

## Preliminary Studies on Various 3-D DNA Lattices

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**Introduction:** The purpose of our trip was to examine DNA crystals whose arrangement in space had been designed intentionally. We screened the crystals for their abilities to diffract X-rays.

**Methods and Materials:** DNA motifs were selected for their abilities to create space-filling intermolecular arrangements (1,2). The three motifs used were DNA double crossovers (3), DNA triple crossovers (4) and DNA parallelograms (5). Crystals were grown using the hanging drop method at various salt and precipitant concentrations. The crystals were transferred to cryosolvents and flash frozen in liquid nitrogen momentarily before x-ray exposure.

**Results:** Diffraction patterns were not observed for the majority of the crystals. We suspect that the exposure to the cryosolvents without previous equilibration shocked the crystals osmotically. One crystal, assembled from double crossover components, did diffract, but it showed evidence of deterioration in the x-ray beam. The data were limited to a sector of reciprocal space, with 8-15 Å resolution. This crystal was designed to be in space group  $P3_1$  with cell dimensions  $a = b = 33.75$  Å and  $c = 357$  Å. We observed  $a = b = 34.5$  Å,  $c = 360$  Å,  $00l = 3n$ , in agreement with the design.

**Conclusions:** Our design was successful in the one case that diffracted, but our crystals were of poor quality, possibly owing to osmotic shock.

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