primary mouse embryo cells but that is not particularly surprising.

The simplest interpretation of all these observations is, of course, that the regulation of expression of SV40 DNA occurs at the level of transcription and involves strand switching after DNA replication begins. Experiments now reported by Aloni (*Proc. US Nat. Acad. Sci.*, **69**, 2404 ; 1972), however, indicate that the situation is a good deal more subtle than it appeared at first sight. Using short pulses (2 min to 20 min) of ^{3}H-uridine to label SV40 RNA made at late times in monkey cells, Aloni has shown that both strands of SV40 DNA are extensively transcribed and that subsequently particular sequences in the two complementary RNA transcripts are selectively degraded by RNAase. In other words, at least late in the lytic cycle the regulation of expression of SV40 genes occurs at the post transcriptional level and involves the selective degradation of some SV40 RNA. Aloni, together with Attardi, has, of course, shown that the transcription of HeLa cell mitochondrial DNA is also symmetric and apart from the raising the question of how selective RNA degradation is achieved these two sets of observations raise the possibility that post transcriptional regulation of gene expression may be a more widespread phenomenon that has previously been countenanced.

CONTROLLED FUSION

Tokamaks to Win?

from a Correspondent

RESEARCH on controlled fusion and plasma physics is now conducted on such a scale that there must be one large international conference every year. By agreement the conferences of the European Physical Society alternate with those of the International Atomic Energy Agency and are now almost equally international in character. Certainly the Fifth European Conference held at Grenoble from August 21 to 25 had strong representation, not only from the Soviet Union (which appears in its own right as a European nation) but also from the United States, Japan and elsewhere.

The most frequently used word at the conference was undoubtedly Tokamak. Since the introduction of this axisymmetric toroidal concept for plasma confinement by members of the Kurchatov Institute in Moscow in the early 1960s, it has gradually gained ground against fierce competition from other ideas for magnetic plasma confinement (notably mirrors, high-β pinches and stellarators), and an uninformed observer at the Grenoble conference might well be forgiven for supposing that its victory is secure. Indeed it is now a hallmark of scientific respectability in a fusion laboratory to possess a Tokamak, and already seven have been (or are being) constructed in Europe, seven in the United States and six in the Soviet Union. This is not, of course, simply the pursuit of fashion: any fusion laboratory wants to have a plasma at something like the temperatures and densities required for a fusion reactor with a lifetime measured in milliseconds, if only to get its feet wet in the new technology involved.

This does not mean, however, that Tokamaks are without problems. In the first place, the plasma pressure confined within a Tokamak has not yet reached the level at which one could hope to design an economic reactor, and it is still unclear whether this is a difficulty of principle or not. In this context one uncertainty has been how small the Kruskal-Shafranov "stability safety factor" q can be, for the maximum attainable pressure theoretically scales as $1/q^2$, and a value $q=3$ would have seriously unfavourable implications. In many Tokamak experiments, for example those reported by Stodiek (Princeton University), a "disruptive instability" is encountered as q is reduced below 3, and one of the interesting new results of the conference was a provisional identification of this as the well known "tearing instability". The Soviet Tokamak group at the Kurchatov Institute have, however, now succeeded in pushing past this instability barrier around $q=2$, and the paper presented by Strelkov gave a convincing demonstration of the possibility of reaching $q=1$.

A second problem in Tokamak research has been that at present they can only operate with a very restricted range of plasma parameters, and all attempts to raise the density or temperature (both of which need to increase by a further factor of five to reach reactor conditions) have been blocked either by the "disruptive instability" or by the "runaway electron" phenomenon. Consequently much effort has been devoted to the search for new procedures to supplement the basic ohmic plasma heating mechanism in a Tokamak. Of the five methods under consideration, three were shown to be feasible, at least at low heating rates, one (injection of high energy neutral atoms) remains untried but promising, and one has encountered serious, though not necessarily insuperable, difficulties. The Princeton group relies on ion cyclotron heating, and has so far supplied 15 kW, amounting to about 15 per cent of the ohmic heating rate, which raised the ion temperature of a rather cool Tokamak plasma ($T_i=50$ eV) by a factor of two. The Kurchatov group, using electron cyclotron heating, raised the electron temperature from 500 to 2,000 eV in a rather low density plasma ($n_e=10^{12}$ cm^{-3}). A group at the Ioffe Institute in Leningrad reported strong absorption of r.f. power by the plasma at the lower hybrid frequency. The one discouraging note was the paper presented by Millar (Culham Laboratory) on the effect of transit time magnetic pumping on a toroidal plasma, which produced negligible heating but a rapid "pump-out" of plasma to the walls.

The outstanding problems facing Tokamak designs are such that it is certainly premature to abandon other toroidal confinement concepts, and it was clear from the conference that important work is still in progress on high-β toroidal pinches and on stellarators.

Methylation of Bovine Rhodopsin

BOVINE rhodopsin can now be added to the growing catalogue of proteins which contain methylated basic amino-acid residues for, as Reporter and Reed report in next Wednesday's issue of *Nature New Biology*, bovine rhodopsin contains monomethyl, dimethyl and possibly trimethyl lysine residues. Furthermore they have found that an uncharacterized protein associated with rhodopsin also contains trimethyl lysine and dimethyl arginine residues.

Reporter and Reed incubated freshly dissected bovine retinas overnight in a medium containing ^{3}H methyl methionine and subsequently solubilized the rhodopsin and other proteins of the retina with a non-ionic detergent and separated them by gel electrophoresis. The rhodopsin contained most of the ^{3}H methyl groups incorporated into amino-acids during the incubation period. Aliquots of rhodopsin isolated from rod outer segments after an overnight incubation with ^{3}H methyl methionine were then hydrolysed and the hydrolysates were separated by paper electrophoresis. Most of the radioactivity in amino-acids was found to be in methylated lysine residues.

Using standard Moore and Stein columns, Reporter and Reed then analysed methylated monomeric rhodopsin and found that of the ten lysine residues in each monomeric rhodopsin molecule one or two are probably monomethylated and four are probably dimethylated. In addition two of the five histidine residues appear to be trimethylated. As Reporter and Reed point out the methylation of the basic amino-acids of the opsin protein of rhodopsin may confer resistance to enzymatic degradation and it may also facilitate the attachment of the 11-cis retinal chromophore.