P A S P C R

N e w s l e t t e r

Volume 1 Number 2 *June, 1993*

Introduction . . .

The quarterly **PASPCR** ***Newsletter*** is intended to serve as an informal means for the members of our Society to communicate with one another. As such, we invite our membership to actively contribute to the ***Newsletter***. Help us to update the Job Listings and Calendar of Events. If you attend a scientific meeting at which you heard about work which you think will be of interest to the membership of the **PASPCR**, please write a few paragraphs summarizing what was presented and share it with us. If you should have a change of affiliation and address, we'd like to know that, too. This is **your** ***Newsletter***, and we depend upon you to help us make sure it best serves the Society's needs. Contributions and comments can be sent to any of the members of the Publications Committee listed in this issue.

Welcome to New Members :

We welcome the following new members to the **PASPCR** . . . .

Jean-Claude Bystryn
Donna Durham-Pierre
Jamal Z Farooqui
Bryan B Fuller
John M Gardner
Alan N Houghton
W Gerald Klingler
Gary D Kruh
Kenneth A Mason
Katsuo Matsumoto
Kenji Mori
Bryan P Murphy
Yoshimichi Nakatsu
J Michael Newton
Richard M Niles
Regina Pietruszko
Brian Potterf
Michael Rachkovsky
Ian R Scott
Richard T Swank
Ram K Tripathi

If anyone is interested in joining our Society or wishes to sponsor a member, application forms can be obtained from Dr. Richard King.

IN THIS ISSUE . . . .

PanAmerican Society for Pigment Cell Research

c/o Dr. Richard King
Department of Medicine
University of Minnesota
516 Delaware St, SE
Minneapolis, MN 55455
FAX: (612) 624-6645

The PASPCR Newsletter is published quarterly; for further information and/or to submit contributions, please contact:

Dr. Zalfa Abdel-Malek
University of Cincinnati
Department of Dermatology
231 Bethesda Avenue
Cincinnati, OH 45267
FAX: (513) 558-0198

Dr. Murray Brilliant
Institute for Cancer Research
Fox Chase Cancer Center
7701 Burholme Ave
Philadelphia, PA 19111
FAX: 215/728-3574

Dr. Seth J. Orlow
Department of Dermatology
New York Univ Med Center
550 First Avenue, RM H100
New York, NY 10016
FAX: (212) 263-8752

Calendar of Events :

May 30 - June 1, 1993 American Society for Biochemistry & Molecular Biology, to be held in San Diego, California (contact: FASEB, 9650 Rockville Pike, Bethesda, MD 20814; FAX: 301/530-7014)

September 21 - 23, 1993 Fifth World Congress on Cancers of the Skin, to be held Berlin, Germany (contact: Dr. Claus Garbe, Department of Dermatology, University Medical Center Steglitz, Hindenburgdamm, 30, 1000 Berlin 45, Germany; FAX: 49/30/798-4141)

September 26 - 30, 1993 XVth International Pigment Cell Conference, to be held in Kensington, UK (contact: Mrs. Rosemary Barton, IPCC Conference Office, P.O. Box 1773, London E17 9LW, United Kingdom, FAX: 44/81/503-6463)

October 28 - 31, 1993 Tricontinental Dermatology Conference, to be held in Kyoto, Japan (contact: Dr. Koucihi Ikai, Dept of Dermatology, Kyoto University Faculty of Medicine, Kyoto 606, Japan)

December 11 - 15, 1993 American Society of Cell Biology Meeting, to be held New Orleans, Louisiana, (contact: ASCB National Office, 9650 Rockville Pike, Bethesda, MD FAX: 301/530-7139)

March 11 - 12, 1994 Melanin Symposium, Melanin: Its Role in Human Photoprotection, to be held in Alexandria, Virginia, (contact: Dr. Ago Ahene, 3696 Haven Avenue, Redwood City, California, 94063, FAX: 415/368-4470)

April 27 - 39, 1994 Annual Meeting of the Society for Investigative Dermatology, to be held in Baltimore, Maryland, (contact: SID Office, Department of Dermatology, University Hospitalss of Cleveland, 2074 Abington Road, Cleveland, OH 44106, FAX: 216/844-8993)

June 26 - 29, 1994 5th PASPCR Annual Meeting, to be held in Philadelpia, Pennsylvania, (contact: Dr. Gert Jacobsohn, Department of Biological Chemistry, Hahnemann University, Broad and Vine, Philadelphia, PA 19102-1192, FAX: 215/762-3722)

1994 PASPCR Vth Annual Meeting

The Vth Meeting of the **PASPCR** will be held in Philadelphia, Pennsylvania from June 26-29, 1994. Dr. Gert Jacobsohn is the Organizer of this meeting, and he and his Program Committee have already assembled a number of exciting keynote speakers and the outline of a most interesting scientific program. More information about this meeting and the tentative program will follow in future ***Newsletters***. We hope that all members of the **PASPCR** will plan to attend this meeting - be sure to mark it on your calendar.

1995 PASPCR VIth Annual Meeting Site :

We are currently soliciting applications from anyone interested in hosting the VIth Annual Meeting of the **PASPCR**, preferably in the middle of 1995. If you are interesting in bidding for this Conference, please contact one of the officers of the **PASPCR**. Previous meeting sites to date have been: I - Minneapolis, Minnesota; II - Bethesda, Maryland; III - Edmonton, Alberta; IV - Cincinnati, Ohio. The next meeting will be held in Philadelphia, Pennsylvania (cf above).

XVth International Pigment Cell Conference

By now, everyone should have received all of the information regarding the meeting site and date of the next IPCC to be held in London from September 26-30, 1993. However, information on hotels and housing available was not sent in the original Announcement, and following is some preliminary data on the hotels and their prices that will be offered to attendees. In addition, we include some information on other types of housing that is available and might be cheaper on a group basis. If anyone has any additional knowledge of relatively cheap housing in the London area, we invite them to send it to us for inclusion in our next Newsletter, which will be sent to members of our Society prior to the IPCC meeting in London.

Hotel Name	Location	Single	Double
Copthorne Tara	W8	88	100
Kensington Close	W8	77	86
Kensington Palace Thistle	W8	80	90
Hospitality Inn	W2	75	86
Park Court	W2	75	85
Charles Dickens	W2	65	80
Phoenix	W2	55	72
Julius Caesar	W2	28	38
The Glouchester	SW7	65	70
The Bailey's	SW7	65	75

* prices are in British pounds and include breakfast and VAT

We have information on apartments that can house up to 8 people for one week; these apartments are located in South Kensington and in Blumbury. The price including all taxes are $1,925 and $1,665 per week respectively (this would work out to $200/$250 per person per week). Contact us if you wish further information about these rentals.

1993 PASPCR Young Investigator Awards The

PASPCR will present three Young Investigator Awards to its members attending the XVth IPCC; these awards are sponsored by our Society and consist of a plaque and a $250 each. Winners of these awards will be chosen by an anonymous Committee during the actual meeting and will be announced at the **PASPCR** Business Meeting to be held during the IPCC in London.

PASPCR Secretary / Treasurer's Report :

Synopsis of the **PASPCR** Council Meeting held by telephone conference call on January 28, 1993.

Hearing opened the meeting and the minutes of the previous meeting held on October 15, 1992 were accepted as amended. Nordlund reviewed the Council Meeting of the IFPCS held in Tokyo in November, 1992 (issues discussed at that meeting were published in Issue #1 of the PASPCR Newsletter). The report on the annual meeting to be held in Philadelphia, 1994 was given; a Program Committee meeting had already been held and planning for that meeting has been initiated. The date for the meeting has been set at June 26-29, 1994. Hearing reviewed the Nomination Committee's recommendation that Elizabeth Russell be made the first honorary member of the PASPCR and this was unanimously accepted by the Council. Hearing discussed the need for a Newsletter that would improve communication within the membership; following discussion it was decided that Hearing and King would serve as the coordinators of publication and mailing and that the first year Council Members (Abdel-Malek, Brilliant, Orlow) serve as an *ad hoc* Publication Committeee to generate future issues. The need for a Membership Committee was reviewed; it was noted that there were 17 new members in 1992 and that many individuals working in pigment research are not members. An *ad hoc* Membership Committee consisting of the third year Council Members (Bagnara, Brumbaugh and Jimbow) was asked to prepare a report on mechanisms for having an ongoing active membership campaign. The Nominating Committee, automatically chaired by the President-Elect (Frost-Mason) will develop a slate of candidates to fill the three Council positions; R Bowers will act as the second member of the Committee and they will select three additional members at large. The Nominations Committee was directed to select candidates from the broad range of pigment cell research; nominations are to be completed by the July, 1993 Council meeting. The issue of travel stipends for the London IPCC was discussed; it was moved and approved that travel stipends be provided for the London meeting, and it was decided to approve them as early as possible so that attendees would have such support committed when planning their trip. The question of the PASPCR Young Investigator awards was also discussed and the Council unanimously approved the motion to give those awards during the London IPCC, limiting eligibility to members of the PASPCR. It was decided to present those awards during the PASPCR business meeting in London, and recipients will be selected by an anonymous Committee. Nordlund reviewed the proposal that the PASPCR agree to cosponsor a Melanin Symposium to be held in March, 1994 in Crystal City, Virginia. There was general discussion as to the appropriateness of the PASPCR sponsoring this meeting. It was generally felt that the idea of this meeting was good, but that the PASPCR should have some role in organizing the meeting if they were to act as sponsor. It was suggested that perhaps this meeting could be held in conjunction with the Philadelphia PASPCR meeting, but it was noted that the organizers wanted to hold it close to Washington DC so that members of the regulatory agencies dealing with new drugs could attend. It was moved and seconded to table this discussion to a later meeting following receipt of additional information. There being no further new business, the meeting was adjourned. Minutes prepared by King, Secretary/Treasurer, PASPCR.

Positions - Wanted and Available :

Available: Postdoctoral Fellowship: NIH-funded position (for up to 3 years) to study the biogenesis of the melanosome and genetic disorders which affect it. Prior training in either immunomicroscopy or molecular biology desirable. US citizen or permanent resident only. Contact: Dr. Seth Orlow, Dermatology Room H-100, NYU Medical Center, 550 First Avenue, New York, NY 10016. phone: 212/263-5070, FAX: 212/263-8752.

Available: Two postdoctoral positions are available to study the recently described receptors for the proopiomelanocortin peptides (Science, 257:1248, 1992). Ongoing projects include structure/function analysis of the MSH receptor, isolation and characterization of neural-specific proopiomelanocortin receptors, and study of the functions of melanocortins in the CNS. One position requires a background in peptide and protein chemistry for receptor structure/function analysis. The second position would ideally be filled by an individual with training in neurobiology and a strong background in molecular biology. Applicants should send a Curriculum Vitae, a statement of research interests, and three letters of recommendation to: Dr. Roger D Cone, Vollum Institute for Advanced Biomedical Research, Oregon Health Sciences University, 3181 SW Sam Jackson Park Road, Portland, OR 97201-3098. phone: 503/494-4732; FAX: 503/494-4534.

Available: One or two (NIH grant-funded) postdoctoral positions in the laboratory of Dr. Murray Brilliant at the Fox Chase starting the summer of 1993. The research involves Mammalian Genetics, Pigmentation Biology and Mouse Models of Human Genetic Disease. Recent efforts have been aimed at understanding the mouse pink-eyed dilution locus (Science 252:566, 1991; PNAS 89:2969, 1992; PNAS 90:297, 1993) and its role in human albinism, Prader-Willi Syndrome and Angelman Syndrome (Mammalian Gen 3:187, 1992; Science 257:1121, 1992). Ongoing projects include characterization of the pigment gene and adjacent genes that mediate other intriguing developmental functions, in both mouse and man. The laboratory research group is small, active, productive and amiable. The laboratory is part of the basic sciences division (The Institute for Cancer Research), located in a new research building on a large wooded campus in a suburban-like setting, just inside the city limits of Philadelphia. The Fox Chase Cancer Center has a large postdoctoral community that benefits from active inter-lab collaborations and weekly seminary/pizza/beer gatherings. In addition to a generous benefits package, other attractive amenities include subsidized housing and excellent day-care facilities, all within walking distance. Contact Dr. Murray Brilliant, Institute for Cancer Research, Fox Chase Cancer Center, 7701 Burholme Ave, Philadelphia, PA 19111; phone: 215/728-2864, FAX: 215/728-3616.

Meeting Report - Society for Investigative Dermatology - 1993

The 1993 Annual Meeting of the Society for Investigative Dermatology was held in Washington, DC from April 28-May 1, 1993. The following summary of abstracts presented was compiled by Dr. Zalfa Abdel-Malek (who is to be congratulated for her tremendous effort - Ed. note)

I. CYTOKINES, NEUROPEPTIDES AND OTHER HORMONES

Expression of Insulin-like growth factor (IGF-1) Message in Pigmented Lesions. *Fleming MG, Graf LH*. IGF-1 message was detected by *in situ* hybridization in common nevi, dysplastic nevi, early primary melanomas, advanced primary melanomas and metastatic melanomas.

Melanocyte Function in Human Skin is Modulated by Neurotrophic Factors Through TRK Receptors. *Yaar M, Eller MS, Di Benedetto P, Reenstra WR, Zhai S, Gilchrest BA.* Human melanocytes stimulated with TPA, UV, treated with keratinocyte conditioned media, or co-cultured with KC, express high affinity receptors of the TRK family that bind NT-3, a neurotrophin related to nerve growth factor

(NGF). These receptors are functional, as evidenced by their rapid tyrosine phosphorylation upon the addition of NGF to melanocytes.

The Behavior of Cytokines, Melanotropic Peptides and Other Proteins in Hyperpigmentation of Human Skin Grafts on Nude Mice. *Matsumoto K, Robb E, Warden G, Nordlund J.* Human skin xenografts (on athymic nude mice) spontaneously hyperpigment. Hyperpigmentation is obvious one week after grafting and increases with time. The tyrosinase related protein (TRP)-1 is activated one week for a subsequent four weeks after grafting. The cytokines IL-1 and TNF-α are transiently increased from 24-48 hours after the graft. The expression of IL-6 is not detected. Some cells in the dermis express α-MSH and ACTH 2-4 weeks after grafting.

Inhibition of B16 Melanoma Growth *In Vivo* After Treatment with Interleukin-1 Receptor Antagonist. *McKenzie RC, Sauder DN, Dinarello C.* Interleukin (IL)-1 and IL-6 enhanced the growth of B16-F10 melanoma cells only when co-injected with the tumor cells. Interleukin-1 receptor antagonist (IL-1RA), which blocks the binding of IL-1 to its receptors, and lacks and agonist activity, reduced tumor growth in a dose-dependent manner. The possible role of IL-1 in melanoma tumor development and the therapeutic value of IL-1RA are suggested.

Involvement of Interleukin-6 in the Biology of Human Malignant Melanoma. *Kokoschka EM, Mittermayer F, Schauer E, Micksche M.* Seventeen out of twenty human malignant melanoma cell lines secreted IL-6. The production of IL-6 was stimulated by PMA (TPA), IL-1β and TNF-α. IL-6 was shown to bind IL-6 receptors, and binding was increased by preincubation with interferon-γ and TNF-α.

Effect of 9-cis Retinoic Acid on Human Primary Melanocytes and Metastatic Melanoma Cells. *Yamanishi DT, Voboril JE, Wagner EA, Meyskens FL, Jr.* 9-Cis retinoic acid resulted in a slight increase in the proliferation of human melanocytes, but inhibited the proliferation of three out of four melanoma cell strains. Melanocytes expressed retinoic acid receptor α, β and γ RNA transcripts, while melanoma cells expressed retinoic acid receptor α and γ, and only two out of the four lines expressed β-transcripts. The relationship of the retinoic acid receptor isotypes to cellular response is still to be determined.

MSH Receptors in Immortalized Human Epidermal Keratinocytes: A Potential Mechanism for Coordinate Regulation of the Epidermal Melanin Unit by UV Light. *Pawelek JM, Chakraborty AK.* Primary human epidermal keratinocytes immortalized in culture expressed MSH receptors. Like S91 melanoma cells, keratinocytes expressed high and low affinity receptors, the former showing positive cooperativity. The MSH receptors in both cell types had similar Ki values, identical gel migration patterns, were associated with plasma membrane and coated vesicles, and were upregulated by UV light and MSH. It is suggested that the presence of MSH receptors on keratinocytes translates UV light into a single hormonal initiation signal in the skin.

Purification and Characterization of Allergy-Induced Melanogenic Factor in Brownish Guinea Pig Skin. *Imokawa G, Yada Y, Higuchi T.* Phenylazo-naphthol (PAN) allergy induces late-appearing hyperpigmentation of brownish guinea pig skin. This hyperpigmentation accompanies the appearance of an epidermal melanogenic soluble factor with a molecular mass of 7.9 kDa, capable of stimulating Ins (1,4,5) P_3 formation and increasing intracellular Ca^{+2} in guinea pig melanocytes. The growth and melanogenic activities of this factor seems to be mediated by the PKC signal transduction pathway.

Identification of Functional Endothelin-1 Receptors in Cultured Human Malignant Melanoma Cells. *Yohn J, Smith S, Stevens T, Morelli J, Dormish J, Kane M, Zamora M.* Endothelin-1 is a peptide growth factor for human melanocytes which is produced in large amounts by vascular endothelium (it is also produced by human keratinocytes). Three human malignant melanoma cell lines were evaluated for specific ET-1 binding, intracellular calcium mobilization and growth response. Human melanoma cell lines SK Mel 28, SK Mel 30 and CU 800 had specific, saturable, high affinity endothelin-1 binding, and responded to endothelin-1 treatment with increased intracellular Ca^{+2} and enhanced proliferation. The expression of functional endothelin-1 receptors by human melanomas may be associated with enhanced perivascular proliferation of malignant melanoma.

II. EXTRACELLULAR MATRIX, INTEGRINS

Extracellular Matrix of Keratinocyte Mediated Cell to Cell Interactions can Control Normal Human Melanocyte Differentiation and Proliferation. *Nakazawa K, Damour O, Collombel C.* Extracellular matrix produced by proliferating or differentiating keratinocytes regulate dendrite formation, growth and melanization of melanocytes, possibly by enhancing attachment of melanocytes to extracellular matrix components or induction of cell adhesion molecules.

Spatial Organization of Integrin Subunits on Cultured Normal Human Epidermal Melanocytes Examined by Confocal Microscopy. *Searles GE, Munoz V, Jimbow K.* Normal human melanocytes were stained by immunofluorescence methods using specific antibodies against integrins. No expression of α_4 or β_2 was found. α_2 had a random distribution along the perikaryon and dendrites, α_3 stained the cell body and dendrites, α_5 and β_1 had a random wide range distribution, α_v and β_3 were localized at the tip of dendrites, and β_4 at hillock and proximal dendrites.

TNF-α and IL-1α Modulate Melanoma Integrin Expression and Cell Migration. *Dekker SK, Vink J, Vermeer BJ, Brijn JA, Mihm MC, Byers HR.* The two cytokines IL-1α and TNF-α upregulate the expression of α_4 and α_5 integrin subunits on metastatic melanoma MM-RU cells plated on plastic, and increase cellular migration rate on fibronectin matrix. Migration is inhibited by monoclonal antibodies against the α_4, α_5 and β_1 subunits, and against TNF-α and IL-1α receptors.

Human Melanocyte Movement on Type IV Collagen is Inhibited by Antibodies to α_2 and α_3, but not α_5 Integrins. *Morelli JG, Yohn JJ, Zekman T, Norris DA.* Human neonatal melanocyte movement *in vitro* is enhanced on a matrix of type IV collagen. This movement was found to be regulated by α_2 and α_3, but not α_5 integrin.

Stimulation of Skin Melanocyte Tyrosinase Activity by Hair Bulb Dermal Papilla Cells. *Buffey JA, Messenger A, Taylor M, Ashcroft ATT, Westgate GF, MacNeil S.* Dopa oxidase activity of tyrosinase in neonatal human melanocytes was increased when melanocytes were (1) co-cultured with hair bulb dermal papilla cells, (2) treated with conditioned medium derived from dermal papilla cell cultures, or (3) cultured on dermal papilla extracellular matrix components.

III. SIGNAL TRANSDUCTION

Protein Kinase C-β Activates Tyrosinase. *Park H-Y, Fernandez E, Russakovsky V, Gilchrest BA.* A human non-pigmented melanoma line NP-MM4 lacks PKC-β and tyrosinase activity despite normal expression of tyrosinase protein. Tyrosinase activity was stimulated by mixing NP-MM_4 lysates with normal melanocyte lysates, and by transfecting NP-MM_4 with PKC-β cDNA, but not by transfecting with a mutated inactive PKC-β cDNA.

Protein Kinase C Stimulates Melanogenesis Through Phosphorylation of Tyrosinase. *Park H-Y, Russakovsky V, Fernandez E, Gilchrest BA.* Neonatal human melanocytes treated with TPA undergo acute activation followed by reduction of PKC and tyrosinase within 24 hours. Incubation of melanocytes with TPA (to increase PKC activity) and [ortho ^{32}P]-phosphate for 15 minutes, followed by immunoprecipitation of tyrosinase resulted in a single ^{32}P band of 70 kD molecular weight. Irradiation with UV increased PKCα and β mRNA 2-3 fold within 1 hour, and the levels returned back to baseline by 2 hours.

Ionizing Radiation Directly Stimulates Pigment Production in Human Melanocytes. *Rubeiz NG, Park H-Y, Rogers GS, Gilchrest BA.* Neonatal human melanocytes responded to 46 γ X-irradiation with decreased proliferation and increased melanin content which was noted 5 days post-irradiation. PKC-β and α were induced within 2 hours, and PKC-β returned to baseline within 24 hours post-irradiation. These effects on PKC were specific to X-irradiation and were not induced by heating melanocytes to 40° C.

IV. PHOTOBIOLOGY

Biochemical Analysis of UVB Induced Hyperpigmentation of Human Melanocytes *In Vitro*. *Abdel-Malek Z, Swope V, Babcock G, Dawes S, Nordlund J.* Human melanocytes in culture respond to UVBR with decreased proliferation, arrest in S/G_2-M phase and increased melanin synthesis. Irradiated melanocytes exhibit an increase in tyrosinase activity, no change in the expression of tyrosinase and TRP-1, and a decrease in the expression of TRP-2. This UVBR induced mechanism might be unique, since cholera toxin and IBMX increase melanogenesis by a mechanism that involves increased expression of tyrosinase, TRP-1 and TRP-2.

Effects of Ultraviolet Light on the Cell Cycle. *Bolognia JL, Sodi SA, Chakraborty AS, Pawelek JM.* UVB irradiation increased MSH binding and responsiveness of mouse Cloudman melanoma cells to MSH. Irradiation of Cloudman melanoma cells, mouse carcinoma cells and 3T3 mouse fibroblasts resulted in a significant increase in the percentage of all three cell types in the G_2 phase of the cell cycle, and increased ^{125}I-βMSH binding to Cloudman melanoma cells. The effects of UVB on MSH binding and melanogenesis seem to be mediated by cell cycle regulation.

Pre- and Post-Translational Expression of UV-Induced Melanogenesis in Melanoma Cells. *Hara H, Chen H, Luo D, Jimbow K.* Irradiation of melanotic and amelanotic human melanoma cells with a fractionated low dose of UVB resulted in increased melanin synthesis, tyrosinase activity and gp75 in the melanotic melanoma cells. The mRNA levels of tyrosinase and gp75 were also increased in these cells. Therefore, in melanoma cells, low doses of UVB increase melanogenesis by pre- and post-translational means.

Ultraviolet A Induces Incorporation of ^{3}H-Dihydroxyphenylalanine in Normal Human Melanocytes. *MacFarlane D, De Leo V.* Human melanocytes demonstrated a dose-dependent increase in dendricity in response to irradiation with UVA. Doses between 10-20 J/cm^2 UVB resulted in increased ^{3}H-DOPA incorporation after 72-96 hours, and significant cytotoxicity with 24 hours.

Endonuclease Treatment Enhances UV-Induced Melanogenesis in Human Melanocytes and S91 Melanoma Cells. *Zhai S, Yaar M, Eller MS, Yarosh DB, Gilchrest BA.* T_4 endonuclease V (T_4N_5) is a DNA repair enzyme involved in the removal of thymidine dimers following UV irradiation. Incubation of UV-irradiated human melanocytes and S91 melanoma cells in a medium containing T_4N_5 overnight, resulted in increased tyrosinase activity and melanin content to levels higher than those in irradiated melanocytes and melanoma cells that were not treated with T_4N_5 or treated with heat inactivated T_4N_5. It was concluded that UV induced melanogenesis is stimulated by DNA repair.

V. MELANOGENIC PROTEINS

A Factor in Mouse and Human Melanoma Cells that Catalyzes the Conversion of 5,6-Dihydroxyindole-2-carboxylic Acid to Melanin. *Chakraborty AK, Pawelek JM.* DHICA conversion factor is expressed in human and murine melanoma cell lines and in a human keratinocyte cell line. It is suggested that this factor is involved in the incorporation of DHICA into melanin and to have the following properties: it is a membrane associated glycoprotein, whose activity is reduced by metal chelators but stimulated by ATP and GTP, Mg^{+2} or Mn^{+2}, and is elevated in COS fibroblasts transfected with Pmel-17 gene.

Co-Transfection and Expression of Both Human Tyrosinase and Tyrosinase-Related Protein Genes in a Single COS Cell. *Luo D, Chen H, Hara H, Jimbow K.* Human tyrosinase and TRP-1 genes were constructed into two separate expression vectors so that cloned genes were under the control of human cytomegalovirus promoters. Monkey COS-7 cells were transfected with either or both genes. The expression of tyrosinase and TRP-1 in transfected cells was confirmed by: RNA-PCR amplification, immunocytochemistry, electron microscopy and DOPA histochemistry. Expression of tyrosinase and TRP-1, however, did not produce mature eumelanin or pheomelanin.

VI. MELANOSOMAL PROTEINS

Identification of a Mammalian Melanosomal Matrix Glycoprotein. *Orlow SJ, Zhou B-K, Boissy RE.* Antisera raised in rabbits against the Triton X-100 insoluble fraction of melanosomes from mouse

melanoma cells specifically decorate the internal matrix of melanosomes by immunoelectron microscopy. This was confirmed by subcellular fractionation followed by immunoblotting. The antisera recognized a protein of Mr 90,000 which is processed to a broadly migrating band of Mr 53-55,000. The processed protein required SDS for solubilization. Tunicamycin, but not deoxymannojirimycin and swainsonine, reduces the Mr of the nascent protein to 75,000. This protein is regulated differently and is not immunologically related to tyrosinase or tyrosinase related proteins, suggesting a bipartite pathway for melanosomal biogenesis.

Identification of cDNAs for Calnexin, β-Galactosidase and Melanotransferrin-like Proteins Associated with Melanosomes in Human Melanoma. *Dakour J, Vinayagamoorthy T, Jimbow K.* Human melanoma cDNA library was developed and immunoscreened with polyclonal antibodies raised against the melanosomal fraction isolated from human melanoma cells. Four different cDNAs were found, two of which had homology with the calnexin, the major Ca^{+2} binding transmembrane ER phosphoprotein. This seems to be a new melanosomal protein, possibly associated with melanogenesis. A third clone showed homology with β-galactosidase which might participate in post-tyrosinase melanogenesis. A fourth clone was homologous to human melanotransferrin which binds and translocates iron within melanoma cells.

Possible Functional Domains of a New Melanosomal Calnexin-like Protein Originating from Endoplasmic Reticulum. *Vinayagamoorthy T, Dakour J, Jimbow K.* Five functional motifs were predicted by analyzing a 3.8 Kb cDNA clone isolated from human cDNA library: (a) Ca^{+2} binding loop, (b) two sites of protein kinase C phosphorylation, (c) cAMP dependent protein A site (both b and c could be involved in signal transduction, docking of coated vesicles from Golgi complex, and translocation of melanosomes), (d) cell cycle kinase phosphorylation site, and (e) membrane spanning region. This clone also had homology with dog calnexin, whose antigenic epitope was present in the endoplasmic reticulum and melanosomal surface membrane.

VII. PIGMENTARY ABNORMALITIES AND MELANOCYTE TRANSFORMATION

Quantitative Investigations of Nucleolar Organizer Regions Associated Protein in Melanocytic Skin Lesions. *Oh CH, Lee SY.* Several morphologic criteria have been used to compare the frequency and size of nucleolar organizer regions in malignant melanoma, congenital nevi, and acquired nevi. A significant difference was found between malignant melanoma and the two types of nevi, but not between congenital and acquired nevi.

Normal Human Melanocytes Expressing Viral Oncogene Products Display Altered Growth Characteristics. *Zepter K, Haffner AC, Elmets CA.* Incubation of neonatal human melanocytes in supernatants of fibroblast cultures shedding retroviral vectors encoding the SV40 large T-antigen (Tag) resulted in populations of Tag positive melanocytes. These melanocytes displayed accelerated population doubling times, grew to highly confluent monolayers, and could be passaged more than twice the passage number of normal melanocytes before reaching senescence. The Tag positive melanocytes, however, did not become malignant, remained anchorage dependent, and failed to form colonies in soft agar.

Melanin Content and Its Morphology in Cutaneous Corneocytes. *Ando N, Edwards C, Pearse AD, Marks R.* Observation of surface corneocytes revealed a higher melanin content in darkly pigmented than in lightly pigmented skin, and in sun-exposed sites than in non-exposed Caucasian skin. Following UV irradiation, melanin could be detected in corneocytes 17 days after irradiation. Cap-like melanin structures could mostly be detected in surface corneocytes of lentigo, and might be a marker for pigmentary anomalies.

Neurocutaneous Melanosis: Immunohistologic and Ultrastructural Tissue Culture Study. *Reyes-Mugica M, Chou P, Alvarez-Franco M, Strauss L, Gonzalez-Crussi F.* Nevomelanocytes cultured from neurocutaneous melanosis, a very rare and highly lethal childhood disorder, were compared to nevus cells cultured from congenital pigmented nevi. Ultrastructurally, no significant differences

were found in the two types of nevomelanocytes to account for the difference in their clinical behavior.

Evidence for Genetic Instability in Melanocytes Isolated from Atypical Moles. *Medrano EE, Yang F, Nordlund JJ.* Melanocytes isolated from normal or atypical moles exhibited loss of territoriality *in vitro*, as they did *in vivo*. Unlike normal melanocytes which do not spread and die within a few days after plating in plastic dishes with poor anchorage capacity, nevocytes spread and proliferate. Some nevocyte cultures grow as a monolayer, while others from tumor-like spheroids. Most nevocyte cultures maintain the requirement for melanocyte growth factors and the ability to terminally differentiate. Some, however, become responsive to, and express receptors for epidermal growth factor, and have increased levels of the mutant form of the tumor suppressor gene p-53. This *in vitro* system may help identify the molecular events in melanoma tumor progression.

Assay to Distinguish Between the Catalytic Activity of Tyrosine Hydroxylase with and without Regulatory Components in Cultured Human Melanocytes. *Zhao H, Boissy R.* Comparison of tyrosine hydroxylase (TH) activity using cell lysates (*in vitro*) or intact cells (*in vivo*) of normal human melanocytes and melanocytes cultured from Chediak-Higashi syndrome (CHS), tyrosinase-positive and tyrosinase-negative albino patients revealed the following. TH activities using intact cells correlated with melanin content of all the above types of melanocytes. The value of TH activity of CHS melanocytes was lower in the *in vitro* than the *in vivo* assay. The increase in activity in these cells following IBMX/cholera toxin stimulation was measurable in the *in vivo*, but not the *in vitro* assay. Tyrosinase-negative albino melanocytes showed no *in vitro* but minimal *in vivo* values. TH activity of two tyrosinase-positive albino melanocyte strains had normal *in vitro* but decreased *in vivo* values. In normal melanocytes, the values for TH activity were comparable in both the *in vivo* and *in vitro* assays. The *in vitro* assay may evaluate the catalytic function of tyrosinase while the *in vivo* assay may reflect additional regulatory components affecting TH activity.

Cutaneous Hyperpigmentary Lesions in Neurofibromatosis-1 are not Due to a Functional or Structural Defect in the Melanocyte. *Abdel-Malek Z, Swope V, Boissy Y, Boissy R, Severs S, Nordlund J.* Cultured melanocytes derived from hyperpigmented (café-au-lait) skin and adjacent non-lesional skin of neurofibromatosis-1 patients had similar (1) tyrosinase activity, (2) melanin content, (3) amounts of tyrosinase, TRP-1 and TRP-2, (4) proliferative rates, and (5) responses to melanogenic stimulators and inhibitors. Neurofibromatosis-1 melanocytes lacked ultrastructural abnormalities and were comparable to normal melanocytes derived from skin type matched donors in all the above criteria.

A highlight of the meeting were two elegant presentations at General Plenary Sessions entitled *"Lessons From the Mouse Regarding Human Pigment Disorders: Steel, Dominant Spotting and Microphthalmia"*, by Neal Copeland, and *"Cutaneous Pigmentation: Lessons from the Bedside to the Gene"*, by our own Richard King.

Current Active Members :

The following list of active members is included to make us all aware of those who belong to the Society, but also to point out the number of active investigators in the field who are not members. Each of us should make an effort to recruit potential members to our Society - both the Society and the member should benefit from this. If each member recruited only a single new member, our Society would obviously double in size !

Zalfa Abdel-Malek, University of Cincinnati
Ago Ahene, Advanced Polymer Systems
Robert Angus, University of Alabama-Birmingham
Pilar Aroca, National Institutes of Health

Lisa Austin, University of Cincinnati
Joseph Bagnara, University of Arizona
Jag Bhawan, Boston University
Karen Bijwaard, Georgetown University
Kenneth Bloom, University of Minnesota
Raymond Boissy, University of Cincinnati
Jean Bolognia, Yale University
Frédéric Bonté, LVMH Recherche - Cosmetics
Roger Bowers, California State University
Murray Brilliant, Fox Chase Cancer Center
Stephanie Brown, University of Minnesota
John Brumbaugh, University of Nebraska
Jean Burnett, Michigan State University
Jean-Claude Bystryn, New York Univ Med Center
Ana Castrucci, University of São Paulo
Catherine Causse, L'Oreal
Miles Chedekel, MEL-CO
Alistair Cochran, UCLA Medical Center
John Conlee, University of Utah
Roy Cosan, Raritan, New York
Mark Costlow, Schering-Plough Corporation
Alan Dean, University of Kansas
John O Dejordy, Weizmann Institute of Science
Vincent DeLeo, Columbia-Presbyterian Med Centr
Donna Durham-Pierre, Fox Chase Cancer Center
Magdalena Eisinger, Pearl River, New York
Jamal Farooqui, University of Cincinnati
Philip Fernandez, Department of Natural Sciences
William Fletcher, Oregon Health Sciences Univ
Paul Forlot, Laboratoires Pharmaceutiques
Timothy Frew, University of Nebraska
Thomas Froiland, Northern Michigan University
Sally Frost-Mason, University of Kansas
Bryan Fuller, University of Oklahoma
John Gardner, Fox Chase Cancer Center
Nels Granholm, South Dakota State University
Herbert Haberman, Toronto Western Hospital
Mac Hadley, University of Arizona
Ruth Halaban, Yale University
Rebat Halder, Howard University
Herlina Handoko, University of Minnesota
Elizabeth Hearing, Data Abstract Search Service
Vincent Hearing, National Cancer Institute
Meenhard Herlyn, The Wistar Institute
George Hill, New Jersey Medical School
Helene Hill, New Jersey Medical School
Thomas Holstein, Roger Williams College
Alan Houghton, Sloan Kettering Cancer Center
Rae Janet Jacobs-Cohen, Columbia University
Gert Jacobsohn, Hahnemann University
Myra Jacobsohn, Hahnemann University
Kowichi Jimbow, University of Alberta
Warren Johnson, University of Arizona
William Johnson, New York, New York
Koichiro Kameyama, Kitasato Institute Med Cen
John Kenney, Howard University
Sang Tae Kim, Kosin Medical College
Richard King, University of Minnesota
W Gerald Klingler, Springfield, Illinois
Joan Krakowsky, University of Cincinnati
Gary Kruh, Fox Chase Cancer Center
Byoung Se Kwon, Indiana University
M Lynn Lamoreux, Texas Veterinary Medical Cen
Maria Lamy-Freund, University of Sao Paulo
Jeffrey Laskin, Robert Wood Johnson Med School
Peter Lea, University of Toronto
Aaron Lerner, Yale University
Norman Levine, University of Arizona
Kenneth Mason, University of Kansas
Katsuo Matsumoto, University of Cincinnati
John McLane, Roche Dermatologics
David McLean, University of British Columbia
Estela Medrano, University of Cincinnati
Aravind Menon, University of Toronto
J Julian Menter, Morehouse School of Medicine
Frank Meyskens, University of California
Nadine Milos, University of Alberta
Beatrice Mintz, Fox Chase Cancer Center
Yutaka Mishima, Kobe University
Gisela Moellmann, Yale University
Kenji Mori, Kanebo, Ltd
Randall Morrison, University of Kansas
Bryan Murphy, Clairol R & D Laboratory
Yoshimichi Nakatsu, Fox Chase Cancer Center
John Naughten, Northern State University
J Michael Newton, University of Arizona
Richard Niles, Marshall University
James Nordlund, University of Cincinnati
William Oetting, University of Minnesota
Alice Oliveira, Fund Oncocentro de São Paulo
Seth Orlow, New York University

Jean Paul Ortonne, Hopital Pasteur
Madhu Pathak, Harvard Medical School
John Pawelek, Yale University
Andrew Pawlowski, University of Toronto
Regina Pietruszko, Rutgers University
Seymour Pomerantz, University of Maryland
Brian Potterf, National Cancer Institute
Neelu Puri, Academic Medical Center
Walter Quevedo, Brown University
Michael Rachkovsky, Yale University
Arthur Rhodes, University of Pittsburgh
Manuel Rieber, Centre de Microbiologica
Mark Rollag, Uniformed Services University
Robert Sayre, Rapid Precision Testing Laboratory
Uwe Schlehaider, New Jersey Medical School
Stefan Schmitz, University of Alberta
Thomas Schultz, Zotos International
Ian Scott, Unilever Research
Wade Sherbrooke, Amer Museum Natural History
Ie-Ming Shih, The Wistar Institute
Willys Silvers, University of Pennsylvania
Andrzej Slominski, Albany Medical College
J Robert Smyth, University of Massachusetts
Arthur Sober, Massachusetts General Hospital
Richard Spritz, University of Wisconsin
Karla Stoner, Gillette Research Institute
Manickam Sugumaran, Univ of Massachusetts
Richard Swank, Roswell Park Cancer Institute
Harold Swartz, Dartmouth-Hitchcock Med Center
Viki Swope, University of Cincinnati
John Taylor, Wayne State University
Kenneth Tomecki, Cleveland Clinic Foundation
DeWayne Townsend, University of Minnesota
Ram Tripathi, Fox Chase Cancer Center
Maria Carolina Tuma, University of São Paulo
Kazunori Urabe, National Cancer Institute
Setaluri Vijayasaradhi, Sloan-Kettering Cancr Cen
Maria Visconti, University of Sao Paulo
Michael Wick, Dana Farber Cancer Institute
Leon Wilkins, Organogenesis, Inc
Joseph Yohn, University of Colorado
Shimatani Youichi, Shiseido Co., Ltd
Lisa Zeise, MEL-CO
Huiquan Zhao, University of Cincinnati

Book Review :

Two reviews of a recently published book are reprinted here in their entirety . . . .

Melanins and Melanogenesis. Giuseppe Prota. Academic Press, San Diego, CA. ISBN: 0-12-565970-9; 290 pages; 1992. $ 55.00

from ***Pigment Cell Research***, **6:(in press), 1993**. "This long overdue book on melanin pigmentation should prove to be a landmark publication on the biosynthesis, structure, physicochemistry, and function of melanins. Dr. Giuseppe Prota has been a leading authority on melanin structure and synthesis for over 30 years and he continues as an active researcher on the subject. Although the author has purposely avoided being encyclopedic his selection of topics summarizes in adequate detail the basic concepts and controversies that relate to the biochemical processes related to melanogenesis within melanocytes. The major chapter captions of the monograph reveal the broad coverage provided and indicate that the book should be of interest not only to pigment cell biologists/chemists but also to: physiologists, geneticists and clinicians of several disciplines such as dermatology and oncology. Following an introductory chapter on the major issues of melanin research and the biological significance of melanin pigmentation in animals including man, the author provides a very well organized series of chapters that include: Melanin-Producing Cells, Tyrosinase, Natural and Synthetic Melanins, Eumelanins, Neuromelanin, Pheomelanins and Trichochromes, Pigment Cell Metabolism, Eznymatic and Chemical Control, Genetic and Hormonal Regulation of Melanogenesis, Photobiology and Photochemistry of Melanogenesis. Over 1100 pertinent references are provided inthis book of about 300 pages in length.

Of the 224 pages or so of text (about 62 pages of references) only about one-fourth is related to the biology of pigment. Nevertheless, the book is about "Melanins and Melanogenesis" and as a world authority on the topic, the author has provided an in-depth coverage of what is known about melanin pigments which play such an important role int he cellular physiology of animals including man. Although much of the book concerns itself with the chemistry and biosynthesis of melanin, as a biologist/endocrinologist I was struck by how well the author integrated the chemistry with biology to provide a book of real relevance to the biologist and clinician.

This very readable monograph certainly belongs on the bookshelf of anyone interested in pigment cell biology. I suspect that "Melanins and Melanogenesis" will also find its way into the hands of a much larger audience.

Mac E Hadley, Dept of Anatomy, University of Arizona

from ***Melanoma Research*** **3:81, 1993** A book summarizing the state of the art in melanin research has finally made an appearance; in spite of the recent surge in interest in melanin research internationally, it had been almost 25 years since Nicolaus wrote his book entitled "Melanins". Dr. Prota has undertaken the formidable task of summarizing research on pigmentation from the biological, medical and especially chemical perspectives. This is quite an ambitious undertaking since advances in numerous relevant areas that have taken place even in the last decade alone are staggering. What has evolved in this book is an extremely interesting synopsis of current thinking of melanogenesis, and the reader should find it a useful research summary as well as an excellent reference work. The citations are up-to-date (through early 1992) and I think that most scientists, even those highly familiar with the topic, would appreciate this addition to their library.

The book recounts current understanding on a variety of topics, some of which might be considered somewhat peripheral to the field, but the sum of which constitute the encompassing field of melanin research. Included as topical headings of chapters are: • An Introduction to Melanin Research, • Melanin-Producing Cells (which discusses not only melanocytes but melanophores and other pigment producing cells), • Tyrosinase (activation and inactivation), • Natural and Synthetic Melanins, • Eumelanins, • Neuromelanins, • Pheomelanins and Trichochromes, • Enzymatic and Chemical Control of Pigment Cell Metabolism, • Genetic and Hormonal Regulation of Melanogenesis, and • Photobiology / Photochemistry of Melanogenesis. As you can see this is a very ambitious undertaking to summarize research in such disparate areas, and yet Professor Prota has done an outstanding job in this regard. He has provided an overview of

each topic that is up-to-date, yet includes enough details of each section to make the reading interesting and pertinent even to those active in each area of expertise. An added bonus is the rich bibliography of approximately 1,000 references - many of which I must admit I was unaware of (even those in my own field).

Professor Prota considers each topic as a part of the whole concept of the field of melanin research and ties each aspect of study nicely into the overall scheme presented. He does an admirable job of presenting the data as an objective scientist; it is obvious that this book has been a long time in the making and is truly a labor of love. In sum, I would suggest that this book would be a valued member of any research library, particularly so for those of us actively engaged in research in the field.

Vincent J Hearing, Laboratory of Cell Biology, National Institutes of Health

Bibliography :

Some questions have arisen about the criteria being used to generate the Bibliography published in the **PASPCR** ***Newsletter***, both with respect to its focus and its contents. The Bibliography is being generated from the Life Sciences edition of Current Contents (600 journal edition), and will include listings from the three month period immediately prior to publication of each ***Newsletter***. Thus the Bibliography published in the February issue covered the three month period from mid-November, 1992 through mid-January, 1993. The Bibliography published in this issue covers the period mid-February, 1993 through mid-May, 1993. We realize that this approach does not cover all disciplines and time frames and hope that everyone will bear these constraints in mind when they scan these Bibliographies. Nevertheless, the great majority of papers published in the field should be covered in this search, and we hope that the members of our Society will find this a useful supplement to their own literature searching strategies. If you notice a paper that was not detected by this search that should be included, please send it to us and we will include it in the next issue. We have highlighted publications which include a member of the **PASPCR** with an asterisk.

MELANINS & MELANOGENS

Broekhuyse RM, Kuhlmann ED: Experimental autoimmune anterior uveitis - the preparation of uveitogenic ocular melanin. Invest Ophthalmol Visual Sci 34:698-700 (1993).

Elgamoussi R, Threadgill MD, Prade M, Stratford IJ, Guichard M: Relationship between the melanin content of a human melanoma cell line and its radiosensitivity and uptake of pimonidazole. Cancer Chemother Pharmacol 31:277-282 (1993).

★Enochs WS, Nilges MJ, Swartz HM: A standardized test for the identification and characterization of melanins using electron paramagnetic resonance (EPR) spectroscopy. Pigment Cell Res 6:91-99 (1993).

Ito S: High-performance liquid chromatography (HPLC) analysis of eumelanin and pheomelanin in melanogenesis control. J Invest Dermatol 100:S166-S171 (1993).

Jellinger K, Kienzl E, Rumpelmair G, et al: Neuromelanin and nigrostriatal dopamine neuron degeneration. J Neurochem 60:1976-1977 (1993).

Jones H, Allibone RO, Clarke T: A histological and electronmicroscopic study of intracorneal melanin in benign and malignant melanocytic lesions. Histopathology 22:169-172 (1993).

Kubota R, Yamada S, Ishiwata K, Tada M, Ido T, Kubota K: Cellular accumulation of F-18-labelled boronophenylalanine depending on DNA synthesis and melanin incorporation - a double-tracer microautoradiographic study of B16 melanomas in vivo. Br J Cancer 67:701-705 (1993).

Li LG, Lishko VK, Hoffman RM: Liposomes can specifically target entrapped melanin to hair follicles in histocultured skin. In Vitro Cell Dev Biol-Animal 29A:192-194 (1993).

Napolitano A, Crescenzi O, Prota G: Copolymerisation of 5,6-dihydroxyindole and 5,6-dihydroxyindole-2-carboxylic acid in melanogenesis - isolation of a cross-coupling product. Tetrahedron Lett 34:885-888 (1993).

Pavel S: Dynamics of melanogenesis intermediates. J Invest Dermatol 100:S162-S165 (1993).

Prezioso JA, Damodaran KM, Wang N, Bloomer WD: Mechanism(s) regulating inhibition of thymidylate synthase and growth by γ-l-glutaminyl-4-hydroxy-3-iodobenzene, a novel melanin precursor, in melanogenic melanoma cells. Biochem Pharmacol 45:473-481 (1993).

Samuelson DA, Smith P, Ulshafer RJ, et al: X-ray microanalysis of ocular melanin in pigs maintained on normal and low zinc diets. Exp Eye Res 56:63-70 (1993).

★ Shibata T, Prota G, Mishima Y: Non-melanosomal regulatory factors in melanogenesis. J Invest Dermatol 100:S274-S280 (1993).

MELANOCYTES & KERATINOCYTES

Akslen LA: p53 immunostaining in melanocytic lesions. Eur J Cancer 29A:652-653 (1993).

Albadri AMT, Foulis AK, Todd PM, et al: Abnormal expression of MHC class-II and ICAM-1 by melanocytes in vitiligo. J Pathol 169:203-206 (1993).

Balmaceda CM, Fetell MR, Powers J, Obrien JL, Housepian EH: Nevus of OTA and leptomeningeal melanocytic lesions. Neurology 43:381-386 (1993).

Bataille V, Boyle J, Hungerford JL, Newton JA: Three cases of primary acquired melanosis of the conjunctiva as a manifestation of the atypical mole syndrome. Br J Dermatol 128:86-90 (1993).

★ Boyce ST, Medrano EE, Abdel-Malek Z, et al: Pigmentation and inhibition of wound contraction by cultured skin substitutes with adult melanocytes after transplantation to athymic mice. J Invest Dermatol 100:360-365 (1993).

Cable J, Barkway C, Steel KP: Characteristics of stria vascularis melanocytes of viable-dominant spotting (wv/wv) mouse mutants. Hear Res 64:6-20 (1992).

Carr NJ, Warren AY: Mast cell numbers in melanocytic naevi and cutaneous neurofibromas. J Clin Pathol 46:86-87 (1993).

Choi JH, Sung KJ, Koh JK: Pigmented epithelioid cell nevus - a variant of spitz nevus. J Am Acad Dermatol 28:497-498 (1993).

Decoste SD, Stern RS: Diagnosis and treatment of nevomelanocytic lesions of the skin -a community-based study. Arch Dermatol 129:57-62 (1993).

★ Der JE, Dixon WT, Jimbow K, Horikoshi T: A murine monoclonal antibody, moab HMSA-5, against a melanosomal component highly expressed in early stages, and common to normal and neoplastic melanocytes. Br J Cancer 67:47-57 (1993).

Duncan LM, Berwick M, Bruijn JA, Byers HR, Mihm MC, Barnhill RL: Histopathologic recognition and grading of dysplastic melanocytic nevi - an interobserver agreement study. J Invest Dermatol 100:S318-S321 (1993).

Goldstein AM, Tucker MA, Crutcher WA, Hartge P, Sagebiel RW: The inheritance pattern of dysplastic naevi in families of dysplastic naevus patients. Melanoma Res 3:15-22 (1993).

Grazia R, Tullini A, Rossi PG, et al: Hypomelanosis of Ito with trisomy 18 mosaicism. Am J Med Genet 45:120-121 (1993).

★ Halaban R, Moellmann G: White mutants in mice shedding light on humans. J Invest Dermatol 100:S176-S185 (1993).

★ Hearing VJ: Unraveling the melanocyte. Am J Hum Genet 52:1-7 (1993).

Imokawa G, Motegi I: Skin organ culture model for examining epidermal melanization. J Invest Dermatol 100:47-54 (1993).

★ Inazu M, Mishima Y: Detection of eumelanogenic and pheomelanogenic melanosomes in the same normal human melanocyte. J Invest Dermatol 100:S172-S175 (1993).

Irwin C, Barnes A, Veres D, Kaidbey K: An ultraviolet radiation action spectrum for immediate pigment darkening. Photochem Photobiol 57:504-507 (1993).

★Jimbow K, Lee SK, King MG, et al: Melanin pigments and melanosomal proteins as differentiation markers unique to normal and neoplastic melanocytes. J Invest Dermatol 100:S259-S268 (1993).

Knox WF, Mcwilliam LJ, Benbow EW, Mcmahon RFT, Wilkinson N, Bonshek R: Foreign body giant cell reactions and ossification associated with benign melanocytic naevi. J Clin Pathol 46:72-74 (1993).

★Larue L, Dougherty N, Bradl M, Mintz B: Melanocyte culture lines from tyr-SV40e transgenic mice - models for the molecular genetic evolution of malignant melanoma. Oncogene 8:523-531 (1993).

★Mancianti ML, Gyorfi T, Shih IM, et al: Growth regulation of cultured human nevus cells. J Invest Dermatol 100:S281-S287 (1993).

★Medrano EE, Farooqui JZ, Boissy RE, Boissy YL, Akadiri B, Nordlund JJ: Chronic growth stimulation of human adult melanocytes by inflammatory mediators in vitro - implications for nevus formation and initial steps in melanocyte oncogenesis. Proc Natl Acad Sci USA 90:1790-1794 (1993).

Morelli JG, Norris DA: Influence of inflammatory mediators and cytokines on human melanocyte function. J Invest Dermatol 100:S191-S195 (1993).

★Morrison ME, Vijayasaradhi S, Engelstein D, Albino AP, Houghton AN: A marker for neoplastic progression of human melanocytes is a cell surface ectopeptidase. J Exp Med 177:1135-1143 (1993).

★Ortonne JP, Bose SK: Vitiligo: Where do we stand? Pigment Cell Res 6:61-72 (1993).

Pepine M, Flowers FP, Ramoscaro FA: Extensive cutaneous hyperpigmentation caused by minocycline. J Am Acad Dermatol 28:292-295 (1993).

Powell MB, Rosenberg RK, Graham MJ, et al: Protein kinase-c β-expression in melanoma cells and melanocytes - differential expression correlates with biological responses to 12-o-tetradecanoylphorbol 13-acetate. J Cancer Res Clin Oncol 119:199-206 (1993).

Reed RJ: Giant congenital nevi - a conceptualization of patterns. J Invest Dermatol 100:S300-S312 (1993).

Regillo CD, Eagle RC, Shields JA, Shields CL, Arbizo VV: Histopathologic findings in congenital grouped pigmentation of the retina. Ophthalmology 100:400-405 (1993).

Sanchez P, Vidal L, Parrado C, Devargas IP: Application of morphometric methods to the cytologic study of intradermal nevi. Anal Quant Cytol Histol 14:386-390 (1992).

Sau P, Graham JH, Helwig EB: Pigmented spindle cell nevus - a clinicopathologic analysis of 95 cases. J Am Acad Dermatol 28:565-571 (1993).

Schindewolf T, Stolz W, Albert R, Abmayr W, Harms H: Classification of melanocytic lesions with color and texture analysis using digital image processing. Anal Quant Cytol Histol 15:1-11 (1993).

Smit NPM, Vanroermund CWT, Aerts HMFG, et al: Subcellular fractionation of cultured normal human melanocytes -new insights into the relationship of melanosomes with lysosomes and peroxisomes. Biochim Biophys Acta 1181:1-6 (1993).

Steele TE, Ashby J: Desipramine-related slate-gray skin pigmentation. J Clin Psychopharmacol 13:76-77 (1993).

Taatjes DJ, Arendashdurand B, Vonturkovich M, Trainer TD: HMB-45 antibody demonstrates melanosome specificity by immunoelectron microscopy. Arch Pathol Lab Med 117:264-268 (1993).

Tucker MA, Crutcher WA, Hartge P, Sagebiel RW: Familial and cutaneous features of dysplastic nevi - a case-control study. J Am Acad Dermatol 28:558-564 (1993).

Vanerp AMM, Kruk MR, Dekloet ER: Induction of grooming in resting rats by intracerebroventricular oxytocin but not by adrenocorticotropic hormone-(1-24) and α-melanocyte- stimulating hormone. Eur J Pharmacol 232:217-221 (1993).

★Yohn JJ, Morelli JG, Walchak SJ, Rundell KB, Norris DA, Zamora MR: Cultured human keratinocytes synthesize and secrete endothelin-1. J Invest Dermatol 100:23-26 (1993).

★Zhou BK, Boissy RE, Pifkohirst S, Moran DJ, Orlow SJ: Lysosome-associated membrane protein-1 (LAMP-1) is the melanocyte vesicular membrane glycoprotein band-II. J Invest Dermatol 100:110-114 (1993).

MELANOMA & METASTASIS

Aapro MS: Advances in systemic treatment of malignant melanoma. Eur J Cancer 29A:613-617 (1993).

Angus J, Thomson F, Parsons PG, Sturm RA: In vivo and in vitro expression of octamer binding proteins in human melanoma metastases, brain tissue and fibroblasts. Pigment Cell Res 6:13-22 (1993).

Anichini A, Maccalli C, Mortarini R, et al: Melanoma cells and normal melanocytes share antigens recognized by HLA-A2-restricted cytotoxic T-cell clones from melanoma patients. J Exp Med 177:989-998 (1993).
Anichini A, Mortarini R, Alberti S, Mantovani A, Parmiani G: T-cell-receptor engagement and tumor ICAM-1 up-regulation are required to by-pass low susceptibility of melanoma cells to autologous CTL-mediated lysis. Int J Cancer 53:994-1001 (1993).
Arienti F, Belli F, Rivoltini L, et al: Adoptive immunotherapy of advanced melanoma patients with interleukin-2 (IL-2) and tumor-infiltrating lymphocytes selected in vitro with low doses of IL-2. Cancer Immunol Immunother 36:315-322 (1993).
Bailly M, Bertrand S, Dore JF: Increased spontaneous mutation rates and prevalence of karyotype abnormalities in highly metastatic human melanoma cell lines. Melanoma Res 3:51-62 (1993).
Bataille V, Pinney E, Hungerford JL, Cuzick J, Bishop DT, Newton JA: Five cases of coexistent primary ocular and cutaneous melanoma. Arch Dermatol 129:198-201 (1993).
Beninati S, Abbruzzese A, Cardinali M: Differences in the post-translational modification of proteins by polyamines between weakly and highly metastatic B16 melanoma cells. Int J Cancer 53:792-797 (1993).
Bizik J, Stephens RW, Grofova M, Vaheri A: Binding of tissue-type plasminogen activator to human melanoma cells. J Cell Biochem 51:326-335 (1993).
Brandau W, Kirchner B, Bartenstein P, Sciuk J, Kamanabrou D, Schober O: N-(2-diethylaminoethyl)-4-<I-123>iodobenzamide as a tracer for the detection of malignant melanoma - simple synthesis, improved labelling technique and 1st clinical results. Eur J Nucl Med 20:238-243 (1993).
Brandberg Y, Bolund C, Michelson H, Manssonbrahme E, Ringborg U, Sjoden PO: Psychological reactions in public melanoma screening. Eur J Cancer 29A:860-863 (1993).
Buzaid AC, Sandler AB, Mani S, et al: Role of computed tomography in the staging of primary melanoma. J Clin Oncol 11:638-643 (1993).
Cantiello HF, Prat AG, Bonventre JV, Cunningham CC, Hartwig JH, Ausiello DA: Actin-binding protein contributes to cell volume regulatory ion channel activation in melanoma cells. J Biol Chem 268:4596-4599 (1993).
Castello G, Comella P, Manzo T, Napolitano M, Parziale AP, Galati MG, Daponte A, Casaretti R, Celentano E, Comella G: Immunological and clinical effects of intramuscular rIFN α-2a and low dose subcutaneous rIL-2 in patients with advanced malignant melanoma. Melanoma Res 3:43-50 (1993).
Choo V: Control of melanoma. Lancet 341:430 (1993).
Church SL, Grant JW, Ridnour LA, et al: Increased manganese superoxide dismutase expression suppresses the malignant phenotype of human melanoma cells. Proc Natl Acad Sci USA 90:3113-3117 (1993).
Coit DG, Brennan MF: Current management of malignant melanoma. Surgery 113:128-129 (1993).
Coleman K, Baak JPH, Dorman A, et al: Deoxyribonucleic acid ploidy studies in choroidal melanomas. Am J Ophthalmol 115:376-383 (1993).
Denijn M, Ruiter DJ: The possible role of angiogenesis in the metastatic potential of human melanoma. Clinicopathological aspects. Melanoma Res 3:5-14 (1993).
Dewit PEJ, Vanthofgrootenboer B, Ruiter DJ, et al: Validity of the histopathological criteria used for diagnosing dysplastic naevi - an interobserver study by the pathology subgroup of the EORTC malignant melanoma cooperative group. Eur J Cancer 29A:831-839 (1993).
Drake LA, Ceilley RI, Cornelison RL, et al: Guidelines of care for malignant melanoma. J Am Acad Dermatol 28:638-641 (1993).
Drepper H, Biess B, Hofherr B, et al: The prognosis of patients with stage-III melanoma - prospective long-term study of 286 patients of the fachklinik-hornheide. Cancer 71:1239-1246 (1993).
Dummer R, Becker JC, Eilles C, Schafer E, Borner W, Burg G: T-cells migrate to tumour sites after extracorporeal interleukin-2 stimulation and reinfusion in a patient with metastatic melanoma. Br J Dermatol 128:399-403 (1993).
Dwyer PK, Mackie RM, Watt DC, Aitchison TC: Plantar malignant melanoma in a white Caucasian population. Br J Dermatol 128:115-120 (1993).

Eisenthal A, Ramakrishna V, Skornick Y, Shinitzky M: Induction of cell-mediated immunity against B16-BL6 melanoma in mice vaccinated with cells modified by hydrostatic pressure and chemical crosslinking. Cancer Immunol Immunother 36:300-306 (1993).
Fallowfield ME, Cook MG: Pagetoid infiltration in primary cutaneous melanoma. Histopathology 22:94 (1993).
Ferradini L, Mackensen A, Genevee C, et al: Analysis of T-cell receptor variability in tumor- infiltrating lymphocytes from a human regressive melanoma - evidence for in situ T-cell clonal expansion. J Clin Invest 91:1183-1190 (1993).
Folberg R: Tumor progression in ocular melanomas. J Invest Dermatol 100:S326-S331 (1993).
Freeze HH, Sampath D, Varki A: α-xyloside and β-xyloside alter glycolipid synthesis in human melanoma and chinese hamster ovary cells. J Biol Chem 268:1618-1627 (1993).
Fumagalli S, Doneda L, Nomura N, Larizza L: Expression of the c-ski-proto-oncogene in human melanoma cell lines. Melanoma Res 3:23-28 (1993).
Gamel JW, Mclean IW, Mccurdy JB: Biologic distinctions between cure and time to death in 2892 patients with intraocular melanoma. Cancer 71:2299-2305 (1993).
Gattonicelli S, Calorini L, Byers HR, Etoh T, Wang ZG, Ferrone S: Abnormalities in HLA class-I antigen expression by melanoma cells - structural characterization and functional implications. J Invest Dermatol 100:S226-S230 (1993).
Geiger JD, Wagner PD, Cameron MJ, Shu SY, Chang AE: Generation of T-cells reactive to the poorly immunogenic B16-BL6 melanoma with efficacy in the treatment of spontaneous metastases. J Immunother 13:153-165 (1993).
Gerard B, Aamdal S, Lee SM, et al: Activity and unexpected lung toxicity of the sequential administration of two alkylating agents - dacarbazine and fotemustine in patients with melanoma. Eur J Cancer 29:711-719 (1993).
Goldenhersh MA: Melanoma screening - critique and proposal. J Am Acad Dermatol 28:642-644 (1993).
Goldstein AM, Dracopoli NC, Ho EC, et al: Further evidence for a locus for cutaneous malignant melanoma dysplastic nevus (CMM/DN) on chromosome 1p, and evidence for genetic heterogeneity. Am J Hum Genet 52:537-550 (1993).
Green A, Maclennan R, Youl P, Martin N: Site distribution of cutaneous melanoma in Queensland. Int J Cancer 53:232-236 (1993).
Guerry D, Synnestvedt M, Elder DE, Schultz D: Lessons from tumor progression - the invasive radial growth phase of melanoma is common, incapable of metastasis, and indolent. J Invest Dermatol 100:S342-S345 (1993).
Hall SC, Smith DM, Masiarz FR, et al: Mass spectrometric and Edman sequencing of lipocortin-I isolated by 2-dimensional SDS/PAGE of human melanoma lysates. Proc Natl Acad Sci USA 90:1927-1931 (1993).
Hallouche F, Adams AE, Hinton OR, Surtees DP, Wadehra V, Sherbet GV: Discriminant analysis for classification of murine melanomas and human cervical epithelial cells. Anal Quant Cytol Histol 15:50-60 (1993).
Halpern AC, Guerry D, Elder DE, Trock B, Synnestvedt M: A cohort study of melanoma in patients with dysplastic nevi. J Invest Dermatol 100:S346-S349 (1993).
Hamilton WB, Helling F, Lloyd KO, Livingston PO: Ganglioside expression on human malignant melanoma assessed by quantitative immune thin-layer chromatography. Int J Cancer 53:566-573 (1993).
Hauser SH, Calorini L, Wazer DE, Gattonicelli S: Radiation-enhanced expression of major histocompatibility complex class-I antigen H-2D(b) in B16 melanoma cells. Cancer Res 53:1952-1955 (1993).
Horsman DE, White VA: Cytogenetic analysis of uveal melanoma - consistent occurrence of monosomy 3 and trisomy 8q. Cancer 71:811-819 (1993).
Houde M, Debruyne G, Bracke M, et al: Differential regulation of gelatinase-b and tissue-type plasminogen activator expression in human Bowes melanoma cells. Int J Cancer 53:395-400 (1993).
Hughes BR, Altman DG, Newton JA: Melanoma and skin cancer - evaluation of a health education programme for secondary schools. Br J Dermatol 128:412-417 (1993).

Hyrc K, Wilczek A, Cieszka K: Electrophoretic heterogeneity of pigment hamster melanoma cells. Pigment Cell Res 6:100-110 (1993).

Ikeyama S, Koyama M, Yamaoko M, Sasada R, Miyake M: Suppression of cell motility and metastasis by transfection with human motility-related protein (MRP- 1/CD9) DNA. J Exp Med 177:1231-1237 (1993).

★Jimbow K, Iwashina T, Alena F, Yamada K, Pankovich J, Umemura T: Exploitation of pigment biosynthesis pathway as a selective chemotherapeutic approach for malignant melanoma. J Invest Dermatol 100:S231-S238 (1993).

Karlsson M, Boeryd B, Carstensen J, Kagedal B, Bratel AT, Wingren S: DNA ploidy and S-phase in primary malignant melanoma as prognostic factors for stage-III disease. Br J Cancer 67:134-138 (1993).

Katz A, Shulman LM, Porgador A, Revel M, Feldman M, Eisenbach L: Abrogation of B16 melanoma metastases by long-term low- dose interleukin-6 therapy. J Immunother 13:98-109 (1993).

Kim CJ, Pak K, Hamaguchi A, et al: Primary malignant melanoma of the female urethra. Cancer 71:448-451 (1993).

Kinder DH, Elstad CA, Meadows GG, Ames MM: Antimetastatic activity of boro-amino acid analog protease inhibitors against B16BL6 melanoma in vivo. Invasion Metastasis 12:309-319 (1992).

Klepfish A, Greco MA, Karpatkin S: Thrombin stimulates melanoma tumor-cell binding to endothelial cells and subendothelial matrix. Int J Cancer 53:978-982 (1993).

Koh HK, Geller AC, Miller DR, Lew RA: Early detection of melanoma - an ounce of prevention may be a ton of work. J Am Acad Dermatol 28:645-647 (1993).

Kohn E: Aging issues in invasion and metastasis - fertile ground for investigation. Cancer 71:552-557 (1993).

Kopp WC, Smith JW, Ewel CH, et al: Immunomodulatory effects of interferon-γ in patients with metastatic malignant melanoma. J Immunother 13:181-190 (1993).

Krementz ET: Influence of level and depth on recurrence rate in thin melanomas - comment. Am J Surg 165:228 (1993).

Kroon BBR, Klaase JM, Vangeel BN, Eggermont AMM, Franklin HR, Vandongen JA: Results of a double perfusion schedule with melphalan in patients with melanoma of the lower limb. Eur J Cancer 29A:325-328 (1993).

Kubota N, Kakehi M, Inada T: Hyperthermic enhancement of cell killing by five platinum complexes in human malignant melanoma cells grown as monolayer cultures and multicellular spheroids. Int J Radiat Oncol Biol Phys 25:491-497 (1993).

Lai DTM, Thompson JF, Quinn MJ, Ingvar C, Uren R, Howmangiles R: New route for metastatic spread of melanoma. Lancet 341:302 (1993).

Lazzaro B, Elder DE, Rebers A, et al: Immunophenotyping of compound and spitz nevi and vertical growth-phase melanomas using a panel of monoclonal antibodies reactive in paraffin sections. J Invest Dermatol 100:S313-S317 (1993).

Lejeune FJ, Lienard D, Leyvraz S, Mirimanoff RO: Regional therapy of melanoma. Eur J Cancer 29A:606-612 (1993).

Lu C, Kerbel RS: Interleukin-6 undergoes transition from paracrine growth inhibitor to autocrine stimulator during human melanoma progression. J Cell Biol 120:1281-1288 (1993).

Luca M, Hunt B, Bucana CD, Johnson JP, Fidler IJ, Bar-Eli M: Direct correlation between MUC18 expression and metastatic potential of human melanoma cells. Melanoma Res 3:35-42 (1993).

Lucas DR, Tazelaar HD, Unni KK, et al: Osteogenic melanoma - a rare variant of malignant melanoma. Am J Surg Pathol 17:400-409 (1993).

Luyten GPM, Mooy CM, Dejong PTVM, Hoogeveen AT, Luider TM: A chicken embryo model to study the growth of human uveal melanoma. Biochem Biophys Res Commun 192:22-29 (1993).

Macaulay D: Malignant melanomas in general practice. Br Med J 306:462 (1993).

Mackie RM: Early detection of malignant melanoma - observation on results of educational strategies. J Invest Dermatol 100:S332-S334 (1993).

MacNeil S, Wagner M, Kirkham PR, Blankson EA, Lennard MS, Goodall T, Rennie IG: Inhibition of melanoma cell/matrix interaction by tamoxifen. Melanoma Res 3:67-74 (1993).

Maragos CM, Wang JM, Hrabie JA, Oppenheim JJ, Keefer LK: Nitric oxide/nucleophile complexes inhibit the in vitro proliferation of A375 melanoma cells via nitric oxide release. Cancer Res 53:564-568 (1993).

Mcclay EF, Albright KD, Jones JA, Christen RD, Howell SB: Tamoxifen modulation of cisplatin sensitivity in human malignant melanoma cells. Cancer Res 53:1571-1576 (1993).

Meadows GG, Elstad CA, Blank SE, Gallucci RM, Pfister LJ: Alcohol consumption suppresses metastasis of B16-BL6 melanoma in mice. Clin Exp Metastasis 11:191-199 (1993).

★Menrad A, Speicher D, Wacker J, Herlyn M: Biochemical and functional characterization of aminopeptidase-n expressed by human melanoma cells. Cancer Res 53:1450-1455 (1993).

Merimsky O, Chaitchik S: Fotemustine-dacarbazine combinations in the treatment of metastatic melanoma. Eur J Cancer 29A:481-482 (1993).

Mohler JL: Cellular motility and prostatic carcinoma metastases. Cancer Metastasis Rev 12:53-67 (1993).

Monti E, Mimnaugh EG, Sinha BK: Synergistic interactions of etoposide and interleukin-1α are not due to DNA damage in human melanoma cells. Biochim Biophys Acta 1180:231-235 (1993).

Montgomery AMP, Declerck YA, Langley KE, Reisfeld RA, Mueller BM: Melanoma-mediated dissolution of extracellular matrix -contribution of urokinase-dependent and metalloproteinase-dependent proteolytic pathways. Cancer Res 53:693-700 (1993).

Morse HG, Gonzalez R, Moore GE, Robinson WA: Preferential chromosome-11q and/or chromosome-17q aberrations in short-term cultures of metastatic melanoma in resections from human brain. Cancer Genet Cytogenet 64:118-126 (1992).

Morton DL, Foshag LJ, Hoon DSB: Prolongation of survival in metastatic melanoma after active specific immunotherapy with a new polyvalent melanoma vaccine (vol 216, pg 463, 1992). Ann Surg 217:309 (1993).

Mujoo K, Donato NJ, Lapushin R, Rosenblum MG, Murray JL: Tumor necrosis factor-α and γ-interferon enhancement of anti-epidermal growth factor receptor monoclonal antibody binding to human melanoma cells. J Immunother 13:166-174 (1993).

Murphy GF, Radu A, Kaminer M, Berd D: Autologous melanoma vaccine induces inflammatory responses in melanoma metastases - relevance to immunologic regression and immunotherapy. J Invest Dermatol 100:S335-S341 (1993).

Nakayama J, Urabe A, Terao H, Taniguchi S, Hori Y: In situe detection of immunocompetent cells in murine B16 melanoma locally treated with interleukin-2 or microwaval hyperthermia. Pigment Cell Res 6:111-116 (1993).

Nicholson AG, Cox PM, Marks CG, Cook MG: Primary malignant melanoma of the rectum. Histopathology 22:261-264 (1993).

★Oka M, Ogita K, Saito N, Mishima Y: Selective increase of the α subspecies of protein kinase-c and inhibition of melanogenesis induced by retinoic acid in melanoma cells. J Invest Dermatol 100:S204-S208 (1993).

Ollert MW, Kadlec JV, Petrella EC, Bredehorst R, Vogel CW: Molecular basis of complement resistance of human melanoma cells expressing the c3-cleaving membrane protease p65. Cancer Res 53:592-599 (1993).

Orourke MGE, Altmann CR: Melanoma recurrence after excision - is a wide margin justified. Ann Surg 217:2-5 (1993).

Parmiter AH, Nowell PC: Cytogenetics of melanocytic tumors. J Invest Dermatol 100:S254-S258 (1993).

Pehamberger H, Binder M, Steiner A, Wolff K: In vivo epiluminescence microscopy - improvement of early diagnosis of melanoma. J Invest Dermatol 100:S356-S362 (1993).

Peltenburg LTC, Dee R, Schrier PI: Downregulation of HLA class-I expression by c-myc in human melanoma is independent of enhancer-A. Nucleic Acids Res 21:1179-1185 (1993).

★Petty EM, Bolognia JL, Bale AE, Yangfeng T: Cutaneous malignant melanoma and atypical moles associated with a constitutional rearrangement of chromosome-5 and chromosome-9. Am J Med Genet 45:77-80 (1993).

Pontikes LA, Temple WJ, Cassar SL, et al: Influence of level and depth on recurrence rate in thin melanomas. Am J Surg 165:225-228 (1993).

Porter CW, Bernacki RJ, Miller J, Bergeron RJ: Antitumor activity of n1,n-11-bis(ethyl)norspermine against human melanoma xenografts and possible biochemical correlates of drug action. Cancer Res 53:581-586 (1993).

Ragnarssonolding B, Johansson H, Rutqvist LE, Ringborg U: Malignant melanoma of the vulva and vagina - trends in incidence, age distribution, and long-term survival among 245 consecutive cases in sweden 1960-1984. Cancer 71:1893-1897 (1993).

Ramachandran C, Samy TSA, Huang XL, Yuan ZK, Krishan A: Doxorubicin-induced DNA breaks, topoisomerase-II activity and gene expression in human melanoma cells. Biochem Pharmacol 45:1367-1371 (1993).

Ramachandran C, Yuan ZK, Huang XL, Krishan A: Doxorubicin resistance in human melanoma cells - MDR-1 and glutathione s-transferase-pi gene expression. Biochem Pharmacol 45:743-751 (1993).

Ramakrishna V, Eisenthal A, Skornick Y, Shinitzky M: Increased projection of MHC and tumor antigens in murine B16-BL6 melanoma induced by hydrostatic pressure and chemical crosslinking. Cancer Immunol Immunother 36:293-299 (1993).

Reifler DM: Excision margins for melanoma in awkward places like the eyelid. JAMA 269:588 (1993).

Repesh LA, Drake SR, Warner MC, et al: Adriamycin-induced inhibition of melanoma cell invasion is correlated with decreases in tumor cell motility and increases in focal contact formation. Clin Exp Metastasis 11:91-102 (1993).

Ringborg U, Afzelius LE, Lagerlof B, et al: Cutaneous malignant melanoma of the head and neck - analysis of treatment results and prognostic factors in 581 patients - a report from the Swedish melanoma study group. Cancer 71:751-758 (1993).

Rush JA: Paraneoplastic retinopathy in malignant melanoma. Am J Ophthalmol 115:390-391 (1993).

Sagebiel RW: Melanocytic nevi in histologic association with primary cutaneous melanoma of superficial spreading and nodular types -effect of tumor thickness. J Invest Dermatol 100:S322-S325 (1993).

Sanchez JA, Robinson WA: Malignant melanoma. Annu Rev Med 44335-342:(1993).

Schmid KW, Zelger B, Hittmair A, Laidler P, Jasani B, Bocker W: Metallothionein overexpression in malignant melanomas -correlation with prognosis and treatment. Verhandlungen der Deutschen Gesellschaft Fur Pathologie 76 (1992).

Schmid U, Bailly M, Fodstad O, Bihl H, Matzku S: Monoclonal antibody accumulation in experimental and spontaneous lung metastases of human malignant melanoma in rodents. J Cancer Res Clin Oncol 119:342-345 (1993).

Scott RN, Mckay AJ: Elective lymph node dissection in the management of malignant melanoma. Br J Surg 80:284-288 (1993).

Seigler HF: Clinicopathologic factors relating to surgical margins for cutaneous melanoma. Ann Surg 217:1 (1993).

Selvaggi K, Saria EA, Schwartz R, et al: Phase I/II study of murine monoclonal antibody-ricin-a chain (XOMAZYME-mel) immunoconjugate plus cyclosporine-A in patients with metastatic melanoma. J Immunother 13:201-207 (1993).

★Shih IM, Herlyn M: Role of growth factors and their receptors in the development and progression of melanoma. J Invest Dermatol 100:S196-S203 (1993).

★Shrayer D, Kouttab N, Maizel A, Wanebo H, Hearing VJ, Gersten DM: Generation of cytotoxic antibodies to the B16 murine melanoma using a formalinized vaccine. Int J Cancer 53:696-702 (1993).

Slingluff CL, Cox AL, Henderson RA, Hunt DF, Engelhard VH: Recognition of human melanoma cells by HLA-a2.1-restricted cytotoxic T-lymphocytes is mediated by at least 6 shared peptide epitopes. J Immunol 150:2955-2963 (1993).

Slingluff CL, Vollmer RT, Seigler HF: Multiple primary melanoma - incidence and risk factors in 283 patients. Surgery 113:330-339 (1993).

Somasundaram C, Matzku S, Schuhmacher J, Zoller M: Development of a bispecific monoclonal antibody against a gallium-67 chelate and the human melanoma-associated antigen p97 for potential use in pretargeted immunoscintigraphy. Cancer Immunol Immunother 36:337-345 (1993).

Staib L, Harel W, Mitchell MS: Protection against experimental cerebral metastases of murine melanoma-B16 by active immunization. Cancer Res 53:1113-1121 (1993).

Stern JB, Peck GL, Haupt HM, Hollingsworth HC, Beckerman T: Malignant melanoma in xeroderma-pigmentosum - search for a precursor lesion. J Am Acad Dermatol 28:591-594 (1993).

Steuhl KP, Rohrbach JM, Knorr M, Thiel HJ: Significance, specificity, and ultrastructural localization of HMB-45 antigen in pigmented ocular tumors. Ophthalmology 100:208-215 (1993).

Takahashi M: Diagnostic utility of magnetic resonance imaging in malignant melanoma. J Am Acad Dermatol 28:513-515 (1993).

Taraboletti G, Belotti D, Giavazzi R, Sobel ME, Castronovo V: Enhancement of metastatic potential of murine and human melanoma cells by laminin receptor peptide-g - attachment of cancer cells to subendothelial matrix as a pathway for hematogenous metastasis. J Nat Cancer Inst 85:235-240 (1993).

Thomas L, Etoh T, Stamenkovic I, Mihm MC, Byers HR: Migration of human melanoma cells on hyaluronate is related to CD44 expression. J Invest Dermatol 100:115-120 (1993).

Tobal K, Deuble K, McCartney A, Lightman S: Characterization of cellular infiltration in choroidal melanoma. Melanoma Res 3:63-66 (1993).

★Toriyama K, Wen DR, Paul E, Cochran AJ: Variations in the distribution, frequency, and phenotype of Langerhans cells during the evolution of malignant melanoma of the skin. J Invest Dermatol 100:S269-S273 (1993).

Tucker MA, Fraser MC, Goldstein AM, Elder DE, Guerry D, Organic SM: Risk of melanoma and other cancers in melanoma-prone families. J Invest Dermatol 100:S350-S355 (1993).

Tucker SM, Hurwitz JJ, Pavlin CJ, Howarth DJC, Nianiaris N: Scleral melt after cryotherapy for conjunctival melanoma. Ophthalmology 100:574-577 (1993).

Uchiyama A, Hoon DSB, Morisaki T, Kaneda Y, Yuzuki DH, Morton DL: Transfection of interleukin-2 gene into human melanoma cells augments cellular immune response. Cancer Res 53:949-952 (1993).

Usmani BA, Lunec J, Sherbet GV: DNA repair and repair fidelity in metastatic variants of the B16 murine melanoma. J Cell Biochem 51:336-344 (1993).

Vandemerwe SA, Vandenberg AP, Kroon BBR, Vandenberge AW, Klaase JM, Vanderzee J: Modification of human tumour and normal tissue pH during hyperthermic and normothermic antiblastic regional isolation perfusion for malignant melanoma - a pilot study. Int J Hyperthermia 9:205-217 (1993).

Vardi G, Modan B, Golan R, Novikov I, Shafir R: Orthodox jews have a lower incidence of malignant melanoma - a note on the potentially protective role of traditional clothing. Int J Cancer 53:771-773 (1993).

Verschraegen CF, Legha SS, Hersh EM, Plager C, Papadopoulos N, Burgess MA: Phase-II study of vindesine and dacarbazine with or without non-specific stimulation of the immune system in patients with metastatic melanoma. Eur J Cancer 29:708-711 (1993).

Vile RG, Hart IR: In vitro and in vivo targeting of gene expression to melanoma cells. Cancer Res 53:962-967 (1993).

Vink J, Thomas L, Etoh T, et al: Role of β-1 integrins in organ specific adhesion of melanoma cells in vitro. Lab Invest 68:192-203 (1993).

Viret C, Davodeau F, Guilloux Y, et al: Recognition of shared melanoma antigen by HLA-a2- restricted cytolytic T-cell clones derived from human tumor-infiltrating lymphocytes. Eur J Immunol 23:141-146 (1993).

Wang Z, Cao Y, Albino AP, Zeff RA, Houghton A, Ferrone S: Lack of HLA class-I antigen expression by melanoma cells SK-MEL-33 caused by a reading frameshift in β2- microglobulin messenger RNA. J Clin Invest 91:684-692 (1993).

Watanabe H, Shinozaki T, Raz A, Chigira M: Expression of autocrine motility factor receptor in serum-independent and protein-independent fibrosarcoma cells -implications for autonomy in tumor-cell motility and metastasis. Int J Cancer 53:689-695 (1993).

Weiner WJ, Singer C, Sanchezramos JR, Goldenberg JN: Levodopa, melanoma, and Parkinson's disease. Neurology 43:674-677 (1993).

Weinstock MA: Epidemiology and prognosis of anorectal melanoma. Gastroenterology 104:174-178 (1993).

Weinstock MA: Cutaneous melanoma. J Am Acad Dermatol 28:666-667 (1993).
Weterman MAJ, Vanmuijen GNP, Ruiter DJ, Bloemers HPJ: Thymosin β-10 expression in melanoma cell lines and melanocytic lesions - a new progression marker for human cutaneous melanoma. Int J Cancer 53:278-284 (1993).
Whitehead RP, Figlin R, Citron ML, et al: A phase-II trial of concomitant human interleukin-2 and interferon-α-2a in patients with disseminated malignant melanoma. J Immunother 13:117-121 (1993).
Wiltshire RN, Elner VM, Dennis T, Vine AK, Trent JM: Cytogenetic analysis of posterior uveal melanoma. Cancer Genet Cytogenet 66:47-53 (1993).
Wong JH, Skinner KA, Kim KA, Foshag LJ, Morton DL: The role of surgery in the treatment of nonregionally recurrent melanoma. Surgery 113:389-394 (1993).
★ Wong P, Bangert JL, Levine N: A papulovesicular eruption in a man receiving chemotherapy for metastatic melanoma. Arch Dermatol 129:233 (1993).
Worm M, Schadendorf D, Czarnetzki BM: Responsiveness to interferon treatment of human melanoma cells correlates to immunophenotype. Melanoma Res 3:29-34 (1993).
Yamamoto M, Takahashi H: Immunohistochemical detection of the p53 oncoprotein in tumours of melanocytic origin. Virchows Arch [A] 422:127-132 (1993).
Zhu DZ, Pauli BU: Correlation between the lung distribution patterns of lu- ECAM-1 and melanoma experimental metastases. Int J Cancer 53:628-633 (1993).

PIGMENT EPITHELIUM

Bok D, Hageman GS, Steinberg RH: Repair and replacement to restore sight - report from the panel on photoreceptor/retinal pigment epithelium. Arch Ophthalmol 111:463-471 (1993).
Bosch E, Horwitz J, Bok D: Phagocytosis of outer segments by retinal pigment epithelium -phagosome-lysosome interaction. J Histochem Cytochem 41:253-263 (1993).
Buse E, Eichmann T, Degroot H, Leker A: Differentiation of the mammalian retinal pigment epithelium in vitro - influence of presumptive retinal neuroepithelium and head mesenchyme. Anat Embryol 187:259-268 (1993).
Chamot L, Zografos L, Klainguti G: Fundus changes associated with congenital hypertrophy of the retinal pigment epithelium. Am J Ophthalmol 115:154-161 (1993).
Cohen SY, Quentel G, Guiberteau B, Coscas GJ: Retinal vascular changes in congenital hypertrophy of the retinal pigment epithelium. Ophthalmology 100:471-474 (1993).
Feldman EL, Randolph AE: Peptides stimulate phosphoinositide hydrolysis in human retinal pigment epithelium. Invest Ophthalmol Visual Sci 34:431-437 (1993).
Gundersen D, Powell SK, Rodriguezboulan E: Apical polarization of n-CAM in retinal pigment epithelium is dependent on contact with the neural retina. J Cell Biol 121:335-343 (1993).
Gupta LY, Marmor MF: Mannitol, dextromethorphan, and catalase minimize ischemic damage to retinal pigment epithelium and retina. Arch Ophthalmol 111:384-388 (1993).
Hamel CP, Tsilou E, Harris E, et al: A developmentally regulated microsomal protein specific for the pigment epithelium of the vertebrate retina. J Neurosci Res 34:414-425 (1993).
Kniesel U, Wolburg H: Tight junction complexity in the retinal pigment epithelium of the chicken during development. Neurosci Lett 149:71-74 (1993).
Korte GE, Wanderman MC: Distribution of Na+ K+-ATPase in regenerating retinal pigment epithelium in the rabbit - a study by electron microscopic cytochemistry. Exp Eye Res 56:219-229 (1993).
Lopezcolome AM, Salceda R, Fragoso G: Specific interaction of glutamate with membranes from cultured retinal pigment epithelium. J Neurosci Res 34:454-461 (1993).
Mclaren MJ, Sasabe T, Li CY, Brown ME, Inana G: Spontaneously arising immortal cell line of rat retinal pigmented epithelial cells. Exp Cell Res 204:311-320 (1993).
Nabi IR, Mathews AP, Cohengould L, Gundersen D, Rodriguezboulan E: Immortalization of polarized rat retinal pigment epithelium. J Cell Sci 104:37-49 (1993).

Nan W, Koutz CA, Anderson RE: A method for the isolation of retinal pigment epithelial cells from adult rats. Invest Ophthalmol Visual Sci 34:101-107 (1993).

Suson JD, Burke JM: Modulation of sodium-potassium adenosine triphosphatase in cultured bovine retinal pigment epithelium by potassium. Invest Ophthalmol Visual Sci 34:694-698 (1993).

Wakakura M, Foulds WS: Heat shock response and thermal resistance in cultured human retinal pigment epithelium. Exp Eye Res 56:17-24 (1993).

MSH, GROWTH FACTORS & RECEPTORS

Cerretti DP, Kozlosky CJ, Vandenbos T, Nelson N, Gearing DP, Beckmann MP: Molecular characterization of receptors for human interleukin-8, GRO/melanoma growth-stimulatory activity and neutrophil activating peptide-2. Mol Immunol 30:359-367 (1993).

Chartrel N, Tonon MC, Lamacz M, Vaudry H: Adenosine inhibits α-melanocyte-stimulating hormone release from frog pituitary melanotrophs - evidence for the involvement of A1 adenosine receptors negatively coupled to adenylate cyclase. J Neuroendocrinol 4:751-757 (1992).

Ciranna L, Mouginot D, Peltz P, Schlichter R: Serotonin inhibits Ca-2+ currents in porcine melanotrophs by activating 5-HT1c and 5-HT1a receptors. J Physiol-London 46317-38:(1993).

Dawson BV, Ford CA, Holloway H, Dorr RT, Johnson P: Administration of melanotropic peptides during gestation in the rodent. Toxicology 77:91-101 (1993).

Dekoning HP, Jenks BG, Roubos EW: Analysis of γ-aminobutyric acid receptor function in the in vitro and in vivo regulation of α-melanotropin- stimulating hormone secretion from melanotrope cells of Xenopus-laevis. Endocrinology 132:674-681 (1993).

Dewildt DJ, Krugers H, Kasbergen CM, Delang H, Versteeg DHG: The hemodynamic effects of γ-2-melanocyte-stimulating hormone and related melanotropins depend on the arousal potential of the rat. Eur J Pharmacol 233:157-164 (1993).

★Forsberg K, Valyinagy I, Heldin CH, Herlyn M, Westermark B: Platelet-derived growth factor (PDGF) in oncogenesis -development of a vascular connective tissue stroma in xenotransplanted human melanoma producing PDGF-BB. Proc Natl Acad Sci USA 90:393-397 (1993).

Gantz I, Konda Y, Tashiro T, et al: Molecular cloning of a novel melanocortin receptor. J Biol Chem 268:8246-8250 (1993).

Garbe C, Krasagakis K: Effects of interferons and cytokines on melanoma cells. J Invest Dermatol 100:S239-S244 (1993).

★ Gitaygoren H, Halaban R, Neufeld G: Human melanoma cells but not normal melanocytes express vascular endothelial growth factor receptors. Biochem Biophys Res Commun 190:702-709 (1993).

Goudreau JL, Manzanares J, Lookingland KJ, Moore KE: 5HT2 receptors mediate the effects of stress on the activity of periventricular hypophysial dopaminergic neurons and the secretion of α-melanocyte-stimulating hormone. J Pharmacol Exp Ther 265:303-307 (1993).

★Graeven U, Rodeck U, Weinmann R, Herlyn M: Stable transfection of human malignant melanoma cells with basic fibroblast growth factor antisense cDNA. Antisense Strategies 660 (1992).

Graminski GF, Jayawickreme CK, Potenza MN, Lerner MR: Pigment dispersion in frog melanophores can be induced by a phorbol ester or stimulation of a recombinant receptor that activates phospholipase-C. J Biol Chem 268:5957-5964 (1993).

Knollema S, Brown ER, Vale W, Sawchenko PE: Novel hypothalamic and preoptic sites of prepro-melanin-concentrating hormone messenger ribonucleic acid and peptide expression in lactating rats. J Neuroendocrinol 4:709-717 (1992).

Kohn EC, Hollister GH, Dipersio JD, Wahl S, Liotta LA, Schiffmann E: Granulocyte-macrophage colony-stimulating factor induces human melanoma-cell migration. Int J Cancer 53:968-972 (1993).

Malecaze F, Mascarelli F, Bugra K, Fuhrmann G, Courtois Y, Hicks D: Fibroblast growth factor receptor deficiency in dystrophic retinal pigmented epithelium. J Cell Physiol 154:631-642 (1993).

Mcclintock TS, Graminski GF, Potenza MN, Jayawickreme CK, Robyshemkovitz A, Lerner MR: Functional expression of recombinant G-protein-coupled receptors monitored by video imaging of pigment movement in melanophores. Anal Biochem 209:298-305 (1993).

Mihara H, Xu M, Nishino N, Fujimoto T: Application of tryptic condensation strategy for the synthesis of α-melanocyte stimulating hormone. Int J Pept Protein Res 41:405-410 (1993).

Mujoo K, Donato NJ, Lapushin R, Rosenblum MG, Murray JL: Tumor necrosis factor-α and γ-interferon enhancement of anti-epidermal growth factor receptor monoclonal antibody binding to human melanoma cells. J Immunother 13:166-174 (1993).

Rakoczy PE, Humphrey MF, Cavaney DM, Chu Y, Constable IJ: Expression of basic fibroblast growth factor and its receptor in the retina of royal-college-of-surgeons rats - a comparative study. Invest Ophthalmol Visual Sci 34:1845-1852 (1993).

Ricchieri GL, Pizzolato G, Fabbri M, Ruggero S, Dam M, Battistin L: Selective d1 or d2 receptor blockade - effects on brain functional responses to l-DOPA. Parkinsons Disease : from Basic Research to Treatment 60 (1993).

★Robbins LS, Nadeau JH, Johnson KR, et al: Pigmentation phenotypes of variant extension locus alleles result from point mutations that alter MSH receptor function. Cell 72:827-834 (1993).

★Shih IM, Herlyn M: Role of growth factors and their receptors in the development and progression of melanoma. J Invest Dermatol 100:S196-S203 (1993).

Suzuki SS, Piette LH: Effect of retinyl acetate on the assembly of the fibronectin extracellular matrix and the processing of the fibronectin receptor β-subunit of confluent C3H/10t1/2 mouse embryo fibroblasts. J Cell Biochem 51:181-189 (1993).

Touzani K, Tramu G, Nahon JL, Velley L: Hypothalamic melanin-concentrating hormone and α-neoendorphin-immunoreactive neurons project to the medial part of the rat parabrachial area. Neuroscience 53:865-876 (1993).

Vanerp AMM, Kruk MR, Dekloet ER: Induction of grooming in resting rats by intracerebroventricular oxytocin but not by adrenocorticotropic hormone-(1-24) and α-melanocyte- stimulating hormone. Eur J Pharmacol 232:217-221 (1993).

TYROSINASE & TYROSINASE -RELATED PROTEINS, MOLECULAR BIOLOGY

★Ando S, Ando O, Suemoto Y, Mishima Y: Tyrosinase gene transcription and its control by melanogenic inhibitors. J Invest Dermatol 100:S150-S155 (1993).

★Colman MA, Stevens G, Ramsay M, Kwon B, Jenkins T: Exclusion of 2 candidate pigment loci, c and b, part of chromosome-11p, and 33 random polymorphic markers as the locus for tyrosinase-positive oculocutaneous albinism. Hum Genet 90:556-560 (1993).

★Kameyama K, Takemura T, Hamada Y, et al: Pigment production in murine melanoma cells is regulated by tyrosinase, tyrosinase-related protein-1 (TRP1), DOPAchrome tautomerase (TRP2), and a melanogenic inhibitor. J Invest Dermatol 100:126-131 (1993).

Karg E, Odh G, Wittbjer A, Rosengren E, Rorsman H: Hydrogen peroxide as an inducer of elevated tyrosinase level in melanoma cells. J Invest Dermatol 100:S209-S213 (1993).

Kelsey G, Ruppert S, Schedl A, Schmid E, Thies E, Schutz G: Multiple effects on liver-specific gene expression in albino lethal mice caused by deficiency of an enzyme in tyrosine metabolism. J Cell Sci 117-122 (1992).

★King RA, Wiesner GL, Townsend D, White JG: Hypopigmentation in angelman syndrome. Am J Med Genet 46:40-44 (1993).

★Kwon BS: Pigmentation genes - the tyrosinase gene family and the pmel-17 gene family. J Invest Dermatol 100:S134-S140 (1993).

Miller MW, Duhl DMJ, Vrieling H, et al: Cloning of the mouse agouti gene predicts a secreted protein ubiquitously expressed in mice carrying the lethal- yellow mutation. Gene Develop 7:454-467 (1993).

★Oetting WS, Witkop CJ, Brown SA, et al: A frequent tyrosinase gene mutation associated with type I-A (tyrosinase-negative) oculocutaneous albinism in puerto rico. Am J Hum Genet 52:17-23 (1993).

★Ohyama Y, Mishima Y: Isolation and characterization of high molecular weight melanogenic inhibitors naturally occurring in melanoma cells. Pigment Cell Res 6:7-13 (1993).
★Orlow SJ, Boissy RE, Moran DJ, Pifkohirst S: Subcellular distribution of tyrosinase and tyrosinase- related protein-1 - implications for melanosomal biogenesis. J Invest Dermatol 100:55-64 (1993).
★Park KC, Chintamaneni CD, Halaban R, Witkop CJ, Kwon BS: Molecular analyses of a tyrosinase-negative albino family. Am J Hum Genet 52:406-413 (1993).
Prota G: Regulatory mechanisms of melanogenesis - beyond the tyrosinase concept. J Invest Dermatol 100:S156-S161 (1993).
★Rinchik EM, Stoye JP, Frankel WN, Coffin J, Kwon BS, Russell LB: Molecular analysis of viable spontaneous and radiation-induced albino (c)-locus mutations in the mouse. Mutat Res 286:199-207 (1993).
Schedl A, Montoliu L, Kelsey G, Schutz G: A yeast artificial chromosome covering the tyrosinase gene confers copy number-dependent expression in transgenic mice. Nature 362:258-261 (1993).
Shibahara S: Functional analysis of the tyrosinase gene and brown-locus protein gene promoters. J Invest Dermatol 100:S146-S149 (1993).
★Shibata T, Pavel S, Smit NPM, Mishima Y: Differences in subcellular distribution of catechol-o-methyltransferase and tyrosinase in malignant melanoma. J Invest Dermatol 100:S222-S225 (1993).
Takeuchi T, Tanaka S, Tanaka M: Expression of tyrosinase gene in transgenic mice - programmed versus non-programmed expression. J Invest Dermatol 100:S141-S145 (1993).
Tomita Y: Tyrosinase gene mutations causing oculocutaneous albinisms. J Invest Dermatol 100:S186-S190 (1993).
Winder AJ, Wittbjer A, Rosengren E, Rorsman H: Fibroblasts expressing mouse-c locus tyrosinase produce an authentic enzyme and synthesise phaeomelanin. J Cell Sci 104:467-475 (1993).

MISCELLANEOUS

Broekhuyse RM, Kuhlmann ED, Winkens HJ: Experimental autoimmune anterior uveitis (EAAU): induction by melanin antigen and suppression by various treatments. Pigment Cell Res 6:1-6(1993).
Cerundolo R, DeCaprariis D, Esposito L, Maiolino P, Restucci B, Roperto F: Vitiligo in two water buffaloes: histological, histochemical and ultrastructural investigations. Pigment Cell Res 6:23-28 (1993).
Conlee JW, Bennett ML: Turn-specific differences in the endocochlear potential between albino and pigmented guinea pigs. Hear Res 65:141-150 (1993).
Hayashi H, Fujii R: Muscarinic cholinoceptors that mediate pigment aggregation are present in the melanophores of cyprinids (Zacco spp.). Pigment Cell Res 6:37-44 (1993).
Hayashi H, Sugimoto M, Oshima N, Fujii R: Circadian motile activity of erythophores in the red abdominal skin of tetra fishes and its possible significance in chromatic adaptation. Pigment Cell Res 6:29-36 (1993).
Hirose E, Matsumoto J: Deficiency of the gene B impairs differentiation of melanophores in the Medaka fish, Oryzias latipes: fine structure studies. Pigment Cell Res 6:45-51 (1993).
Keil JE, Sutherland SE, Knapp RG, Tyroler HA, Pollitzer WS: Skin color and mortality. Am J Epidemiol 136:1295-1302 (1992).
Koch PB: Production of [14C]-labeled 3-hydroxy-L-kynurenine in a butterfly, Heliconius charitonia L (Heliconidae), and precursor studies in buttefly wing ommatins. Pigment Cell Res 6:85-90 (1993).
Schraermeyer U, Dohms M: Atypical granules in the eyes of the white mutant of Drosophila melanogaster are lysosome-related organelles. Pigment Cell Res 6:73-84 (1993).
Thompson ID, Morgan JE: The development of retinal ganglion cell decussation patterns in postnatal pigmented and albino ferrets. Eur J Neurosci 5:341-356 (1993).