

Abstract Submitted  
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**Mechano-genetic DNA hydrogels as a simple, reconstituted model to probe the effect of active fluctuations on gene transcription.**  
DAN NGUYEN, OMAR SALEH, Univ of California - Santa Barbara — Active fluctuations – non-directed fluctuations attributable, not to thermal energy, but to non-equilibrium processes – are thought to influence biology by increasing the diffusive motion of biomolecules. Dense DNA regions within cells (i.e. chromatin) are expected to exhibit such phenomena, as they are cross-linked networks that continually experience propagating forces arising from dynamic cellular activity. Additional agitation within these gene-encoding DNA networks could have potential genetic consequences. By changing the local mobility of transcriptional machinery and regulatory proteins towards/from their binding sites, and thereby influencing transcription rates, active fluctuations could prove to be a physical means of modulating gene expression. To begin probing this effect, we construct genetic DNA hydrogels, as a simple, reconstituted model of chromatin, and quantify transcriptional output from these hydrogels in the presence/absence of active fluctuations.

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