

Method for the separation of mitochondria and apicoplast from the malaria parasite *Plasmodium falciparum*

ABSTRACT

The growth and the survival of the human malaria parasite *Plasmodium falciparum* are critically dependent on the functions of the two organelles - the mitochondrion and the apicoplast. However, these two organelles have been known to be difficult to separate from each other when they are released from *Plasmodium* cell. We have been searching for the conditions with which separation of the mitochondrion and the apicoplast is achieved. In this study, we investigated how the two organelle's separation is affected when the pressure of the nitrogen gas to disrupt the *Plasmodium* cells by nitrogen cavitation method is lowered from the pressure regularly applied (1200 psi). The parasite cell was sufficiently disrupted even when nitrogen cavitation was carried out at 300 psi. The obtained mitochondrial sample was much less contaminated by DNA compared with the sample prepared using the gas at the regular pressure. After the fractionation by Percoll density gradient, the mitochondrion and the apicoplast from the 300 psi cell lysate exhibited different separation profiles. This is the first experimental evidence that indicates the mitochondrion and the apicoplast of *P. falciparum* are separable from each other.