The FASEB Journal

Information for Authors*

Purpose and Scope

The FASEB Journal (FJ) is the official publication of the Federation of American Societies for Experimental Biology (FASEB). FJ publishes research articles. These are: 1) brief, definitive, and essentially final research communications of broad interest that are considered to warrant prompt publication; and 2) state-of-the-art reviews, drawn, as far as possible, from the topics of the FASEB symposia.

Manuscripts containing original communications, or proposals for reviews, should be sent to the Editor-in-Chief, Dr. W. J. Whelan, The FASEB Journal, P.O. Box 016129, Miami, FL 33101, USA.

Original Research Communications

FJ devotes a major portion of its pages (outside the meeting abstracts) to the publication of brief, definitive, original, and essentially final research communications that are considered to warrant prompt publication.

The aim of FJ is to illustrate the unity of biology and the interdependence of its constituent disciplines. Therefore, in keeping with this policy, and to qualify for acceptance, an original communication must not only be of outstanding scientific quality but must also be of broad interest.

The subject coverage of FJ is illustrated by the following disciplinary areas: biochemistry, biophysics, cell biology, developmental biology, genetics, immunology, neurobiology, nutrition, pathology, pharmacology, and physiology.

Papers should begin with an abstract written for the general reader and be free from jargon. They should continue with an introduction followed by the results and discussion; they should conclude with a succinct bibliography. Methods may be included within the figure legends and tables or as a separate section. Papers may not occupy more than four printed pages (equivalent of 4000 words and inclusive of illustrations and diagrams) and will be returned as unacceptable if they exceed this limitation.

Papers (an original and four copies) should be sent to the Editor-in-Chief. Prompt publication of acceptable papers will be ensured by careful conformity to the instructions to contributors and the expedient return of proofs.

State-of-the-Art Reviews

FJ also presents research reviews. Heretofore these have been in the form of extended reports emanating from symposia or mini-symposia presented at FASEB meetings. To provide such research summaries in a more compact form and thereby to allow, within space limitations, a more comprehensive and representative survey of the acquisition of new biological knowledge, FJ publishes state-of-the-art reviews that emphasize interdisciplinary aspects of the growing points of research.

These reviews will serve as a window on topics addressed at Society-sponsored symposia or plenary lectures. Therefore, review authors are sought from among those engaged in organizing the symposia. At the same time, volunteered reviews are welcomed that exemplify the principles of timeliness, topicality, and broad interest. A proposal for such a review, not a completed review, should be sent to the Editor-in-Chief, who will advise on its acceptability.

Copyright

FJ is copyrighted for the protection of authors and FASEB. Requests for permission for any reproduction of this copyrighted material should be made in writing to the Executive Editor at 9650 Rockville Pike, Bethesda, MD 20814, USA, and should include an explicit statement of intended use and detailed specification of the material to be reproduced.

Authors are reminded that an FJ manuscript do so on the understanding that if it is accepted for publication, copyright of the article, including the right to reproduce the article in all forms and media, shall be assigned exclusively to the publisher. The publisher will not refuse any reasonable request by authors for permission to reproduce any of their contributions to the journal.

Authors will also be asked to certify that an original communication has not been published other than as an abstract and is not being considered for publication elsewhere, and that the paper will not be submitted for publication elsewhere until its acceptability for FJ has been decided.

Style of Manuscript

General Instructions

1) Manuscripts should be typewritten, with double spacing and 1-inch margins, on 8.5 x 11 inch bond paper. Computer printouts of manuscripts must be readable; a dot-matrix printer is generally unacceptable. Metric units should be used. An original and four copies, with figures and tables, should be submitted to the Editor-in-Chief. Pages should be arranged and numbered consecutively in the following order: title page, footnotes, abstract of up to 200 words and indexing key words (maximum of five), text, references, figure legends, tables, and illustrations without rewriting. It should state the purpose and major findings and conclusions of the study. Citation of references should be avoided; if used, include bibliographic information.

2) The title page should have the following information: title of article; author(s); laboratory or institution of origin with city and state or country; complete address for mailing proofs and telephone number for corresponding author; and shortened title (maximum of 50 characters and spaces) for the running foot.

3) The title should be brief (no more than 90 characters, including letters, spaces, and punctuation) and informative. Do not use phrases in which more than three words modify another word (use "Renal hemodynamic effects of atrial natriuretic factor" rather than "Atrial natriuretic factor renal hemodynamic effects"). Serial titles, such as "Interferon, IX," are not permitted, except as a footnote.

4) The abstract, a paragraph of no more than 200 words, should be written for the general reader and be free from jargon. It should be self-explanatory and suitable for use in abstracting and indexing services without rewriting. It should state the purpose and major findings and conclusions of the study. Citation of references should be avoided; if used, include bibliographic information.

5) Footnotes, double-spaced, should be assembled on one or more separate sheets; they should be numbered consecutively throughout.

6) The text should be readable, clear, and concise. Any necessary corrections should be neat and legible. Standard nomenclature should be used; unfamiliar words should be defined at first mention. (See Abbreviations section below.) Foreign words not in general use in the English language should be underlined for italics type; italics should not be used for emphasis. Latin plurals should not be used if the English language equivalent has been accepted, e.g., lamellae, not lamellae. Webster's new collegiate dictionary (1977) should be followed for spelling, compounding, and word selection.

7) Drugs and Trade Names. The chemical or generic name should precede the abbrevation of a drug name the first time it appears. Proprietary (trademarked) names should be capitalized and the spelling carefully checked. Trade names of chemicals or equipment should also be capitalized. Authors should supply an acceptable scientific name in every case as an alternative to the trade name. The list should not be used as an alternative to proper names. More generally, the use of trade names should conform to the customary standards of good taste in scientific literature.

8) Active voice rather than passive voice should be used whenever possible. Present tense is used for references to existing knowledge or accepted concepts, and for proven conclusions from the present work; past tense is used when describing experimental work on which the paper is based.

Abbreviations, Symbols, and Terminology

Each author must include, as a footnote to the first page of text, a list of any new or special abbreviations used in the paper, with the spelled-out form and definition if necessary for clarity. This is not required for commonly accepted abbreviations. For information on style in general, authors are referred to the CBE style manual, 5th ed. (1983), prepared by the CBE Style Manual Committee (Bethesda, MD). Chemical and biochemical terms and abbreviations should be in accordance with the recommendations for usage by the IUPAC-International Union of Pure and Applied Chemistry (IUPAC) and its committee on nomenclature [see Biochemical nomenclature and related documents, a compendium of IUPAC-International Union of Biochemistry (IUB) documents, available from The Biochemical Society, PO. Box 32, Commerce Way, Colchester, CO2 8HP, Essex, UK]. Isotope specifications should conform to the IUPAC system, with the mass number placed as a superscript.

*July 1987.

FJ INFORMATION FOR AUTHORS
The following abbreviations or acronyms may be used without explanation; others should be defined at first use in the text.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tr>
<td>A</td>
<td>ampere: blood group; chromosome group</td>
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<tr>
<td>Å</td>
<td>ångström</td>
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<tr>
<td>a</td>
<td>atomic weight</td>
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<tr>
<td>AB</td>
<td>adenine-phosphates</td>
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<tr>
<td>ADPase, ADPase</td>
<td>adenosine phosphates</td>
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<tr>
<td>atm</td>
<td>standard atmosphere</td>
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<tr>
<td>BCG</td>
<td>bacille Calmette-Guérin</td>
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<tr>
<td>bp</td>
<td>boiling point</td>
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<tr>
<td>Bq</td>
<td>Becquerel</td>
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<tr>
<td>Btu</td>
<td>British thermal unit</td>
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<tr>
<td>C</td>
<td>coulomb</td>
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<td>°C</td>
<td>Celsius</td>
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<td>c.</td>
<td>about</td>
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<td>cal</td>
<td>calorie</td>
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<td>cAMP, cGMP, etc.</td>
<td>cyclic AMP, cyclic GMP, etc.</td>
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<tr>
<td>CD</td>
<td>circular dichroism</td>
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<td>cd</td>
<td>candela</td>
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<td>cDNA</td>
<td>complementary DNA</td>
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<td>cf</td>
<td>compare</td>
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<td>Cl</td>
<td>curie</td>
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<tr>
<td>cm, cm², cm³</td>
<td>centimeters</td>
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<td>CMP, CDP, CTP</td>
<td>cytidine phosphates</td>
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<tr>
<td>CoASAc</td>
<td>acetyl coenzyme A</td>
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<td>cps</td>
<td>counts per second</td>
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<td>cp</td>
<td>centipoise</td>
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<td>ct</td>
<td>cycles per second</td>
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<td>complementary RNA</td>
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<td>cubic</td>
<td>use exponent 3</td>
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<td>°</td>
<td>degree, angle</td>
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<tr>
<td>D</td>
<td>diffusion, coefficient</td>
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<td>d</td>
<td>dextro configuration</td>
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<td>d, (±)</td>
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<td>dalton</td>
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<td>dB</td>
<td>decibel</td>
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<td>dc</td>
<td>direct current</td>
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<td>1,1,1-trichloro-2,2-bis-(p-chlorophenyl)ethane</td>
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<td>O-(diethylaminoethyl)cellulose</td>
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<td>df</td>
<td>degrees of freedom</td>
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<td>deoxyribonucleic acid</td>
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<td>DNase</td>
<td>deoxyribonuclease</td>
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<td>dpm</td>
<td>disintegrations per minute</td>
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<td>dTMP, dTDP, dTTP</td>
<td>disintegrations per second</td>
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<tr>
<td>E</td>
<td>electromotive force; exa-electrode force; energy</td>
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<td>effective concentration, 50%</td>
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<td>ED₅₀</td>
<td>editor</td>
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<td>ED₅₀</td>
<td>effective dose, 50%</td>
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<tr>
<td>ETHA</td>
<td>ethylenediaminetetraacetic acid</td>
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<tr>
<td>e.g.,</td>
<td>for example</td>
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<tr>
<td>EGTA</td>
<td>ethylene glycol bis(β-aminoethyl ether)-N,N',N'-tetraacetic acid</td>
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<tr>
<td>emf</td>
<td>electron paramagnetic resonance</td>
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<tr>
<td>EPR</td>
<td>equation(s)</td>
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<td>equ</td>
<td>electron spin resonance</td>
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<tr>
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<td>and others</td>
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<td>and so forth</td>
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<td>exp</td>
<td>electron volt</td>
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<td>farad</td>
<td>farad; filial generations</td>
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<td>Fahrenheit</td>
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<td>femto-</td>
<td>flavin adenine dinucleotides</td>
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<td>ft</td>
<td>foot-candle</td>
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<td>Fig., Figs.</td>
<td>figure(s)</td>
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<td>FMN, FMNH</td>
<td>flavin mononucleotides</td>
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<td>fp</td>
<td>freezing point</td>
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<td>ft</td>
<td>foot</td>
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<td>lb</td>
<td>foot-pound</td>
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<td>G</td>
<td>gauss; general; giga-gram</td>
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<tr>
<td>GMP, GDP, GTP</td>
<td>gravitational constant</td>
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<td>&gt;</td>
<td>guanosine phosphates</td>
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<tr>
<td>GSH, GSSG</td>
<td>greater than glutathiones</td>
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<td>H</td>
<td>henry</td>
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<td>h</td>
<td>hecto-; hour</td>
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<td>Hb</td>
<td>hemoglobin</td>
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<td>heterogeneous nuclear RNA</td>
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<td>hp</td>
<td>horsepower</td>
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<td>height</td>
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<td>Hz</td>
<td>hertz</td>
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<td>IC₅₀</td>
<td>inhibitory concentration, 50%</td>
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<tr>
<td>ID₅₀</td>
<td>infective dose, 50%</td>
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<td>i.d.</td>
<td>inside diameter</td>
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<td>that is</td>
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<td>immunoglobulin</td>
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<td>intramuscular</td>
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<td>IMP, IDP, ITP</td>
<td>inosine phosphates</td>
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<td>in</td>
<td>inch</td>
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<td>i.p.</td>
<td>intraperitoneal</td>
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<td>I.v.</td>
<td>intravenous</td>
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<td>J</td>
<td>joule</td>
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<td>Jr.</td>
<td>junior, with names</td>
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<td>K</td>
<td>kelvin</td>
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<td>Kₘ</td>
<td>Michaelis constant</td>
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<td>kilo-</td>
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<td>kcal</td>
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<td>km</td>
<td>kilometer</td>
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<td>l</td>
<td>levo configuration</td>
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<td>pound</td>
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<tr>
<td>LC₅₀</td>
<td>pounds per square inch</td>
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<tr>
<td>LD₅₀</td>
<td>lethal concentration, 50%</td>
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<td>&lt;</td>
<td>lethal dose, 50%</td>
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<tr>
<td>lumen</td>
<td>less than</td>
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<tr>
<td>ln</td>
<td>natural log</td>
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Book references should include information in the following order: author(s), title, city of publication, publisher, year, and pages. The title of the book should be underlined for italic type. When one chapter is cited its title should be included, and the book's authors or editors should be named.


Illustrations

Illustrations should be identified lightly with pencil on the reverse side with the figure number and author name(s); when necessary, the top should be clearly marked. They should be referred to as figures in the text, and should be numerated with Arabic numerals; each should have a legend.

Inclusion of illustrations are possible only from good copy, authors should pay particular attention to the following:

1) Illustrations should be sharp, contrasty, unmounted photographs on glossy paper. Original drawings should not be submitted. Photographs should be the width of one column (3 1/8 inches) or two columns (6 1/8 inches).

2) All drawings for reduction to a given size should be drawn and labeled to the same scale.

3) Lettering should be done in India ink and must be proportionate to the size of the illustrations if it is to be legible after reduction. Lettering should be sized so its smallest elements (subscripts or superscripts) will be readable when reduced. Typewritten or computer-generated lettering is not preferred.

4) Graphs such as electrocardiograms, kymograms, and oscillograms should be prepared by a skillful photographer so that the dark cross-hatched background is eliminated, the faint portions of the graphs are intensified, and sharp, contrasty prints are obtained. To avoid this processing, use blue-ruled instead of black-ruled recording paper for the original records.

5) When possible, all lettering should be within the framework of the illustration; likewise the key to symbols should be on the face of the chart. When the figure is so filled that it is necessary to explain symbols in the legend, only the following standard characters, for which the printer has type, should be used:

\[ \square \bigcirc \triangle \bigtriangleup \blacktriangle \diamond \blacktriangleleft \blacktriangleright \leftarrow \rightarrow \leftarrow \rightarrow \]

6) Actual magnification of all photomicrographs should be given. The Editorial Office will make corrections for reduction. An appropriate scale on the photomicrograph itself is, however, preferable and more accurate.

7) Arrangements must be made well in advance with the Editorial Office for the reproduction of any illustrations in color. Authors must have funds available to meet the full cost of color plates and their printing.

8) The approximate position of each figure in the text should be indicated in the margin of the manuscript.

9) Inasmuch as it is the policy of *FJ* to reproduce figures and charts in the smallest size consistent with readability and purpose of the illustration, it is understood that an author will accept the decision of the Editors on the printed size; however, recommendations may be submitted for reduction or enlargement.

10) If illustrations that have been published elsewhere are included, permission must be obtained from the publisher and the author for their use in *FJ*. A copy of the letters granting such permission must be submitted with the manuscript to the Editorial Office.

11) Figure legends should be typed double-spaced, consecutively on one or more sheets of paper. They should contain sufficient information to provide adequate description without reference to text.

Tables

Each should be typed, double-spaced, on a separate sheet of paper. Each should have a brief title and should be numbered with Arabic numerals. Explanatory matter should be in footnotes. Table footnotes should be listed in order of their appearance with consecutive superior letters.

Tables should not duplicate material in text or illustrations. They should be prepared for printing either 3 1/8 or 6 1/8 inches with width.

Nonsignificant figures in tabular data should be omitted. Short or abbreviated column heads should be used. Statistical measures of variation, P, SD, SE, etc., should be identified as such.

The approximate position of each table should be indicated in the margin of the text.

Formulas and Equations

Structural chemical formulas, process flow diagrams, and complicated mathematical expressions should be precisely and carefully arranged, but they should be kept to a minimum because in typesetting they are composed by hand and are expensive. Glossy prints of complicated formulas and expressions suitable as line drawings are preferred. All subscripts, superscripts, Greek letters, and unusual characters must be clearly identified.

Acknowledgments

It is customary to acknowledge only persons who have made substantive contributions to the studies reported in the manuscript. Authors will please obtain written permission for everyone acknowledged by name (including references to unpublished work) because readers may infer their endorsement of the paper and its conclusions.

If appropriate, a statement of grant support may be included. Names of grant sources should not be abbreviated.

Experimental Procedures

This journal endorses the principles embodied in the Declaration of Helsinki and expects that all investigations involving humans will have been conducted in conformity with these principles. It is understood that the "Guiding Principles in the Care and Use of Animals" will have been observed in all animal experimentation reported in *FJ*.

Auxiliary Publication

Additional detailed tables, appendices, descriptions of materials and methods, mathematical derivations, extra figures, and other supplementary material too costly to be included in the journal article may be submitted for deposition without charge to the author with the American Society for Information Science (ASIS), National Auxiliary Publications Service. Material is deposited by the Editorial Office with the consent of the author, and a footnote is carried in the published article to the effect that photoprints or microfiche copies are available at moderate cost.

Author Charges

Authors are allowed a certain amount of illustrative material free of charge. Normally this will cover the equivalent of one full page of tables, figures, and halftones, or a half page of chemical and mathematical formulas and equations. Authors are charged for material exceeding this allowance. When excessive charges are anticipated, authors should make the necessary arrangements at the time a manuscript is submitted (i.e., initiation of an institutional purchase order, obligation of funds under a grant, etc.).

Page Charges

No page charges are made for any material appearing in *FJ*, irrespective of the source of such material.

Page Proofs

Two sets of page proofs together with the original manuscript are sent to the author. Proofs should be carefully checked without delay and any necessary changes or printer's errors (to be marked in red) should be clearly indicated in the margins. Except for correction of typographic errors, the cost of authors' alterations of subject matter in type will be charged to authors if these charges exceed the journal's allowance. Proofs should be returned promptly to the Editorial Office, The FASEB Journal, 9650 Rockville Pike, Bethesda, MD 20814, USA. A delay in returning the proofs will result in a delay in publication.

Reprints

Each author receives with the proofs a reprint order form that must be completed and returned with the proofs to the Editorial Office if reprints are desired. Orders submitted after the journal is printed are subject to considerably increased prices.
POSITIONS AVAILABLE — Classified advertisement rates: $160.00 for the first column inch, $145.00 for each additional inch or portion thereof. A column inch consists of eight lines, each containing approximately 70 characters (letters, numbers, symbols, punctuation marks, spaces). Display advertisement rates: $535.00 for a ¼ page (3½ inches x 5 inches); $800.00 for a ½ page (vertical 3½ inches x 10 inches or horizontal 7½ inches x 5 inches); $1070.00 for a full page (7½ inches x 10 inches); copy received not camera-ready is subject to an additional typesetting fee of approximately 5% of the rate. Advertisements will be published in the next available issue unless otherwise specified. Payment or purchase order is required with insertion copy. Advertisements are noncommissionable to agents; no cash discounts are allowed. Blind advertisements are not accepted.

POSITIONS DESIRED — Candidates registered with the FASEB Placement Service are allowed one non-display advertisement of five lines, each containing approximately 70 characters (letters, numbers, symbols, punctuation marks, spaces). The issue in which the advertisement appears will be based on the date of receipt of copy. Fee for publication in additional issues: $10.00 per issue.

Primary employers desiring identification and additional details concerning Positions Desired advertisers should write to the address below, indicating the hyphenated 5-digit number appearing as the last element of the advertisement; a one-page application from advertiser(s) will be provided immediately. Advance telephonic determination of current availability of advertisers from earlier-than-current issues is recommended. Employers not currently registered with the Placement Service are charged a minimum fee of $30.00 for identification of up to 10 advertisers, plus $3.00 for each above 10, payable in advance to the FASEB Placement Service.

Some registered candidates do not prepare Positions Desired advertisements; some advertisements are published at times not coinciding with employer recruitment activities. Therefore, primary employers not finding advertisements herein that appear to match current or projected needs are invited to request a search of all active candidate files; telephone or write a description of the desired qualifications, including the date by which the position is to be filled and any special considerations. Results of the search will be discussed telephonically with the requesting official, and applications from candidates declared suitable will be forwarded. Employers not currently registered with the Placement Service are charged a minimum fee of $30.00 for up to 10 applications, plus $3.00 for each above 10; an invoice will be forwarded with the applications.

In publishing these advertisements FASEB assumes no obligations as to qualifications of prospective employees or responsibility of employers, nor shall FASEB obtain further information concerning positions advertised or those seeking employment. Accuracy and completeness of all listings are the responsibility of the submitting party. Replies to announcements should carry copies of supporting documents, not original documents.

Various U.S. state and national laws against discrimination, including the Federal Civil Rights Act of 1964, prohibit discrimination in employment in the United States because of race, color, religion, national origin, age, sex, or any reason not based on a bona fide occupational qualification. The Federation of American Societies for Experimental Biology endorses these principles and reserves the right to edit all copy and to refuse advertisements not in consonance therewith.

Employment in countries other than the United States may be restricted by government visa and other policies. Moreover, it is suggested that the generally accepted employment practices, the cultural conditions, and the exact provisions of the specific positions being considered be investigated thoroughly. The U.S. Embassies in countries of interest to potential employees should be able to provide up-to-date data concerning internal conditions.

For a description of operation at annual meetings, please refer to the January or February issue or contact the Placement Service.

Address all correspondence to FASEB Placement Service, 9650 Rockville Pike, Bethesda, MD 20814. (301) 530-7020

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POSITIONS AVAILABLE

DIRECTOR OF TRANSPLANTATION IMMUNOLOGY RESEARCH UNIT. A director is being sought for a research program in transplantation immunology. This is a joint venture of the Toronto Hospital Corporation, the Canadian Red Cross, and the University of Toronto. The candidate must be an established investigator in the broad area of transplantation and immunology, with international stature in his/her area of expertise and may hold a Ph.D. and/or M.D.; must be able to provide scientific leadership for a multi-organ transplantation program that includes 8-12 independent investigators; will be expected to interact with university basic science and clinical departments and with the hospital-based transplant programs in developing a strong academic focus in transplantation immunology. Salary and academic rank will be commensurate with experience. The appointment could be made as early as July 1988. In accordance with Canadian immigration regulations, this advertisement is directed in the first instance to Canadian citizens and permanent residents. Applications should be directed to Dr. M. J. Hollenberg, Associate Dean, Research, Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada M5S IAB.

FACULTY POSITIONS IN BIOMEDICAL ENGINEERING AT VANDERBILT UNIVERSITY. Vanderbilt University School of Engineering announces the availability of tenure-track faculty openings in biomedical engineering. Positions are planned at the assistant professor level but applications by more senior candidates with strong records of research will be considered. Applicants should have education to the doctoral level in biomedical engineering or a related field and experience in biomedical engineering research. Preference will be given to applicants with qualifications and interests in the following areas: medical imaging (magnetic resonance, positron emission tomography, and other modalities); quantitative physiology with an emphasis on analysis of cellular and molecular phenomena; medical computing, including artificial intelligence and medical expert systems; some aspect of neurological science or engineering. Vanderbilt offers B.S., M.S., and Ph.D. degrees in biomedical engineering and participates in the M.D./Ph.D. program of the School of Medicine. Vanderbilt is an affirmative action/equal opportunity employer. Minority and female candidates are urged to apply. Applicants should send a CV and the names of three references to Chairperson, Biomedical Engineering Search Committee, Box 1724, Station B, Vanderbilt University, Nashville, TN 37235.
The Upjohn Company, recognized as a world leader in pharmaceutical research, is expanding its Diabetes Research Group and is seeking three scientists to initiate and carry out creative research in the following areas:

**Cell Physiologist/Biochemist/Molecular Pharmacologist**  
(Position #22044-F):  
Conduct original research directed toward understanding the mechanisms involved in translation of insulin receptor activation into biochemical and physiological responses, especially control of carbohydrate metabolism. Study mechanisms and biological processes involved in insulin resistance that might be manipulated pharmacologically to treat non-insulin-dependent diabetes mellitus. The applicants should have a Ph.D. or equivalent doctoral degree in a medical science. Post-doctoral experience studying receptors; post-receptor coupling of biochemical events with physiological response; mechanisms involved in hormone resistance and desensitization, and an interest in applying this knowledge to discovery of new therapeutic approaches for diabetes is desired.

**Integrative Pharmacologist/Physiologist/Endocrinologist**  
(Position #22045-F):  
Conduct original research directed toward understanding the mechanisms involved in the pathology and treatment of non-insulin-dependent diabetes mellitus focusing on functional interactions at the level of integrated physiological responses in vivo. Interface with biochemically and physiologically oriented scientists to investigate how specific chemical modulators of cell functions can be used to elucidate the mechanism(s) involved in development of diabetes and treatment of the disease. The applicants should have a Ph.D or equivalent doctoral degree in a medical science, preferably pharmacology, with at least 2 years of post-doctoral experience. A broad base of expertise in using animal models for studying metabolic diseases, preferably diabetes and its accompanying complications, is desirable. Excellent facilities and resources are available for maintaining special animal colonies.

**Biochemist/Endocrinologist/Pharmacologist**  
(Position #22046-F):  
Conduct original research directed toward understanding physiological control of the pathways involved in carbohydrate and lipid metabolism. Carry out integrative studies to understand how hormones, neurotransmitters, local humoral agents and drugs influence insulin secretion, action, or resistance. Interact with scientists of different disciplines interested in developing new therapeutic agents, especially scientists interested in in vivo models of diabetes and atherosclerosis. The applicants should have a Ph.D or equivalent doctoral degree in a medical science and expertise in the fields of biochemistry, endocrinology or pharmacology. Post-doctoral experience in analysis of mechanisms involved in diabetes is desirable. For all three of the above positions, applicants must have demonstrated effective collaboration with other scientists, the ability to integrate data from different disciplines, and strong oral and written communication skills. Publication of research data is encouraged, and it is expected that the successful candidates will attain peer recognition for their scientific accomplishments.

The Diabetes Research Group works within the Metabolic Diseases Unit, which also includes other laboratories focused on atherosclerosis, lipoprotein metabolism, and vascular cell biology. Interaction between laboratories is encouraged. Kalamazoo is a medium-sized Southwestern Michigan community with immediate access to a mix of excellent cultural, educational and recreational pursuits, including numerous lakes and a four-season climate. Upjohn offers a very competitive salary, commensurate with experience and an outstanding benefits program.

For confidential consideration, please call toll free 1/800/253-8600, ext. 3-6767, (inside Michigan call collect 616/323-6767) to request an employment application be sent to you. Please refer to the appropriate position number above when calling.

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Our commitment to scientific excellence continues...
RUTGERS UNIVERSITY

Seeks neuroscientists in the areas of electrophysiology, neurochemistry, neuroendocrinology, or pharmacology. These are tenured senior research positions at the highest level. Candidates must have a distinguished record of accomplishment in basic research and scholarly achievement. The candidates must be willing to pursue an active basic research program in alcohol and drug related areas.

Rutgers offers competitive salaries, start-up funds, new laboratory space, and an opportunity for active collaborative research. Light graduate teaching load. Qualified candidates should send a CV and letter expressing their interest to:

Dr. John A. Carpenter, Chairperson
Center of Alcohol Studies Search Committee
Smithers Hall – Busch
Rutgers, The State University of New Jersey
Piscataway, NJ 08854

An affirmative action/equal opportunity employer

DREXEL UNIVERSITY

DEAN, COLLEGE OF SCIENCE

Search Re-Opened

Drexel University invites nominations and applications for the position of Professor and Dean of Science. The University is a private, nonsectarian institution that emphasizes programs in science and technology, and is a national leader in cooperative education. Drexel has an attractive, modern campus in the University City section of Philadelphia. It enrolls 12,500 graduate and undergraduate students in seven colleges.

The College of Science includes the departments of Biocience and Biotechnology, Chemistry, Mathematics and Computer Science, Nutrition and Food Sciences, and Physics and Atmospheric Science, as well as associated multidisciplinary programs in Biomedical Science and Environmental Science. With a faculty of 91, an enrollment of over 850, and external research funding of $5 million per year, this growing college seeks a dynamic and innovative Dean.

The Dean is the College’s academic leader, chief administrator, and primary advocate within the University. The Dean reports directly to the Vice President for Academic Affairs and is responsible for administering all aspects of the College, for evaluation of all academic programs and faculty, and for providing leadership and guidance in research, curriculum, and resource development.

The successful candidate must have earned doctorate in an appropriate science discipline, should have demonstrated management experience with creative people, and a record of teaching, research, and scholarly achievement appropriate for tenure in one of the College’s departments. Appointment is for 12 months, effective on or after July 1, 1988. Salary is highly competitive. A letter of application (including a resume) or a letter of nomination should be postmarked by December 31, 1987, and sent to:

Chairperson, Dean of Science Search Committee
c/o Office of the Dean, College of Science
Drexel University, Philadelphia, Pa. 19104-9984

Drexel University is an equal opportunity, affirmative action institution that invites applications from minorities and women.

Research Scientist

The Formulations Section of the Agricultural Research Division of American Cyanamid Company has an immediate opening for a protein and peptide research scientist in an Animal Health Formulations Group to develop peptide/hormone delivery systems.

Applicants should have a Ph.D. with either post-doctoral or research experience in protein chemistry. The candidate should have a strong background in either organic chemistry or pharmaceutical sciences and experience in formulations is desirable but not essential. Responsibilities include delivery system design, formulation and stability work, and analytical method problem solving through the discovery and development of novel drug delivery systems.

American Cyanamid offers competitive salaries, benefits and a relocation package as well as opportunities for personal and professional growth. Please send resume, including salary requirements, to: Employment Office

American Cyanamid Company
Agricultural Research Division
P.O. Box 400
Princeton, NJ 08540

An Equal Opportunity Employer M/F/H

POST DOCTORAL RESEARCH ASSOCIATE

Position currently available for post doctoral studies of elastin. The applicant should be familiar with cell structure and radio labelling procedures. A background in molecular hybridization and/or radio immunoassay techniques is also desirable. Work will entail independent studies as well as collaboration with investigators interested in this protein. Send CV and list of references to Dr. Jerome Cantor, St. Luke’s/Roosevelt Hospital Center, 428 West 59th Street, New York, NY 10019. An Equal Opportunity Employer M/F.
POSTDOCTORAL POSITIONS

Postdoctoral research fellowship positions are available in the Molecular Biology, Cell Biology, Biochemistry, and Immunology Laboratories at the Jerome H. Holland Laboratory for the Biomedical Sciences. The positions are supported by individual investigator awards and by institutional funds. Salaries and benefits are competitive. The investigators and their research interests are:

Wilson H. Burgess: Structure and function of polypeptide growth factors and receptors
William Drohan: Molecular biology of coagulation and fibrinolytic polypeptides
Joan T. Harmon: Molecular and cellular biology of megakaryopoiesis
Leon W. Hoyer: Immunochemical properties of factor VIII inhibitors
Kenneth Ingham: Physical biochemistry of heparin-binding proteins
Graham Jamieson: Structure and function of platelet receptors
Gene Liu: Molecular and cellular biology of the extracellular matrix and atherosclerosis
Thomas Maciag: Molecular and cellular biology of angiogenesis and aging
James Perdue: Molecular and cellular biology of growth factors in development
Dorthea Scandella: Regulation of gene expression
Dudley Strickland: Cellular biochemistry of proteases and inhibitors
Andrea Tenner: Biochemistry and complement receptors
Jeffrey Winkles: Gene expression and the control of vascular cell proliferation

The American Red Cross recently established the Jerome H. Holland Laboratory as part of its commitment to a strong investigator-initiated basic research program. The American Red Cross promotes an open, collegial environment that facilitates scientific interactions. Send CV, names of three references, and an indication of the investigator and area of research interest to Dr. Howard Sandberg, American Red Cross, Research and Development Administration, 15601 Crabbs Branch Way, Rockville, MD 20855, USA.

An equal opportunity/affirmative action employer, M/F/H.

ASSISTANT PROFESSOR, IMMUNOLOGY/MICROBIOLOGY. The Department of Medical Microbiology and Immunology, College of Medicine, Texas A&M University invites applications for a tenure-track faculty position at the assistant professor level. This faculty member will be expected to participate in departmental medical and graduate student teaching programs and to establish a vigorous and independent research program. Postdoctoral experience relevant to a molecular aspect of immunology or microbial pathogenesis is desirable. The position is a 12-month appointment; emphasis will be placed on initial funding to support research and equipment purchases are available. Since the department is located within the campus of Texas A&M University, opportunities for interaction with the expanding university faculty and for participation in campus-wide graduate programs in molecular biology and genetics also exist. Interested applicants should send a detailed CV, reprint(s), and a list of three references to Dr. Karin Hauger. References to: Professor of Medical Microbiology and Immunology, Texas A&M University, College Station, TX 77843. An affirmative action/equal opportunity employer.

RESEARCH ASSISTANT PROFESSOR OF PHARMACOLOGY. to direct and teach graduate students in structure and function of GTP-binding regulatory proteins and related molecular pharmacology. Duties include related research using intrinsic tryptophan fluorescence, 31P and 31P NMR, and preparation and assay of Gs, Go, etc., using applicable physical techniques. Require Ph.D. in physics, biophysics, or physical chemistry and 5 years of experience. Send resumes to Jennifer Cordero, Administrative Assistant, Department of Pharmacology, University of Texas Health Science Center, 5323 Harry Hines Blvd., Dallas, TX 75235-9041. Equal opportunity employer.

CELL BIOLOGIST. The Institute for Environmental Medicine of the University of Pennsylvania seeks a cell biologist for appointment as assistant professor. Successful candidate will establish an independent research program and will supervise a core electron microscopy laboratory. Research areas of special interest include lipid-protein interactions, endocytosis, secretion, and epithelial cell differentiation. Initial appointment will be on the research track in an academic department appropriate to interests of the candidates. Guaranteed salary support, a well-equipped laboratory, and generous start-up funds are available. Deadline for applications is January 15, 1988. Send CV, names of three references, and statement of research interests to Cell Biology Search Committee, c/o Maureen Doran, Executive Assistant, Institute for Environmental Medicine, University of Pennsylvania, 14 John Morgan Bldg., 36th St. and Hamilton Walk, Philadelphia, PA 19104-6068. Equal opportunity/affirmative action employer.

ASSISTANT PROFESSOR OF PHYSIOLOGY. The Department of Physiology and Biophysics of the University of Louisville School of Medicine invites applicants for a tenure-track assistant professor position. An applicant should have a Ph.D. or M.D. degree, 2–3 years of postdoctoral research training, and research expertise in cardiovascular function with the gastrointestinal, systemic endocrine, and/or central nervous systems. This position will require development of an active, independent research program, some collaboration with ongoing departmental research programs, and participation in team teaching to meet departmental responsibilities. The salary is from state-funded sources and is nationally competitive. It is anticipated that the successful candidate will be identified for a starting date by July 1988. Send CV and names of three references by January 30, 1988, to Patrick D. Harris, Ph.D., Professor and Chairperson, Department of Physiology and Biophysics, Health Sciences Center, University of Louisville, Louisville, KY 40292. The University of Louisville is an affirmative action/equal opportunity employer.

CHAIRPERSON, DEPARTMENT OF PHARMACOLOGY. The University of Nebraska College of Medicine is seeking a nationally recognized investigator to fill the position of chairperson of the Department of Pharmacology. The candidates should have an earned doctoral degree in pharmacology or related area, a distinguished record in research that is currently active and funded, strong leadership qualities, and a major interest in the education of health professionals. Interested applicants should submit a CV and the names and addresses of three references to Office of the Dean, Attn.: Chairperson, Pharmacology Search Committee, University of Nebraska College of Medicine, Rm. 5025, Winton Hall, 42nd and Dewey Ave., Omaha, NE 68103. The closing date for applications is January 15, 1988. The University of Nebraska Medical Center is an equal opportunity/affirmative action employer and encourages applications from women and minorities.
FACULTY POSITION—HUMAN TUMOR IMMUNOLOGY-MOLECULAR MECHANISMS. University of Wisconsin Department of Human Oncology is seeking applicants for a tenure-track appointment at the assistant/associate professor level. A highly qualified individual, M.D. or Ph.D., is sought in the general area of tumor immunology with an interest in mechanisms of immune effector cell function and/or tumor cell death. Applicants are expected to be knowledgeable in immunological, biochemical, and molecular methods. Opportunity exists to interact with the Center along with other laboratories on campus. The successful applicant will be expected to develop a strong, independent research program and to participate in the departmental Ph.D. training program. Send resume and statement of research interest to E. C. Borden, M.D., Chairperson, Search Committee, Department of Human Oncology, University of Wisconsin Health Sciences Center, K9410, CSC, 600 Highland Ave., Madison, WI 53792. The University of Wisconsin is an equal opportunity/affirmative action employer.

DIRECTOR OF CLINICAL DIETETICS. Tenure-track 9-month position at the assistant/associate professor level. Candidates must be registered dietitian (R.D.) and have Ph.D. in nutrition or related field. Demonstrated ability in applied nutrition research and coordinated dietetic program administration and development. Starting date 8/88. Send CV and three references to Dr. Leora Shelef, Department of Nutrition and Food Science, Wayne State University, Rm. 160 Old Main Bldg., Detroit, MI 48202. Wayne State University is an equal opportunity/affirmative action employer.

PULMONARY CELL/MOLECULAR BIOL. Assistant or associate professor (tenure track) with expertise in molecular biology. This individual should have the ability to conduct independent research on the effects of inhaled particles (gases or aerosols) on chronic pulmonary disease, with emphasis on cellular and subcellular mechanisms through the utilization of molecular biology approaches. Typical research interests may include mechanisms of gene expression in: 1) collagen accumulation in pulmonary fibrosis, 2) mucin biosynthesis in chronic obstructive pulmonary disease, or 3) regulation of integral membrane proteins such as airway calcium channels in asthma, or ion transporters in cystic fibrosis. Candidates must have 2 or more years of postdoctoral training. Send CV, three letters of reference, and funding history to George Leikau, Ph.D., Director of Pulmonary Cell Biology Laboratory, Department of Environmental Health, University of Cincinnati, Cincinnati, OH 45267-0182. An affirmative action/equal opportunity employer.

THE DEPARTMENT OF PSYCHIATRY AT THE UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES is seeking to hire an assistant/associate professor. This is a tenure-track position with an emphasis on research and teaching. The department is composed of 12 full-time faculty with research interests and activities in the following primary areas: neurobiological and psychosocial consequences of stress, behavioral pharmacology, neurochemical correlates of drugs and behavior, and the neuropathic consequences of HIV infection. Individuals with active research interests that complement or expand on these areas are invited to apply. Send CV, a description of current and anticipated research interests, and the names and CVs of three references to Civilian Personnel, Uniformed Services University of the Health Sciences, 4301 Jones Bridge Rd., Bethesda, MD 20814-4799.

ASSISTANT PROFESSOR OF NUTRITION. Applications are invited for a 12-month, tenure-track appointment in the Graduate Program in Nutrition at the State University of New York at Buffalo (SUNYAB). Ph.D. in nutrition and 2 years of postdoctoral experience are required. Successful candidate is expected to develop and teach graduate courses in biochemical nutrition, develop research program in an area of metabolism that can attract external funding, advise students, and participate in committee work. Deadline for application is February 1, 1988. Send CV, three letters of recommendation, and a letter stating research plans and interest to Atif B. Awad, Ph.D., Nutrition Program Director, Chairperson of the Search Committee, 323 Kimball Tower, SUNY at Buffalo, 3435 Main St., Buffalo, NY 14214. SUNYAB is an affirmative action/equal opportunity employer.

Ph.D. MOLECULAR BIOL. RESEARCHER experienced in aging-related research wanted for expanding gerontology laboratory. Must be independent and competitive for grant funding. Guaranteed salary, benefits, and faculty appointment provided. Send CV to S. R. Gambert, M. D., New York Medical College, Munger Pavilion, Valhalla, NY 10595.

FACULTY POSITION—CLINICAL CHEMIST. The Chemistry Department at Cleveland State University will fill a faculty position in clinical chemistry. Salary and rank are open and depend on background and experience. Ph.D. degree in chemistry or biochemistry required. Candidates will, if they desire, also be considered for appointment as director of the clinical chemistry program. For senior level candidates, certification by the American Board of Clinical Chemistry is desired but not essential. Responsibilities will include teaching at both graduate and undergraduate levels and participation in the operation of the accreditation program. Position available September 1, 1988. Deadline for applications is January 1, 1988. Send CV and three letters of recommendation to Roger W. Binkley, Ph.D., Chairperson Clinical Chemistry Search Committee, Department of Chemistry, Cleveland State University, E. 24th and Euclid Ave., Cleveland, OH 44115. EOE, m/f/h.

PHYSIOLOGY POSITION, UNIVERSITY OF CALIFORNIA, SAN FRANCISCO. The Department of Physiology at UCSF seeks candidates for a tenure-track position at the level of assistant or associate professor. Candidates should have an active research program using cellular, molecular, or biophysical methods to study physiological problems. Those candidates whose research qualifies them to teach mammalian physiology are particularly encouraged to apply. Interested individuals should send a CV and a summary of research and arrange to have at least three letters of recommendation sent to Physiology Search Committee, Box 0444, V. Lingappa, University of California, San Francisco, San Francisco, CA 94143-0444. UCSF is an equal opportunity/affirmative action employer. Women and minorities are encouraged to apply.

ASSISTANT PROFESSOR—MICROBIOLOGY/IMMUNOLOGY. A tenure-track faculty position at the assistant professor level is available for a person capable of teaching immunology to medical students. Allocation of time is 25% teaching and 75% research. Applicants should have Ph.D. and names of three references to Gerald Trizh, Ph.D., Department of Microbiology and Immunology, Kirkvile College of Osteopathic Medicine, 800 W. Jefferson, Kirkville, IA 50435. KCOM is an equal opportunity/affirmative action employer.

CELL PHYSIOLOGIST. Tenure-track position for fall 1988 at the rank of associate or full professor. Ph.D. in physiology or related subject and postdoctoral research experience are required. Candidates must have a demonstrated record of independent research and ability to obtain funding for research. Submit application to Dr. Rajen Anand, Chair, Anatomy and Physiology, California State University, Long Beach, CA 90840 by 1/15/88. CSULB is an equal opportunity/affirmative action employer.

VASCULAR CELL BIOLOGY. The Department of Medical Physiology and the Microcirculation Research Institute at Texas A&M University announce the creation of two new tenure-track faculty positions at the assistant/associate professor levels. We are interested in individuals specializing in molecular and cellular physiology of vascular smooth muscle. Preference will be given to investigators who have already demonstrated the ability to conduct independent research and to garner peer-reviewed grant funding at the national level. The successful candidate will join a faculty composed exclusively of cardiovascular scientists with research interests ranging from molecular biology to system physiology. The new faculty members will participate in the department's medical and graduate education programs. Please send CV, statement of research interests, and the names of three references to Harris J. Granger, Ph.D., Professor and Head, Department of Medical Physiology, College of Medicine, Texas A&M University, College Station, TX 77843.

FACULTY POSITIONS IN PHYSIOLOGY AND BIOPHYSICS, CASE WESTERN RESERVE UNIVERSITY. The Department of Physiology and Biophysics invites applications for tenure-track junior and senior positions. Candidates with strong credentials in micromechanical properties of cell structure, and biophysical and cell physiology approaches are especially encouraged to apply. Women, individuals of minorities, and individuals with disabilities are especially encouraged to apply. Applicants should have Ph.D. and names of four references to Dr. Antonio Scarp, Department of Physiology and Biophysics, Case Western Reserve University, 2119 Abington Rd., Cleveland, OH 44106. The university is an equal opportunity/affirmative action employer.
**POSITIONS DESIRED**

Ph.D., 1983; Physiology, comparative and cellular physiology, epithelial transport, biochemistry; Binding protein studies, radiotracer transport studies, electrophysiology, microelectrode techniques including ion-selective microelectrodes, hormonal/neurotransmitter effects; Salary negot. 1-2020

Ph.D., 1983; Physiology, comparative and cellular physiology, epithelial transport, biochemistry; Binding protein studies, radiotracer transport studies, electrophysiology, microelectrode techniques including ion-selective microelectrodes, hormonal/neurotransmitter effects; Salary negot. 1-2020

Ph.D., 1983; Physiology, comparative and cellular physiology, epithelial transport, biochemistry; Binding protein studies, radiotracer transport studies, electrophysiology, microelectrode techniques including ion-selective microelectrodes, hormonal/neurotransmitter effects; Salary negot. 1-2020

Ph.D., 1977; Cardiovascular, autonomic pharmacology/toxicology; Experience with radioligand-receptor binding, radioimmunoassay, biostatistics, isolated tissue preparations, cardiopulmonary bypass perfusion and hemodynamic measurements; Available immediately; No geographic pref.; Prefer position in industry or govt.; Salary range $38,000. 2-2402

Ph.D., 1977; Cardiovascular, autonomic pharmacology/toxicology; Experience with radioligand-receptor binding, radioimmunoassay, biostatistics, isolated tissue preparations, cardiopulmonary bypass perfusion and hemodynamic measurements; Available immediately; No geographic pref.; Prefer position in industry or govt.; Salary range $38,000. 2-2402

Ph.D., 1988 (expected); Biochemistry, protein kinases/phosphatases; Phosphorylation of RBC membranes, antiproliferative effect of IFN, SDS-PAGE, autoradiography, tissue culture; Available Jan. 1988; Post-doctoral position in academia or industry; Salary negot. 2-2501

Ph.D., 1988 (expected); Biochemistry, protein kinases/phosphatases; Phosphorylation of RBC membranes, antiproliferative effect of IFN, SDS-PAGE, autoradiography, tissue culture; Available Jan. 1988; Post-doctoral position in academia or industry; Salary negot. 2-2501

Ph.D., 1984; Biochemistry, cellular biochemistry, nucleotide and polyamine metabolism; Analysis by HPLC, membrane transport in mitochondria, mechanisms of induced disease resistance in plants; Available January 1988; Teaching with research, industry: R&D, data analysis; Salary negot. 2-2502

Ph.D., 1984; Biochemistry, cellular biochemistry, nucleotide and polyamine metabolism; Analysis by HPLC, membrane transport in mitochondria, mechanisms of induced disease resistance in plants; Available January 1988; Teaching with research, industry: R&D, data analysis; Salary negot. 2-2502

Ph.D., 1989; Cardiovascular-pulmonary physiology, autonomic pharmacology; Expertise: bronchial circulation, airway reactivity, lung fluid balance, baroreceptor and chemoreceptor reflexes, aseptic surgery in large and small animals, in vivo and in vitro animal models, record of extramural funding; Research position; Salary negot. 1-2503

B.S., 1974; Toxicology, training; Experience in GLP animal lab. management, report writing, protocol preparation, development and implementation of technician training program and manual; Available immediately; Washington, DC area; Project coordinator in toxicology or testing lab.; Salary negot. 8-2504

B.S., 1974; Toxicology, training; Experience in GLP animal lab. management, report writing, protocol preparation, development and implementation of technician training program and manual; Available immediately; Washington, DC area; Project coordinator in toxicology or testing lab.; Salary negot. 8-2504

M.D., 1982; Ob/gyn resid. 1986, repro. endo. fellowship 1988, univ. trained, NIH research HPO axis physiology, clinical/basic, RIA, tissue culture, clinical experience, IVF/GIFT, lasers; Avail. July 1988; Prefer mid-southeast; Desire clinical practice/IVF/academia/research. E-192

M.D., 1982; Ob/gyn resid. 1986, repro. endo. fellowship 1988, univ. trained, NIH research HPO axis physiology, clinical/basic, RIA, tissue culture, clinical experience, IVF/GIFT, lasers; Avail. July 1988; Prefer mid-southeast; Desire clinical practice/IVF/academia/research. E-192

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**NOTICE**

**FJ EMPLOYMENT OPPORTUNITIES – POSITIONS AVAILABLE RATES**

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