Michaelis in–constant

F_{ext}	K_M	K'_M	v_{MAX}	v'_{MAX}
0.0	238030	243710	3.905	3.907
−1.0	249970	254680	3.079	3.057
−2.0	263440	268840	2.316	2.273
−3.0	272320	292800	1.584	1.554
−4.0	282930	360000	0.945	0.899
−5.0	296040	$\sim$ 900000	0.389	0.295

$$v' = \frac{v'_{MAX} \cdot q}{K'_M(F_{ext}) + q} \longrightarrow 4\text{–fold increase}$$

$$v = \frac{v_{MAX} \cdot q}{K_M(F_{ext}) + q} + \beta \longrightarrow \text{slight increase}$$

Conclusions

- The rate of ATP consumption strictly follows the Michaelis law;
- Velocity is linear with rate of ATP consumption at high ATP concentration;
- The observed fourfold increase in the Michaelis constant with applied load may be due to forcing $\beta = 0$;
- The model still accounts for an increase in the Michaelis constant smaller than 25% when forces vary by a factor 5 (in the range of pN).

Current Projects

- Investigation of close–to–equilibrium regime.
- Processivity of kinesin in two–state ratchet models.
- Discrete model with external force.
- Monte Carlo and Molecular Dynamics simulations to obtain information at a mesoscopic scale (with F. Cecconi).
- Molecular dynamics with effective potentials for kinesin (collaboration with F. Cecconi).