Selected Abstracts

Overview. Alternative (Non-Animal) Methods for Cosmetics Testing: Current Status and Future Prospects

Eskes C and Zuang V (eds) 2005 Overview. Alternative (Non-Animal) Methods for Cosmetics Testing: Current Status and Future Prospects. *ATLA 33, Suppl 1*: 5

The aim of this report was to provide an objective state of play of the current status of alternative methods/strategies and the prospects for their validation and regulatory acceptance so that they could be used for replacing animal tests in the safety assessment of cosmetic products as required by the EU Cosmetics Directive.

This report served as a basis for the timetable that the Commission needs to prepare in order to estimate the time for phasing out the animal tests as required in the 7th Amendment to the Cosmetics Directive.

An **Executive Summary** is presented at the beginning of the report and covers the main conclusions reached following an expert review of the relevant toxicological areas.

Chapter 1 provides background information on the non-animal testing provisions of the 7th Amendment related to the establishment of the Commission Timetable, and describes the procedure established by the Commission in order to meet these provisions.

Chapter 2 primarily describes the current safety data requirements for the purpose of the Cosmetics Directive. It emphasises the need for data on ingredients to allow safety assessment of cosmetic products under relevant conditions of exposure, i.e. more information than is required for classification and labelling of chemicals.

The final part of Chapter 2 provides the reader with the definitions of terms and rationale used by the experts in a consistent way to draw together the tables and conclusions which are included in the following chapters of the report.

Chapter 3 consists of 11 sub-chapters corresponding to the toxicological areas that may need to be addressed for assessing the safety of cosmetic products. Each sub-chapter provides the outcome of an experts' sub-group review which has been coordinated by ECVAM. The main elements of each subchapter are:

1. *a table summarising the inventory of the most valuable alternative methods currently known to be available.* It includes the status of validation of these methods and the time estimated to achieve ESAC endorsement for individual alternative tests assuming that optimal conditions are met (it does not take into consideration the time needed to achieve regulatory acceptance);

2. *the identification of the gaps left by the* in vitro *methods compared to the animal test*;

3. *the recommendations for achieving full replacement of animal tests*;

4. *the estimated time necessary to achieve full replacement of animal tests* assuming that all necessary conditions such as funding, human resources and coordination, are optimally met.

Appendix 1 of the report presents the list of Commission services and stakeholders involved in the procedure.

Appendix 2 of the report presents the list of participating scientific experts nominated by the Commission services and stakeholders.

Appendix 3 provides the glossary of terms and abbreviations which were used throughout the report.

Appendix 4 provides the list of currently available EU adopted methods for testing chemicals (Annex V of *Directive 67/548/EEC*).

Appendix 5 provides the list of currently available OECD guidelines for testing chemicals.

Pain and emotion interactions in subregions of the cingulate gyrus

Vogt BA 2005 Pain and emotion interactions in subregions of the cingulate gyrus. *Nature Reviews Neuroscience 6*: 533-544

Acute pain and emotion are processed in two forebrain networks, and the cingulate cortex is involved in both. Although Brodmann's cingulate gyrus had two divisions and was not based on any functional criteria, functional imaging studies still use this model. However, recent cytoarchitectural studies of the cingulate gyrus support a four-region model, with subregions, that is based on connections and qualitatively unique functions. Although the activity evoked by pain and emotion has been widely reported, some view them as emergent products of the brain rather than of small aggregates of neurons. Here, we assess pain and emotion in each cingulate subregion, and assess whether pain is co-localized with negative affect. Amazingly, these activation patterns do not simply overlap.

Placebos and painkillers: is mind as real as matter?

Colloca L and Benedetti F 2005 Placebos and painkillers: is mind as real as matter? *Nature Reviews Neuroscience 6*: 545-552

Significant progress has been made in the understanding of the neurobiological mechanisms of the placebo effect and most of our knowledge comes from the field of pain and analgesia. Today the placebo effect represents a promising model to shed new light on the mind–body interaction. In fact, mental events induced by placebo administration are able to activate mechanisms that are similar to those activated by drugs, which indicates a similarity between

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psychosocial and pharmacodynamic effects. These new neurobiological advances are already changing our conception of how clinical trials and medical practice must be viewed and conducted.

Can domestic fowl, Gallus gallus domesticus, *show self-control?*

Abeyesinghe SM, Nicol CJ, Hartnell SJ and CM Wathes 2005 Can domestic fowl, *Gallus gallus domesticus*, show self-control? *Animal Behaviour 70(1)*: 1-11

An important aspect of cognition is whether animals live exclusively in the present or can anticipate the future. Defined as self-control, the ability to choose a large, remote reinforcer over a small, proximate reinforcer available at the same frequency has been examined in a number of species, often proving difficult to demonstrate. We investigated self-control for food in domestic fowl using a standard two-key operant task and an equivalent two-choice return maze (TCRM) task. When hens chose between a 2-s delay to a 3-s feed access (impulsive) and a 6-s delay to a 7-s feed access (self-control), they appeared unable to discriminate in the TCRM but were impulsive in the operant task. We explored reasons for not choosing self-control in the operant task, first by examining the relation between feed access time and actual feed intake. A second operant experiment examined whether failure to show self-control could be attributed to an inability to combine the delay and access (quantity) reward information associated with choices to reach overall predictions of value. New hens chose between a 2-s delay to a 3-s feed access (impulsive) and either a 22-s delay to a 22-s feed access (standard self-control) or a 6-s delay to a 22-s feed access (jackpot self-control). While hens were impulsive in the standard condition, they showed significant and pronounced self-control in the jackpot condition, eliminating the possibility of an absolute cognitive constraint. Impulsive behaviour can instead be explained by temporal discounting: perceived depreciation of reward value as a function of the uncertainty associated with delay. Implications for welfare are discussed.

Suckling behaviour in domestic foals and the development of abnormal oral behaviour

Nicol CJ and Badnell-Waters AJ 2005 Suckling behaviour in domestic foals and the development of abnormal oral behaviour. *Animal Behaviour 70(1)*: 21-29

We investigated how the behaviour of domestic foals, *Equus caballus*, living at pasture with their dams was associated with foal gender, mare rank and the development of abnormal oral behaviour, both during the preweaning period, and over a period of up to 4 years postweaning. A population of 186 foals belonging to private owners and commercial studs was studied. The behaviour of male and female foals hardly differed, but mare rank affected patterns of foal social interaction and suckling behaviour, with foals of subordinate mares involved in more affiliative interactions. These foals also spent more time in perisuckling activities such as teat nuzzling than foals of other mares. During the study, 18 foals developed abnormal oral behaviour before weaning and 42 foals developed abnormal oral behaviour after weaning. The development of abnormal oral behaviour was associated with suckling behaviour in a variety of ways. Foals that had already developed abnormal oral behaviour at the time of the preweaning observations were involved in more suckling terminations within bouts than normal foals or foals that developed future abnormal behaviour, and pushing the udder with the muzzle was most frequent in these foals. Foals that had no current abnormal oral behaviour, but that would develop this in the future, spent more time suckling and twice as much time teat nuzzling as other foals. The results add to the growing evidence of associations between digestive function and abnormal oral behaviour in horses.

A new way to study teaching in animals: despite demonstrable benefits, rat dams do not teach their young what to eat

Galef Jr BG, Whiskin EE and Dewar G 2005 A new way to study teaching in animals: despite demonstrable benefits, rat dams do not teach their young what to eat. *Animal Behaviour 70(1)*: 91-96

Teaching is an alturistic act. Therefore, it is most likely to occur when pupil and teacher are closely related, costs to teachers are small, and benefits to pupils of being taught are large. Here, we determined, first, whether *Rattus norvegicus* dams would modify their food choices to teach their young which of two foods was safe to eat, and second, whether such teaching by mothers would be effective, if it occurred. We examined food choices of rat dams trained to eat one of two foods that their young could access when the dams could also access a third, more palatable food that their pups could not reach (three-bowl condition). These dams spent no more time eating the safe food available to their young than did control dams, which had access to the same three foods, but were not trained to avoid one of the two foods available to their young. Thus, dams that had learned that a food available to their offspring was toxic, failed to act to protect their young. When dams were trained to avoid one of only two foods available to them and their young (two-bowl condition), the young avoided the food that their dam had learned to avoid longer than did young of dams in the three-bowl condition. Thus, young of dams in the three-bowl condition would have been less likely to eat toxic food if their dams behaved appropriately. The present paradigm, though providing no evidence of teaching by rat dams, should permit investigation of teaching in many vertebrate species.

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Rapid change in energy status in fighting animals: causes and effects of strategic decisions

Briffa M and Elwood RW 2005 Rapid change in energy status in fighting animals: causes and effects of strategic decisions. *Animal Behaviour 70(1)*: 119-124

Energetic costs of fighting, such as high lactate or low glucose, have been shown in a range of species to correlate with the decisions made by each opponent, particularly the decision by one opponent, the 'loser', to end the fight by 'giving up'. Studies based on complete fights of differing duration, however, do not provide information on the changes in the physiological correlates of fighting that may take place during the course of the encounter, or how these changes may influence the capabilities and decisions of the contestants. We interrupted fights between hermit crabs, *Pagurus bernhardus*, at specific points, and related energy status to the preceding activities. Costs rose quickly with a rapid accumulation of lactic acid in attackers and declining muscular glycogen in defenders. Changes in physiological status appeared much earlier than the changes in behaviour that they may have caused. Furthermore, some physiological changes might have been an effect, rather than the cause, of fight decisions.

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