ylarsonic acid [MMA(V)] is reduced to MMA(III) before further methylation by methyltransferase, and this highly reactive MMA(III) intermediate has proved elusive and difficult to isolate *in vivo* or *in vitro*.[33] The DMA and MMA that we used in the present study are DMA(V) and MMA(V). The important role of MMA(III) and DMA(III) in promoting the effects of MMA(V) and DMA(V) on hepatocarcinogenesis should be assessed in a further study.

In an earlier study of the Ito test,[11] when the treatment was commenced at 9 weeks of age in 2/3 hepatectomied F344 rats given 100 ppm of DMA, a mortality rate of 60% was demonstrated. Therefore, in the work presented here we used 10-week-old rats at the starting point. Although some rats died of bleeding due to insufficient ligation for partial hepatectomy, no toxicity due to arsenicals was observed, which was a considerable difference in comparison with younger animals.

In our previous rat carcinogenicity studies, we found DMA to be a promoter in liver carcinogenesis, but not in itself a complete carcinogen in the liver,[8,11] even though it induced tumors in the urinary bladder.[12] Whether MMA and TMAO can be demonstrated to be complete carcinogens in the rat liver remains to be clarified.

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