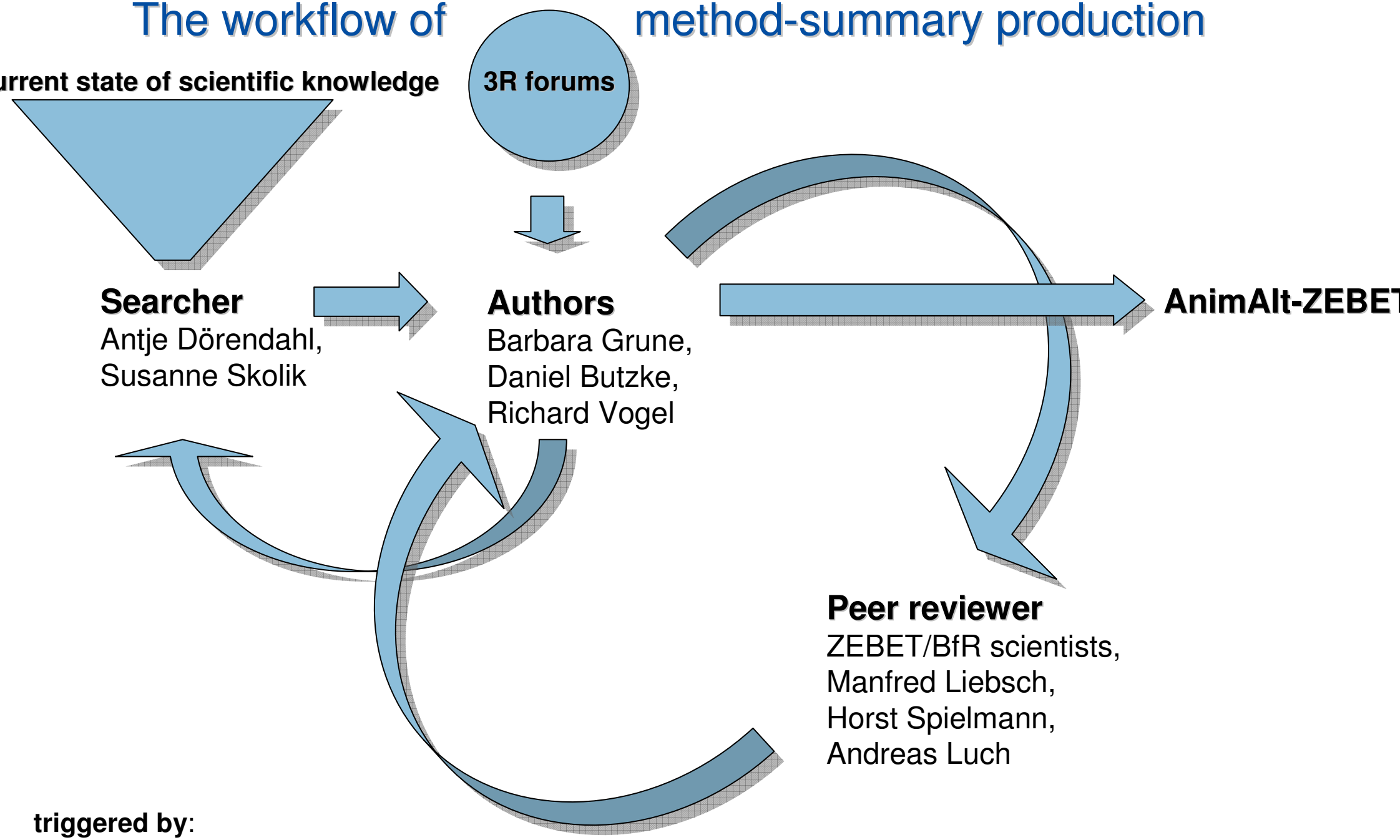
wording of ESAC statements, ICCVAM evaluation reports etc. in extracts

Note

application domain, limitations, performance standards, variations of the basic protocol etc.



The workflow of method-summary production



triggered by:

- urgency of the issue under consideration (e.g. transgenic animals)
- ongoing requests for a review (by ZEBET experts)
- „white space mapping“ (inventory of animal experiments with no established alternatives yet)

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Advisory Services for Public Authorities, Ministries, and Scientists

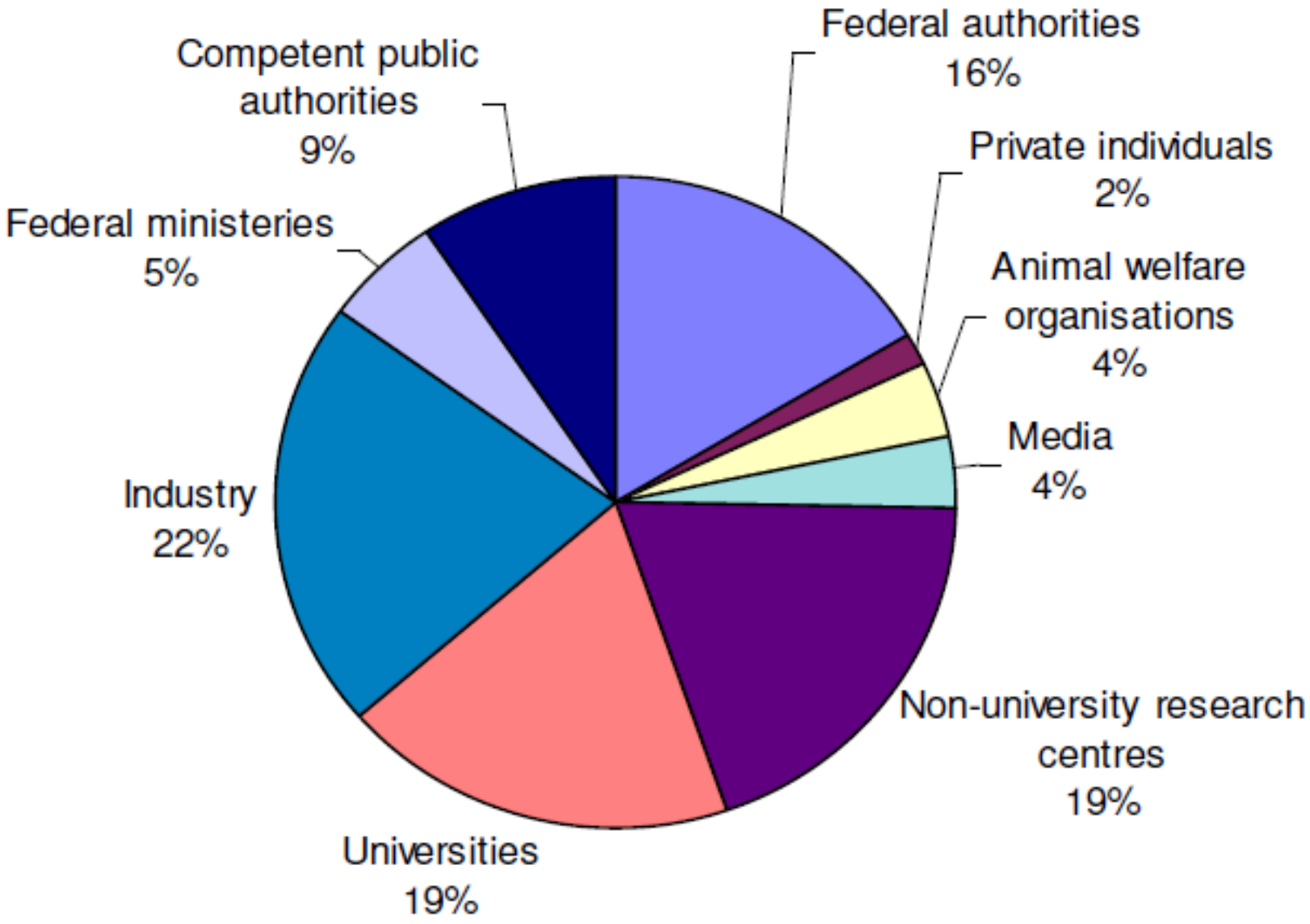
Sara Adler

Federal Institute for Risk Assessment

Centre for Alternative Methods to Animal Experiments -

ZEBET

In 2007 ZEBET responded to 457 inquiries.



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FEDERAL INSTITUTE FOR RISK ASSESSMENT

Thank you for your attention!

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