cation-exchange in the sodium-containing loess continually blown in from the desert which settles in the wetter delta area. Such effects have been noted in the Negev desert[4], and the coastal plain of Israel[5].

Cation exchange is even more clearly apparent in salt water from boreholes 121 and 129, in which Ca is increased compared with sea water; this is typical of areas where overexploitation of fresh ground water has resulted in the upward movement of salt ground water. The cations from seawater (mainly sodium) then exchange with those from the freshwater sediment (mainly calcium) in a process that is a good indicator of salt water upconing even when detailed hydrological information is lacking[6].

The message is clear: relative increases in groundwater concentrations can be used to calculate evapotranspiration, if the principles outlined by Eriksson are valid. This is difficult to demonstrate for cations such as sodium and potassium.

C. A. J. Appelo
Institute for Earth Sciences, Free University, De Boelelaan 1085, 1081 HV Amsterdam, The Netherlands

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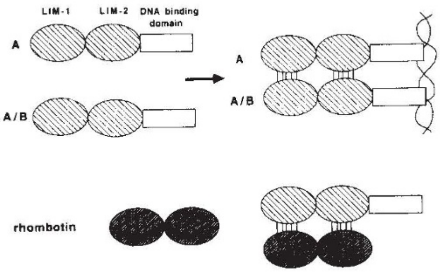
LIM domains

Sir—In the previously reported protein sequence of the presumptive T-cell oncogene rhombotin[1,2], the presence of two tandemly repeated cysteine-rich regions (CRR) was noted, suggesting that these might correspond to metal-binding domains. We have now found that these CRR domains are equivalent to the recently proposed LIM domains in the nematode cell-lineage proteins lin-11 and mec-5 (ref. 3) and the vertebrate transcription factor Isl-1 (ref. 4). This similarity places the rhombotin protein in the family of proteins involved in transcription control. But although lin-11, mec-5 and Isl-1 share a putative DNA binding homeodomain as well as the LIM domains, there is no such DNA-binding domain in the rhombotin protein.

This difference in the putative protein structures, therefore, suggests that LIM domains facilitate, in this case via metal binding, protein–protein interactions in a manner analogous to the leucine zipper[5] or the helix–loop–helix (HLH) motif[6]. Proteins carrying only protein oligomerization motifs could thus compete with transcription factors carrying compatible protein-interaction domains by docking with these proteins and preventing dimerization (see figure). The presence of proteins carrying only protein dimerization motifs may not be without precedent: myoD carries an HLH domain and a basic region thought to be involved in DNA binding[7], and Davis *et al.*[7] cite unpublished evidence for the presence of a protein carrying only an HLH domain in the same cell lineage. Generalizing on earlier proposals[8], interactions of this type could be one way to explain functional inactivation of genes by dominant negative mutations.



Docking model for LIM domain interactions. The hypothetical protein A is capable of homodimer or heterodimer (or oligomer) formation with protein B, via metal linkage at the LIM domains, to form a complex specifically binding to DNA and involved in transcription. The formation of this transcription complex can be competed for by interactions at compatible LIM domains with LIM-only proteins. Activity of such complexes will depend on the balance of concentrations of the various involved proteins. Thus the combinatorial interaction of LIM-only and DNA-binding proteins represents a potential strategy to regulate gene expression.

T. H. Rabbitts
T. Boehm
MRC Laboratory of Molecular Biology, Hills Road, Cambridge CB2 2QH, UK

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Increased bloom

Sir—Algal blooms have recently received considerable attention, particularly when they cause mass mortality of marine organisms. A worldwide increase of algal blooms in coastal waters has been documented and is usually related to man-induced increase in nutrients. It is still open to question whether algal blooms in the North Sea have increased due to such a eutrophication. This debate has considerable political interest: are measures to decrease nutrient inputs to the North Sea necessary?

In the Southern Bight of the North Sea, the colonial flagellate *Phaeocystis* sp. is the most important bloom-forming alga. Fortunately, it is not toxic, but its intensive foam production during the wane of these blooms makes North Sea beaches unattractive during the tourist season[1].

Continuous plankton recorder (CPR) data[2] indicate that *Phaeocystis* around the British Isles decreased from 1948 to about 1970, since when it fluctuated at low levels to increase again slightly from 1980 onwards at the British side of the Southern Bight. For the Dutch side of the Bight the trend is similar, but since 1980 not enough CPR data have been available[2].

This general decline and low levels of *Phaeocystis* after 1970 apparently contradict the almost continuous increase in duration of *Phaeocystis* blooms observed since 1974 at the Marsdiep station[3] for northern Dutch coastal waters. Historical data on *Phaeocystis* in the Marsdiep[4] indicate that *Phaeocystis* blooming periods lasted about 50 days in 1897 and 1899. The duration of these periods has increased two to threefold since then. These historical data and data for 1987–89 confirm our earlier conclusion of an increasing trend in duration of *Phaeocystis* blooms[3].

These two conclusions do not contradict each other: different water masses were sampled in both studies. The towing depth of the CPR (10 metres) prevents any sampling in coastal waters, and the number of sampling routes in the North Sea has decreased. Waters near the Dutch coast have hardly been sampled by CPR, certainly not adequately in recent years.

Dutch coastal waters are eutrophicated by continental river water, particularly from the Rhine[5]. This nutrient-rich water remains near the coast. The change observed during the past few decades in nutrient composition of the coastal waters (increase in nitrogen and phosphorus, no such increase in silica) particularly favours the flagellate *Phaeocystis*[3,5]. Whereas changes in plankton in the open North Sea largely reflect climatic changes[2], in Dutch coastal waters these climatic influences on phytoplankton seem to be overruled by eutrophication effects. Thus, *Phaeocystis* apparently behaves differently in Dutch coastal waters and in open North Sea water, in accordance with the respective elevated and virtually constant nutrient levels.

A decrease in nutrient loadings of the coastal waters is necessary to curb the ever-increasing algal blooms. Apart from nuisance due to foam accumulation on the beach, it is predictable that decomposition of the increased amounts of algal organic matter will lead to oxygen deficiencies, even in normally well-mixed Dutch coastal waters like the Wadden Sea.

Gerhard C. Cadée
Netherlands Institute for Sea Research, PO Box 59, 1790 AB Den Burg, Texel, The Netherlands

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