Different grades of agarose affect electrophoretic migration of large DNA molecules

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The relation between DNA size and mobility during Pulsed Field Gel Electrophoresis (PFGE) is complex. Chromosome mobility varies with switch interval and between the type of system used e.g. PFGE and Field Inversion Gel Electrophoresis (FIGE)(1,2,3). Here we show that the choice of agarose is critical for the separation and comparison of chromosomes and large DNA molecules.

Chromosomes of *Giardia intestinalis* and lambda DNA size markers (Clontech, Rockville, Maine) were separated in three grades of 0.7% Seakem GTG, Seakem ME and SeaPlaque agarose (Marine Colloids) by FIGE. Blocklets of the *G.intestinalis* stock BRIS/83/HEPU/106, were prepared and chromosomes separated by FIGE for 40h as previously described (3). The three grades of agarose were set in the one tray with temporary partitions separating the different grades until they were set.

The figure shows that separation and resolution of large DNA varied in the different grades of agarose. The smallest *G.intestinalis* chromosome is not well resolved in SeaPlaque; the third and fourth chromosomes are not well separated in Seakem ME over 40h; the mobility of the fifth and sixth chromosomes differ markedly between grades. The 700kb lambda species (arrowed) varies as does the migration of the 50kb lambda monomer. The *G.intestinalis* and lambda DNA vary relative to each other in different agarose grades. Different migration patterns have been attributed to various grades of agarose (4) but here we show that separation and resolution of *G.intestinalis* chromosomes which range in size from 0.6-1.5Mb when compared with yeast chromosomes separated by FIGE (3) varies with different grades of agarose.

Legend. Chromosomes of *G.intestinalis* (BRIS/83/HEPU/106) (lanes 2,4 and 5) and lambda DNA markers (lanes 1,3 and 6) were separated by FIGE. Lane 1 and 2-Seakem GTG, lanes 3 and 4-Seakem ME, Lanes 5 and 6- SeaPlaque.

References. 1.Schwartz,D.C. & Cantor,C.R.(1984) Cell 37,67-75. 2.Bernards,A. *et al* (1986) Gene 42,313-322. 3.Upcroft,J.A. *et al* (in press) Int.J.Parasitol. 4.Upcroft,P. (1988) Gene 65, 319-323.