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LETTER TO THE EDITOR

ADDENDUM TO "RECONSTRUCTION OF GLUTAMINE SYNTHETASE USING COMPUTER AVERAGING"

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The article by Frank et al. [1] contains an erroneous term. The term occurs in statements that describe the symmetry of the axial projection of a cylindrical object. The term "centrosymmetric" was wrongly used to describe the presence of mirror symmetry in electron micrographs and in computed averages. Although no results or conclusions in the article are affected by the error, we feel obliged to correct it. This can be done by replacing the three paragraphs on page 287 in ref. [1] by the following:

"For any mass distribution within a cylinder, there are in general two axial projections, and they are mirror images of one another. Therefore an electron micrograph of a field of such cylinders will in general show two projections, related by mirror symmetry. However, only one projection occurs under either of the following conditions:

"(1) the cylinder faces the supporting grid with the same end, or

"(2) the cylinder mass distribution has at least one two-fold axis or symmetry perpendicular to the direction of projection. This would be the case for a stained glutamine synthetase molecule of symmetry 622 [2,3]. When condition (2) holds, the projection has a mirror line of symmetry.

"The average projection obtained from 50 glutamine synthetase molecules (fig. 2) after alignment (figs. 5a, b) does not exhibit a line of mirror symmetry. Instead, a 'windmill' pattern with cyclic symmetry is visible, with six elliptical low-density regions at the periphery of the spiral arms."

References

[1] J. Frank, W. Goldfarb, D. Eisenberg and T.S. Baker, Ultramicroscopy 3 (1978) 283.
[2] W. Kabsch, H. Kabsch and D. Eisenberg, J. Mol. Biol. 100 (1976) 283.
[3] T.G. Frey, D.S. Eisenberg and I.A. Eiserling, Proc. Natl. Acad. Sci. USA 72 (1975) 3402.

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