ECRO Newsletter

European Chemoreception Research Organization

Number 68 (Spring, 2003)



Contributions to the ECRO Newsletter

The ECRO Newsletter is published twice a year. Material for inclusion in the Newsletter should reach the editor by early March for the spring edition and early September for the fall edition.

Editor

Dr. Steven Nordin
Department of Psychology
Umeå University
SE-901 87 Umeå, Sweden

E-mail: steven.nordin@psy.umu.se

Phone: +46-90-7866006 Fax: +46-90-7866695

ECRO Board and Coopted Members

Board

President: Professor Bill Hansson, Swedish University of Agricultural Sciences, Sweden. E-mail: bill.hansson@vv.slu.se

Vice President: Dr. Joerg Strotman, University of Hohenheim, Germany. E-mail: strotman@uni-hohenheim.de

General Secretary: Dr. Ottorino Belluzzi, University of Ferrara, Italy. E-mail: mk5 @dns.unife.it

Executive Secretary and Treasurer: Dr. Krishna Persaud, UMIST, United Kingdom. E-mail: kcpersaud@umist.ac.uk

Coopted Members

Dr. Annick Faurion, Laboratoire de Neurobiologie Sensorielle, EPHE, CNRS, France. E-mail: faurion@ccr. jussieu.fr

Dr. Benoist Schaal, Centre Européen des Sciences du Goût, Dijon, France. E-mail: schaal@cesg.cnrs.fr

Prof. Gerd Kobal, Philip Morris, USA, E-mail: Gerd.Kobal@pmusa.com

European Executive Editors for Chemical Senses

Dr. Robyn Hudson, Institut für Medizinische Psychologie, Universität München, Germany. E-mail: robyn@imp. med.uni-muenchen.de

Dr. Rudolf Ali Steinbrecht, Max-Planck-Institut für Verhalthaltensphysiologie, Germany. E-mail: asd@mpi-seewiesen. mpg.de

Comments from the ECRO President

Dear friends and members,

A number of months have passed since the last Newsletter and spring is here. I want to take this opportunity to briefly inform you regarding what is going on in the organization. During the passed months the board has met electronically every month and worked on a number of issues to make ECRO an active and accessible organization.

The main effort has been put on improving our web presence and to build a web site that can be kept truly up-to-date. To achieve this goal we have moved the web site to a new address, www.ECRO-online.info, where we hope to have a more direct access for immediate changes and updates. This new address should be activated in the very near future. On the site we are also working on address lists, grant information, event information and other member-relevant issues.

A prerequisite for ECRO to function is economic contributions from members, as member fees, and from sponsoring corporations. The board has been active in both these directions. New corporate sponsorship has been attracted, and the number of paying members is increasing. I want to urge those of you who have not yet paid the 2003 membership fee to do so, and thus enable ECRO to remain an active organization.

One very important task of our organization is to support relevant activities and participation therein. During recent moths the board has decided to offer ECRO support to a number of conferences and workshops in the chemosensory area and we have also granted a number of student travel stipends to enable student participation in these conferences.

The year of 2004 promises to be hectic for those of us who want to participate in most chemosensory events around the world. The next ECRO conference will be organized in Dijon during early autumn, but before that both AChemS in USA (http://www.achems.org/) and ISOT in Japan (http://epn.hal.kagoshima—u.ac.jp/ISOT200 4/) are tempting ventures. Students who plan to apply for support to attend these meetings should start thinking about this already now. The deadline tends to approach much faster than expected.

The board's continued efforts will remain to be directed at making ECRO an active organization also between meetings. An active web site is today a prerequisite for this ambition. At the web site members can meet in the chat room and find addresses to potential collaborators. But the board also needs your input to continue improving both the web site and other functions, so we hope that you will offer us your suggestions.

Until our next communication I hope that you will all have a pleasant summer, full of chemosensory experiences. Take a look at the ECRO web site now and then and follow what is happening in the organization.

Bill Hansson

Report from the Symposium on Trigeminal Chemoreception, July, 2002, Pommersfelden, Germany

Contemplating irritation all day obviously fosters patience. Despite a period of 14 years since the last specialised symposium neg-lected sensory (International Symposium on Chemical irritation in the Nose and Mouth¹. Monell Chemical Senses Center, 1988), meeting was evidence that the field of trigeminal (TG) chemoreception is alive and Approximately 70 keen researchers enjoyed this excellent meeting, set in the beautiful surroundings of Schloß Weisenstein in Pommersfelden Erlangen, Germany. The meeting itself provided both a comprehensive over-view of the range of approaches and disciplines now being applied to under-stand the mechanisms and role of irritation, and also a sense of progress since the previous symposium.

With apologies to those whose interesting presentations are not men-tioned, here are a few of the "themes" that were apparent during the two days. These serve, I think, to illustrate the quality and breadth of the work being done on TG chemoreception.

A number of the presentations high-lighted the interdependence of tri-geminal, olfactory and taste systems. This is, of course, unsurprising - sensory integration is the norm, particularly in the chemical senses where it is the overall qualities of the sensed objects (e.g., foods) have high biological significance.

Olfactory/TG interactions were illustrated by psychophysical and brain ERP data confirming earlier suggestions that olfactory loss is accompanied by decreases in sensitivity to trigeminally-mediated sensations (2, 3, 4). Sources of olfactory/TG interactions, perhaps both inhibitory and facilitatory, may derive from the activity of CGRP containing fibers in the olfactory bulb, as well as in more peripheral locations (5).

TG/taste interactions were apparent in studies showing suppression of tastes by capsaicin in both psychophysical and NTS recording data, including evidence for both central and peripheral mec-hanism in these interactions (6, 7). Just how tightly interwoven taste and chemesthesis are was also evident in other presentations (8, 9). Distin-guishing between co-localised sensory systems depends to a degree on the ability to be able to identify compounds that selectively stimulate one sensory system or the other. Yet, most, if not all, tastes appear to have a somatosensory component. Recordings from poly-modal nociceptors in rats shows activation by bitter tastants. psychophysical Conversely, data presented showing that even the prototypical pure irritant, capsaicin, induces bitterness, probably mediated primarily by IXth CN fibers. These strands of data certainly raise questions about whether research into taste oral chemesthesis can proceed independently of one another, as they mostly have in the past.

The role of trigeminal systems in airborne irritation and chemical expo-sure was explored in a number of presentations. Exposure to VOCs re-mains an important occupational health issue, and the role of TG-mediated sensations in odor complaints is well recognised. Data presented on com-2-ethylhexanol pounds such as isopropyl alcohol, and their relevance to the setting of industrial standards, shows the practical importance of this issue (10, 11). Studies of responses to irritation may also help explain poorly understood clinical syndromes such as MCS (12). In an attempt to understand the role of TG reflexes in responses to air pollution, chlorine was shown to induce nasal congestion, most promi-nently in those who suffer seasonal allergic rhinitis. The failure of a cholinergic blocker to influence this response does not support a major role for parasympathetic autonomic reflexes, but instead implicates local, tachykinin-mediated axon reflexes (13).

That this issue is not purely one of physiology and psychophysics was covered in an overview that placed the perception of irritation in a context in which social, psychological and person-ality variables are the determinants of human responses to (14).example irritation An a "psychotoxilogical" app-roach to researching the impact of chemicals in an occupational setting showed that the relative contributions of these multiple determinants of responses irritation can be evaluated experimentally (11).

A key question with TG chemoreception, as with taste and olfaction, is what processes underlie the different chemesthetic sensations produced by the range of oral, nasal and ocular irritants. The recent discovery of the vanilloid (VR1) receptor and a menthol activated channel means that it is an interesting time to be addressing this question. At a neuronal level, there were data showing that TG neurons may respond to multiple sources of stimu-lation - e.g., chemical and mechanical or capsaicin and menthol - but there also appear to be "pure" stimulus-specific neurons as well, including neurons that respond to different degrees of stimu-lation, for example, cold receptors with different thresholds for activation and slowly and rapidly adapting mechano-receptors (15, 16). At a receptor level, there were data illustrating the potential role of nicotinic, vanilloid and P2X receptors in the mediation of responses to nicotine and CO₂ (5), as well as investigations of the role of ATP (18).

Was anything missing? I wonder if we would not have benefited from a broad view of the importance of irritation in that most common of human activities, eating. For example, Paul Rozin, a veteran of this field, might have posed some interesting questions about how it is that oral nociceptive activity is so sought after throughout the world. Next time.

Thomas Hummel is to be congratulated on bringing together such a broad range of scientists, and facilitating such an

exciting meeting. After 2 days of excellent trigeminal science, the main ECRO meeting had a lot to live up to.

References

- Green, B.G., Mason, J.R. & Kare, M.R. (eds) *Irritation* (Chemical Senses Vol. 2), NY: Marcel Dekker, 1990.
- 2. Hummel, T. & Futschik, T. *Impaired trigeminal function in olfactory loss: a study based on lateralization of chemosensory stimuli.*
- 3. Livermore, A. & Hummel, T. The influence of training on chemosensory event-related potentials and interactions between the olfactory and trigeminal systems.
- 4. Gudziol, H., Forster, G, & Hummel, T. Decreased trigeminal sensitivity in anosmia.
- 5. Alimohammadi, H. & Silver, W.L. *In Vivo characterization of nasal trigeminal chemoreceptors*.
- 6. Simons, C.T. Suppression of taste by oral irritants.
- 7. Lugaz, O. et al. Lingual somatosensory and taste interactions: simultaneous recordings of the chorda tympani (VIIth) and trigeminal (Vth) nerves of the hamster.
- 8. Simon, S.A. There is more to taste than meets the tongue
- 9. Green, B.G. Bimodal effects of oral chemesthetic and bitter stimuli across the tongue.
- 10. van Thriel, C. et al. Nasal function and chemoreceptive symptoms during controlled exposure to 2-ethylhexanol.
- 11. Smeets, M.A.M. & Dalton, P.H. Assessment of acute sensory irritation from isopropyl alcohol exposure in humans: A psychotoxicological approach.
- 12. Millqvist, E. Sensitivity for capsaicin inhalation.
- 13. Shusterman, D. Mechanistic studies of nasal trigeminal reflexes using chlorine gas as a model irritant.
- 14. Dalton, P.H. *Perceptual, cognitive and psychosocial factors in trigeminal experience.*

- 15. Belmonte, C. et al. Response of trigeminal ganglion neurons to mechanical and cold stimuli.
- 16. McKeegan, D.E.F. Response characterristics of avian nasal trigeminal nociceptors.
- 17. Paul, J. et al. *Electrophysiological* characterization of P2X-receptors in cultured rat trigeminal neurons.

John Prescott University of Otago, New Zealand

Recent Award Winners in Chemoreception

Max Mozell Award for Outstanding Achievement in the Chemical Senses: Dr. Robert Bradly, The University of Michigan, USA

Ajinomoto Award for Young Investigators in Gustation: Dr. Dana Small, North Western University, USA

Takasago Award for Research in Olfaction: **Dr. Brett Johnson**, University of California, Irvine, USA

The Moskowitz-Jacobs Award for Research Excellence in Psychophysics: **Dr. Noam Sobal**, University of California, Berkley, USA

2002 Don Tucker Award for Outstanding Graduate Student Presentation: Pengcheng Han, University of Utah, USA

Jacques Le Magnen, 1916 – 2002

One of the pioneers in research on olfaction and taste and on the regulation of water and food intake, has left us on Thursday the 23 of May 2002, at the age of 85 years. Jacques Le Magnen was a disciple of the famous French physio-logist Henri Piéron at the Collège de France and developed from 1949 till 1989 his own laboratory of Sensory and Behavioral Neurophysiology in this same renowned institution.

His early work was dedicated to the study of olfaction, and especially, but not only, to the influence of hormonal status and in particular sexual hor-mones on variations in olfactory sensi-tivity (1949-1952). One should also cite such different new trails as:

- The study of the dynamic variables influencing the olfactory effective-ness, and the first proposed concept of delivery rate instead of con-centration, as an efficient stimulus (1947).
- The intra-muscular injection of four odorants increasing the olfactory sensitivity to these compounds (1949). It is the first published case of olfactory sensitization.
- The measurement of the qualitative similarity of odorants in rats, by classical association conditioning be-tween bitter or sweet tastes in drinking water flavored with the aroma under study (1950).
- The first evidence of very early learning in the neonate mammal in the context of nursing (1968).

In addition, the surveys in olfaction and taste by Jacques Le Magnen are numerous and continue to be useful tools for several types of readers. Among his general books, chapters in encyclopedias and chapters in student physiology textbooks, one should mention a technical vocabulary of the organoleptic terms and of food and beverage tasting (1962).

Most of these early original works and overviews are in French and could perhaps be translated in English, in a similar way as was done for his second and "main" field of investigation (13 translations of early papers in food intake *in*: Appetite, 1999, suppl., 59 pp).

The originality of his approach and the precision of his experiments exe-cuted with very primitive olfactometry, assured him immediately a position as one of the leading personalities in the field of olfaction. He always kept a keen interest in olfaction and was a mentor to many young scientists in and outside his laboratory who wanted to study olfactory phenomena, even when the main orientation of his work shifted towards the study of the regulation of food and water

intake. To this latter field of research he made a number of invaluable contributions.

Beginning 1950, Jacques Le Magnen, put forward a series of for that time revolutionary concepts. His ideas have inspired and still inspire generations of scientists. He was the first to develop instruments that allowed to register food and water intake in the rat during all 24 hours per day and to show how the behavior and its determinants change under the influence of circadian cycles. During a phase of activity (the night in the rat), intake permits to build up bodily reserves which will be used in the resting phase, during which consumption is reduced to its simplest form. This day/night alternation is one of the prerequisites energetic of the hydromineral regulation. During the daily active period, the meals alternate with fasting periods in response to metabolic signals that are generated by the acquisition of the ingesta and by the composition of the bodily reserves. In all this, the role of the sensory characteristics of the food, olfactory of course, but also gustatory and visual, was not forgotten. In what he called "learning of palatability", Jacques Le Magnen showed how the sensory characteristics of the food transform themselves into a complex conditioned stimulus that guides the behavior, permits the formation of food prefer-ences and aversions and determines the size of a meal depending on the anticipated metabolic consequences his Furthermore, ingestion. laboratory confirmed that the same sensory and metabolic factors function also in humans. A synthesis of all his visionas in this field has been printed in an important book in (Neurobiology 1992 of feeding nutrition, Academic Press, 385 pp.).

Finally, he was also interested in problems concerning human alcohol consumption and in order to study this he created an animal model that was addicted to ethanol which he used during 30 years of research.

Jacques Le Magnen continued to publish scientific work right till the end of

his life. His bibliography can be found in his last invited publication in an international journal entitled "my scientific life: 40 years at the Collège de France" (Le Magnen J., 2001. *Neuro-science and Biobehavioral Reviews*, 25, 375-394). Thus, the richness of his ideas and his enormous knowledge of the fields that were important to him are readily available.

Jacques Le Magnen played also an important role in the organisation research. As a Research Director of Centre National de Recherche Scienti-fique and of the Ecole Pratique des Hautes Etudes, he played an important role in the evaluation of research and the scientific development in France. The constitution, memorandum and articles of the European Chemo-reception Research Organisation were written by Jacques Le Magnen. They are of French law and were legally registered until now at the Collège de France in Paris, before being transferred to the Centre Européen des Sciences du Goût in Dijon. As co-founder and first president of ECRO, Jacques Le Magnen had a lasting impact on the develop-ment of the coordination of chemosensory research in the world.

But above all, his students and all those who have known him, will remember him by his exceptional courage and dedication to science. At the age of thirteen, he contracted an encephalitis, as a result of which he lost his eye-sight. His blindness, however, did not stop him to pursue a scientific career characterized by brilliant ideas experiments. He was an inde-fatigable worker, a true scholar and a lover of refined music. His intellectual activity did not end with his retirement from the Collège de France in 1989 and he continued to write till the last

His students and his friends were always struck by his phenomenal scientific and encyclopedic memory. Jacques Le Magnen knew everything: who had demonstrated what, by what means and under what circumstances. The most astonishing feats of this memory were his lively and very visual descriptions of cities

he had visited, but of course had never seen directly. He saw these cities through the eyes of Madame Le Magnen, his admirable and devoted companion, who was always at his side wherever he traveled.

Jacques Le Magnen was Chevalier de la Légion d'Honneur and Doctor Honoris Causa of the Universties of Lausanne and Utrecht.

> France Bellisle Paul Laffort Benoist Schaal Ep Köster

Brief report from AChemS 25th Annual Meeting

Twenty-five years of annual meetings! Our multi-continental chemosensory society is no longer a child — rather becoming a mature adult who can look back in time with certain pride. Don't we know quite a lot more today than we (or others) did three decades ago? I would say so. The 25th Annual Meeting of the Association for Chemoreception Sciences, April 9-13, certainly contri-buted to this increased knowledge.

From my perspective it is quite clear that the meeting provided far more new insights into two domains of human chemoreception than usually is the case at AChemS and ECRO meetings. I was delighted to see that the topics of retronasal olfaction and perception of multimodal stimuli had grown in volume and, thus, earned their own sessions.

Twenty-five years of annual meet-ings calls for an anniversary symposi-um, with which the organizers indeed provided us. By means of three talks, and a panel discussion that followed, we were guided through the various major advancements in animal research regarding predominantly cell physio-logy over the past 25 years. During the symposium I was wondering whether any advancement worth mentioning has been made in human chemoreception during this period. I did not fully get an answer to

this question — maybe at the next anniversary? Nevertheless, the meeting in general offered, with its 437 presentations, an excellent balance and representation of the various sub-topics of chemoreception. I'm thankful to the program committee (and presenting colleagues, of course) for a very stimu-lating scientific event.

The most memorable social event of the meeting, I would say, was the anniversary reception at the Ringling Museum. When walking through the museum before the reception it became clear that we are in the wrong business. Let's go into the railroad and circus business, and we can have our own, personal museum with collections of Rembrandt, etc. The reception took place at the "palace yard" — quite impressive! Despite chilly winds, the social atmosphere was at its peak with laughs and dancing, and the food was just great. I don't envy the organizers of the next AChemS meeting who will have to deal with our expectations.

To sum up, those of us who had the privilege to attend the 25th Annual AChemS Meeting are most likely to be, and should be, very grateful to the organizers.

Editor

New Books

Handbook of Olfaction and Gustation (2nd edition).

Edited by R.L. Doty. Marcel Dekker. 2003.

Pheromones and Animal Behaviour: Communication by Smell and Taste. T.D. Wyatt Cambridge University Press

T.D. Wyatt. Cambridge University Press. 2003.

Olfaction, Taste, and Cognition
Edited by C. Rouby, B. Schaal, D. Dubois,
R. Gervais & A. Holley. Cambridge
University Press. 2002.

Insect Chemoreception - Fundamental and Applied

Edited by M.F. Ryan. Kluwer Academic Pub. 2002.

Handbook of Machine Olfaction: Electronic Nose Technology

Edited by T.C. Pearce, S.S. Schiffman, H.T. Nagle & J.W. Gardner. Wiley-VCH. 2002.

Home Pages

ECRO

http://www.ecro-online.org/

AChemS

http://www.achems.org/

JASTS

http://epn.hal.kagoshima-u.ac.jp/ JASTSE/

registered in Paris in 1971 and although it began as a European venture, it now has members from outside Europe and sees its function as world-wide. It encourages a multi-disciplinary approach to research in chemoreception. Since 1978 ECRO has been affiliated with UNESCO.

ECRO activities include (see http://www.ecro-online.org/ for further information):

- Congresses
- Mini-symposia
- Summer Schools
- Meetings for national groups
- Promotion of research in chemoreception through scholarships, fellowships and awards.

ECRO is financed by individual members' subscriptions and by do-nations from industry and research institutions. Its activities are admini-stered by a Board of up to nine members responsible to the General Assembly, which is convened biennially. Currently, ECRO has over 400 members from 29 countries.

About ECRO

ECRO seeks to promote and support research and to assist the exchange of information on all aspects of the chemical senses. It was inaugurated in 1970 at the International Summer Course on Odour Perception, in Utrecht, with the aim of promoting and coordinating research in chemorecep-tion. It was officially

Honorary Members

Dr. M.G.J. Beets (Hilversum)

Dr. G. Birch (Reading)

Dr. D. Glaser (Zurich)

Dr. R. Harper (Reading)

Dr. A. Holley (Lyon)

Dr. K.-E. Kaissling (Seewiesen)

Dr. E.P. Köster (Utrecht)

Late Dr. J. Le Magnen (Paris)

Late Dr. D. Ottoson (Stockholm)

Dr. J. Solms (Zurich)

Late Dr. E. Sundt (Geneva)

Forthcoming Meetings

Gordon Research Conference: Chemical Senses, Taste & Smell
New London, NH, USA, July 6-11, 2003. http://www.achems.org/gordonconf.htm

Sixth IBRO World Congress of Neuroscience

Prague, Czech Republic, July 10-15, 2003. http://www.ibro2003.cz/

11th Annual Meeting of the Society for the Study of Ingestive Behavior Groningen, the Netherlands, July 15-19, 2003. http://www.biol.rug.nl/ssib2003/ The Fifth Pangborn Sensory Science Symposium
Boston, MA, USA, July 20-24, 2003. http://www.pangborn2003.com/

Summer School on Human Olfaction
Dresden, Germany, July 27-August 2, 2003.
http://www.tu-dresden.de/
medkhno/riechen_schmecken/
summerschool.htm

XXVIth Annual AChemS Meeting Sarasota, FL, USA, April 21-25, 2004. http://www.achems.org/

XIIIth International Symposium on Olfaction and Taste/JASTS
Kyoto, Japan, July 5-9, 2004.
http://epn.hal.kagoshima-u.ac.jp/
ISOT2004/

7th Sensometrics Meeting
Davis, CA, USA, July 28-30, 2004.
http://www.statistik.unidortmund.de/sensometrics/

XVIth ECRO Congress Dijon, France, 2004