

since developed, each with a more-or-less separate journal.

One finds, for example, that physicists influenced by Hopfield's work tend to publish in journals such as *Network*, *Physica D* and *Physics Review E*. Computer scientists, engineers and mathematicians, perhaps more heavily influenced by 'backpropagation', tend to publish either in *Neural Networks*, the official journal of the International Neural Network Society, or else in *Neural Computation*, which also accepts papers in theoretical neuroscience and whose chief editor is Terrence Sejnowski. This journal has strong links with the Neural Information Processing Systems Foundation, which sponsors an annual meeting in Denver, Colorado, the (refereed) proceedings of which form an archival record of progress in the field.

What about neurobiologists? Several years ago, under the leadership of James Bower, a new meeting on computational neurobiology was organized, devoted mainly to the properties of single neurons and small networks, ion channels and so on. This soon became a successful annual event, full of talks in which results obtained using well-known simulation software such as GENESIS and NEURON are presented. The forum for publication of these findings is *Journal of Computational Neuroscience*, first published last year. The journal already has a character distinct from those of the other journals mentioned above. Its contents very definitely concern neurobiology, not cybernetics or automata theory, or artificial neural networks, or algorithms and architectures, or implementations. On the basis of my reading of the journal so far (I am in fact a subscriber), I think it is already the best place in which to publish extensive computational and theoretical studies of neurobiological networks. It overlaps a little, but does not compete, with *Neural Computation*, in my opinion the leading periodical dealing with all the other topics as well as with some neuroscience.

The journal itself is well produced, as are all Kluwer periodicals. The format is excellent, the figures and tables are nicely done and the refereeing seems sufficiently rigorous. The subscription price is reasonable. What more can one ask? I expect *Journal of Computational Neuroscience* to become firmly established over the next decade as one of the main outlets for work in computational neuroscience. □

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#### Journal prices

Bibliographical details at the top of each review are given in most instances for 1995. Potential subscribers are therefore advised to check prices with the publisher.

## Calculating the secrets of life

Rakefet Rosenfeld

**Journal of Computational Biology: A Journal of Computational Molecular Cell Biology.** Editor-in-chief David T. Kingsbury. *Liebert*. 4/yr. USA \$174, elsewhere \$218.

*The Journal of Computational Biology* — for which a more suitable name might be *Journal of Biological Computations* — is aimed at filling a void created by the migra-

nable that the complexity and amount of biological data generated in the past two decades are challenging even the more theoretically minded computer scientists. The journal's founding editors, David T. Kingsbury (editor-in-chief) and Michael S. Waterman (senior editor), two of the principal driving forces behind the migration, have therefore taken on an extremely difficult mission: the creation of a truly interdisciplinary journal.

Truly interdisciplinary works that precisely state the biological problem in both biological and computer-science terms, rigorously work out the mathematics involved and go on to apply the algorithms developed in order to answer the biological

question are rare. In the first volume of the journal (containing four issues) the interdisciplinary goal is successfully met in several papers, commonly those written by an interdisciplinary team. A clear example is a paper entitled "On near-optimal alignments of biological sequences" by D. Naor (a computer scientist) and D. L. Brutlag (a biologist) that will undoubtedly interest computer scientists and biologists alike. Many other reports in these first volumes also aim to achieve this goal, but more often than not it is clear that the biology is alien to the authors and the result is a computationally sound but biologically less interesting paper. There are also many papers in which the connection to biology seems almost coincidental and is briefly stated in a single sentence; biologists, even the most computationally oriented, will find little interest in these. As the proportion of the former type of papers increases at the expense of the latter, the journal could well become the preferred 'home' for truly interdisciplinary studies in the field of molecular biology. □

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**Model makers: James Watson and Francis Crick display the structure of DNA.**

tion of computer scientists into the biological sciences. The void is situated between the more mathematical journals such as *Bulletin of Mathematical Biology* and *Mathematical Bioscience* and the more biological journals such as *CABIOS*. In the former category, rigorous mathematical analyses of computational methods with potential applications to biological questions are presented with brief discussions of the biological problems and usually no mention of direct applications or biological results, whereas in the latter category, reports on computational methods and applications are presented with an amateurish treatment of the mathematics, at best using heuristic or empirical arguments.

*Journal of Computational Biology* aims to address — and sometimes answer — biological questions with computational tools that have been rigorously developed and analysed. In the words of the opening editorial article, "biological science is now posing questions that not only require computational solutions, but which also provide problems of fundamental interest to computer scientists, statisticians, and mathematicians, creating an environment for effective interdisciplinary work". Although some would argue that the migration of these workers into biology is due to more prosaic reasons such as funding, it is unde-

## Barrier breaker

Stephen B. Dunnett

**Learning and Memory.** Managing editor Judy Cuddihy. *Cold Spring Harbor Laboratory Press*. 6/yr. USA \$127, elsewhere \$137 (institutional); USA \$57, elsewhere \$67 (personal).

In their introduction to the first issue, the editors of *Learning and Memory* adopt the ambitious mission of spanning topics "ranging from human amnesia to gene expression, from systems neurobiological studies of learning to synaptic plasticity in disassociated culture". They therefore aim to encompass a broad range of levels of