

ACHEMS - 1993

PROGRAM

**THE FIFTEENTH
ANNUAL MEETING
OF THE
ASSOCIATION FOR
CHEMORECEPTION
SCIENCES**

*Hyatt, Sarasota
Florida
April 14-18, 1993*

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GENERAL INFORMATION

1. Registration:

Wednesday evening: 5:00-7:30pm in the Longboat Room & Prefunction Area.

Thursday, Friday and Saturday mornings: 7:30-9:00am, and Thursday evening: 6:00-7:00pm, in the Longboat Room.

2. All slide sessions and workshops will be held in the Sara Desoto Ballroom. All speakers in slide sessions should meet with the session chairperson and give slides to the projectionist at least 20 minutes prior to the start of the session.

**3. All poster sessions will be held in the Hernando Desoto Ballroom. All morning posters should be removed by 3:00pm.
All evening posters should be removed by midnight.**

4. The Clinical Luncheon will take place Thursday at 1:00 PM in the Florida Room.

5. The Industrial Dinner with cash bar and speaker will take place Friday night at 6:00 PM in the Florida Room.

6. There will be a van from the hotel to Lido Beach Thursday, Friday and Saturday afternoons. The van will leave from the front of the hotel on the hour, beginning at 1pm. It will leave Lido Beach to return to the hotel on the half hour. The last bus will leave Lido Beach at 4:30 pm.

7. The Hyatt will provide a cash "Quick-Lunch Sandwich Cart" at the conference center daily at 12:30PM.

Thursday, April 15, 1993

SLIDES

Thursday Morning - 8:00-12:30 p.m.

Olfaction and Taste: Clinical Aspects

Chairperson: Beverly Cowart

- 8:00 #1 Differential Effects of Topical Anesthesia on Taste Qualities. F. CATALANOTTO, P. HOVLIARAS, Y. LECADRE, *New Jersey Dental School* and L. BARTOSHUK, *Yale University*.
- 8:15 #2 Differential Loss of Sensitivity to Bitter Compounds in Aging. YOSHIKO YOKOMUKAI^{1,2}, BEVERLY J. COWART¹ and GARY K. BEAUCHAMP¹, ¹*Monell Chemical Senses Center*; ²*Kirin Brewery Co., Ltd.*
- 8:30 #3 Influence of Stimulus Area, Subject Age, and Tongue Region on a Nonparametric Signal Detection Measure of Taste Sensitivity to NaCl. TOSHI MATSUDA and RICHARD L. DOTY *Smell and Taste Center, and Department of Otorhinolaryngology: Head and Neck Surgery, University of Pennsylvania*.
- 8:45 #4 Documenting Taste Deficits Resulting from Rinsing with Chlorhexidine Gluconate in Humans. MARION E. FRANK, MARY ANNE DELLA-FERA, JILL HELMS and APRIL E. MOTT, *University of Connecticut Health Center, Farmington, CT.*
- 9:00 #5 Development of Olfactory Evoked Potentials for Functional Assessment in the Elderly. CLAIRE MURPHY, STEVEN NORDIN, *UCSD Medical Center and San Diego State University*; RENE de WIJK, *John B. Pierce Laboratory and San Diego State University*; WILLIAM S. CAIN, *John B. Pierce Laboratory*; and JOHN POLICH, *The Scripps Research Institute*.
- 9:15 #6 Age-Related Changes of Chemosensory Event-Related Potentials after Trigeminal and Olfactory Stimulation. T. HUMMEL, S. BARZ, and G. KOBAL, *Dept. of Pharmacology, Univ. of Erlangen-Nurnberg, Erlangen, FRG.*
- 9:30 #7 Assessment of Individual Olfactory Sensitivity in Aging: Role of Threshold Variability. JOSEPH C. STEVENS and AASHISH D. DADARWALA, *John B. Pierce Laboratory*.

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- 9:45 #8 Odor Detection and Recognition Memory in Alzheimer's Disease. STEVEN NORDIN, CLAIRE MURPHY, *San Diego State University and UCSD Medical Center*; RANI NIJJAR and CARLO QUINONEZ, *San Diego State University*.
- 10:00 Refreshment Break
- 10:15 #9 Pre- and Post-Operative Studies of Olfactory Function in Patients with Anterior Temporal Lobectomy. STEVEN E. WEST, RICHARD L. DOTY, MICHAEL J. O'CONNOR, and MICHAEL R. SPERLING, *Smell and Taste Center, Department of Otorhinolaryngology: Head and Neck Surgery, University of Pennsylvania, and Departments of Neurosurgery and Neurology, Graduate Hospital, Philadelphia*.
- 10:30 #10 Chemosensory Event-Related Potentials in Temporal Lobe Epilepsy and First Recordings of Olfactory Event-Related Magnetic Fields. G. KOBAL, T. HUMMEL, B. KETTENMANN *Dept. of Pharmacology and Toxicology*, E. PAULI, P. SCHULER and H. STEFAN *Dept. of Neurology, University of Erlangen, FRG*
- 10:45 #11 PET Scan Representation of Central Olfactory Processing in Phantosmia. DONALD LEOPOLD, GARY E. MEYERROSE, ZSOLT SZABO, and SAMUEL SOSTRE, *Johns Hopkins Medical Institutions*.
- 11:00 - 12:30 Symposium: Electrogustometry: A Simple Way to Test Taste
Opening Remarks - JACK PEARL, NIDCD, *National Institutes of Health*
- 11:05 #12 S1 An Overview of Electrogustometry, A Simple Way to Test Taste. MARION E. FRANK, *University of Connecticut Health Science Center*.
- 11:30 #13 S2 Clinical Use of Electrogustometry -Its Strengths and Limitations. HIROSHI TOMITA, *Department of Otorhinolaryngology, Nihon University, School of Medicine, Tokyo, Japan*.

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- 12:00 #14 S3 Advantages and Limitations of Electrogustometry for Clinical Assessment of Taste Function. CLAIRE MURPHY, *San Diego State University and UCSD Medical Center.*
- 12:15 #15 S4 Electrogustometry and Taste Bud Prevalence, INGLIS MILLER, JR., *Department of Neurobiology and Anatomy, Bowman Gray School of Medicine, Wake Forest University.*

POSTERS

Thursday Morning - 8:00-1:00 p.m.

Invertebrate Chemoreception

- #16 P1 Detection and Choice of Males in the Female Lobster, *Homarus americanus*. PAUL BUSHMANN and JELLE ATEMA, *Boston University Marine Program, Marine Biological Laboratory, Woods Hole.*
- #17 P2 Whole-Cell Recording from Local Interneurons in the Olfactory Pathway of the Spiny Lobster. C.E. DIEBEL and B.W. ACHE, *Whitney Laboratory, and Depts. Zoology & Neuroscience, Univ. Florida, St. Augustine.*
- #18 P3 Modulation of Chemosensory Behavior in the Spiny Lobster: the Influence of Nutritional State. PETER C. DANIEL, *Hofstra University*, CHARLES DERBY, and CAROLE ALLEN, *Georgia State University.*
- #19 P4 Whole-cell Recording from Multi-glomerular Projection Neurons in the Olfactory Lobe of the Spiny Lobster. M. WACHOWIAK and B.W. ACHE, *Whitney Laboratory and Dept. Neuroscience, Univ. Florida, St. Augustine.*
- #20 P5 Mechanisms of Olfactory Mixture Interactions: Whole Cell Patch Clamp Studies of Olfactory Receptor Neurons of the Spiny Lobster. TED SIMON and CHARLES DERBY, *Department of Biology, Georgia State University.*
- #21 P6 Ionic Selectivity and Ligand Specificity of IP₃-gated Channels Mediating Excitatory Transduction in Lobster Olfactory Receptor Neurons. FADOOL, D.A. and B.W. ACHE, *Whitney Laboratory and Depts. of Zoology and Neuroscience, Univ. of Florida, St Augustine.*

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- #22 P7 Sequence of a Partial cDNA Encoding a Putative Cyclic Nucleotide-Gated Ion Channel from Lobster Olfactory Organ. S.D. MUNGER^{1,3}, R.M. GREENBERG¹, H.G. TRAPIDO-ROSENTHAL¹ and B.W. ACHE^{1,2,3}, ¹*Whitney Lab and Depts. of ²Zoology and ³Neuroscience, Univ. of Florida, St. Augustine.*
- #23 P8 Biochemical Analysis of Binding Characteristics of a Putative Glutamate Receptor in the Olfactory Organ of the Spiny Lobster. MICHELE F. BURGESS, CHARLES D. DERBY, and KIRBY OLSON, *Dept. of Biology, Georgia State University.*
- #24 P9 Binding Behavior of Mixtures of Odorant Molecules to the Taurine Olfactory Receptor Sites of the Spiny Lobster. KIRBY OLSON and CHARLES DERBY, *Dept. of Biology, Georgia State University.*
- #25 P10 Biochemistry of olfactory uptake systems: taurine enhances the uptake of glycine. HENRY G. TRAPIDO-ROSENTHAL, LISA R. GENTILCORE, RICHARD A. GLEESON, and WILLIAM E.S. CARR, *Whitney Laboratory, University of Florida, St. Augustine.*
- #26 P11 Cloning, Sequencing, and Activity of a Cytochrome P450 from the Olfactory Organ of the Spiny Lobster. HENRY G. TRAPIDO-ROSENTHAL, SEAN M. BOYLE, STEVEN D. MUNGER, JAMES C. NETHERTON, MARGARET O. JAMES, RICHARD A. GLEESON, and WILLIAM E. S. CARR, *Whitney Laboratory, University of Florida, St. Augustine.*
- #27 P12 Effects of Stimulus Concentration on Frequency Coding in Lobster Chemosensory Cells. GEORGE GOMEZ, RAINER VOIGT and JELLE ATEMA, *Boston University Marine Program, Marine Biological Laboratory, Woods Hole.*
- #28 P13 Functional Architecture of Three Glomerular Neuropiles in the Olfactory System of the Crayfish. DE FOREST MELLON, JR., *University of Virginia.*
- #29 P14 Structure of the Olfactory Sensilla of the Blue Crab, *Callinectes sapidus*. RICHARD A. GLEESON¹, LORRAINE M. McDOWELL², HENRY C. ALDRICH², ¹*The Whitney Laboratory and ²Dept. Microbiol. and Cell Sci., University of Florida.*
- #30 P15 A Comparison of Information Currents in Decapod Crustaceans. THOMAS BREITHAUPT, GEORGE GOMEZ, BARBARA HERR, TASLEEM KACHRA, JAMES DIPALMA and JELLE ATEMA, *Boston University Marine Program, Marine Biological Laboratory, Woods Hole.*

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- #31 P16 IMP And Glutamate As Stimuli In Paramecium Chemoreception. WAN QING YANG and JUDITH VAN HOUTEN, *University of Vermont, Burlington.*
- #32 P17 Contributions of Synaptic Integration to the Spike Patterns Evoked by Odor Blends in Central Olfactory Neurons of Insects. THOMAS A. CHRISTENSEN, and JOHN G. HILDEBRAND, *ARL Div. of Neurobiology, University of Arizona, Tucson.*
- #33 P18 A Neural Networks Model of an Insect's Food Choice System. JOSEPH STITT, SYLWESTER CHYB, *FRANK E. HANSON and JAMES L. FRAZIER, *Department of Entomology, Penn State University, University Park, and Department of Biology, University of Maryland, Baltimore.*
- #34 P19 A Model of Dendritic Signal Transmission in Insect Taste Hairs. KAI HANSEN, *Zoological Institute, University of Regensburg, Germany.*
- #35 P20 Behavioral and Chemosensory Responses of Adult *Diabrotica* Beetles to GABA_A Receptor Agonists and Antagonists. SYLWESTER CHYB, JAMES L. FRAZIER, and CHRISTOPHER A. MULLIN, *Department of Entomology, Penn State University, University Park.*
- #36 P21 Isolation of *Drosophila* Olfactory Genes Using Enhancer Trap Technology. JUAN RIESGO-ESCOVAR, PETER GAINES, CRAIG WOODARD, DEBASISH RAHA, DARIA HEKMATPANAH, PAUL DIBELLO and JOHN CARLSON, *Yale University.*
- #37 P22 Molecular Genetics of Olfaction: Towards Cloning Pentagon, a *Drosophila* Gene Required For Response to a Specific Odorant. B. G. GRIMWADE and S. L. HELFAND, *University of Connecticut Health Center.*
- #38 P23 Fructose and Glucose Non-tasters in the Hawaiian *Drosophila adiastola*. JASON E. POSKANZER and LINDA M. KENNEDY, *Department of Biology and Neuroscience program, Clark University, Worcester.*
- #39 P24 Adaptation-promoting Effect of IP3, Ca2+, and Phorbol Ester on the Sugar Taste Receptor Cell of the Blowfly, *Phormia regina*. MAMIKO OZAKI, *Department of Biology, Osaka University, JAPAN.*
- #40 P25 Molecular Mechanisms Underlying Olfactory Specificity in the Moth Antenna. JOHN JONES, MATTHEW ROGERS, KIMBERLYLOMMAN, MICHAEL HARDEN, and RICHARD G. VOGT, *University of South Carolina.*

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- #41 P26 Olfactory Reception and Inactivation of Insect- and Host Plant Volatiles by the Beet Armyworm Moth, *Spodoptera exigua* (Hubner) (Lepidoptera: Noctuidae). JOSEPH C. DICKENS, USDA, ARS, *Boll Weevil Research Unit, Mississippi State University*; J. H. VISSEER, *Research Institute for Plant Protection (IPO-DLO), Wageningen, The Netherlands*; and J. N. C. VAN DER PERS, *VDP Laboratories, Hilversum, The Netherlands.*
- #42 P27 Effect of Differing Proportions of Two 14-carbon Acetates on Discrimination and Upwind Flight by the Cabbage Looper Moth, *Trichoplusia ni* (Hubner). M. S. MAYER, USDA, ARS, *PO Box 14565, Gainesville, FL 32604.*
- #43 P28 The Effects of Developmental Conditions on Peripheral Receptor Neuron Response in The Cabbage Looper Moth, *Trichoplusia ni*. ALAN J. GRANT, PAOLA BORRONI, and ROBERT J. O'CONNELL, *Worcester Foundation for Experimental Biology, Shrewsbury, MA.*
- #44 P29 Olfactory Learning In the Honey Bee, *Apis mellifera*: Perception of Components After Conditioning to Mixtures. BRIAN H. SMITH, *Department of Entomology, Ohio State University, Columbus.*
- #45 P30 HPLC Analysis of Squid Ink Reveals Olfactory Stimuli, L-Dopa and Dopamine. M. LUCERO*, H. FARRINGTON, and W. GILLY, **Department of Physiology, University of Utah, Salt Lake City; Hopkins Marine Station, Pacific Grove, CA.*

Thursday Afternoon

- 1:00 p.m. Clinical Luncheon: Coordinator: CLAIRE MURPHY
- 4:00-6:00 p.m. Workshop: Electrogustometry: Methodology and Open Forum
Chairperson: JACK PEARL
Discussants: MARION FRANK, GERARD HECK, INGLIS MILLER, CLAIRE MURPHY, and HIROSHI TOMITA

Thursday, April 15

SLIDES

Thursday Evening - 7:00-10:30 p.m.

Chemosensory Transduction and Receptor Adaptation

Chairperson: Gerard Heck

- 7:00 #46 Na⁺-Restricted Rats Lack Functional Na⁺-Channels in Taste Cell Apical Membranes: Proof by Membrane Voltage Perturbation. QING YE, ROBERT E. STEWART*, GERARD L. HECK, DAVID L. HILL*, and JOHN A. DeSIMONE, *Department of Physiology, Virginia Commonwealth University, Richmond; Department of Psychology, University of Virginia, Charlottesville.*
- 7:15 #47 Vasopressin Modulates Amiloride-Sensitive Na and Proton Conductances in Hamster Fungiform Taste Cells. TIMOTHY A. GILBERTSON, STEPHEN D. ROPER and SUE C. KINNAMON, *Department of Anatomy & Neurobiology, Colorado State University, and Rocky Mountain Taste and Smell Center, Denver.*
- 7:30 #48 Biochemical and Physiological Evidence for Dual Transduction Pathways in Lobster Olfactory Receptor Neurons. B. ACHE¹, H. HATT², H. BREER³, I. BOEKHOFF³ AND F. ZUFALL². ¹*Whitney Laboratory and Departments of Zoology and Neuroscience, University of Florida;* ²*Physiologisches Institut, TU München, FRG;* ³*Institut für Zoophysiologie, Universität Hohenheim, FRG.*
- 7:45 #49 Co-Existence of Cation and Anion Components in the Odorant-Induced Current of Vertebrate Olfactory Receptor Neurons. TAKASHI KURAHASHI, *Johns Hopkins University School of Medicine & Monell Chemical Senses Center;* KING-WAI YAU, *Johns Hopkins University School of Medicine.*
- 8:00 #50 Origin of the Chloride Component of Olfactory Receptor Current. STEVEN J. KLEENE, *University of Cincinnati, College of Medicine.*
- 8:15 #51 Rapid Application and Removal of Second Messengers Reveals Integrative Properties of Olfactory Signal Transduction, FRANK ZUFALL, HANNS HATT*, GORDON M. SHEPHERD and STUART FIRESTEIN *Section of Neurobiology, Yale Medical School;* ¹*Physiologisches Institut, Technische Universität, München, FRG*

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- 8:30 #52 Isolation of Human Olfactory Neurons and First Electrophysiological Characterization. NORBERT THÜRAUF, HANNS HATT, *Department of Cell Physiology, Universität Bochum;* MISLAV GIURIC, *Department of Otorhinolaryngology, Universität Erlangen;* and GERD KOBAL, *Department of Exp. and Clin. Pharmacology and Toxicology, Universität Erlangen.*
- 8:45 #231 Human Olfactory Neurons Respond to Odor Stimuli with an Increase in Cytoplasmic Ca²⁺. DIEGO RESTREPO^{1,2}, YUKIO OKADA^{1,5}, JOHN H. TEETER^{1,2}, LOUIS D. LOWRY^{1,4} and JOSEPH G. BRAND^{1,2,3}, ¹*Monell Chem. Senses Center,* ²*Univ. of Penn.,* ³*Veterans Affairs Med. Ctr., Phil.,* ⁴*Thomas Jefferson Univ., and* ⁵*Nagasaki Univ. Sch. of Dent., Nagasaki.*
- 9:00 #53 Sweet Tastic Transduction in the Hamster: The Role of Cyclic Nucleotides and Cations. THOMAS A. CUMMINGS and SUE C. KINNAMON, *Colorado State University and the Rocky Mountain Taste and Smell Center.*
- 9:15 #54 Non-Sugar Sweeteners Activate Cellular Formation of Inositol Trisphosphate (IP₃) in Circumvallate Taste Bud Sheets of the Rat. SAMUEL J. BERNHARDT, YOAV BARUCH, URI ZEHAVI, and MICHAEL NAIM, *Dept. of Biochem., The Hebrew University of Jerusalem, Israel.*
- 9:30 #55 Taste Cell Expression of G-proteins. SUSAN K. McLAUGHLIN, ALAIN ROBICHON, NANCY SPICKOFSKY, and ROBERT F. MARGOLSKEE, *Roche Institute of Molecular Biology.*
- 9:45 #56 Role of Beta-Adrenergic Receptor Kinase, Beta-Arrestin, and Cyclic GMP in Olfactory Desensitization. GABRIELE V. RONNETT, ANGELA J. ROSKAMS, TED M. DAWSON, ROBERT E. BAKIN, and HELEN H. CHO, *Johns Hopkins University, School of Medicine.*
- 10:00 #57 Stimulus-Response Relations of Individual Olfactory Receptor Neurons Determined With Controlled Odor Stimuli. STUART FIRESTEIN, *Yale Medical School;* CRISTIANA PICCO and ANNA MENINI, *Istituto di Cibernetica e Biofisica.*
- 10:15 #58 Standing Calcium Gradients in Olfactory Receptor Neurons: Patch Clamp and Calcium Imaging Analysis. F.W. LISCHKA and D. SCHILD, *Physiologisches Institut, Universität Göttingen, Germany.*
- 10:30 #59 Intracellular-Messenger-Dependent Calcium Channels Open Before Ca²⁺-Dependent Cation Channels in Cultured Insect Olfactory Receptor Neurons. MONIKA STENGL, *Institut für Zoologie/Biologie I, Universität Regensburg, Germany.*

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POSTERS

Thursday Evening - 6:00 - 11:00 p.m.

Human Chemoreception: Function and Dysfunction

- #60 P1 Intensity and Hedonics of Gustatory and Olfactory Stimuli In Taste-Smell Mixtures. LORI A. WHITTEN and H.P. WEINGARTEN, *McMaster University*.
- #61 P2 Taste-Smell Interactions With Multiple Sweeteners. N. J. VAN DER KLAUW and R. A. FRANK, *University of Cincinnati*.
- #62 P3 Oral Sensitivities and Saliva Flow/Composition. CHRISTINE E. ZOUMAS, JEAN-XAVIER GUINARD, *The Pennsylvania State University*.
- #63 P4 PROP Supertasters and the Perception of Ethyl Alcohol. L.M. BARTOSHUK, E. CONNER, D. GRUBIN, T. KARRER, K. KOCHENBACH, M. PALCSO, D. SNOW, *Yale University School of Medicine*; M. PELCHAT, *Monell Chemical Senses Center*; S. DANOWSKI, *San Diego State University*.
- #64 P5 Relationships among Papillae, Taste Pores, and 6-nPropylthiouracil (PROP) Suprathreshold Taste Sensitivity. F.E. REEDY, Jr.¹, L.M. BARTOSHUK², I.J. MILLER, Jr.¹, V.B. DUFFY^{1,2}, K. YANAGISAWA², *Bowman Gray School of Medicine*¹; *Yale University School of Medicine*².
- #65 P6 Statistical Analysis of Taste Clinic Outpatients Examined Between Years 1976-1990. KOICHI ISHIYAMA, SOHEI ENDO, and HIROSHI TOMITA, *Department of Otolaryngology, Nihon University, School of Medicine, Tokyo JAPAN*.
- #66 P7 Correlation and Multifactorial Analysis of the Threshold of the Electrogustometry. SOHEI ENDO, KOICHI ISHIYAMA, and HIROSHI TOMITA, *Department of Otolaryngology, Nihon University, School of Medicine, Tokyo JAPAN*.
- #67 P8 Assessing the Value of Electrogustometry as a Clinical Tool. CHRISTOPHER T. SAMPSON, MARION E. FRANK, and APRIL E. MOTT, *University of Connecticut Health Center, Farmington, CT*.

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- #68 P9 Taste Performance of the Anterior Human Tongue Varies With Fungiform Taste Bud Density. R. ENGLEHARDT, J. ZUNIGA, S. DAVIS, N. CHEN, C. PHILLIPS, *University of North Carolina*; S. SCHIFFMAN, *Duke University*; and I. J. MILLER, *Wake Forest University*.
- #69 P10 Gustatory and Appetitive Effects of Cannabinoids. RICHARD MATTES, *Monell Center*; LESLIE SHAW and KARL ENGELMAN, *Hospital of the University of Pennsylvania*.
- #70 P11 Investigation of the Relationship Over Time Between Oral Glucose Concentration and Perceived Sweetness Intensity. B. GUGGENBÜHL and A.C. NOBLE, *University of California, Davis*.
- #71 P12 Multivariate Analysis of the Time-Intensity Profiles of Sweet and/or Bitter Stimuli. DOREEN Y. HONG, and JEAN-XAVIER GUINARD, *The Pennsylvania State University*.
- #72 P13 Sweetness Intensity Ratings of Binary Mixtures of Various Sweeteners. SUSAN S. SCHIFFMAN¹, ELIZABETH SATTELY-MILLER¹, BREVICK G. GRAHAM¹, SUZANNE D. PECORE², BARBARA J. BOOTH², and MICHAEL L. LOSEE², ¹*Duke University* and ²*The NutraSweet Co.*
- #73 P14 The Effect of Tannic Acid on Sweetness Intensity Ratings During the Adaptation of Sweet Compounds. SUSAN S. SCHIFFMAN¹, ELIZABETH SATTELY-MILLER¹, BREVICK G. GRAHAM¹, ZOE S. WARWICK¹, SUZANNE D. PECORE², BARBARA J. BOOTH², and MICHAEL L. LOSEE², ¹*Duke University* and ²*The NutraSweet Co.*
- #74 P15 Bitterness is Suppressed By Sodium Salts. PAUL A. S. BRESLIN and GARY K. BEAUCHAMP, *Monell Chemical Senses Center*.
- #75 P16 Pleasantness of Sweetened Juice Rated Individually and in a Social Setting. HELEY TUORILA and LIISA LAHTEENMAKI, *University of Helsinki, Department of Food Technology, Viikki, SE-00014 Helsinki, FINLAND*.
- #76 P17 Effect of 2-(4-methoxy-phenoxy) Propanoic Acid (PMP-Sodium salt) on the Taste of Bitter-sweet Stimuli. CLAIRE JOHNSON and GORDON G. BIRCH, *Department of Food Science and Technology, University of Reading, Whiteknights, Reading, UK*.
- #77 P18 Saltiness Ratings and Preferences for Salty Food of Japanese and Australians. JOHN PRESCOTT, GRAHAM BELL, ROBIN GILLMORE, MASAAKI YOSHIDA¹, DAVID LAING, SUZANNE ALLEN, and KAZUMI

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- YAMAZAKI¹, CSIRO Sensory Research Centre, Sydney, AUSTRALIA, ¹Chuo University, Tokyo, JAPAN.
- #78 P19 Modelling an Identification Experiment with Salty Stimuli. TERRI ROBERTSON, Division of Foods and Nutrition, University of Illinois, Urbana; DANIEL M. ENNIS, Philip Morris Research Center; and BARBARA P. KLEIN, University of Illinois.
- #79 P20 Effects of Amiloride on Tracked Taste Intensity and on Taste Quality Descriptions of NaCl: Individual Differences and Dose-response Effects. B. P. HALPERN, J. S. MELTZER, and R. B. DARLINGTON, Cornell University, Ithaca.
- #80 P21 Perception of the Fat Content of Common Foods: A Comparison of Two Scaling Methods. BEVERLY J. TEPPER and SUSAN E. SHAFFER, Rutgers University.
- #81 P22 Gustatory Loss - A Taste of Malingering? A.R. HIRSCH, Smell & Taste Treatment and Research Foundation; B.M. MACKENZIE, Jr., University of Illinois, College of Medicine.
- #82 P23 Clinical Application of the Smell identification Test in Japan. SHIGERU FURUTA and MASARU OHYAMA, Department of Otolaryngology, Kagoshima University, Kagoshima, JAPAN.
- #83 P24 Olfactory Discrimination of Carvone Enantiomers. C.A. HORMANN and B.J. COWART, Monell Chemical Senses Center.
- #84 P25 Recency Re-Visited: Serial Position Effects in Olfactory Short-Term Memory. THERESA WHITE, University of Warwick, Coventry, UK.
- #85 P26 Amyloid β -Peptide Toxicity in Organotypic Cultures of Rat Cortex as a Model for Alzheimer's Disease. L. SHAJENKO, T. S. DONTA, and J. A. LONDON, Department of Biostructure and Function, Center for Neurological Sciences, The University of Connecticut Health Center, Farmington, CT.
- #86 P27 Taste and Smell Function in Persons at Risk for Alzheimer's Disease. SUSAN S. SCHIFFMAN, BREVICK G. GRAHAM, ELIZABETH SATTELY-MILLER, and KATHLEEN A. WELSH, Duke University.
- #87 P28 Confidence Ratings for Odor and Visual Stimuli in Alzheimer's Patients and Normal Controls. DAYNA WILHITE, LETICIA ACOSTA, CARLO QUINONEZ, San Diego State University; STEVEN NORDIN, UCSD

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- Medical Center and San Diego State University; and CLAIRE MURPHY, San Diego State University and UCSD Medical Center.
- #88 P29 Olfactory Functioning from Childhood to Old Age. JOHANN P. LEHRNER, Department of Psychology, Abteilung für Methodik, University of Vienna, Austria.
- #89 P30 Relationships between Olfactory Identification Ability, Cacosmia, and Memory in Older Adults with and without Depression. IRIS R. BELL, DIANE AMEND, ALFRED W. KASZNIAK, and GARY E. SCHWARTZ, University of Arizona.
- #90 P31 Lower Olfactory Functioning Associates with Nutritional Risk in Elderly Women. VALERIE B. DUFFY^{1,2}, ANN M. FERRIS¹, and WILLIAM S. CAIN^{2,3}, ¹University of Connecticut, Storrs; ²Yale University, and ³John B. Pierce Laboratory.
- #91 P32 Effects of Familiarity and Odor Pleasantness on Food Acceptance by the Elderly. MARCIA LEVIN PELCHAT, Monell Chemical Senses Center.
- #92 P33 Odor Threshold Sensitivity is Impaired in Patients With AIDS Dementia Complex. L. JILL RAZANI, San Diego State University; LISA CHARTIER, San Diego State University; TERENCE M. DAVIDSON, UCSD Medical Center; and CLAIRE MURPHY, San Diego State University and UCSD Medical Center.
- #93 P34 Direct Cortical Recording of EEG to Odors in Epilepsy Patients. GARY E. SCHWARTZ, GEOFFREY L AHERN, MARTIN E. WEINAND, ZIYA V. DIKMAN, JOHN P. KLINE, and DAVID LABINER, University of Arizona.
- #94 P35 The EEG Response to Odour. SUE HOTSON, University of North Carolina at Chapel Hill Dental Research Center.
- #95 P36 Application of 3-channel Lissajous' Trajectory to Human Olfactory Evoked Potentials: Consistency across Subjects and Stimulus Intensities. J.D. PRAH, US Environmental Protection Agency, RTP, NC
- #96 P37 Theophylline Treatment of Hyposmia. A. R. HIRSCH, Smell & Taste Treatment and Research Foundation; G. C. WECLAW, University of Illinois, College of Medicine.
- #97 P38 Validation of the Chicago Smell Test (CST) in Patients with Subjective Olfactory Loss. A.R. HIRSCH, Smell and Taste Treatment and Research

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- Foundation; M.B. GOTWAY and A.T. HARRIS, *University of Illinois, College of Medicine.*
- #98 P39 Olfaction In A Cluster Headache Sufferer. A. R. HIRSCH, *Smell & Taste Treatment and Research Foundation;* N. THAKKAR, *University of Illinois Medical School.*
- #99 P40 Validation of the Chicago Smell Test (CST) in Subjective Normosmic Neurologic Patients. A.R. HIRSCH, *Smell & Taste Treatment and Research Foundation;* M.B. GOTWAY, *University of Illinois Medical School.*
- #100 P41 Effect of an Ambient Odor on Slot-machine Usage in a Las Vegas Casino. A. R. HIRSCH, *Smell and Taste Treatment and Research Foundation.*
- #101 P42 Lingering Time in a Museum in the Presence of Congruent and Incongruent Odors. SUSAN C. KNASKO, *Monell Chemical Senses Center.*
- #102 P43 Can Anosmic Patients Separate Trigeminal and Nontrigeminal Stimulants? DAVID E. HORNUNG, *Biology Department, St. Lawrence University;* DANIEL KURTZ and STEVEN L. YOUNGENTOB, *Physiology Department, SUNY, Syracuse.*
- #103 P44 Bilateral and Unilateral Assessment of Odor Memory Function. STEVEN M. BROMLEY and RICHARD L. DOTY, *Smell and Taste Center & Department of Otorhinolaryngology, University of Pennsylvania.*
- #104 P45 Impairment of Odor Identification as a Function of Age and Disease State in Patients with Cystic Fibrosis. J. A. ANDERSON, *UCSD Medical Center;* L. JILL RAZANI, *San Diego State University;* MARITESS MAURICIO, *San Diego State University and UCSD;* MICHAEL J. LIGHT, *UCSD Medical Center;* IVAN R. HARWOOD, *UCSD Medical Center;* CLAIRE MURPHY, *San Diego State University and UCSD Medical Center.*
- #105 P46 Temporal Irritant Perception. MARGARET CLIFF, and HILDEGARDE HEYMANN, *University of Missouri-Columbia.*
- #106 P47 The Temporal Perception of Menthol. ELIZABETH SKIBBA and HILDEGARDE HEYMANN, *Department of Food Science and Human Nutrition, University of Missouri-Columbia.*
- #107 P48 Portable Olfactometer for Human Psychophysics and Electrophysiology RENÉ A. DE WIJK, *John B. Pierce Laboratory and San Diego State University;* WILLIAM S. CAIN, *John B. Pierce Laboratory and Yale University;* and CLAIRE MURPHY, *San Diego State University.*

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- #108 P49 Evaluating Nasal Obstruction by Video Morphometric Analysis of Expired Air Condensation Patterns. ALFREDO A. JALOWAYSKI, *UCSD Medical Center, San Diego;* CLAIRE MURPHY, *San Diego State University and UCSD Medical Center;* and TERENCE M. DAVIDSON, *UCSD Medical Center, San Diego.*
- #109 P50 Repressive and Defensive Subjects show Selective Anosmia for Androstenone. JOHN P. KLINE, GARY E. SCHWARTZ and ZIYA V. DIKMAN, *University of Arizona.*
- #110 P51 Perceived Odor Intensity in Subjects with Multiple Chemical Sensitivity. DANIEL KURTZ, THERESA WHITE, ELIZABETH BELKNAP, *Smell and Taste Disorders Clinic, SUNY Health Science Center, Syracuse.*
- #111 P52 CSERPs to Butanol: Correlations with Olfactory Performance. TYLER S. LORIG, TIMOTHY THOMPSON, and AMY JAMES, *Washington and Lee University.*
- #112 P53 CSERPs to Butanol: Signal Feature Extraction. TYLER S. LORIG, *Washington and Lee University* and GARY E. SCHWARTZ, *University of Arizona.*
- #113 P54 Olfactory Impairment in Children Detected by the Children's Odor Identification Test. STACY MARKISON, *San Diego State University;* RANI NIJJAR, *San Diego State University;* CLAIRE MURPHY, *San Diego State University and UCSD Medical Center.*
- #114 P55 Central and Peripheral Effects in Binary Mixtures: Importance of Side Taste Adjustments. CORINNE A. OSSEBAARD and JAN H.A. KROEZE, *Psychological Laboratory, Utrecht University, The Netherlands.*
- #115 P56 Pemenone Exposure Increases the Sensitivity of Human Subjects to Androstenone. DAVID A. STEVENS, *Clark University;* and ROBERT J. O'CONNELL, *Worcester Foundation for Experimental Biology.*
- #116 P57 Cross-Adaptation of Androstenone by an Odorless Structural Analog. JOHN D. PIERCE, JR., CHARLES J. WYSOCKI, and EVGENY V. ARONOV, *Monell Chemical Senses Center.*
- #117 P58 Influence of Pleasantness and Concentration of Androstenone on Women's Assessment of Men. REGINA E. MAIWORM, WERNER U. LANGTHALER, *Department of Psychology I, University of Münster, Germany.*

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- #118 P59 Trimethylaminuria: A Metabolic Disorder Presenting with Primary Complaints of Dysosmia/Dysgeusia. GEORGE PRETI, *Monell Chem Senses Ctr. & Dept. of Dermatology, Univ. of PA*; BEVERLY J. COWART, *Monell Chem. Senses Ctr. & Dept. of Otolaryngology, Jefferson Med. Coll.*; HENRY J. LAWLEY, CARL A. HORMANN, *Monell Chem. Senses Ctr.*; ROY S. FELDMAN, *Veterans Affairs Med. Ctr., Phila. & Dept. of Periodontology, Univ. of PA*; IN-MIN YOUNG & LOUIS D. LOWRY, *Dept. of Otolaryngology, Jefferson Med. Coll.*

- #119 P60 Olfactory Cues Suppress Newborn Human Infant Crying. REGINA M. SULLIVAN¹, DONALD A. WILSON¹ and PAUL L TOUBAS², ¹*Developmental Psychobiology Lab, Department of Psychology, University of Oklahoma*; ²*Department of Pediatrics, University of Oklahoma Health Sciences Center.*

Friday, April 16, 1993

SLIDES

Friday Morning 8:00-12:30 p.m.

Chemosensory Cell Immunocytochemistry and Gene Expression

Chairperson: Charles A. Greer

- 8:00 #120 Primary Structure of Olfactomedin: A Novel Olfactory Tissue-Specific Extracellular Matrix Protein. ROBERT R. H. ANHOLT and HIROKO YOKOE *Department of Neurobiology, Duke University Medical Center.*
- 8:15 #121 Expression of α -Gustducin in Human Taste Cells. SHIGERU TAKAMI^{1,2}, MARILYN L. GETCHELL^{2,3}, SUSAN K. MC LAUGHLIN⁴, ROBERT F. MARGOLSKEE⁴ & THOMAS V. GETCHELL^{1,3}. ¹*Department of Physiology and Biophysics, Sanders-Brown Center on Aging*, ³*Division of Otolaryngology-Head and Neck Surgery, Department of Surgery, University of Kentucky College of Medicine*; ⁴*Roche Institute of Molecular Biology*.
- 8:30 #122 Developmental Expression of Rabbit Olfactory P450. XINXIN DING, HWEI-MING PENG, and MINOR J. COON *Department of Biological Chemistry, Medical School, The University of Michigan.*
- 8:45 #123 Identification of Novel Protein-Tyrosine Phosphatases Expressed by Sensory Neurons of the Olfactory Epithelium. BRIAN L. LARGENT, KEVIN M. WALTON, KAREN J. MARTELL, and JACK E. DIXON *University of Michigan.*
- 9:00 #124 Expression of Mucociliary-specific Epitopes in the Human Olfactory Mucosa. THOMAS V. GETCHELL^{1,2,3}, YING CHEN², HEINZ BREER⁴ and MARILYN L. GETCHELL^{2,3}. ¹*Department of Physiology and Biophysics*; ²*Division of Otolaryngology, Department of Surgery*; ³*Sanders-Brown Center on Aging, University of Kentucky College of Medicine*; ⁴*Institut für Zoophysiologie, Universität Stuttgart-Hohenheim, Germany.*
- 9:15 #125 Synaptic Organization of Tyrosine Hydroxylase Immunoreactive Processes in Rat Olfactory Bulb Glomeruli. JUAN C. BARTOLOMEI and CHARLES A. GREER *Sections of Neurosurgery & Neurobiology, Yale University and School of Medicine.*
- 9:30 #126 Localization of Immune System Markers in Adult Human and Rat Vomeronasal Organ, MARILYN L. GETCHELL^{1,2} and THOMAS V.

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GETCHELL^{1,2,3}. ¹Division of Otolaryngology, Department of Surgery; ²Sanders Brown Center on Aging; ³Department of Physiology and Biophysics, University of Kentucky College of Medicine.

9:45 #127 Vomeromodulin Gene Expression in the Nasal Mucosa of Rats During Postnatal Development. N.S. RAMA KRISHNA¹, MARILYN L. GETCHELL^{2,3}, FRANK L. MARGOLIS⁴, and THOMAS V. GETCHELL^{1,2,3}. ¹Department of Physiology and Biophysics; ²Division of Otolaryngology, Department of Surgery; ³Sanders Brown Center on Aging, University of Kentucky College of Medicine; and ⁴Department of Neuroscience, Roche Institute of Molecular Biology.

10:00 Refreshment break

10:15 #128 Axonal Abnormalities in the Mammalian Olfactory System. JAMES E. SCHWOB, KAREN E. MIELESZKO SZUMOWSKI, DONALD A. LEOPOLD and STEVEN L. YOUNGENTOB, *Clinical Olfactory Research Center, SUNY Health Science Center, Syracuse*.

10:30 #129 Selective Association and Specific Bulbar Projections of Olfactory Receptor Neurons Reactive to an Anti-hsp70 Mab. V. McMILLAN CARR and A.I. FARBMAN, *Northwestern University*.

10:45 #130 Rapid Assessment of Interactions between Ligands and G-Protein Coupled Receptors. MICHAEL R. LERNER, TIMOTHY S. MCCLINTOCK, MARC N. POTENZA, CHANNA JAYAWICKREME, GERARD F. GRAMINSKI AND SURESH KARNE, *Yale University School of Medicine*.

11:00 Symposium: Comparative and Evolutionary Aspects of Olfaction

Chairpersons: Heather Eisthen and Richard Vogt

11:05 #131 Strategies of Comparison: Models, Opportunism, and Cladistics. R. GLENN NORTHCUTT, *University of California, San Diego*.

11:25 #132 S2 Neurochemical Conservatism in the Olfactory Bulb. HARRIET BAKER, *Cornell University Medical College*.

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11:40 #133 S3 Development of Primary Olfactory Centers. LESLIE P. TOLBERT, *University of Arizona*.

12:00 #134 S4 Comparative and Evolutionary Aspects of Olfactory Physiology. ROBERT J. O'CONNELL, *Worcester Foundation for Experimental Biology*.

12:15 #135 S5 Towards a Common Strategy for Transducing Olfactory Information. BARRY W. ACHE, *Whitney Laboratory, University of Florida*.

POSTERS

Friday Morning 8:00-1:00 p.m.

Vertebrate Chemosensory-Mediated Behavior/Vomeronasal System

#136 P1 Androstenone Sensitivity in the Domestic Pig: Sex Difference and Role of the Vomeronasal Organ. KATHLEEN M. DORRIES, MARK J. THOMAS, ELIZABETH ADKINS-REGAN, and BRUCE P. HALPERN, *Cornell University, Ithaca*.

#137 P2 Added Significance of the First LHRH Injection in Facilitating Mating Behavior in Inexperienced Male Hamsters. SANTIAGO MOLINA and MICHAEL MEREDITH, *Program in Neuroscience, Florida State University*.

#138 P3 Evidence for G-Protein Coupled Chemoattractant Receptors in the Vomeronasal Epithelium of Garter Snakes. YONGQUAN LUO, SHAJIA LU, DALTON WANG and MIMI HALPERN, *Program in Neural and Behavioral Science, SUNY Health Science Center, Brooklyn*.

#139 P4 Microscopical and Ultrastructural Anatomy of the Vomeronasal Organ and Vomeronasal Gland in the Opossum *Monodelphis domestica*. NAOMIE S. PORAN, *Zoology Department, North Carolina State University*.

#140 P5 Preliminary Observations on the Morphology of the Vomeronasal Organ of a Newborn Asian Elephant. L.E.L. RASMUSSEN, *Oregon Graduate Institute*; EDWARD W. JOHNSON, and BRUCE W. JAFEK, *University of Colorado Health Sciences Center and The Rocky Mountain Taste and Smell Center*.

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- #141 P6 C-Fos Expression During Mating Behavior in Male Hamsters: Contributions of Vomeronasal Sensory Input and Copulatory Performance. GWEN FERNANDEZ and MICHAEL MEREDITH, *Program in Neuroscience, Florida State University.*
- #142 P7 Removal of the Vomeronasal Organ Produces Long-Term Deficits in Reproductive Responses of Female Prairie Voles. KIMBERLY V. TILLEY and JOHN J. LEPRI, *Department of Biology, The University of North Carolina, Greensboro.*
- #143 P8 Activation of Female Vole Reproduction: Species Specificity of the Stimulus and a Role for the Vomeronasal System. MAUREEN L. TUBBIOLA and CHARLES J. WYSOCKI, *Monell Chemical Senses Center.*
- #144 P9 Birth Rate and Pup Mortality Considerations in the Husbandry of Captive Prairie Voles: Role of "Dirty" Cages. BARBARA DAVIDSOHN and JOHN J. LEPRI, *Department of Biology, The University of North Carolina, Greensboro.*
- #145 P10 Gonadal-Hormone Dependence Sources of Sex-Specific Odors in Voles. MICHAEL H. FERKIN and ROBERT E. JOHNSTON, *Cornell University.*
- #146 P11 Individual Recognition: The Effects of Early Experience. VERA V. VOZNESSENSKAYA, *Institute of Evolutionary Animal Morphology and Ecology, Russian Academy of Science, Moscow;* and CHARLES J. WYSOCKI, *Monell Chemical Senses Center.*
- #147 P12 Individual Recognition: Roles for the Olfactory and Vomeronasal Systems. VERA V. VOZNESSENSKAYA, NINA VASILEVA, *Institute of Evolutionary Animal Morphology and Ecology, Russian Academy of Science, Moscow;* LINDA M. WYSOCKI and CHARLES J. WYSOCKI, *Monell Chemical Senses Center.*
- #148 P13 The Vomeronasal Organ in Frog Functions as an Olfactory Organ for Odorants in Water. KJELL B. DOVING, *Dept. Biology, Univ. Oslo, Oslo NORWAY;* DIDIER TROTIER, JEAN-FRANCOIS ROSIN, *Lab. de Neurobiologie Sensorielle, Ecole Pratique des Hautes Etudes, 1, Avenue des Olympiades, F-91 305 Massy, FRANCE.*
- #149 P14 Discrimination of Y-Chromosome-Dependent Urinary Odortypes within a Mouse Species. EDWARD MONAHAN¹, KUNIO YAMAZAKI², GARY K. BEAUCHAMP², and STEPHEN MAXSON³, ¹*John B. Pierce Laboratory and Yale University;* ²*Monell Chemical Senses Center;* ³*The University of Connecticut, Storrs.*

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- #150 P15 Fetal H-2 Odortypes are Evident in the Urine of Pregnant Female Mice. GARY K. BEAUCHAMP¹, KUNIO YAMAZAKI¹, MARYANNE CURRAN¹, JUDITH BARD² and EDWARD A. BOYSE², ¹*Monell Chemical Senses Center;* ²*University of Arizona, Tucson.*
- #151 P16 Composition of an Aphrodisiac Pheromone. ALAN G. SINGER, *Monell Chemical Senses Center* and FOTEOS MACRIDES, *Worcester Foundation for Experimental Biology.*
- #152 P17 Odor-cued Taste Avoidance: A Simple and Rapid Method for Assessing Olfaction in the Rat. FRANCES M. C. DARLING and BURTON M. SLOTNICK, *The American University.*
- #153 P18 Generalization of a Conditioned Aversion to Lick-paired Electrical Stimulation of the Nucleus of the Solitary Tract in the Rat. PATRICIA M. DI LORENZO and GERALD S. HECHT, *SUNY at Binghamton.*
- #154 P19 Taste Aversion to NaCl Solutions as A Result of Exposure to NaCl Solutions in Rats. JODI RHINEHART-DOTY and JAMES C. SMITH, *The Florida State University.*
- #155 P20 The Saltiness Hypothesis and Taste Characteristics of Gluconate Salts in Mineral Replete Rats. KAREN M.L. CIACCI, ALEXIA KARAEFTHIMOGLU, and CHARLES N. STEWART, *Department of Psychology, Franklin & Marshall College.*
- #156 P21 Amiloride Reduces the Sham NaCl Intake of Sodium Deficient Rats. SANDRA P. FRANKMANN, JOHN H. DOKKO & ILENE BERNSTEIN, *Bourne Lab, NY Hospital /Cornell U. Med. Coll. & Dept. of Psychology, U. Washington.*
- #157 P22 Effects of the Photoperiod on Saccharide Intake in Siberian Hamsters. JACQUELINE B. FINE and TIMOTHY J. BARTNESS, *Departments of Psychology and Biology, Georgia State University.*
- #158 P23 Polycose Conditioning in Hamsters. C. KEARNS, B.K. FORMAKER and M.E. FRANK, *The University of Connecticut Health Center, Farmington.*
- #159 P24 Polysaccharide Taste in the Hamster (*Mesocricetus auratus*). BRUCE I. MACKINNON and BRADLEY G. REHNBERG, *University of Connecticut Health Center, Farmington.*

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- #160 P25 The Effects of Gustatory Nerve Section on Concentration-Dependent Licking to Quinine in Rats. STEVEN ST. JOHN, MIRCEA GARCEA, and ALAN C. SPECTOR, *Department of Psychology, University of Florida.*
- #161 P26 Injections of Bombesin on Feeding Patterns. A. KURT THAW, *Florida State University.*
- #162 P27 Neural Mechanisms Regulating Gender-Specific Patterns of Behavioral Chemosensitivity During Foraging. MARC WEISSBURG, *Department of Biology, Georgia State University;* C.K. GOVIND, J. PEARCE, *University of Toronto;* and C. DERBY, *Department of Biology, Georgia State University.*
- #163 P28 Preference and Aversion for "Deterrent" Chemicals in Two Species of *Peromyscus* mouse. JOHN I. GLENDINNING, *Department of Biological Sciences, Florida State University.*
- #164 P29 The Effect of Minnow Extract Components on Mudpuppy Feeding Behavior. ANDREW G. BOWERMAN and SUE C. KINNAMON *Colorado State University and the Rocky Mountain Taste and Smell Center.*
- #165 P30 Effects of Chemo-stimulation on Swim Path Patterns in Minnows. HARALD ESSLER, *Konrad Lorenz Forschungsstelle A-4645 Grunau 11;* KURT KOTRSCHAL, *KLF and Zoologisches Institut der Universität Wien.*
- #166 P31 Intraoral Food Discrimination in Goldfish. CHARLES F. LAMB, and THOMAS E. FINGER, *University of Colorado Health Science Center.*

Friday Afternoon 4:00-6:00 p.m.

Workshop: Comparative and Evolutionary Aspects of Olfaction

Chairpersons: HEATHER EISTHEN and RICHARD VOGT

Discussants: BARRY ACHE, HARRIET BAKER, GLENN NORTHCUTT, ROBERT O'CONNELL, and LESLIE TOLBERT

Friday, April 16

SLIDES

Friday Evening 7:00-10:30 p.m.

Chemosensory Quality/Scaling/Plasticity/Memory in Humans/Vertebrates

Chairperson: Daniel Ennis

- 7:00 #167 Apparent Novel Interactions Between Denervated and Intact Taste Receptors in Dietary NaCl-Restricted Rats: Evidence for Local Circulating Factors? D.L. HILL and L.M. PHILLIPS, *University of Virginia.*
- 7:15 #168 Chorda Tympani Section has Profound Effects on Preference Behavior for NaCl and KCl in Golden Hamsters. MICHAEL A. BARRY and DAVID C. LARSON *Department of BioStructure and Function, University of Connecticut Health Center.*
- 7:30 #169 Cross Adaptation to NaCl: Implications for the Coding of Saltiness. DAVID V. SMITH and NICOLETTA J. VAN DER KLAUW, *University of Cincinnati College of Medicine.*
- 7:45 #170 Anions Determine the Taste Intensity and Perceived Saltiness of Three Sodium Salts. J. WEIFFENBACH and N. RYBA, *National Institute of Dental Research, NIH.*
- 8:00 #171 Ibotenic Acid Lesions of the Parabrachial Nucleus Disrupt Learned Taste and Odor Aversions, but Permit a Learned Capsaicin Aversion and a Learned Flavor Preference. P.S. GRIGSON, T. SHIMURA, S. REILLY, and R. NORGREN *Pennsylvania State University.*
- 8:15 #172 Memory for Brief, Widely-spaced Odor Presentations in the Rat. CHRISTOPHER T. LOVELACE and BURTON M. SLOTNICK, *The American University.*
- 8:30 #173 Enhancement of Mucosal Inherent Activity Patterns in Rats Trained on an Odorant Identification Task. STEVEN L. YOUNGENTOB and PAUL F. KENT, *Clinical Olfactory Research Center, SUNY HSC, Syracuse.*
- 8:45 #174 The Relationship between Odorant Quality Identification and Mucosal Inherent Activity. PAUL F. KENT and STEVEN L. YOUNGENTOB, *Clinical Olfactory Research Center, SUNY HSC, Syracuse.*

Friday, April 16

9:00 Refreshment Break

- 9:15 #175 Specific Anosmia: Practical Significance? HARRY LAWLESS, MARY JOHNSTON, CAROL CORRIGAN and MICHAEL ANTINONE *Cornell University*.
- 9:30 #176 Detection Thresholds of an Olfactory Mixture and its Three Components. MATTHEW Q. PATTERSON, JOSEPH C. STEVENS, WILLIAM S. CAIN, and J. ENRIQUE COMETTO-MUÑIZ, *John B. Pierce Laboratory*.
- 9:45 #177 Common Chemical and Olfactory Responses to Homologous Alkylbenzenes. J. ENRIQUE COMETTO-MUÑIZ and WILLIAM S. CAIN, *John B. Pierce Laboratory and Yale University*.
- 10:00 #178 A Semantically-Labelled Magnitude Scale of Oral Sensation with Apparent Ratio Properties. BARRY G. GREEN, GREGORY S. SHAFFER and MAGDALENA M. GILMORE *Monell Chemical Senses Center*.
- 10:15 #179 Context and Attribute Response Restriction: Psychological Biases Influencing Time-Intensity Scaling, COLLEEN CORNELIUS CLARK and HARRY T. LAWLESS *Cornell University*.

POSTERS

Friday Evening 6:00-11:00 p.m.

Chemosensory System Development and Plasticity

- #180 P1 Regeneration and Functional Response in the Chorda Tympani Nerve of the Golden Syrian Hamster (*Mesocricetus auratus*). PETER CAIN and MICHAEL A. BARRY, *Department of BioStructure and Function, University of Connecticut Health Center*.
- #181 P2 Ultrastructure of Rat Fungiform Taste Buds After Chorda Tympani Denervation. MARNY BENJAMIN^{1,2}, TERRI A. SHERMAN-CROSBY^{1,2}, BRUCE OAKLEY³ and JOHN C. KINNAMON^{1,2}, *University of Denver¹; Rocky Mountain Taste and Smell Center²; University of Michigan³*.

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- #182 P3 Chorda Tympani Section in Neonatal Rats Permanently Alters Taste Preference and Taste Bud Morphology. SUZANNE I. SOLLARS & ILENE L. BERNSTEIN, *University of Washington*.
- #183 P4 Expression of Human Blood Group Antigens by Rat Fungiform Papillae Following Cross-reinnervation by the Glossopharyngeal Nerve. MARK E. GERBER, RAISA KLEVITSKY, and DAVID V. SMITH, *University of Cincinnati College of Medicine*.
- #184 P5 Extracellular Matrix Molecules May Modulate Cell Adhesion during Papilla and Taste Bud Morphogenesis and Innervation. CHARLOTTE M. MISTRETTA and LINDA F. HAUS, *Department of Biologic and Materials Sciences, University of Michigan*.
- #185 P6 Innervation Patterns of Single Gustatory Papillae During Rat Development. ROBIN F. KRIMM and DAVID L. HILL, *Department of Psychology, University of Virginia*.
- #186 P7 Development of Nerve Supply to the Tongue of Rat Embryos. J. P. MBIENE and C.M. MISTRETTA, *Department of Biologic and Materials Sciences, University of Michigan*.
- #187 P8 Effects of Early Postnatal Cross-Fostering Between Normal and Sodium Restricted Rats on Chorda Tympani Responses. L.M. PHILLIPS, R.E. STEWART and D.L. HILL, *University of Virginia*.
- #188 P9 Terminal Field of Taste Afferents in the Nucleus of the Solitary Tract is Unaffected by High Maternal NaCl Intake. ELIZABETH K. BASCO, ISKE L. VANDEVELDE, AND ROBERT J. CONTRERAS, *Department of Psychology, Florida State University*.
- #189 P10 The Role of Orochemical Stimulation in Postnatal Development of the Rostral Gustatory NST. PHILLIP S. LASITTER, *Florida Atlantic University*; JAIME DIAZ, *University of Washington*.
- #190 P11 Establishment of the Early Solitary Tract and Boundaries of the Nucleus of the Solitary Tract in Developing Sheep Brainstem. CAMILLE TESSITORE KING and CHARLOTTE M. MISTRETTA, *Department of Biologic and Materials Sciences, University of Michigan*.
- #191 P12 Are There CNS Consequences of Taste Cell Turnover? DAVID V. SMITH, MANTANA NORMAN, and MICHAEL T. SHIPLEY, *University of Cincinnati College of Medicine*.

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- #192 P13 The Effects of Dietary Sodium Chloride Deprivation on the Terminal Field Organization of Second Order Gustatory Afferents Projecting to the Parabrachial Nucleus. B.R. WALKER and D.L. HILL, *University of Virginia*.
- #193 P14 The Effect of Neonatal Capsaicin Administration on the Morphology of the Rat Ethmoid Nerve. W. L. SILVER, *Wake Forest University*; T. E. FINGER, *University of Colorado*.
- #194 P15 Changes in Cell Proliferation in the Developing Olfactory Epithelium Following Neonatal Unilateral Nasal Occlusion. DIANA M. CUMMINGS and PETER C. BRUNJES, *University of Virginia*.
- #195 P16 Learning Induced Changes in Metabolic Activity in the Adult Rat Olfactory System. WILLIAM D. HAMRICK, DONALD A. WILSON and REGINA M. SULLIVAN, *Department of Psychology, University of Oklahoma*.
- #196 P17 Plasticity of Olfactory Receptor Neurons. EDWARD E. MORRISON, *College of Veterinary Medicine, Auburn University*.
- #197 P18 An Analysis of Olfactory Neuron Lineage Using a Replication Incompetent Retrovirus. MARY E. CAGGIANO, DALE D. HUNTER and JOHN S. KAUER, *Neuroscience Program, Tufts/New England Medical Center*.
- #198 P19 Pioneering Olfactory Axons May Influence Cell Cycle Kinetics in the Developing Olfactory Primordium. QIZHI GONG and MICHAEL T. SHIPLEY, *University of Cincinnati*.
- #199 P20 Some New Ultrastructural Aspects of Developing Olfactory Cilia and Supporting Cell Microvilli. BERT PH. M. MENCO, *Department of Neurobiology & Physiology, Northwestern University*.
- #200 P21 L1, a Cell Surface Adhesion/Recognition Molecule, Is Transiently Expressed on Immature Olfactory Receptor Neurons. MICHAEL T. SHIPLEY and QIZHI GONG, *University of Cincinnati*.
- #201 P22 Induction of Olfactory Receptor Sensitivity in Mice. HAI-WEI WANG, CHARLES J. WYSOCKI and GEOFFREY H. GOLD, *Monell Chemical Senses Center*.
- #202 P23 Adult Rat Nasal Mucosal Cultures Show Neurogenesis and Contain Functional Olfactory Receptor Neurons. R.J. GRILL, P. FARMER, ROBERT C. GESTELAND and S.K. PIXLEY, *University of Cincinnati*.

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- #203 P24 Comparison of Expression of GFAP and S-100 in Glia of the Olfactory and Vomeronasal Systems of Postnatal and Adult Short-tailed Opossums *Monodelphis domestica*. LENA SHNAYDER, *SUNY-Downstate, Program in Neural and Behavioral Sciences*, INNA SHCHUCHINSKY, *Midwood High School at Brooklyn College*; and MIMI HALPERN, *SUNY-Downstate, Program in Neural and Behavioral Sciences*.
- #204 P25 Developmental Expression of Carbohydrate Moieties in the Olfactory and Vomeronasal Systems of Postnatal Short-tailed Opossums, *Monodelphis domestica*. PEI-LEE EE, *Midwood High School at Brooklyn College*; LENA SHNAYDER and MIMI HALPERN, *SUNY-Downstate, Program in Neural and Behavioral Sciences*.
- #205 P26 Retrovirus-Labeled Cells of the Olfactory Placode Migrate to the Brain of Embryonic Chick Along an NCAM Pathway. MIMI HALPERN, *SUNY Health Science Center At Brooklyn*; ANTHONY M. C. BROWN, *Cornell University Medical College*; MARLENESCHWANZEL-FUKUDA, *Rockefeller University*; DREW NODEN, *New York State College of Veterinary Medicine, Cornell University*.
- #206 P27 The Effect of Unilateral, Complete Removal of the Olfactory Placode (OP) Early in Embryogenesis on the Development of the Olfactory Bulb (OB) in Chick Embryos. EROL LALE AND ALBERT I. FARBMAN, *Department of Neurobiology, Northwestern University*.
- #207 P28 Differentiation and Growth of the Olfactory Organ in the Zebrafish, *Brachydanio rerio*. ANNE HANSEN and EKART ZEISKE, *Zoological Institute, Universität Hamburg, GERMANY*.
- #208 P29 The Ultrastructure of the Olfactory Organ in Embryonic Sea Lamprey. BARBARA ZIELINSKI, ELLA WONG, *Department of Biological Sciences, University of Windsor, Canada* and ROD MCDONALD, *Department of Fisheries and Oceans (Canada)*.
- #209 P30 Protein Gene Product 9.5 in the Developing and Mature Rat Peripheral Olfactory and Vomeronasal Systems. EDWARD W. JOHNSON, PAMELA M. ELLER and BRUCE W. JAFEK, *University of Colorado Health Sciences Center and The Rocky Mountain Taste and Smell Center*.
- #210 P31 Development of the Serotonergic System in the Olfactory Bulb of *Monodelphis domestica*. BENJAMIN D. PHILPOT and PETER C. BRUNJES, *University of Virginia*.

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- #211 P32 Neural Correlates of Growth Recovery from Early Hypothyroid Retardation in the Rat Olfactory Bulb. TIMOTHY J. SENDERA and ESMAIL MEISAMI, *Physiology Department, University of Illinois.*
- #212 P33 Loss of Somatic Granule Cell Spines - Effect of Reduced Information? ELKE WEILER, *Department of Zoology, University of Tübingen, FRG.*
- #213 P34 Reinnervation and Behavioral Recovery Following Deafferentation of the Olfactory Bulbs. KAREN YEE and RICHARD COSTANZO, *Department of Physiology, Virginia Commonwealth University.*
- #214 P35 Functional Recovery of the Deafferented Olfactory Bulb. NANCY KOSTER and RICHARD COSTANZO, *Department of Physiology, Virginia Commonwealth University.*

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SLIDES

Saturday Morning 8:00-11:30 a.m.

Chemosensory Neural Coding

Chairperson: David L. Hill

- 8:00 #215 Neural Network Processing of Responses to Odorants by a Biological Nose (mouse) and a Bionic nose (Chemical Sensor Array). GRAHAM A. BELL, DONALD BARNETT, FAN NG, CSIRO, *Sensory Research Centre, North Ryde, Australia*, JUNNI ZHAN *Department of Anatomy, Monash University, Clayton, Australia* and DAVID C. LEVY *Department of Electronic Engineering, University of Natal, Durban, Republic of South Africa.*
- 8:15 #216 Basic Design of the Cortico-cortical Connections of the Primate Olfactory Brain CHRISTIAN K.H. REYHER *Department of Neurobiology, Max-Planck-Institute of Biophysical Chemistry, Göttingen, Germany.*
- 8:30 #217 Information Flow Through and Between Glomeruli in the Mammalian Olfactory Bulb. DAVID M. SENSEMAN, JOEL L. SOLIS, *Division of Life Sciences, University of Texas, San Antonio*; and W.T. NICKELL *Department of Anatomy and Cell Biology, University of Cincinnati.*
- 8:45 #218 Descending Innervation Targets the Somata of Central Olfactory Neurons in Decapod Crustaceans. MANFRED SCHMIDT *Institut für Biologie, TU Berlin, Germany*; and BARRY W. ACHE, *Whitney Laboratory and Departments of Zoology and Neuroscience, University of Florida.*
- 9:00 #219 Taste Representations in the Hamster Solitary Nucleus: Individual Differences and Effect of Stimulus Array. MARION E. FRANK, LAWRENCE D. SAVOY, ANTHONY P. KNOX and THOMAS P. HETTINGER, *University of Connecticut Health Center.*
- 9:15 #220 Pruning of the Cortical Taste Neurons by Artificial Neural Network Model. TAKATOSHI NAGAI, *Department of Physiology, Teikyo University, Tokyo, Japan*; TAKASHI YAMAMOTO, *Department of Behavioral Physiology, Osaka University*; HIROSHI KATAYAMA, MASAHIRO ADACHI and KAZUYUKI AIHARA, *Department of Electronic Engineering, Tokyo Denki University.*
- 9:30 Refreshment break

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Symposium: Neural Mechanisms of Sensory Processing in the Nucleus Tractus Solitarius.

Chairperson: ROBERT BRADLEY

- 9:45 S1 Introductory Remarks and Overview. ROBERT BRADLEY, *University of Michigan*.
- 10:00 S2 Organization of Cell Types and Synapses in the Gustatory Nucleus of the Solitary Tract. MARK C. WHITEHEAD, *University of California, San Diego*.
- 10:20 S3 A Circuit Diagram of the Rostral Nucleus Tractus Solitarius. MICHAEL S. KING, *University of Michigan*.
- 10:40 S4 Morphology of Gustatory Responsive Neurons. WILLIAM E. RENEHAN, *Henry Ford Hospital, Detroit*.
- 11:00 S5 Efferent Organization of the Nucleus of the Solitary Tract. JOSEPH TRAVERS, *Ohio State University*.
- 11:20 S6 Identification, Isolation, and Electrical Properties NTS Neurons Innervated by Sensory Afferent Fibers. DIANA L. KUNZE, *Baylor College of Medicine*.

11:45 General Business Meeting

AChemS Business

NIDCD Update -Dr. RALPH NAUNTON

POSTERS

Saturday Morning 8:00-1:00 p.m.

Probing Peripheral Chemosensory Reception

- #221 P1 Whole Cell Patch Clamp Recording of Olfactory Bulb Mitral Cells from In Vitro Slices: Membrane Properties and Synaptic Responses to Stimulation of

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the Olfactory Nerve. W.T. NICKELL, MICHAEL M. BEHBEHANI, M.T. SHIPLEY, *University of Cincinnati*.

- #222 P2 Electrophysiological Studies in Toad Olfactory Receptor Neurons. J. BACIGALUPO, B. MORALES, G. UGARTE, R. DELGADO, O. JORQUERA, and P. LABARCA, *Departamento de Biología, Facultad de Ciencias, Universidad de Chile and Centro de Estudios Científicos de Santiago, Chile*.
- #223 P3 Molecular Cloning, Expression and Localization of Inhibitory G-Proteins in the Olfactory Epithelium of Channel Catfish. FE C. ABOGADIE and RICHARD C. BRUCH, *Department of Neurobiology & Physiology, Northwestern University*.
- #224 P4 Second Messenger Production in Catfish. LISA M. FITZGERALD, DIEGO RESTREPO, and BRUCE BRYANT, *Monell Chemical Senses Center and University of Pennsylvania*.
- #225 P5 Expression of Inositol-1,4,5-Trisphosphate Receptor in Chemosensory Tissue of Channel Catfish and Rat. GREGORY SMUTZER, *Lansdowne, PA*; NICHOLAS VITALI, and AMARIS RODRIGUEZ, *Monell Chemical Senses Center*.
- #226 P6 Responses to Binary Mixtures of Amino Acids in the Facial Taste System of the Channel Catfish. K. OGAWA and J. CAPRIO, *Louisiana State University*.
- #227 P7 Differential Localization of Putative Alanine and Arginine Receptors in Catfish Taste Buds. B. BÖTTGER, T. FINGER, *Rocky Mountain Taste & Smell Center*; L KALINOSKI, B. BRYANT, J. BRAND, *Monell Chemical Senses Center*; and R.H. CAGAN, *Colgate-Palmolive Company*.
- #228 P8 Taste Recognition at the L-Alanine Receptor in the Channel Catfish: A Preliminary Model. T.J. VENANZI, *Chemistry Department, College of New Rochelle*; B. P. BRYANT, *Monell Chemical Senses Center*; and C.A. VENANZI, *Chemistry Division, New Jersey Institute of Technology*.
- #229 P9 Structure/Activity Studies of L-Glutamate Reception in the Olfactory System of the Channel Catfish, *Ictalurus punctatus*. BRUCE BRYANT, D. LYNN KALINOSKI, JOHN QUINN and RENEE LUCAS, *Monell Chemical Senses Center*.
- #230 P10 Nitric Oxide Synthetase Activity of the Taste Organ of the Channel Catfish, *Ictalurus punctatus*. TAUFIQUL HUQUE and JOSEPH G. BRAND, *Monell Chemical Senses Center*.

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#231 See Thursday Evening Slide Session

#232 P12 Olfactory Signal Transduction in Atlantic Salmon. DENNIS E. RHOADS, LEE-JU CHENG, RICHARD E. WOLKE, *University of Rhode Island* and PAUL C. STERNWEIS, *Southwestern Medical Center, University of Texas, Dallas.*

#233 P13 Carbocyanine Dyes as Tracers in the Elasmobranch Olfactory System. LAURENCE DRYER, *Florida State University.*

#234 P14 Sodium-Dependent Action Potentials in the Dendrites of Mudpuppy Olfactory Neurons. ADRIENNE E. DUBIN and VINCENT E. DIONNE, *Department of Pharmacology, University of California, San Diego.*

#235 P15 Conductances in the Ciliated Dendrites of Mudpuppy Olfactory Receptor Neurons. ADRIENNE E. DUBIN and VINCENT E. DIONNE *Department of Pharmacology, University of California, San Diego.*

#236 P16 Expression of Members of a Putative Olfactory Receptor Family in Salamander Olfactory Epithelium. ALEXANDER JESURUM, DONA M. CHIKARAISHI and JOHN S. KAUER, *Neuroscience Program, Tufts Medical School/New England Medical Center Hospitals.*

#237 P17 Imaging the Salamander Peripheral Olfactory System: Structure/Activity Relationships for Two Homologous Odorant Series. JOEL WHITE and JOHN KAUER, *Neuroscience Program, Tufts Medical School/New England Medical Center.*

#238 P18 Odor Responses of Olfactory Receptor Neurons Measured with Voltage-Sensitive Dye Confocal Microscopy. ROBERT C. GESTELAND, JAN BROUWER, PEGGY FARMER, and BARBARA CINCUSH, *University of Cincinnati.*

#239 P19 IP₃ Receptors May Occur in Supporting Cell Microvilli of Rat Olfactory Epithelia. BERT PH. M. MENCO, *Northwestern University*; CHRISTIAN DELLACORTE, D. LYNN KALINOSKI and DIEGO RESTREPO, *Monell Chemical Senses Center.*

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#240 P20 IP₃-Induced Current in Isolated Rat Olfactory Neurons. Y. OKADA, J. H. TEETER and D. RESTREPO, *Monell Chemical Senses Center.*

#241 P21 Carnosinase-Immunoreactivity in Human Nasal Mucosa. YING CHEN¹, MARILYN L. GETCHELL^{1,2}, THOMAS V. GETCHELL^{1,2,3}, ¹*Division of Otolaryngology, Department of Surgery*, ²*Sanders-Brown Center on Aging*, ³*Department of Physiology and Biophysics, University of Kentucky College of Medicine.*

#242 P22 Expression of Members of the TRK Neurotrophin Receptor Family in Rat Olfactory Epithelium. P. HATTON and BARBARA R. TALAMO, *Tufts Medical School.*

#243 P23 Interleukin-1 Expression in Normal and Traumatized Olfactory Epithelial Tissue. ANDREA DELKESCAMP and JOEL MARUNIAK, *Division of Biological Sciences, University of Missouri-Columbia.*

#244 P24 Comparative Analysis of Activity and Distribution of Nasal Carboxylesterases (CE) in Nasal Tissues and Olfactory Bulbs. JOHNNYE L. LEWIS, *Inhalation Toxicology Research Institute (ITRI) and WESTON/UMTRA, Albuquerque, NM*; KRISTEN J. NIKULA, *ITRI*; RAYMOND NOVAK, *Wayne State University, Detroit*; ALAN R. DAHL, *ITRI.*

#245 P25 Altered Cellular Distribution of Mouse Olfactory Cytochrome P450 Immunoreactive Isozymes by Dichlobenil is Inhibited by Metryrapone. ERIC WALTERS, *Roche Institute for Molecular Biology*; KAY BUCHHEIT and JOEL MARUNIAK, *Biological Sciences, University of Missouri.*

#246 P26 Androgen Regulation of β -glucuronidase Expression in Different Strains of Laboratory Mice: On the Enzyme Involvement in Pheromone Activation. ANATOLY A. PHILIMONENKO, GENNADY A. CHURAKOV, VALENTINE E. SUKONINA, *Department of Genetics, St. Petersburg State University*; SERGEI N. NOVIKOV, *Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg, RUSSIA.*

#247 P27 Expression of Amyloid Precursor Protein Isoforms in Rat Olfactory Epithelium. NIKHAT ZAIDI and BARBARA R. TALAMO, *Tufts Medical School.*

#248 P28 A Ventrally-Projecting Subset of Olfactory Receptor Neuron Axons in Rats Displays Anti-Tau Protein Immunoreactivity. THOMAS A. SCHOPENFELD, HENRY M. MELTSER and AMY L. MAY, *Departments of Psychology and Biology and the Neuroscience Program, Clark University.*

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- #249 P29 Sub-Cellular Localization of N-Acetylglucosamine-containing Glycoconjugates in the Salamander Olfactory Mucosa. ZHAOYU SUI¹, MARILYN L. GETCHELL^{2,3} and THOMAS V. GETCHELL^{1,2,3}, ¹*Department of Physiology and Biophysics, ²Division of Otolaryngology, Department of Surgery, and ³Sanders-Brown Center on Aging, University of Kentucky College of Medicine.*
- #250 P30 Retroviral labeling of clonally related cells en rat olfactory epithelium. JOSEE M.T. HUARD, MARLA B. LUSKIN, STEVEN L. YOUNGENTOB and JAMES E. SCHWOB, *Department of Anatomy and Cell Biology and Clinical Olfactory Research Center, SUNY Health Science Center, Syracuse.*
- #251 P31 Cross-adaptation of Response to Odor and Electrical Stimulation in Rat Olfactory Epithelium. J.W. SCOTT, P.I. EZEH, and B. MICHELL, *Department of Anatomy and Cell Biology, Emory University School of Medicine.*
- #252 P32 Effects of the Herbicide Dichlobenil on Olfactory Function in the Rat. L. HASTINGS, A. ANDRINGA and M.L. MILLER, *University of Cincinnati, Cincinnati.*
- #253 P33 Localization of Presumptive Olfactory Neurons in Cultured Neurogenic Olfactory Epithelial Spheres (NOESs). S.K. PIXLEY, L. HASTINGS, D. MILLER, and M.L. MILLER, *University of Cincinnati.*
- #254 P34 Morphometric Analysis of Mitochondria in Support and Receptor Cells in Human Olfactory Epithelium. PAMELA M. ELLER, EDWARD W. JOHNSON, and BRUCE W. JAFEK, *University of Colorado Health Sciences Center and Rocky Mountain Taste and Smell Center.*
- #255 P35 Electrotolfactogram Recordings Show Regional Differences in the Rat Olfactory Epithelium. PATRICK I. EZEH and JOHN W. SCOTT, *Department of Anatomy and Cell Biology, Emory University School of Medicine.*
- #256 P36 Differential Expression Patterns of Mouse Odorant Receptors in the Olfactory Epithelium. SUSAN SULLIVAN, KERRY RESSLER, and LINDA BUCK, *Department of Neurobiology, Harvard Medical School.*
- #257 P37 Spatial Segregation of Olfactory Neurons Expressing Identified Odorant Receptors. H. BREER, J. STROTMANN, I. WANNER, J. KRIEGER and K. RAMING, *Institute of Zoophysiology, University Stuttgart-Hohenheim, FRG.*
- #258 P38 Second Messenger Signaling in Olfactory Receptor Cells. H. BREER, I. BOEKHOFF, S. SCHLEICHER, J. STROTMANN, and E. TAREILUS, *Institute of Zoophysiology, University Stuttgart- Hohenheim, FRG.*

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- #259 P39 The Channel-Forming Properties of Novobiocin: A Compound that Enhances Salty Taste. A.M. FEIGIN, *Monell Chemical Senses Center; S.M. BEZRUKOV, NIH, LBM/NIDDK, Bethesda, MD; I. VODYANOY, ONR, Arlington, VA; J.H. TEETER & J.G. BRAND, Monell Chemical Senses Center and University of Pennsylvania.*
- #260 P40 The Electrochemical Concentration is the Complete Na-Salt Taste Intensity Dimension. QING YE, GERARD L. HECK, JOHN A. DESIMONE, *Department of Physiology, Virginia Commonwealth University, Richmond VA, 23298-0551.*
- #261 P41 Strain Differences in Amiloride-Suppression of Chorda Tympani Nerve Responses to NaCl and KCl. MICHELLE M. MINEAR and ROBERT J. CONTRERAS, *Department of Psychology, Florida State University.*
- #262 P42 Taste Pre-stimulation Increases the Chorda Tympani Nerve Response to Menthol. ROBERT F. LUNDY JR. and ROBERT J. CONTRERAS *Department of Psychology, Florida State University.*
- #263 P43 Apparent First-Order and Second-Order Binding Kinetics for a Disaccharide (Sucrose) and Its Constituent Monosaccharides (Glucose and Fructose) in the Hamster. HARRY WMS. HARPER, *Duck Engineering Design, 500 E. 63rd St., New York.*
- #264 P44 Structure-activity Relationships of Sweet Taste Suppression by Holducin. LYNNE RUDNICK^{1,2}, LINDA M. KENNEDY^{1,2} and MARK TURNBULL³, *Department of Biology¹, Neuroscience Program² and Department of Chemistry³, Clark University.*
- #265 P45 Brazzein: A Natural Thermostable Sweet Protein from *Pantadiplandra brazzeana*. DING MING and GÖRAN HELLEKANT, *Department of Animal Health and Biomedical Sciences, University of Wisconsin.*
- #266 P46 Synthesis and Evaluation of Fluorescent Guanidine Sweeteners as Probes for Binding Sites. MICHELLE SULIKOWSKI, GARY SULIKOWSKI, P. R. DROUPADI, JERRY ANCHIN, and D. SCOTT LINTHICUM, *Department of Chemistry, Center for Macromolecular Design, Texas A&M University.*
- #267 P47 Anatomical Features of Human Fungiform Papillae. I.J. MILLER, JR., D.F. BLACK and D.W. SINK, *Department of Neurobiology and Anatomy, Bowman Gray School of Medicine, Wake Forest University.*
- #268 P48 Response Properties of Lingual Trigeminal Nerves to Acid Stimuli. PAUL A. MOORE and BRUCE BRYANT, *Monell Chemical Senses Center.*

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- #269 P49 Capsaicin Eliminates Peptidergic, but Not Synaptophysin Immunoreactive Fibers From Rat Circumvallate Taste Buds. GINA M. NELSON, *Mountain and Plains RTC for Chemosensory Disorders, University of Colorado Health Sciences Center.*
- #270 P50 Interpretation of the Cryoprotectant Effect of α,α -Trehalose through its Solution Properties and its Time/Intensity Profile. M.O. PORTMANN, G.G. BIRCH, and I. HUNT, *Department of Food Science and Technology, University of Reading, Whiteknights, Reading, UK.*
- #271 P51 Maintenance of Isolated Rat Taste Buds. C.J. RUIZ, M. MCPHEETERS, R.S. LASHER and S.C. KINNAMON, *Colorado State University, University of Colorado Health Sciences Center and the Rocky Mountain Taste and Smell Center.*
- #272 P52 Rapid Kinetic Measurements of Bitter Stimulus-Induced IP₃ in Mouse Taste Tissue. ANDREW I. SPIELMAN, *New York University*; TAUFIQUL HUQUE, *Monell Chemical Senses Center*; INGRID BOEKHOFF and HEINZ BREER, *University Stuttgart, Hohenheim*; GLAYDE WHITNEY, *Florida State University*, and JOSEPH G. BRAND, *Monell Chemical Senses Center, and Veterans Affairs Medical Center.*
- #273 P53 Effect of Modulators of the Adenylate Cyclase System on Sweet Electrophysiological Taste Responses in Gerbil. SUSAN S. SCHIFFMAN and MARK S. SUGGS, *Duke University* and MICHAEL L. LOSEE, *The Nutrasweet Co.*
- #274 P54 Solvation Studies of Amiloride. R.A. BUONO, C.A. VENANZI, *New Jersey Institute of Technology*; T.J. VENANZI, *College of New Rochelle*; and R.J. ZAUHAR, *Biotechnology Institute, Pennsylvania State University.*
- #275 P55 A Hair-like Structure in the Vallate Papilla of the Balb Mouse. R. XIAO and I. MILLER, JR., *Department of Neurobiology and Anatomy, Bowman Gray School of Medicine, Wake Forest University.*
- #276 P56 A Computerized Gustatory Stimulator That Delivers Taste Solutions Through a Single Nozzle Without Contamination. L.A. EVEY, and R. NORRIS, *Pennsylvania State University.*

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Saturday Afternoon - 4:00-6:00 p.m.

Workshop: Teaching Science in the Public Schools with Chemical Senses

Chairperson and Coordinator: W.R. KLEMM, *Texas A&M University*

SLIDES

Saturday Evening - 7:00-10:30 p.m.

Ranges of Chemosensory Stimulus Detection/Detection Deficits

Chairperson: Marilyn L. Getchell

- 7:00 #277 Specific Anosmia and Olfactory Sensitivity to 3-Methyl-2-Hexenoic Acid: A Major Component of Human Axillary Odor. CHARLES J. WYSOCKI *Monell Chemical Senses Center and Department of Animal Biology, University of Pennsylvania*; XIAO-NONG ZENG and GEORGE PRETI *Monell Chemical Senses Center and Department of Dermatology Univ. of Pennsylvania.*
- 7:15 #278 Congenital Anosmia: MR Volumetric Analysis. DAVID M. YOUSEM, CHENG LI, and RICHARD L. DOTY, *Smell and Taste Center and Departments of Radiology and Otorhinolaryngology, University of Pennsylvania.*
- 7:30 #279 EEG Registration of Conscious and Unconscious Concentrations of Isoamyl Acetate and Androstenone GARY E. SCHWARTZ, JOHN P. KLINE, ZIYA V. DIKMAN and ERNEST H. POLAK, *University of Arizona.*
- 7:45 #280 Stimulus and Recording Parameters of the Olfactory Evoked Potential in Humans. W. JAMES EVANS and ARNOLD STARR *Department of Neurology, University of California, Irvine.*
- 8:00 #281 Does Allergic Rhinitis Contribute to Olfactory Loss? ANDREA APTER, APRIL MOTT, MARION FRANK, and JON CLIVE, *University of Connecticut Health Center.*

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- 8:15 #282 Inhalation of 2-Acetylpyridine for Weight Reduction A.R. HIRSCH, *Smell & Taste Treatment and Research Foundation*; D.D. DOUGHERTY, *University of Illinois Medical School*.

- 8:30 #283 Further Studies on the Effect of Semiochemicals and Olfactants on the Human Vomeronasal Organ (VNO). L. MONTI-BLOCH^{1,2}, A. D. DOLBERG², C. JENNINGS-WHITE² and D.L BERLINER². ¹*University of Utah*; ²*Pherin Corporation, Menlo Park, CA*.

8:45 Refreshment Break

- 9:00 #284 Applying-Chemosensory Science: CSIRO's Japan Project. GRAHAM A. BELL and JOHN PRESCOTT *CSIRO, Sensory Research Centre, Division of Food Science and Technology, North Ryde, Australia*.

- 9:15 #285 The National Geographic Smell Survey and Gas Warning Odor: Replication and Extension. WILLIAM S. CAIN, JANNEANE F. GENT, and J. ENRIQUE COMETTO-MUÑIZ *John B. Pierce Laboratory and Yale University*.

- 9:30 #286 The Olfactory System as a Model for the Assessment of Neurotoxicology. RAIMUND APFELBACH, MICHAEL REIBENSPIES and ELKE WEILER, *Department of Zoology, University of Tübingen, FRG*.

- 9:45 #287 Averaging of Sensory Time-Intensity Curves with Principal Component Analysis. S. BONNANS *University of North Carolina*; and A.C. NOBLE, *University of California, Davis*.

- 10:00 #288 Keratins in Taste Buds. BRUCE OAKLEY, ANNE LAWTON, LIANNA WONG¹, and CHUNXIAO ZHANG, *Department of Biology, University of Michigan*, ¹*Department of Molecular and Cell Biology, University of California, Berkeley*.

- 10:15 #289 A High-Resolution Casting Method for Visualizing Human Taste Papillae *In Vivo*. WALTER E. MYERS, THOMAS P. HETTINGER, JOSEPH A. D'AMBROSIO, STANLEY L. WENDT, CHRISTINE B. PEARSON and MARION E. FRANK, *University of Connecticut Health Center*.

Saturday, April 17

POSTERS

Saturday Evening 6:00 - 11:00 p.m.

Post-Receptor Neural Processing in Vertebrate Chemoreception

- #290 P1 Locus Coeruleus Increases Perithreshold Sensory-Evoked Excitation of Mitral Cells. M. JIANG, E.R. GRIFF, L.A. ZIMMER, M. ENNIS, and M.T. SHIPLEY, *University of Cincinnati College of Medicine*.
- #291 P2 Mitral/Tufted Cell Late Depolarizations in Salamander Olfactory Bulb Slices. A.R. CINELLI and J.S. KAUER, *Tufts Medical School and New England Medical Center*.
- #292 P3 The Intrabulbar Association System is Formed by CCK-containing Tufted Cells in the Rat. WEILIN LIU and MICHAEL T. SHIPLEY, *University of Cincinnati*.
- #293 P4 Olfactory Bulb Input to the Rat Olfactory Tuberclie is Limited to Specific Tubercular Regions. ELEANOR CAUDILL JOSEPHSON and DONALD F. BUXTON, *College of Veterinary Medicine, Auburn University*.
- #294 P5 A Morphometric View of the Mink Olfactory Bulb - A Comparative Analysis of Three Different Races. WILLI BENNEGGER and RAIMUND APFELBACH, *Department of Zoology, University of Tübingen, FRG*.
- #295 P6 Evidence for Columnar Organization in the Rat Olfactory Bulb: Intracellular Injection of Lucifer Yellow into Mitral Cells. MARKA. PATERNOSTRO and PETER C. BRUNJES, *University of Virginia*.
- #296 P7 Morphological and Physiological Characterization of Salamander Olfactory Bulb Granule Cells. DAVID P. WELLIS and JOHN S. KAUER, *Neuroscience Program, Tufts/New England Medical Center*.
- #297 P8 GABA and Taurine in the Frog Olfactory Bulb: Possible Colocalization in the Granule Cells. I. KRATSKIN, *Smell and Taste Center, University of Pennsylvania*; N. KENIGFEST, *Sechenov Institute, St.Petersburg, Russia*; and J. P. RIO, *INSERM U-106, Hopital de la Salpetriere, Paris, France*.

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- #298 P9 Multiple Amino Acid Receptors Mediate Inhibition in the Olfactory Bulb.
PAUL Q. TROMBLEY AND GORDON M. SHEPHERD, *Section of Neurobiology, Yale Medical School.*
- #299 P10 NMDA Receptor Modulation of Olfactory Bulb Inhibitory Circuits.
DONALD A. WILSON¹, KATHLEEN M. GUTHREE², REBECCA SMART¹, CHRISTINE M. GALL² and REGINA M. SULLIVAN¹,
¹*Developmental Psychobiology Lab, Department of Psychology, University of Oklahoma;* ²*Dept of Anatomy and Neurobiology, University of California, Irvine.*
- #300 P11 Secretions from Olfactory Bulb Influence Migration of Ensheathing Cells.
K.L. LIU, M.I. CHUAH, and K.K.H. LEE, *Department of Anatomy, Chinese University of Hong Kong.*
- #301 P12 Ultrastructure of the Elasmobranch Olfactory Glomerulus. LAURENCE DRYER, and PASQUALE P.C. GRAZIADEI, *Florida State University.*
- #302 P13 NADPH-Diaphorase Localization in the Olfactory System. HAIQING ZHAO¹, STUART FIRESTEIN¹ and CHARLES GREER^{1,2}, *Section of Neurobiology and Neurosurgery², Yale University.*
- #303 P14 Comparison Between OMP-Immunoreactive and LHRH-Positive Fibers in the Brain. ARIELLA G. MONTI-GRAZIADEI, *Department of Biological Science, Florida State University.*
- #304 P15 Single Trigeminal Ganglion Cells Have Collateral Branches in the Nasal Epithelium and the Olfactory Bulb. T.E. FINGER, *University of Colorado Medical School;* and W.L. SILVER, *Wake Forest University.*
- #305 P16 Optical Recording of Cortical Activity Evoked by Chorda Tympani Stimulation in the Hamster. J. ZEIGER and J.A. LONDON, *Department of BioStructure and Function, Center for Neurological Sciences, University of Connecticut Health Center.*
- #306 P17 Optical Recordings with Voltage-Sensitive Dyes in Organotypic Cultures of Rat Agranular Insular Cortex. T. S. DONTA and J. A. LONDON, *Department of Biostructure and Function, Center for Neurological Sciences, The University of Connecticut Health Center.*
- #307 P18 Secondary Facial Lobe Connections in a Specialized Cod, the Rockling (*Ciliata mustela*, *Gadidae*, *Teleostei*). KURT KOTRSCHAL, *Zoologisches Institut der Universität Wien und Konrad-Lorenz-Forschungsstelle, Austria;*

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- and THOMAS E. FINGER, *Department of Cellular and Structural Biology, University of Colorado Health Science Center.*
- #308 P19 Innervation of the Nares Constrictor Muscle by the Nervus Terminalis and Palatine Ganglion in the Tiger Salamander. CELESTE R. WIRSIG-WIECHMANN, *Bowman Gray School of Medicine.*
- #309 P20 In Vitro Patch Clamp Analysis of Postsynaptic Potentials Mediated by Excitatory and Inhibitory Amino Acids on Neurons in the Gustatory Zone of the Nucleus Tractus Solitarius. LIMEI WANG, MICHAEL S. KING and ROBERT M. BRADLEY, *Department of Biologic and Materials Sciences, School of Dentistry, University of Michigan.*
- #310 P21 Fos Protein Expression in NST Neurons Following Electrical Stimulation of Taste Nerves. THERESA A. HARRISON and NANCY W. MILLER, *Cellular Biology & Anatomy, Medical College of Georgia.*
- #311 P22 Spatiotemporal Coding of Taste Quality in the Nucleus of the Solitary Tract of the Rat. S. MONROE and P.M. DI LORENZO, *Department of Psychology, SUNY, Binghamton.*
- #312 P23 Morphology and Physiology of Neurons in the Gustatory Zone of the Nucleus Tractus Solitarius. MICHAEL S. KING and ROBERT M. BRADLEY, *Department of Biologic and Materials Sciences, School of Dentistry, University of Michigan.*
- #313 P24 GABA Inhibition of Taste Responses in the Hamster Solitary Nucleus. HONGYANG LIU, MICHAEL BEHBEHANI and DAVID V. SMITH, *University of Cincinnati College of Medicine.*
- #314 P25 Chemosensitive Neurons in the Globus Pallidus. I. Endogenous Chemosensory Characteristics. L. LÉNÁRD, Z. KARÁDI, B. FALUDI A. CZURKÓ, A. HAJNAL, P. SÁNDOR and I. VIDA, *Institute of Physiology, Pécs University, Medical School, Pécs, Hungary.*
- #315 P26 Chemosensitive Neurons in the Globus Pallidus. II. Exogenous Chemosensory Characteristics. Z. KARÁDI, B. FALUDI, A. CZURKÓ, A. HAJNAL, P. SÁNDOR, I. VIDA and L. LÉNÁRD, *Institute of Physiology, Pécs University, Medical School, Pécs, Hungary.*
- #316 P27 Effects of Chorda Tympani Section on NaCl Taste-induced Expression on C-fos in the Parabrachial Nucleus of Golden Hamsters. DAVID C. LARSON and MICHAEL A. BARRY, *Department of BioStructure and Function, University of Connecticut Health Center.*

Saturday, April 17

- #317 P28 Responses of Single Hamster Parabrachial Neurons to Binary Taste Mixtures: Sucrose + Citric Acid and NaCl + Citric Acid. MARK B. VOGT and DAVID V. SMITH, *University of Cincinnati College of Medicine.*

- #318 P29 Physiological Mechanisms in Differential Context Effects. KRYSTYNA M. RANKIN, *John B. Pierce Laboratory and Yale University, and Psychology Department, Stockholm University;* LAWRENCE E. MARKS, *John B. Pierce Laboratory and Yale University.*

Sunday, April 18, 1993

SLIDES

Sunday Morning - 8:00-12:00 noon

Aspects of Vertebrate Taste

Chairperson: Judith van Houten

- 8:00 #319 Chimpanzee Single Taste Fibers. GÖRAN HELLEKANT, ANDY TSANG, *University of Wisconsin and Wisconsin Regional Primate Center;* YUZO NINOMIYA, *Asahi University, Gifu, Japan;* and GRANT DUBOIS, *Corporate Research and Development, The Coca Cola Company.*

- 8:15 #320 Chromosomal Location of Genes Affecting Sweet and Bitter Tastes in the BXD Recombinant-Inbred Strains. DAVID A. BLIZARD, *Pennsylvania State University;* and APRIL CHANG, *Mayo Clinic.*

- 8:30 #321 Amino Acid Preference in Rats Controlled by Activin A Release in Plasma as a Neurotrophic Factor and Neural Plasticity in Brain under Protein or Lysine Deficiency K. TORII^{1,2}, K. OOSAWA², M. FUNABA³, T. MURATA², M. TAKAHASHI⁴ and T. ONO⁵ ¹Ajinomoto Co. Inc., Yokohama, Japan; ²ERATO, JRDC, Yokohama, Japan; ³Azabu Univ., Sagamihara, Japan; ⁴Tokyo Univ., Tokyo, Japan; ⁵Toyama Med. Pharm. Univ., Toyama, Japan.

- 8:45 #322 On the Relativity of Chemosensory Perception, LAWRENCE E. MARKS, *John B. Pierce Laboratory and Yale University.*

- 9:00 #323 Time-Intensity Measurements of Astringent Subqualities in Selected Organic and Inorganic Acids. CAROL CORRIGAN and HARRY T. LAWLESS, *Cornell University.*

- 9:15 #324 Interindividual Differences in Temporal Perception of Sweet and /or Bitter Stimuli and Implications at the Receptor Level. JEAN-XAVIER GUINARD and DOREEN Y. HONG *The Pennsylvania State University.*

- 9:30 #325 A Temporal Study of Bite and Burn Perception in Carbonated Water. STEVEN J. HARPER and MINA R. McDANIEL *Oregon State University.*

Sunday, April 18

9:45 #326 Lateral Inhibition of Citric Acid on the Anterior Tongue in Humans. J. ZUNIGA *University of North Carolina*; S. DAVIS, N. CHEN, and C. PHILLIPS, *University of North Carolina*.

10:00 Refreshment break

Aspects of Vertebrate and Invertebrate Olfaction

10:15 #327 Measuring Odor Plumes Which Direct Chemo-Orientation in Turbulent Flow, N.D. PENTCHEFF and R.K. ZIMMER-FAUST, *University of South Carolina*.

10:30 #328 The Olfactory System of Sea Lamprey is Highly Sensitive and Specific to Bile Acids Naturally Produced by Fish. WEIMING LI, PETER W. SORENSEN *Department of Fisheries and Wildlife, University of Minnesota, St Paul*, and DANIEL D. GALLAHER *Department of Food Science and Nutrition, University of Minnesota, St Paul*.

10:45 #329 Environmental Correlates to Chemically Stimulated Behavior in Hermit Crabs. D. RITTSCHOF and J. SARRICA. *Duke University Marine Laboratory*.

11:00 #330 Epidermal Growth Factor-Receptor (EGF-R) and EGF and/or Transforming Growth Factor- α (TGF- α) May Play a Role in Regulating Olfactory Cell Proliferation, ALBERT I. FARBMAN, RICHARD C. BRUCH and JUDITH A. BUCHHOLZ, *Department of Neurobiology, Northwestern University*.

11:15 #331 Early Events in Development of Olfactory Bulb Glomeruli: A Cytochrome Oxidase Study in the Rat. ESMAIL MEISAMI and TIMOTHY J. SENDERNA, *Physiology Department, University of Illinois*.

11:30 #332 Metabolic Activity in Mouse Septal Tissue following Odour Stimulation. JUNNI ZHAN¹, GRAHAM A. BELL² and MALCOLM K. HORNE¹; ¹*Department of Anatomy, Monash University, Australia*; ²*CSIRO Division of Food Processing, North Ryde, Australia*.

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