

Abstract Submitted
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Polymer Models of Interphase Chromosomes¹ JOSHUA MARTIN,
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— Experiments during interphase, the growth phase of the cell cycle in eukaryotic
cells, have shown that parts of chromosomes are tethered to the nuclear periphery[1].
Using a simple polymer model of interphase chromosomes that includes tethering,
we compute the probability distribution for the distance between two marked points
on the chromosome. These calculations are inspired by recent experiments with two
or more fluorescent markers placed along the chromosome[2]. We demonstrate how
experiments of this kind, in conjunction with simple polymer models, can be used
to systematically dissect the spatial organization of interphase chromosomes in the
nucleus of living cells. This comparison of theory with experiments has led to the
conclusion that the structure of chromosome III in yeast is consistent with a 10nm-
fiber model of chromatin.

[1]Wallace F. Marshall. *Current Biology*, 12, 2002.

[2] Kerstin Bystricky, Patrick Heun, Lutz Gehlen, Jörg Langowski and Susan M.
Gasser. *PNAS*, 101(47) 2004

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