THE SENSES: A COMPREHENSIVE REFERENCE

Volume 5
PAIN

Volume Editors
Dr M. Catherine Bushnell
McGill University, Montreal, Quebec, Canada

Dr Allan I. Basbaum
University of California, San Francisco, CA, USA

Advisory Board
Dr Allan I. Basbaum
University of California, San Francisco, CA, USA

Dr Akimichi Kaneko
Keio University, Tokyo, Japan

Dr Gordon M. Shepherd
Yale University, New Haven, CT, USA

Dr Gerald Westheimer
University of California, Berkeley, CA, USA
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K Okura, *Tokushima Graduate School, Tokushima, Japan*  
M T Smith, *John Hopkins Medical School, Baltimore, MD, USA*

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M Schmelz, *University of Heidelberg, Mannheim, Germany*

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E Eliav, *UMDNJ-New Jersey Dental School, Newark, NJ, USA*

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I Marc, *Université Laval, Quebec City, QC, Canada*

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Contributors to All Volumes

B W Ache  
*University of Florida, Gainesville, FL, USA*

P J Albrecht  
*Albany Medical College, Albany, NY, USA*

J M Alexander  
*University of Wisconsin–Madison, Madison, WI, USA*

T S Alioto  
*University of California, Berkeley, CA, USA*

M Alvarez  
*Universidad Nacional Autónoma de México, México*

B L Anderson  
*University of New South Wales, Sydney, NSW, Australia*

D E Angelaki  
*Washington University School of Medicine, St. Louis, MO, USA*

V Anseloni  
*University of Maryland Dental School, Baltimore, MD, USA*

A V Apkarian  
*Northwestern University, Chicago, IL, USA*

K M Armstrong  
*Stanford University School of Medicine, Stanford, CA, USA*

K Bowmaker  
*University College London, London, UK*

A A Bachmanov  
*Monell Chemical Senses Center, Philadelphia, PA, USA*

C A Bagley  
*Johns Hopkins Hospital, Baltimore, MD, USA*

R Bandler  
*University of Sydney, Sydney, NSW, Australia*

L A Barlow  
*University of Colorado School of Medicine, Aurora, CO, USA*

R Baron  
*Christian-Albrechts-Universität Kiel, Kiel, Germany*
L M Bartoshuk  
*University of Florida, Gainesville, FL, USA*

K I Baumann  
*University of Hamburg, Hamburg, Germany*

G K Beauchamp  
*Monell Chemical Senses Center, Philadelphia, PA, USA*

O Behrend  
*Humboldt-University, Berlin, Germany*

K W Beisel  
*Creighton University, Omaha, NE, USA*

F Benedetti  
*University of Turin Medical School, Turin, Italy*

S Bensmaia  
*The Johns Hopkins University, Baltimore, MD, USA*

D A Bereiter  
*University of Minnesota, Minneapolis, MN, USA*

J Bergan  
*Stanford University School of Medicine, Stanford, CA, USA*

I L Bernstein  
*University of Washington, Seattle, WA, USA*

D M Berson  
*Brown University, Providence, RI, USA*

T Berta  
*University of Lausanne, Lausanne, Switzerland*

K Bielefeldt  
*University of Pittsburgh, Pittsburgh, PA, USA*

L A Birder  
*University of Pittsburgh School of Medicine, Pittsburgh, PA, USA*

F Birklein  
*University of Mainz, Mainz, Germany*

J D Bohbot  
*Vanderbilt University, Nashville, TN, USA*

R T Born  
*Harvard Medical School, Boston, MA, USA*

J D Broughter Jr.  
*University of Tennessee Health Science Center, Memphis, TN, USA*

S Bradesi  
*University of California, Los Angeles, CA, USA*

R M Bradley  
*University of Michigan, Ann Arbor, MI, USA*

A S Bregman  
*McGill University, Montreal, QC, Canada*

K H Britten  
*University of California, Davis, CA, USA*
Contributors to All Volumes

M-C Broillet
University of Lausanne, Lausanne, Switzerland

S M Bromley
University of Pennsylvania, Philadelphia, PA, USA, UMDNJ-Robert Wood Johnson Medical School, Camden, NJ, USA

R M Burger
Lehigh University, Bethlehem, PA, USA

H Burton
Washington University School of Medicine, St. Louis, MO, USA

M R Byers
University of Washington, Seattle WA, USA

A Büschges
University of Cologne, Cologne, Germany

S W Cadden
University of Dundee, Dundee, UK

J N Campbell
Johns Hopkins University, Baltimore, MD, USA

J Caprio
Louisiana State University, Baton Rouge, LA, USA

C E Carr
University of Maryland, College Park, MD, USA

J Carroll
Medical College of Wisconsin, Milwaukee, WI, USA

E Carstens
University of California, Davis, CA, USA

M J Caterina
Johns Hopkins School of Medicine, Baltimore, MD, USA

B Cerf-Ducastel
San Diego State University, San Diego, CA, USA

F Cervero
McGill University, Montreal, QC, Canada

L M Chen
Vanderbilt University, Nashville, TN, USA

J Christensen-Dalsgaard
University of Southern Denmark, Odense, Denmark

T A Cleland
Cornell University, Ithaca, NY, USA

T J Coderre
McGill University, Montreal, QC, Canada

D Copenhagen
University of California San Francisco, CA, USA

R M Costanzo
Virginia Commonwealth University, Richmond, VA, USA
Contributors to All Volumes

E Covey  
*University of Washington, Seattle, WA, USA*

A D Craig  
*Barrow Neurological Institute, Phoenix, AZ, USA*

W Cronin  
*University of Maryland, Baltimore, MD, USA*

C Darian-Smith  
*Stanford University School of Medicine, Stanford, CA, USA*

R Davis-Taber  
*Global Pharmaceutical Research and Development, Abbott Park, IL, USA*

J W Dawson  
*Carleton University, Ottawa, ON, Canada*

Y De Koninck  
*Centre de recherches Université Laval Robert-Giffard, Quebec, QC, Canada*

V de Lafuente  
*Universidad Nacional Autónoma de México, México*

I Decosterd  
*University of Lausanne, Lausanne, Switzerland*

P H Delano  
*Universidad de Chile, Santiago, Chile*

C D Derby  
*Georgia State University, Atlanta, GA, USA*

S W G Derbyshire  
*University of Birmingham, Birmingham, UK*

J A DeSimone  
*Virginia Commonwealth University, Richmond, VA, USA*

J DeSimone  
*Virginia Commonwealth University, Richmond, VA, USA*

M Devor  
*Hebrew University of Jerusalem, Jerusalem, Israel*

R A DiCaprio  
*Ohio University, Athens, OH, USA*

E Disbrow  
*University of California, San Francisco, CA, USA*

J O Dostrovsky  
*University of Toronto, Toronto, ON, Canada*

R L Doty  
*University of Pennsylvania, Philadelphia, PA, USA*

A Dray  
*AstraZeneca Research and Development, Montreal, PQ, Canada*

R Dubner  
*University of Maryland, Baltimore, MD, USA*

G E DuBois  
*The Coca-Cola Company, Atlanta, GA, USA*
B Duchaine
*University College London, London, UK*

V B Duffy
*University of Connecticut, Storrs, CT, USA*

J D Durrant
*University of Pittsburgh, Pittsburgh, PA, USA*

P L Edds-Walton
*Parmly Hearing Institute, Chicago, IL, USA*

E Eliav
*UMDNJ-New Jersey Dental School, Newark, NJ, USA*

M Ennis
*University of Tennessee Health Science Center, Memphis, TN, USA*

R S Erzurumlu
*University of Maryland School of Medicine, Baltimore, MD, USA*

R T Eskew Jr.
*Northeastern University, Boston, MA, USA*

T Euler
*Max-Planck-Institute for Medical Research, Heidelberg, Germany*

A Faurion
*Neurobiologie Sensorielle, NOPA-NBS, INRA, Jouy en Josas, France*

R R Fay
*Loyola University Chicago, Chicago, IL, USA*

D J Felleman
*University of Texas Medical School, Houston, TX, USA*

A S Feng
*University of Illinois at Urbana-Champaign, Urbana, IL, USA*

K M Fenn
*University of Chicago, Chicago, IL, USA*

R D Fernald
*Stanford University, Stanford, CA, USA*

J Ferraro
*University of Kansas Medical Center, Kansas City, KS, USA*

R B Fillingim
*University of Florida College of Dentistry, Community Dentistry and Behavioral Science Gainesville, FL, USA*

T E Finger
*University of Colorado School of Medicine, Aurora, CO, USA*

N B Finnerup
*Aarhus University Hospital, Aarhus, Denmark*

M F Fitzgerald
*University College London, London, UK*

J R Flanagan
*Queen's University, Kingston, ON, Canada*

H Flor
*Central Institute of Mental Health, Mannheim, Germany*
Contributors to All Volumes

A Fontanini
Brandeis University, Waltham, MA, USA

D H Foster
University of Manchester, Manchester, UK

M E Frank
University of Connecticut Health Center, Farmington, CT, USA

M A Freed
University of Pennsylvania School of Medicine, Philadelphia, PA, USA

A S French
Dalhousie University, Halifax, NS, Canada

R Friedman
Vanderbilt University, Nashville, TN, USA

B Fritzsch
Creighton University, Omaha, NE, USA

M Frot
INSERM U879, Bron France

T Fukushima
The University of Tokyo School of Medicine, Tokyo, Japan

D N Furness
Keele University, Keele, UK

G Galizia
Universität Konstanz, Konstanz, Germany

J L Gallant
Helen Wills Neuroscience Institute, Berkeley, CA, USA

P D R Gamlin
University of Alabama at Birmingham, Birmingham, AL, USA

E P Gardner
Department of Physiology and Neuroscience, New York University School of Medicine, New York, NY, USA

G F Gebhart
University of Pittsburgh, Pittsburgh, PA, USA

C D Gilbert
The Rockefeller University, New York, NY, USA

D Rodriguez Gil
Yale University School of Medicine, New Haven, CT, USA

J I Glendinning
Barnard College, Columbia University, New York, NY, USA

P J Goadsby
University of California, San Francisco, CA, USA

P Gochee
University of Kansas Medical Center, Kansas City, KS, USA

M S Gold
University of Pittsburgh, Pittsburgh PA, USA

A W Goodwin
University of Melbourne, Parkville, Vic, Australia
J Gottlieb
Columbia University, New York, NY, USA

R H Gracely
University of Michigan Health System, VAMC, Ann Arbor, MI, USA

C A Greer
Yale University School of Medicine, New Haven, CT, USA

M Gridi-Papp
University of California, Los Angeles, CA, USA

M Grim
Charles University, Praha, Czech Republic

S E Grossman
Brandeis University, Waltham, MA, USA

B Grothe
Ludwig-Maximilians-University, Munich, Germany

M C Göpfert
University of Cologne, Cologne, Germany

T A Hackett
Vanderbilt University, Nashville, TN, USA

C M Hackney
University of Cambridge, Cambridge, UK

A Hajnal
Milton S. Hershey Medical Center, Hershey, PA, USA

Z Halata
University of Hamburg, Hamburg, Germany

R Hallworth
Creighton University, Omaha, NE, USA

R C Hardie
University of Cambridge, Cambridge, UK

K M Hargreaves
University of Texas Health Science Center, San Antonio, TX, USA

I A Harrington
Augustana College, Rock Island, IL, USA

J P Harris
University of California, San Diego, CA, USA

G J Hathway
University College London, London, UK

S E Hausselt
Max-Planck-Institute for Medical Research, Heidelberg, Germany

A Hayar
University of Arkansas for Medical Sciences, Little Rock, AR, USA

J E Hayes
Brown University, Providence, RI, USA

D He
Creighton University, Omaha, NE, USA
B Hedwig
University of Cambridge, Cambridge, UK

H E Heffner
University of Toledo, Toledo, OH, USA

R S Heffner
University of Toledo, Toledo, OH, USA

M M Heinricher
Oregon Health & Science University, Portland, OR, USA

A Hernández
Universidad Nacional Autónoma de México, México

A Hirsh
University of Florida, Gainesville, FL, USA

J R Holt
University of Virginia School of Medicine, Charlottesville, VA, USA

P Honore
Global Pharmaceutical Research and Development, Abbott Park, IL, USA

S S Hsiao
The Johns Hopkins University, Baltimore, MD, USA

J W Hu
University of Toronto, Toronto, ON, Canada

J Iglesias
Cuban Center for Neuroscience, Habana, Cuba

F Imamura
Yale University School of Medicine, New Haven, CT, USA

S L Ingram
Washington State University, Vancouver, WA, USA

J Isnard
Lyon I University and INSERM U879, Bron, France

G H Jacobs
University of California, Santa Barbara, CA, USA

W Jänig
Physiologisches Institut, Christian-Albrechts-Universität zu Kiel, Germany

W Jänig
Christian-Albrechts-Universität zu Kiel, Kiel, Germany

L Jasmin
Neurosurgery and Gene Therapeutics Research Institute, Los Angeles, CA, USA

T S Jensen
Aarhus University Hospital, Aarhus, Denmark

R S Johansson
Umeå University, Umeå, Sweden

S J St. John
Rollins College, Winter Park, FL, USA

B A Johnson
University of California, Irvine, CA, USA
B Johnson  
UC Berkeley, Berkeley, CA, USA

J I Johnson  
Michigan State University, East Lansing, MI, USA

J H Kaas  
Vanderbilt University, Nashville, TN, USA

T Kamigaki  
The University of Tokyo School of Medicine, Tokyo, Japan

E Kaplan  
The Mount Sinai School of Medicine, New York, NY, USA

H Kasahara  
The University of Tokyo School of Medicine, Tokyo, Japan

D B Katz  
Brandeis University, Waltham, MA, USA

B J B Keats  
Louisiana State University Health Sciences Center, New Orleans, LA, USA

K Keay  
University of Sydney, Sydney, NSW, Australia

V Kefalov  
Washington University School of Medicine, St. Louis, MO, USA

D R Ketten  
Woods Hole Oceanographic Institution, Woods Hole, MA, USA

R M Khan  
UC Berkeley, Berkeley, CA, USA

M C Killion  
Etymotic Research Ltd., Elk Grove Village, IL, USA

J C Kinnamon  
University of Denver, Denver, CO, USA

S C Kinnamon  
Colorado State University, Fort Collins, CO, USA

K R Kluender  
University of Wisconsin–Madison, Madison, WI, USA

E Knudsen  
Stanford University School of Medicine, Stanford, CA, USA

T Kobayakawa  
National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan

H Komatsu  
National Institute for Physiological Sciences, Okazaki, Japan

M Konishi  
California Institute of Technology, Pasadena, CA, USA

H G Krapp  
Imperial College London, London, UK

B Krekelberg  
Rutgers University, Newark, NJ, USA
R F Krimm
University of Louisville School of Medicine, Louisville, KY, USA

L Krubitzer
University of California, Davis, CA, USA

T Kurahashi
Osaka University, Osaka, Japan

M Kössl
Johann Wolfgang Goethe Universität, Frankfurt/Main, Germany

S Lacey
Emory University School of Medicine, Atlanta, GA, USA

R Ladher
RIKEN Centre for Developmental Biology, Kobe, Japan

A K Lalwani
New York University School of Medicine, New York, NY, USA

G J Lavigne
Université de Montréal, Montreal, QC, Canada

H C Lawson
Johns Hopkins Hospital, Baltimore, MD, USA

D Le Bars
INSERM U-713, Paris, France

B B Lee
SUNY College of Optometry, New York, NY, USA

S Lee
Korea Institute of Science and Technology, Seoul, Korea

T Leinders-Zufall
University of Maryland School of Medicine, Baltimore, MD, USA

A Lelli
University of Virginia School of Medicine, Charlottesville, VA, USA

L Lemus
Universidad Nacional Autónoma de México, México

F A Lenz
Johns Hopkins Hospital, Baltimore, MD, USA

M Leon
University of California, Irvine, CA, USA

A R Light
University of Utah, Salt Lake City, UT, USA

D Lima
Universidade do Porto, Porto, Portugal

C Linster
Cornell University, Ithaca, NY, USA

W Li
The Rockefeller University, New York, NY, USA

P-M Lledo
Pasteur Institute, Paris, France
Contributors to All Volumes

E R Loew
Cornell University, Ithaca, NY, USA

R Luna
Universidad Nacional Autónoma de México, México

D-G Luo
Johns Hopkins University School of Medicine, Baltimore, MD, USA

V Lyall
Virginia Commonwealth University, Richmond, VA, USA

H Machelska
Charité – Universitätsmedizin Berlin, Campus Benjamin Franklin, Berlin, Germany

E A Macpherson
University of Michigan, Ann Arbor, MI, USA

S F Maier
University of Colorado at Boulder, Boulder, CO, USA

H Maija
Helsinki University Hospital, Helsinki, Finland

P B Manis
The University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

G A Manley
Technische Universität München, Garching, Germany

I Marc
Université Laval, Quebec City, QC, Canada

D Margoliash
University of Chicago, Chicago, IL, USA

R F Margolskee
Mount Sinai School of Medicine, New York, NY, USA

G R Martin
University of Birmingham, Birmingham, UK

S C Massey
University of Texas Medical School, Houston, TX, USA

F Mauguie
Lyon I University and INSERM U879, Bron, France

M Max
Mount Sinai School of Medicine, New York, NY, USA

B J May
The Johns Hopkins University School of Medicine, Baltimore, MD, USA

E A Mayer
University of California, Los Angeles, CA, USA

C H McCool
University of California, Davis, CA, USA

D H McDougal
University of Alabama at Birmingham, Birmingham, AL, USA

P A McGrath
The University of Toronto, Toronto, ON, Canada
Contributors to All Volumes

E M McLachlan  
Prince of Wales Medical Research Institute, Randwick, NSW, Australia

D G McLaren  
University of Wisconsin, Madison, WI, USA

L M Mendell  
State University of New York, Stony Brook, NY, USA

J A Mennella  
Monell Chemical Senses Center, Philadelphia, PA, USA

S Mense  
Institut für Anatomie und Zellbiologie, Universität Heidelberg, Heidelberg, Germany

W Meyerhof  
German Institute of Human Nutrition Potsdam-Rehbruecke, Nuthetal, Germany

R A Meyer  
Johns Hopkins University, Baltimore, MD, USA

H J Michalewski  
University of California, Irvine, CA, USA

J C Middlebrooks  
University of Michigan, Ann Arbor, MI, USA

E D Milligan  
University of Colorado at Boulder, Boulder, CO, USA

Y Miyashita  
The University of Tokyo School of Medicine, Tokyo, Japan

J S Mogil  
McGill University, Montreal, QC, Canada

T Moore  
Stanford University School of Medicine, Stanford, CA, USA

T Moser  
University of Goettingen, Goettingen, Germany

V Nácher  
Universidad Nacional Autónoma de México, México

P M Narins  
University of California, Los Angeles, CA, USA

J Ngai  
University of California, Berkeley, CA, USA

M A L Nicolelis  
Duke University, Durham, NC, USA

R Norgren  
Milton S. Hershey Medical Center, Hershey, PA, USA

P T Ohara  
University of California, San Francisco, CA, USA

S Ohara  
Johns Hopkins Hospital, Baltimore, MD, USA

K Okura  
Tokushima Graduate School, Tokushima, Japan
D Oliver  
*Universität Freiburg, Freiburg, Germany*

G A Orban  
*K.U. Leuven Medical School, Leuven, Belgium*

D Osorio  
*University of Sussex, Brighton, UK*

M H Ossipov  
*University of Arizona, Tucson, AZ, USA*

C C Pack  
*McGill University School of Medicine, Montreal, PQ, Canada*

G E Pickard  
*Colorado State University, Fort Collins, CO, USA*

R J Pitts  
*Vanderbilt University, Nashville, TN, USA*

G S Pollack  
*McGill University, Montreal, QC, Canada*

A N Popper  
*University of Maryland, College Park, MD, USA*

F Porreca  
*University of Arizona, Tucson, AZ, USA*

C V Portfors  
*Washington State University, Vancouver, WA, USA*

M Postma  
*University of Cambridge, Cambridge, UK*

R J Prenger  
*University of California, Berkeley, CA, USA*

T M Preuss  
*Emory University, Atlanta, GA, USA*

D D Price  
*University of Florida, Gainesville, FL, USA*

I Provencio  
*University of Virginia, Charlottesville, VA, USA*

A C Puche  
*University of Maryland School of Medicine, Baltimore, MD, USA*

S Puria  
*Stanford University, Stanford, CA, USA*

H-X Qi  
*Vanderbilt University, Nashville, TN, USA*

P Rainville  
*Université de Montréal, Montreal, QC, Canada*

S N Raja  
*Johns Hopkins University, Baltimore, MD, USA*

R Rajimehr  
*Massachusetts General Hospital, Charlestown, MA, USA*
R L Reed  
University of Florida, Gainesville, FL, USA

B E Reese  
University of California, Santa Barbara, CA, USA

L Rela  
Yale University School of Medicine, New Haven, CT, USA

K Ren  
University of Maryland, Baltimore, MD, USA

B A Revill  
Brandeis University, Waltham, MA, USA

J Reynolds  
The Salk Institute for Biological Studies, San Diego, CA, USA

A Ribeiro-da-Silva  
McGill University, Montreal, QC, Canada

F L Rice  
Albany Medical College, Albany, NY, USA

F Rieke  
University of Washington, Seattle, WA, USA

M Ringkamp  
Johns Hopkins University, Baltimore, MD, USA

H L Rittner  
Charité – Universitätsmedizin Berlin, Campus Benjamin Franklin, Berlin, Germany

D Robert  
University of Bristol, Bristol, UK

W M Roberts  
University of Oregon, Eugene, OR, USA

M E Robinson  
University of Florida, Gainesville, FL, USA

L Robles  
Universidad de Chile, Santiago, Chile

V Rodriguez  
Cuban Center for Neuroscience, Habana, Cuba

I Rodriguez  
University of Geneva, Geneva, Switzerland

A W Roe  
Vanderbilt University, Nashville, TN, USA

E T Rolls  
University of Oxford, Oxford, UK

R Romo  
Universidad Nacional Autónoma de México, México

E W Rubel  
University of Washington, Seattle, WA, USA

I Russell  
University of Sussex, Brighton, UK
M A Rutherford
*University of Oregon, Eugene, OR, USA*

K Saito
*University of Pennsylvania, Philadelphia, PA, USA*

H Sakano
*University of Tokyo, Tokyo, Japan*

A N Salt
*Washington University School of Medicine, St. Louis, MO, USA*

J Sandkühler
*Medical University of Vienna, Vienna, Austria*

K Sathian
*Emory University School of Medicine, Atlanta, GA, USA*

R J Schafer
*Stanford University School of Medicine, Stanford, CA, USA*

S S Schiffman
*Duke University Medical Center, Durham, NC, USA*

M Schmelz
*University of Heidelberg, Mannheim, Germany*

J Schouenborg
*Lund University, Lund, Sweden*

B A Schulte
*Medical University of South Carolina, Charleston, SC, USA*

I Schwetz
*Medical University, Graz, Austria*

J E Schwob
*Tufts University School of Medicine, Boston, MA, USA*

V E Scott
*Global Pharmaceutical Research and Development, Abbott Park, IL, USA*

R V Shannon
*House Ear Institute, Los Angeles, CA, USA*

A Sharma
*Columbia University, New York, NY, USA*

L T Sharpe
*University College London, London, UK*

S M Sherman
*The University of Chicago, Chicago, IL, USA*

T Shimura
*Osaka University, Osaka, Japan*

J Siegel
*Northwestern University, Evanston, IL, USA*

C T Simons
*Global Research and Development Center, Cincinnati, OH, USA*

W Singer
*Max Planck Institute for Brain Research, Frankfurt, Germany*
Contributors to All Volumes

D V Smith
*The University of Tennessee College of Medicine, Memphis, TN, USA*

M T Smith
*John Hopkins Medical School, Baltimore, MD, USA*

R G Smith
*University of Pennsylvania, Philadelphia, PA, USA*

J B Snow Jr.
*University of Pennsylvania, Philadelphia, PA, USA*

D J Snyder
*Yale University, New Haven, CT, USA*

N Sobel
*UC Berkeley, Berkeley, CA, USA*

P J Sollars
*Colorado State University, Fort Collins, CO, USA*

A C Spector
*The Florida State University, Tallahassee, FL, USA*

H Staecker
*University of Kansas Medical Center, Kansas City, KS, USA*

A Starr
*University of California, Irvine, CA, USA*

R Staud
*University of Florida, Gainesville, FL, USA*

E A Stauffer
*University of Virginia School of Medicine, Charlottesville, VA, USA*

G C Stecker
*University of Washington, Seattle, WA, USA*

C R Steele
*Stanford University, Stanford, CA, USA*

C Stein
*Charité – Universitätsmedizin Berlin, Campus Benjamin Franklin, Berlin, Germany*

L J Stein
*Monell Chemical Senses Center, Philadelphia, PA, USA*

A Stockman
*University College London, London, UK*

R Storms
*Veterans Administration Medical Center, Kansas City, MO, USA*

E Strettoi
*Neuroscience Institute, Pisa, Italy*

H Takeuchi
*Osaka University, Osaka, Japan*

E Thomson
*Duke University, Durham, NC, USA*

N Tian
*Yale University, New Haven, CT, USA*
D J Tollin  
*University of Colorado Health Sciences Center, Aurora, CO, USA*

M Tominaga  
*National Institutes of Natural Sciences, Okazaki, Japan*

R Tootell  
*Massachusetts General Hospital, Charlestown, MA, USA*

K Touhara  
*The University of Tokyo, Chiba, Japan*

S P Travers  
*The Ohio State University, Columbus, OH, USA*

R D Treede  
*Johannes Gutenberg-University, Mainz, Germany*

R D Treede  
*Ruprecht-Karls-University Heidelberg, Heidelberg, Germany*

N F Troje  
*Queen's University, Kingston, ON, Canada*

L O Trussell  
*Oregon Health and Science University, Portland, OR, USA*

A Tsuboi  
*University of Tokyo, Tokyo, Japan*

M J Valdés-Sosa  
*Cuban Center for Neuroscience, Habana, Cuba*

D I Vaney  
*The University of Queensland, Brisbane, QLD, Australia*

M Vater  
*Universität Potsdam, Golm, Germany*

M Vorobyev  
*University of Queensland, Brisbane, QLD, Australia*

E T Walters  
*University of Texas at Houston, Medical School, Houston, TX, USA*

M E Warchol  
*Washington University School of Medicine, St. Louis, MO, USA*

E Warrant  
*University of Lund, Lund, Sweden*

W H Warren  
*Brown University, Providence, RI, USA*

L R Watkins  
*University of Colorado at Boulder, Boulder, CO, USA*

L A Werner  
*University of Washington, Seattle, WA, USA*

U Wesselmann  
*The Johns Hopkins University School of Medicine, Baltimore, MD, USA*

G Westheimer  
*University of California, Berkeley, CA, USA*
K N Westlund
University of Texas Medical Branch, Galveston, TX, USA

H E Wheat
University of Melbourne, Parkville, Vic, Australia

M C Whitehead
University of California, San Diego, La Jolla, CA, USA

M C Whitman
Yale University School of Medicine, New Haven, CT, USA

M Wicklein
University College London, London, UK

M C Wiest
Duke University, Durham, NC, USA

J C Willer
INSERM U-731, Paris, France

M A Willis
Case Western Reserve University, Cleveland, OH, USA

W D Willis Jr
University of Texas Medical Branch, Galveston, TX, USA

J F Willott
University of South Florida, Tampa, FL

D A Wilson
University of Oklahoma, Norman, OK, USA

M Wilson
University of California, Davis, CA, USA

J M Wolfe
Brigham and Women's Hospital & Harvard Medical School, Cambridge, MA, USA

J N Wood
University College London, London, UK

H Wässle
Max-Planck-Institute for Brain Research, Frankfurt/Main, Germany

J E Yack
Carleton University, Ottawa, ON, Canada

T Yamamoto
Osaka University, Osaka, Japan

R Yang
University of Denver, Denver, CO, USA

K-W Yau
Johns Hopkins University School of Medicine, Baltimore, MD, USA

R P Yezierski
Comprehensive Center for Pain Research and The McKnight Brain Institute, University of Florida, Gainesville, FL, USA

W A Yost
Loyola University Chicago, Chicago, IL, USA

J M Young
Fred Hutchinson Cancer Research Center, Seattle, WA, USA
G Yovel
Tel Aviv University, Tel Aviv, Israel

A Zainos
Universidad Nacional Autónoma de México, México

H U Zeilhofer
University of Zurich, Zurich, Switzerland

D M Zeitler
New York University School of Medicine, New York, NY, USA

F G Zeng
University of California, Irvine, CA, USA

J-K Zubieta
University of Michigan, Ann Arbor, MI, USA

F Zufall
University of Maryland School of Medicine, Baltimore, MD, USA

L J Zwiebel
Vanderbilt University, Nashville, TN, USA
It has been argued that pain, unlike audition, vision, somatosensation, and olfaction, is not a primary sense, but instead is more of an emotional experience. Most researchers of pain, however, consider pain to be a complex perception evoked by noxious stimuli. Pain is probably far more complicated than the other perceptual modalities described in this series. For example, in the setting of tissue or nerve injury, where pain is persistent, the stimulus that evokes pain can change. In fact, under these conditions innocuous stimuli can readily evoke the perception of pain.

But even these unusual characteristics do not capture the features that make pain among the most complex of perceptions. The International Association for the Study of Pain defines pain as “An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.” In other words, although there is a very discrete anatomical and physiological basis for the detection and transmission of messages that are interpreted as painful, what makes the experience of pain so special is that there is always a profound emotional quality to the experience. For all of these reasons, pain is unquestionably one of the most interesting subjects to address in the The Senses: A Comprehensive Reference.

Pain in general, and pain research in particular, is especially exciting as it brings together elements of so many disciplines. This volume is comprehensive. It includes a wealth of information on the molecular biology, anatomy, physiology, and biochemical bases of ‘pain’, both in the normal and injury setting. But this volume also addresses the critical cognitive component of the pain experience, including some of the most provocative cerebral imaging studies that for the first time are providing insights into the gestalt of brain activity that occurs when pain is experienced. There are chapters on the pharmacological basis of the placebo, on the utility of hypnosis for the treatment of pain, and even an essay on consciousness and pain.

This is not a ‘how to treat’ clinical textbook. Nevertheless, the editors are advocates of the new mantra in the field, namely that chronic pain is not a symptom of disease, but rather is a disease entity itself, a disease of nervous system function. Therefore, in addition to covering the fundamentals of acute ‘pain’ processing, from the nociceptor to cortical activation, we also cover, in depth, the changes that occur in the setting of injury, including molecular, structural, and biochemical alterations in the properties of nociceptors and central nervous system pathways. Some of the particularly intractable clinical pain conditions are discussed. These chapters not only provide insights into pathophysiology but also clues to pain management.

Of course, a variety of compendia have recently appeared, and many also provide comprehensive reviews of the field. With this in mind, the editors have made a concerted effort to produce a final product that is different. Too often the excitement that epitomizes the field of pain research is buried within, or indeed omitted from, the typical edited book. Some textbooks include the proverbial ‘box’ that highlights an interesting topic, but these are generally very limited. We wanted to bring these topics to the forefront. Our approach is to include, in association with each major chapter, at least one or two cameos that illustrate fascinating and provocative areas of basic and clinical neuroscience that intersect the study of pain.

A few years ago we knew almost nothing about the cortical mechanisms that underlie the pain experience. Today in 2007, some scientists, albeit the minority, believe that cortical imaging can provide an objective measure of the pain experience. A few years ago, the tetrodotoxin–resistant subtype of voltage-gated sodium
channel, NaV1.8, was considered the Holy Grail for the next breakthrough in pain management. How fast things change. The discovery that a loss of function mutation of NaV1.7 underlies a condition of congenital insensitivity to pain and that a gain of function mutation underlies the excruciatingly painful condition of erythromelalgia has dramatically altered the focus, not only of the science community but also of the pharmaceutical industry. The pace of discovery in pain research is indeed remarkable. We hope that this volume conveys the excitement inherent in this discovery process and, most importantly, that it stimulates the next generation of basic and clinical scientists to unravel the mystery of the pain experience.

Allan I. Basbaum and M. Catherine Bushnell