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Structural virology: Picturing the antics of a drugged virus

Biologists working at the level of the whole organism can (and often do) boast about the glorious complexity of their systems, and those who prefer to be at the molecular level flaunt the rigor of their reductionistic approach. However, only the virologists can legitimately claim both the honors, especially when they investigate drug–virus interactions. In their article on **page 441** of this issue, Arundhati Ghosh, R. Nayak and M. S. Shaila describe (and illustrate) the striking changes in the structure of the rinderpest virus, grown on host cells treated with 5-fluorouracil, a well known anti-cancer and anti-viral drug.

Being an analogue of uracil, 5-Fu is known to get incorporated in RNA, and the rinderpest virus, with an RNA genome containing many long stretches of uracils makes a particularly appropriate model system for the study of mechanism of action of this drug. By skillfully manipulating the dosage, the authors have arrived at the concentration of the drug low enough to permit the virus to multiply, yet high enough to alter it. The accompanying electron micrographs show dramatic changes in the virus particles – shrunken size, disappearance of the surface projections and near absence of the loosely packed coils of the nucleocapsids. Even more pronounced are the changes in the structure of the nucleocapsids which harbor the virus genome – the 'herring bone' appearance giving way to 'beads on a string' and the vanishing of the central core.

Ongoing biochemical studies will undoubtedly elucidate the detailed mechanism by which 5-Fu brings about these changes. Equally interesting and important would be the information generated about the basic molecular biology of the rinderpest virus – arguably the most important affecting the livestock as well as populations of wild ungulates in India and elsewhere.

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