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Journal Name:	American Chemical Science Journal
Manuscript Number:	2015_ACSj_17117
Title of the Manuscript:	Kinetics and entropy production of force-induced oligomeric enzyme catalysis in a single trajectory: effect of multiple substrates
Type of the Article	

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

(<http://www.sciencedomain.org/page.php?id=sdi-general-editorial-policy#Peer-Review-Guideline>)



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PART 1: Review Comments

		Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	The paper is well written and extensively discusses entropy production for a mechanical force induced enzyme kinetics in a chemiostatic conditions, both theoretically and numerically. Recently, different entropy production optimization principles have been applied to the study of enzymatic kinetics, and a very brief discussion on the issue of possible relations between two approaches would be interesting also. S Possible comments on the mentioned issue are left to the volition of the author(s).	In this work we have pointed out the calculation of entropy production and estimation of various thermodynamic quantities. For example, in time dependent chemical processes are described by the chemical master equation to obtain the thermodynamic quantities like entropy production. The thermodynamic quantities like entropy production are generally considered as an ensemble average property. However, very recently, microscopically one can define entropy production along a single stochastic trajectory which can be negative as well, particularly at short time and for small systems. Trajectory analysis technique has been successfully applied to various systems, e.g, chemical reaction networks, driven colloidal particles, single two level systems and also single biomolecular reactions . Enzyme kinetics at single molecular level has been extensively studied both theoretically and experimentally.



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<u>Minor</u> REVISION comments		We have also reduced some figures(three) which were less relevant in this version in view of our of our earlier works. Please see all the three references of our earlier works. In this version we have revised the article thoroughly for more clarity.
<u>Optional/General</u> comments		