Collective nomenclature for LAP proteins

Sir — In 1996 Mary Kennedy and colleagues isolated the protein Densin-180 from the rat postsynaptic density[1]. This protein had a unique structure, in that it contained a set of leucine-rich repeats (LRRs) as well as a PSD-95/Dlg/ZO-1 (PDZ) domain; these domains are thought to mediate protein–protein interactions. Recently, further proteins containing both types of domain have been isolated from fly[2], worm[3], mouse[4] and human[4,5]. It seems an opportune time to select a collective name for this family of proteins.

We endorse the name 'LAP (LRR And PDZ domain) proteins' for proteins with this structure. We emphasize that the individual proteins will not be renamed. The known LAP proteins contain 16 canonical LRRs located at the amino terminus of the protein, as well as a conserved, LRR-like region immediately carboxy-terminal to the LRRs. The LRRs from LAP proteins are more closely related to each other than to LRRs from other proteins. The known LAP proteins also contain either one or four PDZ domains. It may be useful to distinguish between these subfamilies by using the designations 'LAP1' and 'LAP4' respectively.

Amongst eukaryotes for which complete genomic sequence is available, *Saccharomyces cerevisiae* (in which both LRR and PDZ domains can be found) contains no LAP proteins. *Caenorhabditis elegans* contains a single LAP1 protein, Let-413 (Ref. 3), whereas *Drosophila* contains both a LAP1 protein, dLAP1 (GenBank AAF58179), and a LAP4 protein, Scribble[2] (two alternative splice variants, GenBank AF190774 and AJ271647). Vertebrates are likely to contain at least three LAP proteins, as the LAP1 proteins Densin-180 (Ref. 1) and Erbin[4] are both found in rat, whereas human hScribble[2,5] (two variants, GenBank AF271734 and AF240677) is a LAP4 protein. Further vertebrate LAP proteins may be identified as complete genomic sequence becomes available.

Although analyses of these proteins are just beginning, one striking feature is their polarized localization along the cell membrane. This localization, in conjunction with the modular arrangement of the protein–protein interaction domains they contain, is consistent with genetic and molecular analyses indicating that LAP proteins may play a key role in regulating the subcellular distribution of other proteins. Identification and further studies of LAP proteins will reveal what aspects of function, as well as of structure, are conserved within this family.

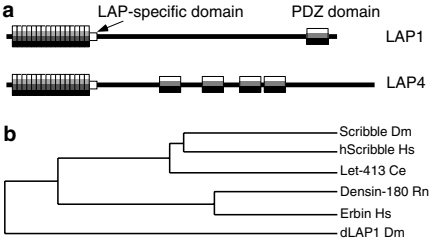

Fig 1 **The LAP protein family. a**, Structure of LAP proteins — LAP1 (Densin-180, dLAP1, Erbin, Let-413) and LAP4 (Scribble, hScribble) subfamilies. **b**, Phylogenetic tree of LAP proteins.

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1. Apperson *et al. J. Neurosci.* **16,** 6389–6352 (1996).
2. Bilder, D. & Perrimon, N. *Nature* **403,** 676–680 (2000).
3. Legouis, R. *et al. Nature Cell Biol.* **2,** 415–422 (2000).
4. Borg, J-P. *et al. Nature Cell Biol.* **2,** 407–414 (2000).
5. Nagase *et al. DNA Res.* **2,** 167–174 (1995).

Is the US benefiting from non-US scientists?

Sir — The Editorial 'Draining resources' published in *Nature Cell Biology*[1] deserves comment. I too share your concerns regarding the 'brain drain' from UK, but I should add that there is a similar drain from Europe, a fact mentioned in a report by Levin and Stephan[2]. They have shown that in 1980, 18.3% of postgraduate scientists in the US were non-US-born, but by 1990 this figure had risen to 24.7%. Also, from 1980 to 1990, more non-US-born or non-US-educated scientists were elected as members of the National Academy of Science, and significantly more citations, patents and founded biotechnology companies were from non-US-born or non-US-educated life scientists. Thus, a large proportion of individuals, making exceptional contributions to science in the US, are drawn from abroad and in particular from the European Community.

As a European, I am happy that European countries prepare people to make valuable contributions to science. Yet I realize and regret that Europe continues to lose these scientists to the US. Scientific institutions should therefore make it their priority to intensify research investment and to entice young scientists to remain in Europe. In the US, although they have benefited from the educational investments made by other countries, the effect on US-born scientists must be detrimental. I feel that reversing the poor public perception of science in Europe is crucial in stopping this brain drain, otherwise in a couple of generations much of the structure of European education and science may be lost.

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1. Editorial *Nature Cell Biol.* **2,** E51 (2000).
2. Levin.S & Stephan.P *Science* **285,** 1231–1214 (2000).

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